

## Unearthing the Voices Within: Pre-service Teachers' Critical Perspectives on the Climate Crisis through Photovoice

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**Abstract**— The climate crisis has emerged as a pressing socio-environmental challenge that demands critical engagement from future educators. This qualitative study explored pre-service teachers' critical perspectives on climate change through Photovoice, a participatory visual methodology that fosters reflection on lived community experiences. Nine pre-service teachers from a Philippine Center of Excellence in Teacher Education documented environmental conditions within their local communities through photographs and accompanying narratives that examined observed climate-related issues through the SHOWED technique. Data were analyzed using reflexive thematic analysis, resulting in five interconnected themes: urbanization and heat island effects, deforestation and ecosystem degradation, waste burning and environmental pollution, drought and agricultural vulnerability, and flooding linked to infrastructure deficiencies. Findings indicate that participants conceptualized the climate crisis not merely as an environmental phenomenon but as a complex socio-ecological issue shaped by human activities, economic constraints, governance shortcomings, and community practices. Their narratives reflect the development of critical environmental consciousness, moving beyond descriptive observations toward deeper interrogation of the structural factors driving environmental degradation and climate vulnerability. Moreover, Photovoice functioned as both a research and pedagogical tool that enabled participants to bridge theoretical understandings of climate change with contextual realities in their communities. The study contributes to the growing literature on climate change education by demonstrating the value of participatory visual methodologies in cultivating environmental literacy, critical reflection, and climate-responsive pedagogical orientations among future educators. Integrating such approaches into teacher education programs may strengthen the capacity of pre-service teachers to engage learners in meaningful, locally grounded responses to climate and environmental challenges.

**Keywords:** climate change education, climate crisis, critical pedagogy, environmental literacy, Photovoice, teacher education

### I. INTRODUCTION

The climate crisis remains one of the most urgent, complex, and far-reaching challenges of the twenty-first century (Fawzy et al., 2020). It is commonly associated with rising global temperatures, intensified extreme weather events, biodiversity loss, declining ecosystem stability, and widespread environmental degradation (Pörtner et al., 2023, p. 5). However, beyond these scientific indicators, the climate crisis is also experienced as a social, economic, and educational concern. Its consequences are visible not only in global climate reports but also in the everyday realities of communities that face extreme heat, flooding, drought, pollution, waste mismanagement, and livelihood instability.

In urban areas, climate change is often experienced through the intensification of heat, air pollution, congestion, and the disappearance of green spaces. The expansion of roads, buildings, and other concrete structures contributes to the urban heat island effect, where built environments absorb and retain heat more than natural landscapes (Imran et al., 2018, p. 394). In rural communities, the climate crisis is strongly felt through drying farmlands, reduced agricultural productivity, water scarcity, and threats to food security (Toromade et al., 2024). These experiences show that climate change is not an abstract environmental issue but a concrete reality that affects how people live, work, study, and survive.

The climate crisis is primarily driven by human activities such as fossil fuel consumption, industrial operations, and land-use change (Fawzy et al., 2020). These activities contribute to greenhouse gas emissions and weaken the natural systems that regulate climate conditions. At the same time, the impacts of climate change are not equally distributed. Communities with fewer resources, weaker infrastructure, and limited access to sustainable livelihood opportunities often experience greater vulnerability. Thus, climate change must be understood not only as an ecological issue but also as a matter of social justice, governance, and community resilience (Ali et al., 2025).

Education plays a crucial role in addressing this crisis. Schools are not only spaces for transmitting scientific knowledge but also institutions where learners can develop values, attitudes, and behaviors that support environmental responsibility. Within this process, teachers occupy a central position. Their understanding of climate change influences how environmental education is taught, how learners are encouraged to reflect on ecological problems, and how classroom discussions are connected to real-world community issues (García-Vinuesa, 2024; Sarıbaş & Bakanay, 2024; Seroussi et al., 2019). For this reason, pre-service teachers must be prepared not only to understand climate change conceptually but also to interpret it critically as a lived and systemic problem.

Traditional approaches to environmental education often rely heavily on lectures, textbook-based discussions, and scientific explanations (Howell, 2021). While these are important, they may not be sufficient to develop deep environmental awareness and critical engagement. Pre-service teachers need opportunities to observe, document, analyze, and reflect on environmental issues within their own communities. Such experiences allow them to connect theory with reality and to recognize that environmental problems are shaped by human choices, social conditions, economic pressures, and policy decisions.

Photovoice provides a meaningful approach for this purpose. As a participatory research method, Photovoice allows participants to capture photographs of issues that matter to them and to explain these images through reflective narratives (Reimer-Watts et al., 2022, p. 6). This method transforms participants from passive respondents into active meaning-makers who document their own realities. Through photography and storytelling, participants can express what they see, what they feel, what they understand, and what they believe should be done.

This study is anchored in Freire's Critical Pedagogy, Constructivist Learning Theory, and Bronfenbrenner's Ecological Systems Theory. Freire's Critical Pedagogy supports the development of critical consciousness by encouraging learners to reflect on social realities and act toward transformation. Constructivist Learning Theory emphasizes that knowledge is actively constructed through experience and reflection. Bronfenbrenner's Ecological Systems Theory provides a lens for understanding how individual experiences are shaped by wider environmental, social, institutional, and policy systems (Walker, 2023).

Guided by these perspectives, this study explored pre-service teachers' critical perspectives on the climate crisis through Photovoice. They documented environmental conditions within their local communities through photographs and accompanying narratives that examined observed climate-related issues. By focusing on future teachers, the study contributes to discussions on teacher preparation, environmental literacy, climate change education, and participatory learning.

## II. REVIEW OF RELATED LITERATURE

### 2.1 Climate Change as an Educational and Socio-Ecological Issue

Climate change is widely recognized as a complex global phenomenon characterized by rising temperatures, extreme weather events, biodiversity loss, and ecological degradation. Beyond its environmental dimension, it is deeply intertwined with social, economic, and political systems that influence vulnerability and adaptive capacity. The Intergovernmental Panel on Climate Change (IPCC) emphasizes that climate change impacts are unevenly distributed, disproportionately affecting low-income and resource-limited communities (Campbell-Lendrum et al., 2023). In education, climate change is increasingly framed as a socio-ecological issue that requires not only scientific literacy but also critical awareness and civic engagement.

### 2.2 Environmental Education and Teacher Preparation

Environmental education aims to develop the knowledge, attitudes, and skills necessary for addressing environmental problems, and it emphasizes systems thinking, sustainability, and behavioral change. International frameworks like the Paris Agreement highlight that effective climate education should enhance both awareness and action (Molthan-Hill et al., 2019). However, challenges associated with situated learning, which may also apply to teacher education programs, include a lack of effective learning support or concrete objective design to improve students' learning engagement and problem-solving competences (Cheng et al., 2019). This gap limits the ability of future educators to translate environmental knowledge into meaningful classroom practice.

### 2.3 Photovoice as a Participatory Research Method

Photovoice, developed by Wang and Burris (1997), is a participatory action research method that allows individuals to document their lived experiences through photography and narrative reflection. Rooted in empowerment theory and Freire's critical pedagogy, Photovoice transforms participants into co-researchers. It enables critical reflection, dialogue, and the communication

of lived realities. Studies show that Photovoice strengthens engagement, critical thinking, and community awareness, particularly in environmental and health-related research (Robertson et al., 2022).

## 2.4 Critical Pedagogy and Environmental Consciousness

Freire's critical pedagogy (1970) emphasizes education as a practice of freedom that encourages reflection and action, or praxis. In environmental education, it helps learners identify the structural causes of ecological degradation, such as industrialization, policy gaps, and unsustainable practices, and it shifts learners from passive recipients of knowledge to active agents of change. This framework is essential in understanding how pre-service teachers interpret environmental issues in their communities (Damoah & Bunmi, 2023, p. 2).

## 2.5 Ecological Systems Theory and Environmental Interpretation

Bronfenbrenner's Ecological Systems Theory (1979) explains human development through nested environmental systems: the microsystem, mesosystem, exosystem, and macrosystem. In the context of climate change, this theory helps explain how local environmental experiences are shaped by broader structural forces. Flooding or pollution at the community level, for example, is often influenced by urban planning, governance, and national environmental policies.

## 2.6 Photovoice in Environmental and Climate Studies

Recent studies demonstrate that Photovoice is an effective tool in environmental research as it allows participants to visually represent and share environmental challenges and impacts. It promotes critical reflection and empowers participants to propose solutions (Wang & Burris, 1997). In higher education curricula, Photovoice strengthens students' ability to connect theoretical concepts with lived experience (Robertson et al., 2022).

## 2.7 Synthesis of Related Literature

The reviewed literature suggests that climate change education must move beyond the simple transmission of environmental facts. While scientific knowledge remains essential, effective climate education also requires critical thinking, emotional engagement, community awareness, and social responsibility. Climate change is not experienced uniformly. Rather, it is shaped by local conditions, livelihood patterns, infrastructure, governance, and community practices. Therefore, learners must be given opportunities to examine environmental problems within the contexts in which they occur.

Environmental education becomes more meaningful when it is connected to lived experience. For pre-service teachers, this connection is particularly important because their future roles require them to translate environmental concepts into classroom learning experiences. If teacher education remains limited to theoretical discussion, future educators may struggle to help learners understand the urgency and complexity of environmental issues (Nuangchalerm et al., 2024). Experiential methods such as Photovoice address this gap by allowing pre-service teachers to directly observe environmental problems, reflect on their causes, and consider possible responses.

Photovoice is especially relevant because it combines visual documentation with critical narration. It encourages participants to critically examine their surroundings and to interpret what their photographs reveal about social, political, and environmental realities. In this way, Photovoice supports the goals of critical pedagogy by encouraging reflection, dialogue, and action. It also allows participants to amplify their experiences, encouraging critical dialogue and reflection on issues of shared concern (Reimer-Watts et al., 2022).

Taken together, the literature supports the use of Photovoice as both a research method and a pedagogical strategy in environmental education. It enables participants to bridge the gap between environmental knowledge and lived experience, while also helping them develop the critical consciousness necessary for climate-responsive teaching (Reimer-Watts et al., 2022; Robertson et al., 2022).

## III. METHODOLOGY

### 3.1 Research Design

This study employed a qualitative research design using Photovoice (Sutton-Brown, 2014; Wang & Burris, 1997) as the primary methodology. A qualitative approach was appropriate because the study aimed to explore the meanings, interpretations, and reflections of pre-service teachers regarding the climate crisis. Rather than measuring environmental awareness through

numerical indicators, the study sought to understand how participants made sense of environmental problems they personally observed in their communities.

Photovoice was selected because it allows participants to document lived realities through images and narratives. As a participatory method, it positions participants as co-researchers who actively contribute to the production of knowledge. This approach was suitable for the study because it encouraged pre-service teachers to observe their environment critically, capture meaningful visual evidence, and explain the social and ecological significance of their chosen photographs.

### 3.2 Participants

This qualitative study included nine pre-service teachers from a Philippine Center of Excellence in Teacher Education. They were selected through purposive sampling. They were chosen for their relevance to the study's focus on teacher education and environmental awareness. As future educators, their perceptions of the climate crisis are significant, as these perspectives may influence how they eventually teach environmental issues to their own learners.

The participants documented environmental issues in their communities. Their photographs represented contextual realities, allowing the study to capture varied manifestations of the climate crisis, including heat in built environments, tree cutting, charcoal production, waste burning, plastic pollution, drought-stricken farmland, and flooding caused by weak infrastructure (Sullivan et al., 2021, p. 59).

### 3.3 Data Collection

Data were gathered through participant-captured photographs taken over a documentation period of approximately two months. Each participant was asked to identify and photograph an environmental issue that they observed within their community. After taking the photograph, participants prepared a reflective narrative explaining the meaning of the image.

The narratives were guided by reflective questions using the structured SHOWED technique: What do you See here? What is really Happening here? How does this relate to Our lives? Why does this situation, concern, or strength exist? and What can we Do about it? This allowed the participants to move beyond simple visual documentation and engage in deeper environmental analysis.

The combination of photographs and narratives provided rich qualitative data. The photographs served as visual evidence of environmental realities, while the narratives revealed the participants' interpretations, emotions, values, and proposed responses. Together, these data sources captured both the visible and reflective dimensions of the participants' environmental awareness (Harahap & Fithriani, 2024, p. 215).

### 3.4 Data Analysis

The data were analyzed using reflexive thematic analysis (Braun & Clarke, 2022). The researcher repeatedly examined the photographs and read the accompanying narratives to become familiar with the data. Initial codes were developed based on recurring ideas, environmental issues, causes, effects, and proposed solutions found in the participants' accounts.

These codes were then grouped into broader categories and refined into major themes. The final themes were urbanization and heat islands, deforestation, waste burning and pollution, drought and agricultural vulnerability, and flooding and infrastructure failure. The themes were interpreted in relation to the study's theoretical foundations, particularly critical pedagogy and ecological systems theory.

### 3.5 Trustworthiness and Ethical Considerations

To strengthen the trustworthiness of the study, the researcher ensured that interpretations remained closely grounded in the participants' photographs and narratives. The use of both visual and textual data provided a form of triangulation, allowing the findings to be supported by multiple forms of evidence. The participants' original meanings were preserved as much as possible to avoid misrepresentation.

Ethical considerations were observed throughout the study. Participation was voluntary, and participants were informed of the purpose of the research. Pseudonyms were used to protect their identities. Consent was also secured for the use of photographs and narratives in the study.

## IV. RESULTS AND DISCUSSION

Thematic analysis of the participants' photographs and narratives produced five major themes. Each theme is presented below together with the participants' titled photographs and an account of their narratives. Pseudonyms were assigned to protect the confidentiality of the participants.

### 4.1 Urbanization and Heat Islands

The first theme concerns the intensification of heat in built-up urban environments.

Cruzada's photograph, titled "The City Street and High-Rise Building," shows massive concrete buildings and busy highways that have replaced what used to be green spaces, creating what he described as concrete heat islands. The road traps solar radiation and combines with vehicle exhaust, leaving the city hotter and affecting residents' living conditions and comfort. Cruzada attributed this to rapid urbanization in which nature is ignored, and he called on urban planners to prioritize green spaces and walkable streets.



**Figure 1.** "The City Street and High-Rise Building." Photograph by Cruzada.

Cruzada's account connects directly to the urban heat island phenomenon noted earlier, in which the replacement of vegetation with concrete and asphalt raises local temperatures. Notably, he did not stop at naming the discomfort. He traced it to a development pattern that overlooks nature and proposed a planning response. Viewed through Bronfenbrenner's (1979) ecological systems perspective, the photograph situates an individual experience of heat within the wider, macro-level decisions of urban planning, while the call for green and walkable spaces reflects the kind of critical, solution-oriented awareness that environmental education seeks to cultivate (Sachindra et al., 2022; Wang et al., 2021).

### 4.2 Deforestation

The second theme centers on the loss of forest cover through logging and charcoal production.

In a photograph titled "Cutting of Trees," Vicente documented felled tree trunks and observed that logging and land development are wiping out trees that provide clean air, shade, and food. He linked the problem to human development being prioritized over the preservation of nature, and he recommended planting new trees and protecting those that remain so that the environment can recover.



**Figure 2.** “Cutting of Trees.” Photograph by Vicente.

Gelo’s photograph, titled “Silakbo ng Abo,” captures thick smoke surrounding a rural road, where large piles of freshly cut trees are burned to produce charcoal. He noted that residents are forced to inhale the smoke, which can harm their lungs, and that the practice also drives deforestation. Recognizing that families turn to charcoal making in order to survive, he advocated for eco-friendly and sustainable livelihoods that protect both human dignity and the forests.



**Figure 3.** “Silakbo ng Abo.” Photograph by Gelo.

Together, Vicente’s and Gelo’s photographs frame deforestation as both an ecological loss and a livelihood issue. Vicente emphasizes the services that trees provide, such as clean air, shade, and food, echoing the ecological balance discussed in the literature, while Gelo foregrounds the economic pressures that push families toward charcoal production. The juxtaposition is significant: rather than condemning those who cut and burn trees (Mohammed et al., 2025; Smith et al., 2016). Gelo reframes the problem as one of survival that calls for sustainable alternatives. This reflects an emerging critical consciousness in the Freirean sense, in which environmental harm is read alongside the social and economic conditions that produce it (Tireli & Jacobsen, 2023, p. 57).

### 4.3 Waste Burning and Pollution

The third theme groups three accounts of waste burning and pollution.

Titled “Burn,” Menor’s photograph shows flames rising from a large pile of trash. He explained that this open burning releases toxic smoke into the air that the community breathes every day, and that the neighborhood resorts to it because it lacks proper waste collection. He recommended shifting to the composting of organic waste and consistent recycling.



**Figure 4.** “Burn.” Photograph by Menor.

Perla’s photograph, titled “Ang Sunog na Pag-asa,” documents a thick plume of dark smoke rising behind green trees from backyard burning, locally known as pagsisiga, which releases harmful pollutants and threatens community health. She observed that people often dismiss backyard burning as a minor issue compared with factory emissions, and she urged residents to stop burning household waste, to report illegal burning, and to compost instead.



**Figure 5.** “Ang Sunog na Pag-asa.” Photograph by Perla.

In a photograph titled “Improper Plastic Waste Disposal,” Mara captured a barren stretch of land littered with plastic waste, where the soil has been so degraded that grass and plants can no longer grow. She traced the problem to the careless use and irresponsible disposal of plastics and called for greater mindfulness through waste segregation, the proper use of trash bins, and recycling.



**Figure 6.** “Improper Plastic Waste Disposal.” Photograph by Mara.

The three accounts in this theme converge on the everyday management of waste and its consequences for air, soil, and health (Pathak et al., 2024, p. 4). Menor and Perla both identify open and backyard burning as harmful practices that persist because of inadequate waste collection and a perception that small-scale burning is harmless, while Mara turns attention to the slow degradation of soil by plastic. Across the three, the participants consistently link a visible environmental problem to a behavioral and structural cause and then to a concrete remedy such as segregation, composting, and recycling (Chantika et al., 2026), (Pillay & Govender, 2021, p. 6). This movement from observation to proposed action is precisely the reflective process that Photovoice is designed to elicit, and it suggests that the participants see themselves as agents capable of influencing community practice (Foster-Fishman et al., 2005).

#### 4.4 Drought and Agricultural Vulnerability

The fourth theme reflects the vulnerability of agriculture and rural livelihoods to drought.

Ursula's photograph, titled "Depleted," shows cracked and drained farmland. She described a field that should be full of life but is now drying up and can no longer be planted, warning that if the soil continues to dry, the community will lose its food source. She attributed the condition to heatwaves worsened by climate change and urged immediate care for the environment to avoid worse consequences.



**Figure 7.** "Depleted." Photograph by Ursula.

Titled "The Reality in a Rural Community," Teddy's photograph captures dry, cracked ground that looked, in his words, as if it were begging for water after intense heat and a lack of rain. Because farming is the community's life, food, and income, he stressed that when the land suffers, so do livelihoods and water sources, and he called for collective action such as harvesting rainwater and planting drought-tolerant crops.



**Figure 8.** "The Reality in a Rural Community." Photograph by Teddy.

Ursula's and Teddy's photographs give a human face to the agricultural impacts of climate change. Both connect cracked, depleted soil to heatwaves and reduced rainfall, and extend the consequences beyond the field to food security, water availability,

and livelihoods (Caviedes et al., 2023). Teddy's description of land that appears to be begging for water illustrates the affective dimension of Photovoice, in which an image carries emotional as well as informational weight. Their proposed responses, such as rainwater harvesting and planting drought-tolerant crops, indicate an awareness that adaptation is necessary and that communities can take practical measures rather than remain passive in the face of change (Hochachka, 2021; Thomas & Olago, 2024).

## 4.5 Flooding and Infrastructure Failure

The fifth theme addresses flooding and the failure of community infrastructure.

Mario's photograph, titled "Luha ng Kalikasan," shows rainwater flooding a local public market that had burned down months earlier, leaving the ruined stalls submerged in stagnant water. He observed that the flood is paralyzing the community's efforts to rebuild, destroying livelihoods and posing health hazards, and that existing infrastructure is unprepared for the extreme weather brought by climate change. He recommended building climate-resilient structures and better drainage systems.



**Figure 9.** "Luha ng Kalikasan." Photograph by Mario.

Mario's photograph captures the compounding nature of environmental risk, in which a market already destroyed by fire is then submerged by floodwater. His narrative locates the cause not only in heavy rainfall but also in infrastructure that is unprepared for increasingly extreme weather, and his call for climate-resilient buildings and improved drainage reflects an understanding of adaptation at the level of community systems. Viewed ecologically, the account links a single neighborhood's hardship to the broader failure of planning and infrastructure to keep pace with a changing climate (Adamson et al., 2017; Bohensky & Leitch, 2013; Campbell et al., 2021; Marschütz et al., 2020).

## 4.6 Cross-Theme Synthesis

The findings reveal that pre-service teachers understand the climate crisis as a lived and visible reality. Their photographs show that environmental problems are not distant or abstract but are present in streets, farms, forests, markets, and residential communities. Through Photovoice, the participants were able to identify concrete environmental issues and connect them to broader social, economic, and institutional conditions.

The theme of urbanization and heat islands shows how participants recognize the environmental cost of rapid development. The photograph of concrete buildings and busy roads demonstrates how urban expansion can reduce green spaces and intensify heat. This reflects a critical understanding that environmental problems are often produced by planning decisions that prioritize infrastructure over ecological balance.

The theme of deforestation reveals a deeper awareness of the relationship between environmental degradation and livelihood. Participants did not simply describe tree cutting as a harmful act; they also recognized that some communities depend on activities such as charcoal production for survival. This is important because it shows that the participants' environmental awareness is not judgmental or simplistic. Instead, it reflects an understanding that ecological problems are often tied to poverty, limited livelihood options, and the absence of sustainable alternatives.

The theme of waste burning and pollution emphasizes the everyday nature of environmental harm. The participants identified open burning, backyard burning, and improper plastic disposal as common practices that damage air quality, soil health, and community well-being. Their narratives suggest that these problems continue not only because of individual carelessness but also because of inadequate waste collection systems and weak environmental enforcement. This indicates that the participants are beginning to understand environmental problems as both behavioral and structural.

The theme of drought and agricultural vulnerability highlights the direct connection between climate change and livelihood insecurity. The images of cracked and dry farmlands illustrate how extreme heat and lack of rainfall affect farmers, food production, and community survival. The participants' reflections demonstrate empathy for rural communities and awareness of the need for adaptation strategies such as rainwater harvesting and drought-tolerant crops.

The theme of flooding and infrastructure failure shows that climate risks are intensified when communities lack resilient infrastructure. The flooded public market demonstrates how extreme weather can worsen existing community problems and delay recovery after disasters. The participants' recommendation for better drainage systems and climate-resilient structures reflects an understanding that climate adaptation requires planning, investment, and governance.

Across all themes, the participants showed a consistent pattern of critical reflection. They first described a visible environmental issue, then explained its causes, discussed its effects, and proposed possible solutions. This pattern reflects the development of critical consciousness because participants were not merely observing environmental problems; they were interpreting them and imagining ways to respond.

The findings also show that Photovoice has strong pedagogical value in teacher education (Robertson et al., 2022). It allows pre-service teachers to connect environmental concepts with real community experiences. Through this process, they develop not only environmental knowledge but also empathy, systems thinking, and social responsibility. These are important qualities for future teachers who will be expected to help learners understand and respond to climate-related challenges.

## V. CONCLUSION

This study explored the critical perspectives of pre-service teachers, from a Philippine Center of Excellence in Teacher Education, on the climate crisis through Photovoice. The findings demonstrate that pre-service teachers perceive climate change as a visible, lived, and socially embedded reality. Their photographs and narratives revealed environmental issues related to urbanization and heat islands, deforestation, waste burning and pollution, drought and agricultural vulnerability, and flooding and infrastructure failure.

The study shows that participants possess an emerging critical consciousness of the climate crisis. They were able to move beyond simple description and identify the human behaviors, economic pressures, infrastructure weaknesses, and governance gaps that contribute to environmental degradation. Their reflections also demonstrated concern for community well-being, livelihood security, public health, and ecological sustainability.

Photovoice proved to be an effective method for eliciting critical environmental reflection. It allowed participants to document real environmental conditions, interpret their significance, and propose practical responses. More importantly, it functioned as a pedagogical tool that helped pre-service teachers connect environmental education with lived community realities.

The study concludes that participatory and experiential approaches should be strengthened in teacher education, and it recommends integrating Photovoice into teacher education programs, strengthening environmental literacy across the curriculum, and promoting experiential learning approaches that connect future teachers with the environmental realities of their communities.

Although this study has implications for preservice teacher education, given the small sample size of the study, the results are not generalizable. Future studies are recommended in other contexts and bigger sample size and population.

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