

Beyond the Hazy Skyline: Commuter Perspectives on the Effectiveness of R.A. 8749 in Addressing Jeepney Smoke Emissions in Davao City

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ABSTRACT

This study focused on examining the different perspectives of commuters in Davao City on the effectiveness of Republic Act 8749 in mitigating jeepney smoke emissions, as well as identifying the commuters' insights on this phenomenon, grounded in daily experiences in the context of public transportation in Davao City. The concept of the study was covered in SDG 11, particularly promoting sustainable transport, minimizing the negative environmental impact, and safeguarding the well-being of the environment in the city. The importance of sustainable consumption and production involving responsible practices in transportation systems was accentuated in SDG 12 as well. Employing a phenomenological approach, seven participants were selected and interviewed in depth through face-to-face interviews with informed consent, and a phone recorder was used to obtain notes and official records. The data gathered and documented responses were analyzed thoroughly, and five crucial findings emerged. Firstly, the R.A. 8749 is effective while necessitating regulatory measures in reducing air pollutant emissions. Secondly, challenges are leading to ineffectiveness of the Clean Air Act, involving the lack of awareness, insufficient policy promotion, and minimal fines for noncompliant jeepney drivers. Thirdly, the Clean Air Act can be both effective and ineffective through the policy's enforcement, ensuring rigorous implementation and a collaborative approach to alleviate critical health risks of air pollution. Fourthly, personal responsibility as a prevention measure is necessary to resist the challenges of environmental regulations. Lastly, intensive implementation of R.A. 8749 is essential in addressing the impact of jeepney smoke emissions on the well-being of the environment and health.

Keywords: Republic Act 8749 Clean Air Act, jeepney smoke emissions, air pollution, public transportation, Davao City

INTRODUCTION

Air pollution from vehicular emissions continues to be a significant and pressing issue despite the efforts to implement Republic Act 8749, also known as the Clean Air Act of 1999. Despite the passage of the country's Clean Air Act three decades ago, the Philippines has yet to achieve comprehensive air pollution control (Tantengco & Guinto, 2022). In a global setting, California's Clean Air Act and other states have been making ongoing efforts to reduce local air pollution and address the impact of mobile sources on climate change (Pappalardo, 2020). According to Böhm, Nanni, and Pappalardo (2022) the automobile emissions in European cities such as Rome, London, and Florence, the air pollution caused by vehicle emissions has become more noticeable and contribute significantly to air pollution, which has a significant effect on the environment and human health.

In the Philippines, according to the results of the study conducted by Myllyvirta (2023), the transportation sector substantially impacts the Philippines' greenhouse gas (GHG) emissions, accounting for around 15% of the nation's overall greenhouse gas emissions. Furthermore, vehicles are responsible for 65% of the air pollution in Manila, and jeepneys are also a significant contributor to the emission of pollutants in the Philippines. The majority of jeepneys are powered by diesel engines that are either obsolete or refurbished, and these engines are responsible for the emission of significant amounts of black soot and other contaminants. As a result, they are

responsible for more than 15% of the greenhouse gas emissions caused by road transportation, and they account for forty-eight percent of the airborne particulate matter in Manila (Climate Adaptation Platform, 2024).

Locally, the Davao City Airshed Governing Board, in collaboration with the Anti-Smoke Belching Unit (ASBU) of the City Environment and Natural Resources Office, Davao City (CENRO), has found a significant number of noncompliant operators and drivers to vehicular emissions standards. Of the 905 automobiles that underwent testing, only 379 tests were successful, while 526 failed (Environmental Management Bureau, 2023). Consequently, 526 citation tickets were issued to drivers and operators who failed to meet emission standards, and 164 drivers in Davao City have already been caught violating the Clean Air Act due to smoke belching. Meanwhile, one of the primary causes of failed emission tests is when vehicle owners neglect to properly maintain their vehicle's condition and fail to clean the pipes (Land Transportation Office, 2024). Moreover, a study in region 11 found that outdated vehicles were emitting unsafe levels of air pollutants, requiring rigorous monitoring and more vigorous enforcement of emission standards in the area to ensure they remain within acceptable levels of safety (Lu, 2022).

Therefore, this study seeks to fill the gap by evaluating the perspectives of commuters in Davao City regarding the efficacy of the Republic Act 8749 in mitigating jeepney smoke emissions. While previous studies may have assessed the general effectiveness of the Republic Act 8749, there are limited insights into how the commuters perceive its effectiveness in daily life in mitigating jeepney smoke emissions, particularly in the context of public transportation in Davao City. This study aims to fill that gap by understanding how these policies affect commuters' experiences and offering valuable insights to improve local and national air quality efforts. Hence, this calls for urgency and the need to conduct the study.

The research aims to offer and provide further knowledge and information for the stricter implementation of environmental laws. Generally, our study aims to examine and describe the different perspectives of commuters on the effectiveness of Republic Act 8749 in addressing jeepney's smoke emissions in Davao City and how it can help gauge its importance. To be specific, to explore the views of commuters on the effectiveness of Republic Act 8749 in addressing jeepney smoke emissions in Davao City, as well as to identify the insights of commuters on this phenomenon.

Furthermore, the study's findings are crucial for responsible government agencies, as they aid in improving policies, implementing restrictive measures, and refining operational processes to enhance air quality in the region. The results of this research would benefit responsible government agencies by advancing insights into public practices grounded in experiences inclined toward mitigating the environmental impact of vehicle emissions. This knowledge enables them to improve enforcement and refine monitoring systems that address the issues. The study findings also aim to motivate jeepney drivers to adopt climate measures that would significantly boost their economic prospects and advance their compliance with rules and ordinances supporting sustainable transport and community resilience. Finally, future researchers can use the findings and research outcomes as a guide for studying and further exploring the context of the Clean Air Act and its effectiveness in addressing the environmental impact of public utility vehicles.

Moreover, this study was covered in UN Sustainable Development Goal 11, which recognizes the importance of sustainable transport that promotes the integration of the economy while also considering the well-being of the environment. More importantly, the 2030 Agenda for SDGs underscores the significance of the transport sector in addressing climate change. By examining the different perspectives of the commuters on the efficacy of the Republic Act 8749, known as the Philippine Clean Air Act of 1999, in addressing jeepney smoke emissions, the study provides valuable insights towards promoting compliance behavior and increasing awareness regarding climate action. Thus, it is crucial to accomplish SDG 12, which entails reducing air pollution resulting from responsible practices in production and consumption, encompassing transportation (Clean Air Fund, 2023).

This study is anchored on risk perception theory, which explains how people perceive the risk of air pollution and understand the importance of R.A. 8749. It discusses the role of the perception of air pollution risks, due to its relevance in the environmental and health field. Commuters tend to expose themselves to air pollution due to their daily travel purpose. For instance, considering daily travel is necessary for the students going to school,

and tends to expose different vehicles emitting smoke. Moreover, this study focuses generally on the experiences of commuters towards jeepney smoke belching and how these experiences gave them the perception of the effectiveness of Republic Act 8749 (Cori et al., 2020).

Hence, Laranjo's (2016) theory of the health belief model is also a helpful framework that suggests that individuals are more likely to take preventive action against a health risk if they perceive the risk. In other words, every commuter needs awareness of health risk problems to evaluate whether the Republic Act 8749 was being implemented well. Proper awareness and advanced knowledge increased the willingness to follow the policy and have a healthy environment.

Moreover, Adam Smith's Rational Choice Theory, also called rational action theory, holds that people are self-interested, rational individuals who base their actions on carefully considering the advantages and disadvantages of various options. It also argued that if the commuters experienced smoke belching, Republic Act 8749 was not implemented, and followed by the people. Also, vehicle owners and operators might engage in smoke belching and may be motivated not to follow the policy as it does not benefit them (MasterClass, 2022).

METHOD

This section contains the research design, research participants, research instrument, data gathering procedure, analysis of data, and ethical considerations used in coming up with the study's findings.

Design and Procedure

The qualitative phenomenology method offers a valuable theoretical framework for educational research. It supports an in-depth exploration of complex phenomena such as human science experience or disciplines through flexible activities (Alhazmi & Kaufmann, 2022). The phenomenological approach is suitable for the research subject being examined, as the phenomenological study aims to comprehend the essence of social phenomena from the perspective of people who experienced it (Ataro, 2020). Additionally, a phenomenological design was used in this research to explore the experiences of the commuters in Davao City and seek to understand and describe their perspectives on the efficacy of environmental law, such as the Philippine Clean Air Act, in addressing the climate problems caused by vehicle emissions. Furthermore, Thomas (2021) notes that an evocative interview is essential for impactful and credible phenomenological research. Accordingly, it was supported by Iddo (2020) that open-ended and semi-structured interviews contribute to clarifying how individuals engaged in research should approach the inferences drawn from in-depth interviews and offer comprehension of the relationships among various situations by emphasizing how the discourse of actors facilitates collective action, often reinforcing the projects they describe.

Researchers obtained consent from the university's Research and Publishing Center before data collection. To conduct the study outside campus, researchers would submit a letter of authorization to the Dean's office of the College of Arts and Sciences Education (CASE). Upon approval of the study, the researchers would employ purposive sampling to identify the participants. Additionally, data would be collected via in-depth interviews and semi-structured formats utilizing open-ended, verified interview guide questions, enabling participants to convey their experiences and viewpoints freely and effectively. Furthermore, the researchers record the data using audio and video recordings, accompanied by notes created before, during, and after the interview. The data would be transcribed verbatim and subsequently examined through thematic analysis to identify patterns and themes. Ethical issues such as voluntary involvement, informed consent, and confidentiality would be rigorously observed during the procedure.

The significance of conducting ethically sound research is widely recognized (Tribe & Morrissey, 2020). Ethical considerations must be paramount and continuously addressed from the study's inception. The researcher must account for all potential scenarios and prevent harm (Lenton, Smith, Bacon, May, & Charlesford, 2021). Moreover, as research frequently necessitates extensive collaboration and coordination among diverse individuals across various disciplines and institutions, ethical standards uphold the fundamental values crucial for cooperative endeavors, including trust, accountability, mutual respect, and fairness (Resnik, 2020). Furthermore, the researchers intend to rigorously observe and comply with the ethical considerations imposed

on individuals and themselves. The researchers also aim to furnish prospective volunteers with detailed information on the study's objective and significance. The researchers would adhere to the Data Privacy Act of 2012 to safeguard the anonymity and confidentiality of participants' data and information.

Participants

The researchers opted to get participants who reside in Davao City. The researchers used non-probability sampling techniques when selecting research participants since they decided to use qualitative research, where the research participants cannot be randomly selected. Non-probability sampling methods were less objective than probability techniques. It was a sampling in which the researcher selects, refers, or self-selects participants rather than having each member of a target population engage in a study (Stratton, 2021).

The researchers selected participants based on their knowledge of the target population and the study. Moreover, the researchers chose participants who fit the study's purpose. Therefore, purposive sampling was used in this qualitative research. According to Campbell (2020), purposive sampling involves matching the sample, which were the research participants, to the research's goal and objectives.

The research participants were selected using criteria set to fit the study. The following are (a) a commuter in Davao City; (b) a resident in Davao City. The target participants were a total of seven (7) individuals. Moreover, exclusion criteria were constructed to specify participants. Those who were not commuters or residents in Davao City were not qualified to participate in the study. Moreover, participants who felt uncomfortable during the interview were allowed to withdraw.

Materials and Instruments

To gather appropriate data for the study, the researchers utilized interview guides to help unveil the participants' experiences and insights into dealing with jeepney smoke emissions under R.A. 8749 in Davao City. The researchers used open-ended questions consisting of research, identifying, and probing questions utilized during the interview with the participants.

The researchers would employ thematic analysis to examine the data. Christou (2022) asserts that this research method involves identifying, analyzing, and interpreting themes within a qualitative dataset. Thematic analysis is a vital analytical instrument for qualitative research that, when executed correctly, reliably yields insights into the phenomenon being studied or contributes to theory development. Thematic analysis facilitates the construction of a conceptual model of findings through a sequence of phases, encompassing keyword and quotation selection, coding, theming, interpretation, and model creation. This entails monitoring occurrences throughout data collection, generating prospective codes and themes, and formulating preliminary assertions that would be refined into a final model (Naeem & Ozuem, 2022).

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RESULTS AND DISCUSSION

This section includes the presentation and analysis of the findings of the data obtained in the study of the seven selected participants who are commuters within Davao City from both District 1 and District 2. In accordance with the inclusion criteria set for the sampling, the participants of the study are the following:

Participant 1 (P1) is a 21-year-old College of Arts and Sciences Education student. She is currently residing in District 1, Davao City.

Participant 2 (P2) is a 21-year-old College of Arts and Sciences Education student. She is currently residing in District 1, Davao City.

Participant 3 (P3) is a 20-year-old College of Arts and Sciences Education student. She is currently residing in District 1, Davao City.

Participant 4 (P4) is a 21-year-old College of Arts and Sciences Education student. She is currently residing in District 1, Davao City.

Participant 5 (P5) is a 21-year-old College of Arts and Sciences Education student. She is currently residing in District 2, Davao City.

Participant 6 (P6) is 21-year-old, and a student from the College of Arts and Sciences Education. She is currently residing in District 2, Davao City.

Participant 7 (P7) is a 22-year-old College of Arts and Sciences Education student. She is currently residing in District 1, Davao City.

Perspectives of commuters on the effectiveness of R.A. 8749 in addressing jeepney smoke emissions in Davao City

Based on the findings from the data being gathered, three themes revolved around the perspectives of commuters on the effectiveness of R.A. 8749 in addressing jeepney smoke emissions in Davao City. The themes are The Clean Air Act is effective, The Clean Air Act is ineffective, and The Clean Air Act is both effective and ineffective.

The Clean Air Act is Effective. Based on the gathered results, the enforcement of R.A. 8749 has proven effective and successful in reducing smoke emissions from jeepneys, particularly the black soot released by these vehicles. Compared to the period before the law was enacted, black carbon from poorly maintained jeepneys was more prevalent (Anbumozhi, 2023).

The study revealed that Participant 1 and Participant 5 supported enacting Republic Act 8749, indicating that it is an excellent approach and that regulatory measures are essential in curbing the dark smoke released by jeepneys. Additionally, Participant 1 accentuates the favorable effects of the Philippine Clean Air Act of 1999 in Davao City, pointing out the environmental and air quality improvements before implementing the law. According to Participant 1, Republic Act 8749 effectively reduces the black soot emitted by jeepneys. This demonstrates a significant achievement in addressing smoke emissions from jeepneys in Davao City.

“It is highly effective because, as I have witnessed, the streets of Davao, the jeepneys are not emitting dark smoke as they once did to evade the law.” (The R.A. 8749 is highly effective because I have witnessed in the streets of Davao, the jeepneys are not emitting dark smoke compared to before the law was enacted.) (P1, RQ 1.1)

Same with P1, P5 also highlighted that it is effective. According to her:

“The R.A. 8749 is needed gyud siya kay I've been in Manila, ang nakita nako didto kay ang air pollution is grabe ka grey and black ang color. So here in Davao City nga growing city and also daghan siya og naga agi nga vehicles from Digos moagi og Davao padung Tagum or Panabo. Dako kaayo siya og help para i-reduce ang air pollution and also help nga mag-less ang negative, especially sa citizens health.” (My perspective is that this law is essential. I have been to Manila, and the air pollution there is extremely severe and appears gray and black. In Davao City, a growing city, many vehicles pass through from one city to another, such as Digos to Davao or from Davao to Tagum and Panabo. Republic Act 8749 significantly reduces air pollution and minimizes its adverse effects, especially on public health.) (P5, RQ 1)

There was a perception identified by Participant 5 through a comparative lens, which expresses a comparative view based on their experience regarding the effectiveness of Republic Act 8749 in Davao City, noting that the level of air pollution from jeepney emissions is higher in cities like Manila. While Davao City experiences significant economic growth, it has also made notable progress in decreasing air pollution caused by jeepneys. Even though the transportation roadmap of Davao City aligns with other cities from Region XI, it has successfully upheld the positive outcomes of R.A. 8749, which has reduced vehicle-related air pollution, particularly from jeepneys.

Furthermore, the participant revealed the benefit of enforcing the Philippine R.A. 8749 in reducing the harmful impacts of air pollution on personal health. This implies that the health belief model influences individuals' awareness of health issues and associated behaviors in response to the risk level of pollution exposure (Oh et al., 2022). Research also indicates that behaviors associated with a higher pollution exposure risk are connected to fundamental beliefs regarding personal health risks, self-efficacy, and economic and material constraints. This suggests that presenting pollution primarily as an individual health matter, rather than a social issue in public discussions, could promote actions that decrease exposure and ultimately enhance both individual and community health outcomes (Bekbossynova et al., 2023).

The Clean Air Act is Ineffective. Although there was a substantial success manifested as the harmful pollutants released by jeepneys have declined in Davao City, Participants 2, 3, 6, and Participant 7 disclose the shortcomings of implementing the law, the Philippine Clean Air Act of 1999, in addressing the harmful pollutants from jeepneys. The results gathered involved a dereliction of duty related to minimizing the effects of a poorly maintained jeepney exhaust system. Lu (2022) discovered that the regulatory measures to address harmful pollutants from public transportation have been overlooked and pose safety risks due to noncompliance with emission standards. This entails that the number of jeepneys failing emission tests significantly exceeds those that do not emit black smoke from their exhaust pipes.

Moreover, Participant 2 highlighted that implementing emission testing and environmental regulations for public utility vehicles (PUVs) in Davao City appears ineffective. While there are noticeable improvements in some areas, such as the presence of PUVs emitting lighter, white smoke, many jeepneys, particularly in the downtown area, continue to emit thick, black smoke. This suggests that many of these vehicles may not have undergone or passed proper emission testing. The persistence of visible air pollution from these jeepneys indicates gaps in policy enforcement and compliance, highlighting the need for stricter monitoring, consistent implementation of emission standards, and perhaps more accessible or subsidized vehicle upgrades for operators.

“Actually, to be honest it is not yet effective gyud dinhi sa Davao City since kanang we can still see visible nga mga jeepneys nga mga black smoke gihapon. So basically, those jeepneys gyud kay wala to sila nag run through the emission test. So dili pa ingon ana ka effective though naay other mga PUVs nga white smoke na, however daghan gihapon ta og makita especially dinhi sa downtown area nga mga black smoke jeepney.” (The R.A. 8749 is not yet fully effective in Davao City. The jeepneys still emit visible black smoke; these jeepneys have not undergone emission tests. The black smoke emitted by the jeepney still outweighs the clear smoke emitted by other Public Utility Vehicles.) (P2, RQ 1.1)

Conversely, Participant 3 pointed out the significance of the enforcement of the Philippine Clean Air Act in addressing air pollution in the city, as it contributes to the Sustainable Development Goals for the environment by meeting air quality standards. According to him:

"Para sa akua, ma'am, if ang concern or ang gina address sa R.A. 8749 is ang smoke emission sa mga transport vehicles diri sa Davao City, I would say, ma'am, nga, according to my experience, is dili siya ingon ana ka effective or wala siya na implement og tarong, because as a commuter man gud makasinati man gyud gihapon ko kanang itom gani kaayo siya nga abog. I don't think nga kung na implement og tarong ang balaod is naa pa na siya karon." (For me, ma'am, if the concern being addressed by the R.A. 8749 is the smoke emissions from transport vehicles here in Davao City, I would say that, based on my experience, it is not very practical or has not been adequately implemented. As a commuter, I still experience much thick, dark smoke in the air, and I do not think that should still be happening if the law had been properly enforced. (P3, RQ 1.1)

Moreover, Participants 6 and 7 discovered that despite the significant changes in air quality emitted from the jeepney pipes, they failed to fully diminish the rampant cases of black carbon emitted by public transportation. Based on the data collected, concerns have been raised regarding the level of awareness of the measures outlined by law enforcement. The research circumstantially discovered the difficulties in adopting sustainability measures, including negligence relating to achieving the emission standard test, stemming from factors such as lack of sustainability knowledge, limited policy advertisement, and the light felonies imposed by the government for non-compliant jeepney drivers.

Correspondingly, insight through the fundamental lens of rational choice theory discloses the secondary negative collective consequences and that environmental problems are frequently caused by social dilemmas involving individuals' purposive action. Ultimately, the study demonstrates that factors influencing decision-making involving supportive leadership and commitment can and frequently significantly aid in enforcing sustainability (Alsharif, 2020).

"I can see nga naay significant changes nga gibuhay or na-achieve tungod sa ani nga balaod, sa R.A. 8749, pero I don't think nga it is fully successful kay naa gihapon ko ma observe nga mga jeepney nga naga emit og black smoke." (I can see that there are significant changes that have been achieved because of this law, R.A. 8749. But I don't think it is fully successful because I still observe some jeepneys emitting black smoke.) (P6, RQ 1)

As with P6, P7 shared that the implementation of R.A. 8749 is ineffective. He said:

"Dili kaayo siya ingon nga effective based sa akong experience because, then again, daghan og mga wala kaayo alam nga mga drivers, dili lang kay public vehicle drivers but also mga private vehicle nga mga drivers about this R.A. 8749, kay daghan gihapon og kanang mga nisupak ani na batas and then ang consequences ani nga mga butang kay dili pud siya strong ba, wala kaayo siya gina advertise or like man lang kanang mga tarps regarding this Republic Act. So dili kaayo gyud siya implemented, though naay uban nagafollow sa implementation especially tong mga knowledgeable about this, kaya lang, mostly gyud sa tanan especially sa the way nako makita as commuter, daghan gyud gihapon og wala naga follow." (It is not that effective based on my experience because, then again, many drivers both public vehicle drivers and private vehicle drivers are not aware of R.A. 8749. Many still violate this law, and the consequences for these violations are not strong. It is also not well-advertised, like having tarpaulins or posters about this Republic Act. So, it is not fully implemented, although some follow the law, especially those who are knowledgeable about it. But mostly, based on what I see as a commuter, many still do not comply.) (P7, RQ 1.1)

The standpoint of commuters accentuates the policy problem, as the findings indicate alarming smoke emissions from public transport vehicle engines. Consequently, the implementation of R.A. 8749 in Davao City has not fully addressed the societal issue of legal negligence, resulting in the proliferation of harmful pollutants. Thus, the result displayed the different aspects of environmental law barriers and overlapping influences on individual environmental behavior, noting the need for collective efforts to combat extreme consequences. Considering emissions from mobile sources like jeepneys, the black smoke emissions are still perceptible, underscoring the ineffective result of the R.A. 8749 framework.

The Clean Air Act is Both Effective and Ineffective. The feedback from a commuter perspective reveals a dual perception of the clean air policy: it is viewed as both effective and ineffective. This response highlights the complex relationship between policy formulation and implementation, particularly in urban transportation and environmental regulation. According to him:

"Ang akoang maingon ana nga policy kay both effective and ineffective. Effective siya in a way nga ginatabangan niya some certain advocates like kanang SDG nato karon, solving the air pollutions, deminishing somehow some problems with regards in our environment kay ang smoke itself kay very ka damaging not only to the atmosphere but the environment itself. The second one, ineffective siya kay as a commuter karon mapansin nimo nga naa gihapon mga jeepney nga ang mga tambutso daghan kaayo og aso naa man gud toy kemikal, like sa atoa palang nga mga tao nga makalanghap ato very pod siya ka damaging sa atoaang well-being. Ineffective siya in a way nga ang enforcement dili kaayo siya ingon ana ka visible, dili lagi applicable ang enforcement." (I can say that this policy is both effective and ineffective. It is effective in a way that it helps support certain

advocates, particularly those aligned with the Sustainable Development Goals (SDGs), such as addressing air pollution and minimizing some environmental issues as the smoke emitted from vehicles is very harmful not only to the atmosphere but also to the environment. On the other hand, it is ineffective because, you can still observe many jeepneys with exhaust pipes emitting excessive black smoke which has not been fully addressed, and inhaling such fumes that contains chemicals is extremely harmful to people's well-being. The policy itself is well-intended, but its enforcement is not as effective.) (P4, RQ 1)

The policy is seen as effective in terms of its goals and alignment with global advocacy efforts, such as the United Nations' Sustainable Development Goals (SDGs), particularly Goal 13 (Climate Action) and Goal 11 (Sustainable Cities and Communities). Meaningful advancements in air quality can only be realized by integrating the objectives of the Sustainable Development Goals into policy efforts. As Anh (2023) noted, the policy addresses air pollution by aiming to reduce harmful vehicle emissions, which are recognized as major contributors to environmental degradation and health hazards. This indicates that the policy successfully promotes awareness and provides a framework for cleaner air and healthier living conditions.

However, the perceived ineffectiveness lies in the lack of strict, visible enforcement. Despite the policy's existence, commuters continue to observe widespread non-compliance, especially among public utility vehicles like jeepneys that emit thick smoke. This persistent issue suggests a gap between policy intent and real-world practice. Moreover, the continued presence of smoke-belching vehicles implies that mechanisms for monitoring, regulating, and penalizing violators are either weak or inconsistently applied.

The results also emphasize profound health implications, especially for daily commuters regularly exposed to toxic fumes. Lesidan et al. (2023) state that air pollution has specific health effects. When air quality monitoring devices are unavailable, cities can utilize medical records from hospitals and health centers to gather data on the percentage of patients with respiratory-related illnesses to evaluate air pollution's health and mortality effects.

Moreover, environmental legislation has been present in the Philippines for over a century, yet enforcing these laws has consistently proven difficult. Although the government establishes these regulations and outlines standards, they remain ineffective if not enforced consistently and adequately. For genuine environmental protection, a collaborative approach is essential; regulatory bodies require support from the private sector, local governments, and communities to foster a change in attitudes and behaviors towards sustainability (Deron, 2020).

Furthermore, the results suggest that encouraging eco-awareness through educational initiatives and strategic programs enhances the enforcement of regulations and contributes to both human well-being and environmental sustainability, especially when individuals engage actively. It aids in addressing the shortcomings of insufficient institutional enforcement and enhances the effectiveness of legal frameworks.

Commuters' insights on the effectiveness of R.A. 8749 in addressing jeepney smoke emissions in Davao City

Based on the findings from the data obtained, two themes revolve around the commuters' insights on the effectiveness of R.A 8749 in addressing jeepney smoke emissions in Davao City. The two themes were Personal Responsibility and Intensive Implementation Concerning Jeepney Smoke Emissions.

Personal Responsibility. Implementing the Philippine Clean Air Act of 1999 (R.A. 8749) necessitates systemic enforcement and active participation from the commuting public. Insights from Participants 2, 5, 6, and 7 reveal a recurring theme of personal responsibility in addressing the persistent jeepney smoke emissions in Davao City. These commuters emphasized that while governmental efforts are crucial, individuals can proactively reduce their exposure and promote environmental awareness.

“It is inevitable man gyud na syempre as a commuter dili man gyud ta pwede makabuot sa mga drivers nga kailangan gyud nila mag undergo og emission test kay we never know nga kana pud diay nga drivers naay something hindrance na di sila makapa-emission test. We need to do lang gyud is to be extra careful if ever nga maka encounter ta og mga black smoke during our commute days, just protect yourself na lang. It is essential to

do their job properly to undergo an emission test. Lastly, murag daghan na man gyud ta og mga nakita, I think it's time for us to tell na sa mga naay mga position na naa gihapon mga ingon ani na mga panghitabo na dili gyud tanan naga follow, para mahibal-an nila na ang ilang gihimo na balaod is not yet effective.” (Inevitably, we cannot control the drivers' decision-making to undergo emission tests; we never know the hindrances that prevent some drivers from complying with the law. We must be extra careful during our commute days; if we ever encounter black smoke from the jeepney, protect ourselves. It is important to undergo a jeepney emission test. We can still witness many violations, but it is time to tell the authorities that not all drivers follow this law entirely, and also for them to be aware that it is not yet fully effective.) (P2, RQ 2.3)

Furthermore, P7 substantiated the viewpoint of P2 by stating:

“Ang akoang na learn sa kani nga R.A. kay kinahanglan kanang maging aware pud ta, dili lang kay ang mga drivers but also kita. Kung dili man ma implement og maayo sa government kita na lang hatag og advice sa mga drivers or di kaya mag mask na lang gyud para dili kaayo maapektuhan imong health and para ma aware pud ang ubang tawo na naga exist diay ni nga R.A.” (The lesson I've learned regarding this R.A. is we need to be aware not just the drivers but also us commuters. If the government cannot fully implement it properly, like giving advice to drivers or by wearing mask to protect ourselves. So that we will not be too affected. And we can also help others to be aware that this R.A. exists.) (P7, RQ 2.3)

This perspective aligns with recent findings indicating that individual actions, influenced by social norms and personal awareness, significantly promote sustainable behavior. Moreover, Click (2025) highlights that social norms are among the most effective strategies to encourage eco-friendly behavior, suggesting that when individuals observe others engaging in pro-environmental actions, they are more likely to adopt similar behaviors. This behavior also aligns with the Risk Perception Theory, which suggests that individuals are more likely to take preventive actions if they perceive themselves at risk (Slovic, 2023). Commuters who experience enhanced health effects due to air pollution tend to perceive greater personal risk, prompting actions like mask-wearing or avoiding smoke-heavy areas.

“Ang lesson nako nga na take is pahalagahan gyud nimo ang health since taas pud kaayo akong exposure sa pollution. So, if ever nga maapektohan ko, dako kaayo siya og drawback not just sa health nako but overall gyud nako nga activities.” (“I've learned the importance of prioritizing health due to daily exposure to pollution, which can negatively impact both well-being and daily activities.”) (P5, RQ 2.3)

Additionally, the Health Belief Model (HBM) helps explain commuters' behaviors through its key components: perceived susceptibility, perceived severity, perceived benefits, and cues to action. Commuters recognize their susceptibility to air pollution and the severity of its effects on health and productivity. The perceived benefits of wearing masks and educating others are substantial, especially without institutional safeguards.

The Rational Choice Theory also supports this theme. Commuters act based on cost-benefit analysis: when enforcement is weak, the rational action is to protect oneself rather than rely on external systems. This rationality is seen in behaviors like opting for different transport modes, mask-wearing, and speaking out to drivers and officials.

“Naa gyud koy mga experiences nga makaingon ko nga dili gyud fully effective ang kani nga legislation pero it was gradually improving nga gamay na lang ang jeepneys nga nagabuga og black smoke. Although naa rani nga problema gihapon, makaingon man ko na dili gyud ni siya ma solve nga problem o mas mograbe pa siya in the future. Naa man pud tay mga options like mag opt out na lang sa mga closed space nga vehicles. We should be flexible and dapat mag venture out jud ta sa laing options pa instead of finding alternatives, we can also be the one who can help or kanang mag sita mismo sa mga jeepney drivers nga naa gihapoy mga engines nga outdated and nagabuga gihapon og black smoke.” (This legislation is not fully effective. The situation is gradually improving, fewer jeepneys are now emitting less black smoke. Although the problem still exists, I think this issue cannot be completely solved or may even get worse in the future, and that we have options like we can opt for enclosed vehicles. We should be flexible and explore other options. But instead of just looking for alternatives, we can also take part in addressing the issue for example, calling out jeepney drivers who still use outdated engines that emit black smoke.) (P6, RQ 2.3)

Furthermore, the study by de Guinto et al. (2024) underscores the importance of transitioning to cleaner technologies, such as Euro-4 engines for jeepneys, to significantly reduce air pollution. While systemic changes are essential, the role of commuters in advocating for and supporting these transitions is equally critical. Commuters' proactive behaviors, such as choosing eco-friendly transportation options and supporting policies for cleaner air, can collectively influence broader environmental outcomes.

Despite these commendable personal initiatives, these actions reflect the government's failure to build structural environmental responsibility. According to the Department of Environment and Natural Resources-Environmental Management Bureau (DENR-EMB), vehicles primarily contribute to Metro Manila's air pollution, accounting for nearly 88% of pollutants (Gonzales, 2023). This statistic underscores the need for more robust policy enforcement and public education to complement individual efforts.

This underlines a critical gap in the Clean Air Act's effectiveness. While commuter behavior shows promise in supporting environmental goals, it also exposes structural weaknesses in enforcement, public education, and stakeholder collaboration. The insights gathered suggest that commuters are not merely passive recipients of policy outcomes but active agents in shaping environmental resilience, where individuals compensate for systemic gaps by engaging in self-protective and advocacy behaviors. This angle deserves recognition and reinforcement through future policy amendments.

Intensive Implementation. From the results that the researchers have gathered, we have observed that commuters understand and learned that the implementation of R.A. 8749 in addressing jeepney smoke emission in Davao City needs enhanced enforcement. The responses of Participants 3, 4, and 1 highlight a recurring emphasis on the need for intensive implementation as a strategic approach to address the ongoing issue of jeepney smoke emissions in Davao City. Enhancing the enforcement of the implementation helps commuters lessen internal and external effects or outcomes, such as health risks and increased pollution impact. Furthermore, enhancing the implementation of the R.A. 8749 in addressing jeepney smoke emission in Davao City led the commuters to value the importance of well-being and the environment.

“I’ve learned that the implementation is need to be enhance. If possible siguro magbuhat pa ta og mas updated nga balaod nga mas rigorous ang pag implement, especially nga kabalo ta nga harmful diay na siya sa atong environment og ilabi na sa atong health. Ang law siguro is need siya ma-update or need siya ma implement og tarong gyud.” (The law needs to be enhanced and updated to ensure stricter implementation as it is harmful on the environment and public health. It should be properly implemented.) (P3, RQ 2.3)

This viewpoint underscores the weak enforcement of policies in governing harmful smoke emissions from jeepneys containing old engines. Commuters' call for stricter laws shows growing concern about environmental health risks and highlights weak law enforcement. The participant's support for the strict enforcement of R.A. 8749 reflects the Rational Choice Theory, which states that individuals make decisions through a cost-benefit analysis to optimize their well-being and minimize harm. From this perspective, commuters and citizens support effective environmental policies when the anticipated advantages, such as enhanced air quality and improved health, exceed the associated inconvenience or cost (Nickerson, 2023).

“I would be a full pledge advocating that kind of policy. Kay ako mismo biktima man gyud ko, kana ganing ni agi lang ko sa kilid sa jeep, unya ang aso gyud kay ni sugat sa akoang atubangan. Nganong naa pay mga ingon ani nga naa man tay policy. Nganong wala paman sila kabalo og wala nila nasabtan nga ilaha manang makina. Ang kuan gyud ani nila means of income concern pud ta like dili pud ta maka-selfish nga ang halin, ang kwarta nga atong matigum for that day kay mao lang gyud atong priority. Let’s be considerate sa karon nga panahon nga like earth is a fragile thing. Pwede ko magtabang og mag-volunteer. Dili lang gyud siya ingon ana ka applicable ug visible nimo makita sa society, especially sa Davao City kay tungod sa kadaghan og tawo og tungod sa kanang unregistered jeepneys. Hopefully soon ma enforce ang system og tarong.” (The policy is important, but enforcement remains weak, especially in Davao City. Many jeepneys still emit harmful smoke, affecting both people and the environment. While jeepney drivers prioritize income, they should also consider the long-term consequences of pollution. Given the opportunity, the speaker would advocate for stricter enforcement and awareness campaigns to ensure better compliance and environmental protection.) (P4, RQ 2.3)

Furthermore, P1 also supported the answers of P4 as he stated: “I would highly propose the strict implementation of R.A. 8749. Society must comply with this since we are trying to fight the emission of smoke through the gases in the vehicles in Davao City. Moreover, if I saw a non-compliant jeepney driver with the R.A. 8749, I would try to educate them on the importance of complying with this.” (I would highly propose the strict implementation of R.A. 8749. Society must comply with this since we are trying to fight the emission of smoke through the gases in the vehicles in Davao City. Moreover, if I saw a non-compliant jeepney driver with the R.A. 8749, I would try to educate them on the importance of complying with this.) (P1, 2.3)

Systemic and vigorous enforcement of the implementation of policies allows individuals to improve their well-being and regulate air pollution. Hence, strict policy implementation is needed, especially in a growing city. Aside from this, systemic enforcement of implementation means effective prevention and creates comfort for its constituents. According to the Health Belief Model, people are more likely to support health-related behaviors and policies when they perceive personal risk. In this case, commuters inhale smoke from aging jeepneys, leading to direct health consequences. P3 stated that strict implementation reflects the well-being of constituents, specifically commuters, daily. He also knows that advocating for systemic implementation can ease environmental problems, especially air pollution.

Enhancements for policy implementation must be strictly enforced for the public as they aim to regulate health risks and air pollution. According to Ruud (2021), strict implementation significantly improves the efficacy of policy execution. In addition, intensively implemented policies enhance the probability of attaining desired outcomes through heightened accountability and concentration. Thus, mainly aids in bridging the gap between policy formulation and practical implementation.

Moreover, commuters' favor for stricter law enforcement reflects an increasing public demand for accountability and responsiveness from the Local Government in Davao City. Most commuters dislike the health risks and air pollution in Davao City and are more likely to prioritize well-being and safety. Because of this, many commuters' experiences indicate that the mere presence of laws is insufficient to prevent violations or enhance safety. The most important aspects are the effectiveness of enforcement and observable consequences for non-compliance. However, since commuters cannot control environmental pollution, we must allow them to advocate for systemic or stricter implementation of Republic Act 8749 in addressing jeepney smoke emissions in Davao City (Sehgal, 2020).

CONCLUSION AND IMPLICATION

This section presents the conclusions and implications of the research based on the themes generated from the results and discussions discussed in the previous chapter. This study explores commuters' perspectives and insights into the effectiveness of R.A. 8749 in addressing jeepney smoke emissions in Davao City.

Conclusion

This qualitative research in-depth interview presents the positive and negative perspectives, as well as the amalgamation of both viewpoints and insights of commuters regarding the effectiveness of R.A. 8749 in addressing jeepney smoke emissions in Davao City. Firstly, although the Clean Air Act has been proven effective by commuters in curbing the dark smoke emitted by jeepneys, the importance of regulatory measures as an excellent approach to managing and decreasing air pollutant emissions is emphasized. Conversely, some commuters believe the Clean Air Act has not been effective due to challenges in reducing black carbon from poorly maintained jeepneys and external factors such as a lack of awareness about sustainability, insufficient promotion of policies, and minimal fines imposed on non-compliant jeepney drivers. Moreover, the Clean Air Act can be viewed as both effective and ineffective; commuters voiced their support for the policy's enforcement as it improves air quality and curbs jeepney emissions, accentuating the significant achievements with SDGs for environmental enhancement in air quality standards. While participants proved the pollution-free environment is not fully achieved, it stresses the importance of stringent enforcement of environmental regulations and a collaborative approach among communities, local government, and private sectors to mitigate the serious health risks posed by harmful pollutants emitted by jeepneys and to foster environmental sustainability. However, it can be concluded that implementing the Philippine Clean Air Act is ineffective in addressing the jeepney smoke

emissions in Davao City.

Secondly, the commuters' insights accentuate that while R.A. 8749 implementation in Davao City faces enforcement challenges, commuters are not passive, emphasizing personal responsibility, a conscious effort to protect their health, and advocating for cleaner air despite institutional limitations. Commuters perceive the dangers of jeepney smoke emissions, recognize the insufficiency of policy enforcement, and take rational, preventive actions such as mask-wearing, behavioral adjustments, and public awareness efforts. This suggests that while personal responsibility is commendable and necessary, it must be complemented by stronger policy implementation, guiding local government efforts to improve environmental regulations to avoid unjustly shifting the burden of environmental protection solely to public health. Furthermore, grounded in the Health Belief Model (Laranjo, 2016) and Risk Perception Theory (Cori et al., 2020), commuters recognize the health risks associated with jeepney smoke emissions. Therefore, they are motivated to take preventive actions and advocate for stricter and enhanced policy implementation. Lastly, aligned with Rational Choice Theory, commuters are more likely to support environmental regulations when perceived benefits, such as improved air quality and health, outweigh personal or economic challenges.

Implication

The study thrives on examining and describing the different perspectives and insights of commuters on the effectiveness of R.A. 8749 in addressing jeepney smoke emissions in Davao City. It has become significant to recognize their various insights and perspectives concerning their environment and health, such as the Clean Air Act, which is both effective and ineffective. This situation is to inform citizens that the effectiveness of R.A. 8749 in addressing jeepney smoke emissions in Davao City has advantages and disadvantages. In connection to this, being a commuter in Davao City compared to provinces would allow them to develop the health prevention initiative. This initiative includes personal responsibility and intensive implementation. Thus, these initiatives help others deal with less pollution exposure from commuters. Moreover, the notion of the effectiveness of R.A. 8749 in addressing jeepney smoke emissions in Davao City brings insights from commuters in ways such as Personal Responsibility and Intensive Implementation. This insight provides initiatives and awareness to society and gives enough knowledge on health prevention as a commuter in Davao City.

Hence, this research brings awareness to commuters, gives them more prevention options, and initiates actions. Despite the advantages and initiatives that our participants had mentioned, it is worth noting that there are a lot of adjustments and precautions to take in this kind of situation. This also serves as an eye-opener to lawmakers and local government to conduct an annual survey on their constituents or citizens, specifically commuters, regarding the effectiveness of rules and laws, especially addressing jeepney smoke emissions in Davao City. This serves as a basis for how to change and make more amendments to rules and regulations that can enhance and better implement to reduce the harm of air pollution to commuters.

Furthermore, the research also puts drivers, both public and private, to keep in mind that if given a chance, they are financially capable of maintaining their vehicles in accordance with the regulations of the Land Transport Office, and should be law-abiding citizens to ensure safety and order on the roads. It puts commuters' protection and comfort. However, if they are incapable of maintenance, prevention, and limitations would be a better alternative. Since they are not earning much to provide personal needs, their prevention and initiatives can also significantly decrease commuters' exposure to polluted air and make it more bearable. This puts public institutions in a position to provide more awareness of air pollution, environmental prevention, and initiatives, as well as the corresponding positive and negative situations commuters may encounter. This could be done through a seminar. Allowing commuters to broaden their mind in the circumstances regarding air pollution, more specifically in Davao City. Lastly, this becomes more valuable to future researchers in having this study as a basis for conducting related research. There are specific situations, and the same situation may suffice for the next few years.

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