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Climate change mitigation strategies in DESMA CENTER: Challenges, tourism's role, and community engagement

Satria Rizky Aviory[1], Diani Mustika Prianti[1]*

[1] *Department of Tourism Studies, Vocational Education Program, Faculty of Engineering, Universitas Indonesia, Depok, West Java 16424, Indonesia.*

[2] *Correspondence: diani.mustika15@gmail.com

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ABSTRACT

Background: Climate change is a significant phenomenon that affects both humans and nature, driven by both natural processes and human activities, with the latter playing a major role. Addressing this issue requires strategic interventions, particularly from organizations engaged in environmental advocacy. This study aims to analyze and elaborate on the meaning, strategies, and challenges in climate change mitigation efforts undertaken by DESMA CENTER. **Methods:** This research employs a qualitative method with a case study approach, utilizing qualitative data collected from January 4 to June 30, 2023. Data were obtained through interviews with representatives from three divisions within DESMA CENTER: top management (deputy director and co-founder), the communication unit (communication officer), and the program unit (program officer). **Findings:** The study identifies four strategic approaches implemented by DESMA CENTER in addressing climate change: internal strategies, external strategies, action strategies, and communication strategies. These strategies are integral to the organization's efforts in mitigating climate change and advocating for sustainable tourism practices. **Conclusion:** The findings highlight the need for DESMA CENTER to amplify its environmental advocacy efforts and provide objective insights into the impacts of tourism on environmental degradation, as well as its potential role in conservation. **Novelty/Originality of this article:** This study offers a comprehensive analysis of an environmental organization's strategic approach to climate change mitigation in the tourism sector, providing insights into effective advocacy and intervention models.

KEYWORDS: climate change; climate change mitigation; climate crisis.

1. Introduction

According to the *Kamus Besar Bahasa Indonesia* (2022), climate is defined as the atmospheric conditions, including temperature, humidity, clouds, rainfall, and sunlight, that persist over a long period (approximately 30 years) in a specific region. Climate plays a crucial role in human life, influencing various aspects such as social, cultural, and economic conditions. Consequently, climate change has become a daunting phenomenon for humanity. The initial indicator of climate change is an increase in the average global surface temperature, commonly referred to as global warming (Sumampouw, 2019). The primary cause of global warming is greenhouse gas emissions. Based on data from the Ministry of Environment and Forestry of the Republic of Indonesia (2014) as cited in Setiani (2020), four greenhouse gases significantly contribute to the rise in global surface temperature: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and perfluorocarbons (PFCs),

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particularly CF_4 and C_2F_6. The *Sixth Assessment Report* by the Intergovernmental Panel on Climate Change (IPCC) states that global temperatures have risen by 1.1°C (2°F) since the 19th century, with projections indicating that the world may reach or exceed 1.5°C of warming within the next two decades. Furthermore, the IPCC estimates that global warming could reach 4.4°C by 2100 (IPCC, 2022). Such an increase in surface temperature leads to extreme weather events, posing significant threats to life on Earth.

According to the Meteorology, Climatology, and Geophysics Agency of Indonesia (BMKG, 2022), the impacts of extreme weather include increased rainfall intensity, rising sea levels, changes in wind direction and speed that contribute to tropical cyclones, and prolonged dry spells leading to drought. These extreme climate conditions endanger human and ecological systems, leading to what is now recognized as the *climate crisis*. Climate change has also been linked to the occurrence of various disasters. According to Law No. 24 of 2007 on Disaster Management, disasters are defined as events or series of events that threaten and disrupt human life and livelihoods, caused by natural, non-natural, or human-induced factors, resulting in loss of life, environmental damage, material losses, and psychological impacts. The Regional Disaster Management Agency of Buleleng Regency defines ecological disasters as natural events arising from disturbances in ecological balance, influenced by interactions between humans, living organisms, and environmental conditions (BPBD Kabupaten Buleleng, 2014). Disruptions to ecological systems result in environmental imbalances, ultimately leading to natural disasters such as floods, landslides, storms, and other catastrophic events. Data from the National Disaster Management Agency (BNPB, 2022) indicate that Indonesia experienced 3,522 natural disasters throughout 2022, with floods, extreme weather, landslides, and forest and land fires (karhutla) being the most frequent.

These disasters are largely attributed to unsustainable human activities that disrupt ecological balance, exacerbating climate change and leading to severe consequences. Besides environmental destruction, climate-related disasters pose significant risks to human survival, contributing to food and energy crises, drought, disease outbreaks, and other threats. Climate change has placed humanity in a state of increasing vulnerability, which, if left unaddressed, could lead to existential risks. The tourism sector also contributes to climate change through greenhouse gas emissions from transportation, food waste, excessive energy consumption, and other unsustainable practices.

Mitigating climate change has become an essential global responsibility, requiring collective efforts through structured and systematic actions. Climate change mitigation cannot be undertaken individually but necessitates collaboration among multiple stakeholders, including academia, the private sector, communities, governments, and the media. Furthermore, mitigation efforts must be multi-sectoral, meaning that various industries, including tourism, must actively contribute. The tourism sector can play a role in mitigating climate change by reducing excessive energy consumption, minimizing food waste, lowering greenhouse gas emissions, and implementing other sustainability measures.

In multi-stakeholder climate mitigation efforts, civil society is often represented by non-governmental organizations (NGOs). According to Hannan (1988), as cited in Wardhani (2016), NGOs are organizations dedicated to grassroots development, typically by fostering and supporting local self-help groups. Additionally, Law No. 16 of 2001 on Foundations defines a foundation as a legal entity established with separated assets for social, religious, and humanitarian purposes, without membership. Law No. 16 of 2017 on Community Organizations further defines such organizations as voluntary entities formed by the public to participate in national development efforts based on shared aspirations, interests, and objectives aligned with Indonesia's foundational principles. Essentially, NGOs are independent institutions founded by communities to advocate for specific causes.

One such organization is DESMA CENTER, established in 2010. DESMA stands for *Destination Management*, and the organization provides consultancy services and intervention programs at all levels of tourism destinations, adopting a sustainable tourism approach. DESMA CENTER focuses on destination planning, management, development,

and marketing through strategic sustainable tourism initiatives. Over the years, DESMA CENTER has implemented various programs, including education and training initiatives such as *TVET for Sustainable Tourism in Sumba*, digitalization projects like *Digitalization of Ecotourism and Capacity Building for Ecotourism Actors in Gunung Leuser National Park, Langkat, North Sumatra*, destination development programs such as the *Sustainable Tourism Destination Standard and Training—Pilot Project in Tana Mori, Labuan Bajo*, supported by IA-CEPA ECP KATALIS, and regulatory studies like the *Analysis and Legal Evaluation of Jakarta Regional Regulation No. 6 of 2015 on Tourism*. These projects involve multiple stakeholders, including government agencies, private entities, NGOs, local communities, and other relevant parties. The majority of DESMA CENTER's projects have been concentrated in the provinces of East Nusa Tenggara (NTT) and North Sumatra (Sumut). Its most recent initiative is the *TVET for Sustainable Tourism in Sumba* project, which remains ongoing.

Given the urgency of climate change mitigation and the critical role of NGOs in addressing this issue, this study examines the strategies employed by DESMA CENTER in combating climate change. Through this research, it is expected that insights will be generated to inform future climate change mitigation strategies at DESMA CENTER. Additionally, the findings may serve as a valuable resource for researchers interested in further exploring climate change mitigation efforts within the tourism sector.

2. Methods

The qualitative method is a research approach that interprets phenomena based on perceptions, generating descriptive analyses in the form of verbal explanations from the research object. Qualitative research requires extensive knowledge from the researcher, as it involves direct interviews with the research subjects (Sahir, 2021). According to Fitrah and Lutfiyah (2017), a case study approach entails an in-depth exploration of a bounded system through extensive data collection. Case studies investigate a particular case, which is defined as an entity or object of study that is limited in terms of time, location, or physical boundaries.

Based on this explanation, this study employs a qualitative methodology to analyze and describe the existing or ongoing conditions within the organization. The qualitative data comprise DESMA CENTER's ongoing and completed projects, the organization's interpretation of climate change, and its relevance as a climate mitigation effort. Furthermore, through the case study method, the researcher can directly observe and gather first-hand information from the organization's representatives.

2.1 Types and sources of research data

This research utilizes qualitative data obtained from two primary sources: primary data and secondary data. According to Arikunto (2013), primary data refer to information collected from first-hand sources, such as individuals through interviews or survey responses. Similarly, Arikunto (2013) also defines primary data as information acquired directly from the original source via interviews, opinion polls, or other methods. Based on this definition, primary data in this study were obtained directly from first-hand sources using interview and observation methods. The primary research subjects in this study include DESMA CENTER staff and directors participating as respondent

According to Sugiyono (2017), secondary data refer to information not directly provided to the researcher but rather obtained through other sources, such as documents or reports. Similarly, secondary data as information collected indirectly through other research sources, whether obtained commercially or non-commercially. Examples of secondary data include literature sources, reports, or information provided by third parties in various formats. In this study, secondary data were gathered from organizational documents and official sources such as relevant journals and reports.

2.2 Data collection methods

In this study, several data collection methods were used to ensure comprehensive and reliable information gathering. These methods include observation, interviews, and literature reviews, each of which plays a crucial role in acquiring the data necessary to address the research questions effectively.

The observation method is a fundamental technique in research, as it allows researchers to gather firsthand information by observing the research subjects in their natural environment. Riyanto (2010) emphasizes that observation involves directly or indirectly monitoring the phenomena relevant to the research. Widoyoko (2014) further defines observation as a systematic process of monitoring and recording occurrences related to the subject of study. In this research, the observation was conducted directly, meaning that the researcher physically examined the facts and behaviors in the field. This approach enabled the researcher to gather real-time data, providing insights into the subject's actions, environment, and interactions that could not be captured through other methods.

The interview method, as outlined in Kurniawan (2020), is another vital data collection technique. Interviews involve a direct, oral question-and-answer process between the researcher and the participant(s). This method provides an opportunity for the researcher to observe facial expressions, body language, and hear responses in real-time, which can enhance the depth of understanding regarding an individual's perspective. Interviews can be conducted one-on-one or in groups, depending on the research objectives and the context of the study. By using this method, the researcher was able to gather authentic, valid, and detailed information from participants, which may not have been evident through other techniques. Interviews are particularly useful in exploring personal experiences, opinions, and perceptions that contribute to the research problem.

Lastly, the literature review method was employed to gather secondary data from existing academic and professional sources. This method involves reviewing a variety of materials, including books, journal articles, academic papers, and other scholarly publications that are relevant to the research topic. The literature review helps provide a theoretical foundation for the study, offering insights into previous research findings, theoretical frameworks, and established concepts. It also allows researchers to identify gaps in existing knowledge and helps contextualize the primary data collected from other methods. By integrating information from credible literature sources, the researcher was able to support the analysis and findings of the study, ensuring the research is grounded in established academic knowledge.

3. Results and Discussion

3.1 The meaning of climate change for DESMA CENTER

The process of interpreting climate change in this study involves several DESMA CENTER employees, including program officers, communication officers, and the deputy director and co-founder. These respondents are considered to have the necessary capacity to provide relevant information based on the required data. The information presented in this section is derived from both observations and interviews, resulting in the following findings:

The respondents understand climate change as an anomalous climatic phenomenon that disrupts weather cycles, making them unpredictable and extreme. In addition to causing erratic weather patterns, climate change is also believed to contribute to ecological disasters. Respondents attribute climate change to two primary factors: natural (ecological) causes and human-induced (anthropogenic) causes. However, they predominantly believe that human activities, such as deforestation, fossil fuel consumption, and excessive exploitation of natural resources, play a major role in driving climate change.

Respondents also personally experience the effects of climate change, both directly and indirectly. Direct impacts include extreme weather conditions that lead to increased thirst and perspiration, droughts that make access to water more difficult, and unpredictable weather patterns that disrupt outdoor activities. Indirect effects include rising air temperatures, making highland areas feel warmer, and rising sea levels, which threaten coastal communities with submersion.

3.1.1 Organizational interpretation of climate change

DESMA CENTER perceives climate change as a large-scale phenomenon caused by human actions, resulting in significant environmental and social impacts, particularly on local communities who serve as grassroots stakeholders. The organization views climate change as a consequence of human irresponsibility in managing the planet, driven by an anthropocentric mindset that assumes nature exists solely to meet human needs.

According to DESMA CENTER, humanity must adopt a more responsible and geocentric perspective that prioritizes environmental sustainability. By doing so, people can actively mitigate and prevent the adverse effects of climate change. The organization believes that solutions must begin at the local community level, where traditional knowledge and wisdom play a vital role in protecting the environment. Through this approach, local actions can yield broader positive impacts on a global scale, aligning with the philosophy of "Act Locally, Think Globally."

3.1.2 Implementation of sustainability values at DESMA CENTER

DESMA CENTER adheres to the principles of sustainability and conservation, which are reflected in its slogan, "Sustainable Tourism and Conservation." These values serve as the organization's foundation and guide its initiatives. Additionally, its tagline, "Your Partner in Tourism Sustainability," emphasizes its commitment to collaborating with various stakeholders in designing and implementing sustainability practices. Sustainable Development Goals (SDGs) focus on improving societal well-being, preserving social harmony, maintaining environmental quality, and ensuring justice and good governance to enhance quality of life (Badan Perencanaan Pembangunan Nasional, 2015).

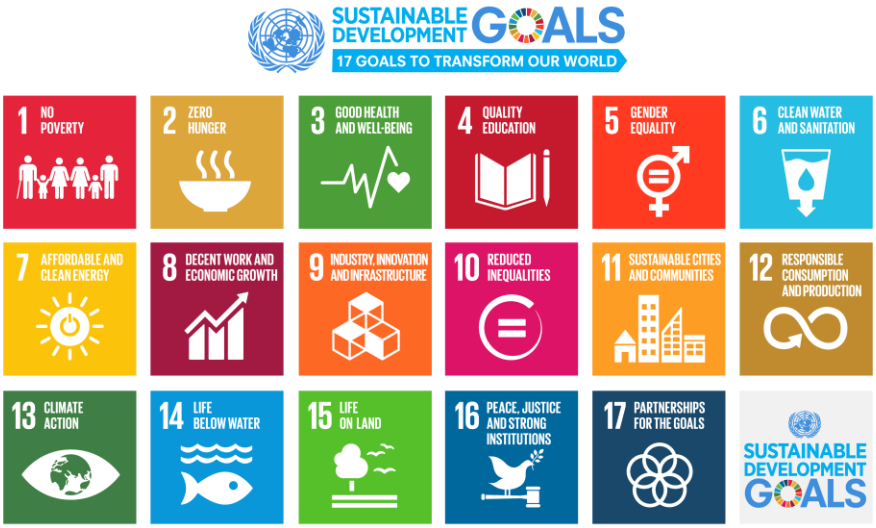

Fig 1. Sustainable Development Goals (SDGs) Adopted by DESMA CENTER (United Nations Development Program, 2015)

The SDGs consist of 17 core objectives, but DESMA CENTER primarily aligns its work with four specific goals: SDG 4, SDG 8, SDG 12, and SDG 13. SDG 4 (quality education)–DESMA CENTER upholds quality education, particularly in the field of sustainable tourism. SDG 8 (decent work and economic growth)–the organization conducts training programs and capacity-building initiatives to help local communities secure decent employment and foster economic growth. SDG 12 (responsible consumption and production)–DESMA CENTER engages in research and feasibility studies for sustainable tourism development. SDG 13 (climate ation)–the organization implements numerous projects aimed at climate change mitigation. Each project is carefully selected based on its alignment with SDGs and DESMA CENTER's sustainability branding.

3.2 DESMA CENTER's strategies for addressing climate change

DESMA CENTER employs a dual-approach strategy to combat climate change. The first categorization is based on target groups, which are divided into internal efforts focused on improving management practices and external efforts aimed at engaging communities in climate action. The second categorization is based on intervention types, which include action-oriented initiatives through organizational projects and communication-based efforts through social media engagement

The DESMA CENTER Jakarta office is strategically situated within the Patra Ahmad Yani Complex, adjacent to Ahmad Yani Street in Central Jakarta. This prime location ensures convenient access to various public transportation options, facilitating sustainable mobility for employees and visitors. The closest TransJakarta bus service operates along Corridor 10, which connects Pusat Grosir Cililitan (PGC 2) and Tanjung Priok.

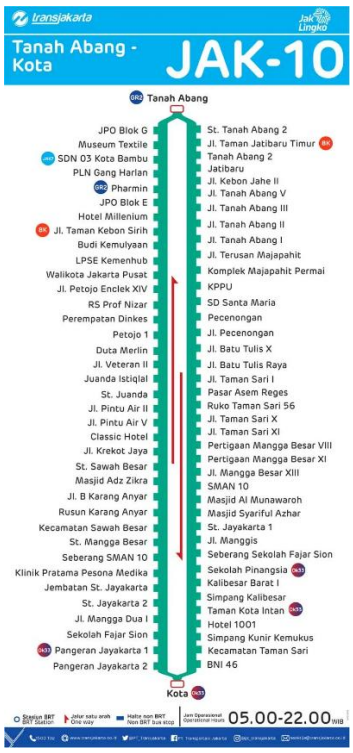

Fig 2. Pulomas Bypass TransJakarta Bus Stop and Corridor 10 Route
(PT Transportasi Jakarta, 2023)

The nearest bus stop, "Pulomas Bypass," is approximately 450 meters from the office, making it easily accessible for daily commuters. Additionally, Corridor 10 integrates with the KRL Commuter Line at Jatinegara Station, providing an extended network for individuals traveling from the Bekasi–Kampung Bandan route. Beyond bus services, the Mikrotrans

minibus system further enhances connectivity. The nearest Mikrotrans route, JAK 33, links Pulo Gadung Terminal and Kota Station, with "Simpang Cempaka Putih Ahmad Yani" serving as the closest stop at a similar distance from the office. Given the comprehensive public transportation infrastructure surrounding DESMA CENTER, most employees prefer using buses and minibuses instead of private vehicles. This shift towards public transit significantly contributes to reducing individual carbon footprints and lowering greenhouse gas (GHG) emissions, aligning with the organization's sustainability objectives.

Energy conservation is an integral part of DESMA CENTER's sustainability efforts, with the Jakarta office enforcing a culture of responsible energy consumption. Employees are required to adhere to an unwritten rule mandating the reduction of unnecessary energy usage. This includes turning off lights, unplugging electrical devices, and switching off air conditioners (AC) when a room is unoccupied. These small yet impactful behavioral changes collectively contribute to a significant reduction in electricity consumption, ultimately lowering the GHG emissions associated with fossil fuel-based power generation. Such conservation measures reflect DESMA CENTER's commitment to minimizing its environmental impact while fostering an eco-conscious work environment. By embedding these energy-saving habits into daily operations, the organization not only enhances its operational efficiency but also strengthens its role in promoting sustainable practices within the tourism sector.

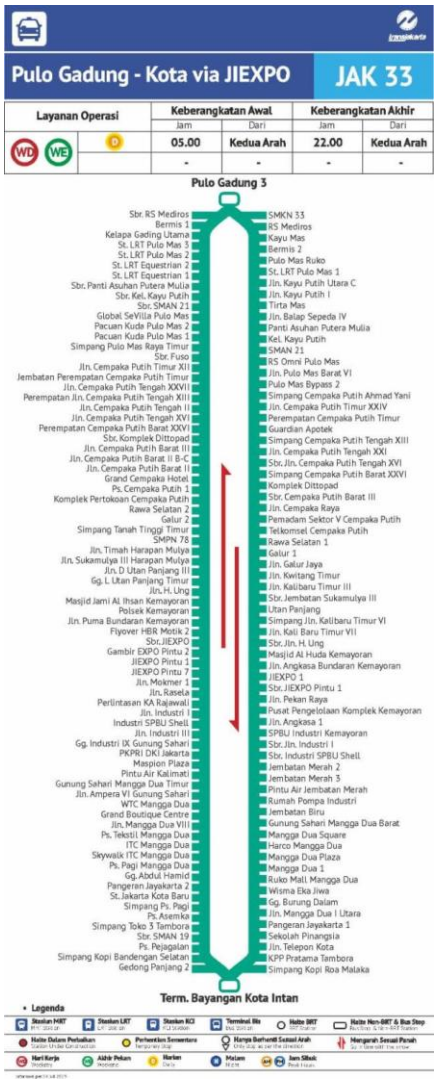

Fig 3. Simpang Cempaka Putih Ahmad Yani Mikrotrans Stop and JAK 33 Route (PT Transportasi Jakarta, 2023)

External strategies are those implemented by the entire management of DESMA CENTER, focusing on the general public. These strategies are carried out through two main approaches: DESMA CENTER projects oriented toward sustainable tourism development and educational initiatives on sustainable tourism and environmental conservation, which are disseminated through social media posts on @desmacenter. The sustainable tourism-oriented projects are primarily located in North Sumatra Province and East Nusa Tenggara (NTT).

3.2.1 Action strategies

DESMA CENTER addresses climate change through action-oriented projects that focus on environmental sustainability. The following projects serve as key initiatives in mitigating climate change as follows. Promotion of Gunung Leuser National Park, the project involves developing and promoting tourism in Gunung Leuser National Park (TNGL). This initiative highlights TNGL's biodiversity potential, raises awareness regarding responsible visitation, provides ethical guidelines for visitors, and supports local economic potential. The project is part of an ecotourism promotion strategy that encourages sustainable tourism trends as an alternative to conventional tourism, thereby reducing the impact of mass tourism on climate change. Workshop on Building a Resilient Sumatra Tropical Rainforest for Climate Change Mitigation and Biodiversity Conservation, this workshop was a multi-stakeholder initiative attended by the UNESCO Jakarta Office, the Coordinating Ministry for People's Welfare, and the Ministry of Forestry. Held on September 23-24, 2014, at Aryaduta Hotel, Medan, North Sumatra, the workshop aimed to develop a Strategic Environmental Assessment (SEA) to address threats to the Tropical Heritage Rainforest of Sumatra (THRS). THRS consists of four national parks: Bukit Barisan National Park (TNBB), Gunung Leuser National Park (TNGL), and Kerinci Seblat National Park (TNKS), recognized as World Heritage Rainforests. The workshop emphasized a participatory approach in developing strategies and action plans to counteract threats, particularly those related to road construction in Bukit Barisan. As a result of this workshop, a dedicated task force was established to safeguard THRS, along with policy measures for its protection. This initiative contributes to climate change mitigation and biodiversity conservation by engaging stakeholders in the formulation of conservation strategies

Policy Brief on Integrated Ecotourism Development in Sumatra's World Heritage Rainforest, This initiative was part of the "Strengthening the Heritage of Sumatra's Tropical Rainforest through Ecotourism" program, which aimed to support ecotourism planning in THRS. One of the key activities involved drafting a policy brief on ecotourism development policies, particularly in the context of strengthening UNESCO's Sumatra Tropical Rainforest Heritage through sustainable ecotourism policies. This project serves as a climate change mitigation effort by advocating for forest conservation within TNBB as an ecotourism destination. Raising Awareness Among Tourism Stakeholders for the Implementation of Low-Emission Tourism in Bali, this awareness campaign was conducted in the form of a webinar targeting 385 participants from the tourism industry in Bali. The objective was to encourage more responsible energy consumption and carbon emission reduction. The initiative collaborated with professional associations, including the Indonesian Hotel and Restaurant Association (PHRI) and the Bali Tourism Transport Association (PAWIBA). By educating tourism business operators on energy conservation and carbon footprint reduction, this project directly contributes to climate change mitigation. Capacity Building for Village Governments and Social Forestry Management in Community-Based Ecotourism Development, this initiative aims to strengthen the capacity of village governments and community forest managers in promoting the sustainable management of peatlands and mangroves. The project forms part of a broader conservation effort that balances environmental protection with economic benefits for local communities. Implemented in Atap Village and Setabu Village, Nunukan Regency, North Kalimantan, the program enhances village and community welfare by promoting sustainable ecotourism. This project serves as a climate change mitigation measure by prioritizing the conservation of mangroves and peatlands, both of which are critical carbon sinks. Technical Vocational Education and Training (TVET) for Sustainable Tourism Development in Sumba, the TVET project is a vocational training program implemented in schools in West Sumba and Southwest Sumba regencies. This initiative focuses on capacity building for schools and teachers, fostering industry partnerships, and enhancing students' entrepreneurial skills. Additionally, the program incorporates sustainable tourism education, instilling environmental awareness within formal education frameworks. This initiative

contributes to climate change mitigation by integrating environmental consciousness into the education sector.

3.2.2 Communication Strategies

DESMA CENTER also addresses climate change through communication strategies that emphasize education and public awareness. The organization employs visual and non-verbal communication methods through various digital platforms. One of the key communication tools is DESMA CENTER's official website, accessible at https://desmacenter.com, which publishes articles on climate change-related topics.

Beyond its website, DESMA CENTER actively engages audiences through Instagram (@desmacenter), which has 6,984 followers and 627 posts. The Instagram account utilizes various content features, including feeds, reels, live broadcasts, and stories, to deliver educational messages on climate change.

3.2.3 Pentahelix Collaboration

Soemaryani (2016) in Vani et al. (2020) describes the pentahelix model as a framework for fostering synergy among institutions to achieve common goals. This model is reinforced in the Indonesian Ministry of Tourism Regulation No. 14/2016 on Sustainable Tourism Destination Guidelines, emphasizing the importance of optimizing tourism development through the integration of five key sectors: Business, Government, Community, Academia, and Media (BGCAM). This integration is essential for enhancing the quality of tourism activities, facilities, services, and overall visitor experiences while ensuring environmental and societal benefits.

In executing its projects, DESMA CENTER adopts the pentahelix collaboration strategy, involving BGCAM stakeholders to ensure synergy and sustainability. Additionally, the organization engages donors to support project implementation. Typical stakeholders include academic institutions (schools/universities), businesses (state-owned and private enterprises), local communities, government agencies (regional and national), and media outlets. DESMA CENTER has collaborated with various local and international organizations across all its projects.

3.3 Challenges faced by DESMA CENTER in Addressing climate change and strategies to overcome them

Like other organizations, DESMA CENTER faces numerous challenges in implementing its programs, including internal organizational constraints, external factors, regulatory hurdles, and financial limitations. In its climate change mitigation efforts, DESMA CENTER encounters challenges such as limited support and awareness from local communities and insufficient stakeholder participation in project execution. To address these challenges, DESMA CENTER employs targeted engagement strategies.

For example, to overcome the lack of local community support, the organization showcases its successfully implemented projects and provides scientifically sound, logical justifications to persuade stakeholders. Similarly, low stakeholder participation is mitigated through preventive measures, such as pre-project agreements and structured planning discussions. Furthermore, the lack of awareness regarding environmental conservation is tackled through continuous education and the demonstration of tangible environmental benefits.

3.4 Tourism in climate change mitigation

Tourism is a significant contributor to climate change; however, the sector also presents opportunities for mitigation. Several measures can be taken to reduce tourism-related greenhouse gas emissions, including promoting public transportation for travel, minimizing food waste in accommodations through optimized meal preparation and composting, and transitioning to renewable energy sources such as solar and wind power. Additionally, tourism destinations can shift from a car-centric to a pedestrian-centric approach, encouraging transit-oriented development (TOD) rather than car-oriented development (COD), which would be complemented by increased public transportation options.

A concrete example of these efforts can be seen in the climate action policies implemented by the Jakarta Provincial Government (Pemprov DKI Jakarta) as part of its Net Zero Emission 2050 agenda. Net zero emissions refer to a balance between greenhouse gas emissions released and those absorbed. Pemprov DKI Jakarta has committed to electrifying 50% of TransJakarta's bus fleet by 2025, with 30 electric buses already in operation. Additionally, the government aims to expand green open spaces (RTH) to 30% of the city's area by 2030 (Prakoso & Herdiansyah, 2019). Jakarta has also introduced Low Emission Zones (LEZ) in Kota Tua, restricting private vehicle access and improving air quality through TOD-based urban development. In 2018, these initiatives successfully reduced 1.5 million tons of CO2e, equivalent to 11% of total emissions from the transportation sector (Resilience Development Initiative & Greenpeace Indonesia, 2022). Through these measures, the tourism sector contributes to emission reductions by supporting green space expansion, increasing public transport accessibility, and promoting low-emission tourism zones.

4. Conclusions

Based on the research on the strategies for addressing climate change at DESMA CENTER, the findings lead to the following conclusions. For DESMA CENTER, climate change is understood as a significant alteration in weather patterns and seasons, which occurs in extreme forms and causes severe impacts on individuals and communities, either directly or indirectly. DESMA CENTER interprets climate change as a large-scale shift driven by massive factors with far-reaching consequences that ultimately affect even the smallest communities. However, it is believed that these impacts can be mitigated through local wisdom. DESMA CENTER's strategies are guided by values such as sustainability, conservation, and a focus on sustainable tourism branding. The organization divides its strategies into two categories based on target groups: external strategies aimed at the general public, implemented through visual communication on social media and climate change-oriented projects, and internal strategies involving the management and employees. These strategies manifest as actions in the form of DESMA CENTER's projects and communications disseminated via its social media platforms. Additionally, DESMA CENTER utilizes a pentahelix collaboration approach, engaging academia, businesses, communities, government, and media, which supports the successful execution of its projects.

The challenges faced by DESMA CENTER in addressing climate change include a lack of support from the community, insufficient participation from stakeholders, and a general lack of awareness regarding climate change. These issues can be addressed through targeted efforts such as intensive communication with local communities, establishing preventive measures through agreements and task division, and raising awareness about environmental preservation. Furthermore, tourism can play a significant role in mitigating climate change by shifting towards pedestrian-centric development, increasing public transportation for mobility, expanding green spaces, reducing food waste, and utilizing renewable energy sources. As a recommendation, DESMA CENTER can amplify its environmental advocacy by addressing other environmental issues such as biodiversity, air

pollution, and plastic waste, in addition to climate change. It can also demonstrate, objectively, that the tourism sector is concerned with environmental preservation and contributes to mitigating climate change. As an NGO focused on tourism, DESMA CENTER has the potential to promote its work on a larger scale, proving that tourism students possess ideals, concerns, and responsibilities toward environmental sustainability.

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Author Contribution
The authors was responsible for the conceptualization, data collection, analysis, and manuscript writing. All aspects of the research, including the formulation of research questions, literature review, and interpretation of findings, were conducted independently. The author also reviewed and approved the final version of the manuscript.

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The authors declare no conflict of interest.

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Biography of Authors

Satria Rizky Aviory, Department of Tourism Studies, Vocational Education Program, Faculty of Engineering, Universitas Indonesia, Depok, West Java 16424, Indonesia.

- Email: s.riz.aviory@gmail.com
- ORCID: N/A
- Web of Science ResearcherID: N/A
- Scopus Author ID: N/A
- Homepage: N/A

Diani Mustika Prianti, Department of Tourism Studies, Vocational Education Program, Faculty of Engineering, Universitas Indonesia, Depok, West Java 16424, Indonesia.

- Email: diani.mustika15@gmail.com
- ORCID: https://orcid.org/0009-0002-8637-0872
- Web of Science ResearcherID: N/A
- Scopus Author ID: N/A
- Homepage:https://sinta.kemdikbud.go.id/authors/?q=diani%20mustika%20prianti