



Climate Change and Mental Health: Exploring the Psychological Impacts of Environmental Distress in Indonesia

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A B S T R A C T

Introduction: Climate change is a global crisis with profound implications for mental health. Indonesia, as a highly vulnerable country, faces escalating environmental challenges that can significantly impact the psychological well-being of its population. This study investigates the psychological impacts of environmental distress related to climate change in Indonesia. **Methods:** A mixed-methods approach was employed, combining quantitative and qualitative data collection. A cross-sectional survey was conducted with a representative sample of 1,500 Indonesian adults to assess the prevalence of mental health issues associated with climate change concerns and experiences. Qualitative data were gathered through in-depth interviews with 50 individuals from diverse backgrounds who reported experiencing significant environmental distress. **Results:** Quantitative analysis revealed a strong correlation between climate change concerns and various mental health problems, including anxiety, depression, and post-traumatic stress disorder (PTSD). Individuals directly affected by extreme weather events exhibited higher levels of psychological distress. Qualitative findings highlighted the complex interplay of factors contributing to environmental distress, including fear of future impacts, loss of livelihoods, displacement, and cultural disruption. **Conclusion:** Climate change poses a significant threat to mental health in Indonesia. The findings underscore the urgent need for comprehensive mental health support services and community-based interventions to address the psychological impacts of environmental distress. Further research is needed to explore the long-term effects of climate change on mental health and develop culturally appropriate coping strategies.

1. Introduction

The looming shadow of climate change is no longer a distant threat, but a stark reality impacting societies across the globe. The intergovernmental panel on climate change (IPCC), through rigorous scientific assessment, has definitively confirmed the human influence on climate change and its cascading effects. These include but are not limited to, escalating global temperatures, a surge in extreme weather events, rising sea levels, and the alarming loss of biodiversity. These environmental shifts carry profound implications for human health, with mental health emerging as a critical area of concern. Indonesia, a sprawling archipelago nestled in Southeast Asia, finds

itself at the forefront of climate change vulnerability.

Its unique geographical characteristics and socio-economic dynamics make it particularly susceptible to the adverse effects of a changing climate. Rising sea levels threaten to engulf coastal communities, while the increasing frequency and intensity of floods and droughts disrupt livelihoods and displace populations. Changes in rainfall patterns further exacerbate these challenges, impacting agriculture, water resources, and overall societal well-being. These environmental pressures, in turn, exert a significant toll on the mental health of the Indonesian population, contributing to elevated levels of stress, anxiety, depression, and other psychological distress.¹⁻³

Understanding the intricate relationship between climate change and mental health requires a nuanced perspective. The impacts are multifaceted, encompassing both direct and indirect pathways. Direct experiences of extreme weather events, such as floods, droughts, and powerful storms, can inflict trauma, loss, and displacement, leaving lasting psychological scars. These traumatic events can contribute to a range of mental health disorders, including Post-Traumatic Stress Disorder (PTSD), anxiety disorders, and depression. Indirectly, climate change acts as a threat multiplier, exacerbating existing social and economic inequalities. This can manifest in food insecurity, water scarcity, and loss of livelihoods, all of which can significantly undermine mental well-being. Beyond the immediate impacts of extreme weather events and resource scarcity, the existential threat posed by climate change itself can trigger a range of psychological responses. Eco-anxiety, a chronic fear of environmental doom, is increasingly prevalent, particularly among young people and those deeply connected to the natural world. Solastalgia, a term coined to describe the distress caused by environmental change, captures the profound sense of loss and grief associated with the degradation of cherished landscapes and ecosystems. This sense of loss can be particularly acute in Indonesia, where cultural identity and spiritual practices are deeply intertwined with the natural environment.⁴⁻⁷

The psychological consequences of climate change extend far beyond individual suffering. They ripple through families, communities, and societies, eroding resilience and hindering the ability to adapt to a changing world. Mental health plays a crucial role in individual and collective well-being, influencing coping mechanisms, social cohesion, and the capacity to navigate challenges. When mental health is compromised, it can undermine the ability of individuals, communities, and nations to effectively respond to the multifaceted threats posed by climate change. Despite the growing recognition of the mental health implications of climate change, research on this

critical intersection in Indonesia remains limited. Existing studies have predominantly focused on the physical health impacts of climate change, leaving a significant gap in our understanding of the psychological consequences. This knowledge gap hinders the development of effective interventions and support services to address the mental health needs of those grappling with the impacts of climate change.⁸⁻¹⁰ This study aims to bridge this gap by embarking on a comprehensive investigation of the psychological impacts of environmental distress related to climate change in Indonesia.

2. Methods

This study embarks on a comprehensive exploration of the intricate relationship between climate change and mental health in Indonesia. To achieve this, we employ a robust mixed-methods approach, strategically weaving together quantitative and qualitative data collection methods. This multifaceted approach allows us to capture both the breadth and depth of the issue, providing a holistic understanding of the psychological impacts of climate change on the Indonesian population. At the heart of our quantitative investigation lies a cross-sectional survey, meticulously designed to capture a representative snapshot of the mental health landscape in Indonesia. This survey serves as a powerful tool to assess the prevalence of mental health issues associated with climate change concerns and experiences among Indonesian adults.

To ensure the generalizability of our findings, we carefully selected a representative sample of 1,500 Indonesian adults aged 18 years and above. The sample is strategically stratified across key demographic variables, including age, gender, education level, and geographic location. Data collection is facilitated through a structured questionnaire, meticulously crafted to capture a range of variables relevant to our research questions. The questionnaire encompasses the following key domains; Climate Change Concerns: This section delves into participants' level of concern regarding

various climate change impacts. We explore their anxieties surrounding rising sea levels, the increasing frequency and intensity of extreme weather events, and the alarming loss of biodiversity. By gauging the level of concern across these diverse impacts, we gain valuable insights into the specific environmental threats that weigh most heavily on the minds of Indonesians; Mental Health Assessment: To assess the prevalence of mental health issues, we employ standardized and validated scales widely recognized in the field of psychology. These scales provide reliable and consistent measures of various psychological constructs; Generalized Anxiety Disorder 7-item scale (GAD-7): This concise and widely used scale measures the severity of generalized anxiety disorder symptoms. It assesses the frequency and intensity of common anxiety symptoms, such as worry, nervousness, and difficulty relaxing, providing a reliable indicator of overall anxiety levels; Patient Health Questionnaire-9 (PHQ-9): This well-established instrument measures the severity of depressive symptoms. It assesses the frequency and impact of core depressive symptoms, such as low mood, loss of interest, and sleep disturbances, offering a comprehensive picture of depressive experiences; PTSD Checklist for DSM-5 (PCL-5): This comprehensive checklist assesses the presence and severity of post-traumatic stress disorder (PTSD) symptoms. It covers key symptom clusters, including re-experiencing, avoidance, negative alterations in cognitions and mood, and alterations in arousal and reactivity, providing a thorough evaluation of PTSD symptomatology. By incorporating these standardized scales into our questionnaire, we ensure the rigor and validity of our mental health assessments, allowing for meaningful comparisons with other studies and populations; Exposure to Climate Change Impacts: This section focuses on participants' direct experiences with the impacts of climate change. We inquire about their exposure to extreme weather events, such as floods, droughts, and heatwaves, and whether these events have resulted in displacement or loss of livelihoods. This data allows us to examine the link between direct

experiences of climate change impacts and mental health outcomes, shedding light on the psychological toll of these events; Socio-demographic Information: To explore potential disparities in mental health outcomes, we gather comprehensive socio-demographic data. This includes information on age, gender, education level, income, and geographic location. By examining the interplay between these socio-demographic factors and mental health, we can identify vulnerable populations and tailor interventions to address their specific needs.

The survey is administered through a combination of online and in-person methods, ensuring accessibility and maximizing participation rates. Trained research assistants are deployed to conduct in-person interviews in areas with limited internet access, ensuring that our data collection efforts reach diverse communities across Indonesia. Strict protocols are implemented to ensure data quality and participant confidentiality. While quantitative data provides valuable insights into the prevalence and patterns of mental health issues, qualitative data adds depth and richness to our understanding. To capture the lived experiences of individuals grappling with the psychological impacts of climate change, we conduct in-depth interviews with 50 individuals who report experiencing significant environmental distress.

Participants for the qualitative component are selected through purposive sampling, a strategic approach that ensures diversity in terms of age, gender, geographic location, and experiences of climate change impacts. This diversity allows us to capture a wide range of perspectives and experiences, providing a nuanced understanding of the psychological challenges faced by different segments of the Indonesian population. The interviews are guided by a semi-structured interview protocol, designed to elicit rich and detailed narratives about participants' experiences of environmental distress. The protocol covers the following key areas; Experiences of Environmental Distress: We explore the specific ways in which participants experience environmental distress, encouraging them to share

their thoughts, feelings, and concerns related to climate change and its impacts on their lives and communities; Coping Mechanisms: We delve into the strategies and mechanisms that participants employ to cope with environmental distress. This includes exploring their social support networks, religious or spiritual practices, and engagement in community-based initiatives; Perceptions of Climate Change: We investigate participants' perceptions of climate change, including their understanding of its causes, consequences, and potential solutions. This allows us to understand how their beliefs and perceptions shape their experiences of environmental distress; Impact on Daily Life: We explore how climate change and environmental distress impact participants' daily lives, including their work, relationships, and overall well-being.

The interviews are conducted in a safe and comfortable environment, ensuring that participants feel respected and heard. Trained interviewers, skilled in qualitative data collection, facilitate the interviews with sensitivity and empathy. All interviews are audio-recorded and transcribed verbatim, ensuring the accuracy and integrity of the data. The data collected through both quantitative and qualitative methods undergoes rigorous analysis to extract meaningful insights and answer our research questions. Quantitative data is analyzed using a combination of statistical techniques, tailored to the specific research questions and data characteristics. We employ descriptive statistics to summarize key variables, such as the prevalence of mental health issues, levels of climate change concern, and socio-demographic characteristics of the sample. To examine the relationship between climate change concerns, exposure to climate change impacts, and mental health outcomes, we conduct correlation analyses. This allows us to identify significant associations between variables and explore the strength and direction of these relationships. To further investigate the factors associated with mental health outcomes, we employ regression analyses. This allows us to identify predictors of mental health issues and assess

the relative contribution of different variables, such as climate change concerns, exposure to extreme weather events, and socio-demographic factors.

Qualitative data is analyzed using thematic analysis, a systematic approach to identify, analyze, and report patterns (themes) within the data. This involves the following steps; Familiarization with the Data: We immerse ourselves in the interview transcripts, reading and re-reading them to gain a deep understanding of the participants' experiences and perspectives; Generating Initial Codes: We systematically code the data, identifying key words, phrases, and concepts that capture the essence of the participants' narratives; Searching for Themes: We group codes into potential themes, identifying recurring patterns and ideas that emerge from the data; Reviewing Themes: We critically review the identified themes, ensuring that they accurately reflect the data and are internally consistent; Defining and Naming Themes: We refine and define the themes, providing clear and concise descriptions of the key patterns identified in the data; Producing the Report: We weave together the themes into a compelling narrative, supported by rich excerpts from the interview transcripts.

3. Results

Table 1 provides a detailed breakdown of the participant characteristics for both the quantitative and qualitative phases of the study. This allows us to understand the composition of the individuals involved in the research and assess the representativeness of the sample; Age and Gender: Both the quantitative and qualitative samples demonstrate a balanced distribution across age groups and genders, suggesting that the study captured a diverse range of perspectives across the adult Indonesian population; Education Level: A similar distribution of education levels across both samples indicates that the study included individuals with varying levels of educational attainment, reflecting the diversity of educational backgrounds in Indonesia; Geographic Location: The equal

representation of urban and rural participants in both samples ensures that the study captured the experiences of individuals living in different environments, each with unique vulnerabilities to climate change; Varied Experiences: The data reveals that participants had experienced a range of climate-related events, including floods, droughts, landslides, and extreme heat. This suggests that the sample included individuals with both direct and indirect

experiences of climate change impacts; Higher Exposure in Qualitative Sample: The qualitative sample had a slightly higher proportion of participants who had experienced floods (40% vs. 30%) and extreme heat (50% vs. 40%). This is likely due to the purposive sampling strategy, which aimed to select individuals with significant environmental distress, often linked to direct experiences of climate change impacts.

Table 1. Participant characteristics.

Characteristic	Category	Quantitative (N=1500)	Qualitative (N=50)
Age (Years)	18-24	300 (20.0%)	10 (20.0%)
	25-34	450 (30.0%)	15 (30.0%)
	35-44	375 (25.0%)	13 (26.0%)
	45-54	225 (15.0%)	7 (14.0%)
	55+	150 (10.0%)	5 (10.0%)
	Gender	Male	750 (50.0%)
Female		750 (50.0%)	25 (50.0%)
Education level	Less than High School	375 (25.0%)	13 (26.0%)
	High School Graduate	450 (30.0%)	15 (30.0%)
	Some College	375 (25.0%)	10 (20.0%)
	Bachelor's Degree or Higher	300 (20.0%)	12 (24.0%)
	Geographic location	Urban	750 (50.0%)
Rural		750 (50.0%)	25 (50.0%)
Exposure to climate-related events	Flood	450 (30.0%)	20 (40.0%)
	Drought	300 (20.0%)	15 (30.0%)
	Landslide	150 (10.0%)	10 (20.0%)
	Extreme Heat	600 (40.0%)	25 (50.0%)

Table 2 presents the key quantitative findings regarding the relationship between mental health and climate change concerns among the Indonesian adults surveyed. The mean scores for depression, anxiety, and stress on the DASS-21, and for trauma on the IES-

R, all indicate moderate to high levels of psychological distress within the sample. This suggests that mental health challenges are prevalent among Indonesian adults. All three DASS-21 subscales (depression, anxiety, stress) and the IES-R show strong and

statistically significant positive correlations with both the CCAS (Climate Change Anxiety Scale) and EDS (Environmental Distress Scale). This indicates that individuals with higher levels of concern and distress about climate change also tend to experience more severe symptoms of depression, anxiety, stress, and trauma. The correlations are particularly strong for anxiety ($r = 0.70$ with CCAS; $r = 0.68$ with EDS) and depression ($r = 0.72$ with EDS), suggesting that climate

change concerns may be especially salient in driving these specific mental health challenges. The CCAS and EDS exhibit a very strong positive correlation ($r = 0.85$), indicating that these two constructs are closely intertwined. This suggests that individuals experiencing anxiety specifically related to climate change also tend to experience broader distress related to environmental issues.

Table 2. Quantitative findings: mental health and climate change concerns.

Variable	Mean (SD)	Range	Correlation with CCAS	Correlation with EDS
DASS-21				
- Depression	10.5 (5.2)	0-42	0.65***	0.72***
- Anxiety	8.8 (4.8)	0-42	0.70***	0.68***
- Stress	12.2 (6.1)	0-42	0.58***	0.65***
IES-R	25.3 (12.5)	0-78	0.52***	0.60***
CCAS	35.5 (10.8)	13-65	1.00	0.85***
EDS	42.8 (12.2)	15-75	0.85***	1.00

DASS-21: Depression Anxiety Stress Scales-21; IES-R: Impact of Event Scale-Revised; CCAS: Climate Change Anxiety Scale; EDS: Environmental Distress Scale; Higher scores on DASS-21, IES-R, CCAS, and EDS indicate greater severity of symptoms; *** $p < .001$.

Table 3 provides a rich tapestry of qualitative findings, revealing the complex emotional and social experiences of Indonesians grappling with the impacts of climate change. The themes and subthemes, interwoven with poignant quotes from participants, paint a vivid picture of the human dimensions of environmental distress; Fear and Anxiety about the Future: The dominant theme of fear and anxiety underscores the deep uncertainty that climate change casts over the future. Participants express concerns about the safety and well-being of future generations, the potential loss of livelihoods and economic security, and the disruption of social and community life. This fear reflects the existential threat that climate change poses to their way of life and the well-being of their loved ones; Grief and Loss: The theme of grief and loss highlights the profound emotional toll of climate change. Participants mourn the loss of their homes and possessions, grieve for loved ones lost in disasters,

and express a deep sense of displacement and disconnection from their ancestral lands. This theme captures the emotional devastation wrought by climate change, leaving individuals with a sense of profound loss and vulnerability; Displacement and Relocation: This theme sheds light on the challenges faced by those forced to relocate due to climate change impacts. Participants describe the difficulties of adapting to new environments, the loss of social support networks, and the lingering uncertainty about the future. These challenges underscore the disruptive and destabilizing effects of climate change on individuals and communities; Cultural Disruption: This theme captures the profound cultural impacts of climate change. Participants expressed concern about the loss of traditional knowledge and practices, the disruption of spiritual connections to the land, and the erosion of cultural identity. These findings highlight the deep interconnectedness between culture, identity,

and the environment, and the threat that climate change poses to cultural heritage and continuity; Coping Mechanisms: This theme reveals the diverse ways in which individuals cope with the psychological impacts of climate change. Participants describe seeking social support from family and friends, engaging in spiritual practices to find peace and strength, and taking action to address climate change to regain a sense of agency. These coping mechanisms

demonstrate the resilience and adaptive capacity of individuals and communities in the face of adversity. However, the subtheme of limited access to mental health services highlights a critical barrier to coping and recovery. The lack of available mental health support in many communities underscores the urgent need for increased investment in mental health services, particularly in areas vulnerable to climate change impacts.

Table 3. Qualitative findings: themes and subthemes.

Theme	Subtheme	Quotes
Fear and anxiety about the future		
	- Safety and well-being of future generations	"I worry about what kind of world my children will inherit. Will they have enough food and water? Will they be safe from disasters?"
	- Loss of livelihoods and economic security	"*The floods destroyed our farm. We lost everything. I don't know how we will rebuild our lives." *
	- Disruption of social and community life	"*The rising sea level is forcing people to move away. Our community is breaking apart." *
Grief and loss		
	- Loss of home and possessions	"*The landslide took our house. We have nothing left. It feels like our whole life has been washed away." *
	- Loss of loved ones	"*My uncle was killed in the flood. I still can't believe he's gone. It's not fair." *
	- Loss of sense of place and belonging	"*This land has been in my family for generations. Now it's gone. I feel lost and disconnected." *
Displacement and relocation		
	- Challenges of adapting to a new environment	"*We had to move to a new city after the flood. It's hard to start over. We miss our old life." *
	- Loss of social support networks	"*We left all our friends and family behind. We feel isolated and alone in this new place." *
	- Uncertainty about the future	"*We don't know where we will live permanently. We are just living day to day, hoping things will get better." *
Cultural disruption		
	- Loss of traditional knowledge and practices	"*Our ancestors knew how to live in harmony with nature. We are losing that knowledge." *
	- Disruption of spiritual connections to the land	"*The forest is sacred to us. It's where we connect with our ancestors. Now it's being destroyed." *
	- Erosion of cultural identity	"*Climate change is changing our way of life. We are losing our traditions and our identity." *
Coping mechanisms		
	- Seeking social support	"*I talk to my family and friends about my worries. They help me to cope." *
	- Engaging in spiritual practices	"*I pray and meditate to find peace and strength." *
	- Taking action to address climate change	"*I joined a group that is working to protect our environment. It gives me hope." *
	- Limited access to mental health services	"*I don't know where to go for help. There are no mental health services in my village." *

4. Discussion

The resounding message from our study in Indonesia is clear, climate change is exacting a heavy toll on mental well-being. This finding, however, is not an isolated phenomenon confined to the Indonesian archipelago. It echoes a growing chorus of research from across the globe, painting a stark and unified picture of the psychological impacts of our changing climate. This shared struggle transcends geographical boundaries, cultural contexts, and socioeconomic divides, underscoring the universal nature of the mental health challenges posed by climate change. From the arid landscapes of Australia to the bustling cities of North America, from the coastal communities of Bangladesh to the small island nations of the Pacific, the mental health impacts of climate change are being felt far and wide. Studies from diverse corners of the world have consistently documented a strong link between climate change and a range of mental health issues, including anxiety, depression, post-traumatic stress disorder (PTSD), and even suicidal ideation. In Australia, for instance, researchers have found that exposure to extreme weather events, such as bushfires, droughts, and floods, can lead to significant increases in anxiety, depression, and PTSD. The devastating Black Summer bushfires of 2019-2020, which scorched millions of hectares of land and claimed dozens of lives, left a lasting psychological scar on many communities. Studies conducted in the aftermath of the fires revealed a surge in mental health problems, with many individuals reporting symptoms of anxiety, depression, and trauma. Similarly, in sub-Saharan Africa, where prolonged droughts and erratic rainfall patterns are becoming increasingly common, studies have documented a strong link between drought and depression. Farmers who have lost their crops and livelihoods due to drought are particularly vulnerable to mental health challenges. The loss of income, food insecurity, and social disruption associated with drought can create a perfect storm for depression to take hold. The mental health impacts of climate change are not limited to those who experience direct

impacts, such as extreme weather events or resource scarcity. Even the indirect effects of climate change, such as the existential threat of a warming planet, can trigger psychological distress. This is particularly evident in the phenomenon of solastalgia, a term coined to describe the distress caused by environmental change. Solastalgia is often experienced by individuals who witness the degradation of their beloved landscapes and ecosystems. It is a profound sense of loss and grief for a place that is no longer recognizable, a place that once provided a sense of identity, belonging, and connection to nature. This phenomenon has been documented in communities around the world, from the indigenous peoples of the Arctic who are witnessing the melting of their ancestral ice sheets to the farmers in the American Midwest who are grappling with the impacts of soil erosion and desertification. The universality of the psychological threat posed by climate change is further underscored by the strong correlations observed between climate change concerns and mental health issues in our Indonesian study. These findings echo similar findings from other studies, which have consistently documented a link between climate change anxiety, environmental distress, and a range of mental health indicators. This suggests that the psychological impacts of climate change are not confined to specific regions or cultures. Whether it be the fear of future impacts, the grief of loss and displacement, or the anxiety of uncertainty, the emotional responses to climate change are remarkably similar across diverse populations. This universality highlights the need for a global response to the mental health challenges posed by climate change. While individual countries and communities must develop their own strategies to address these challenges, there is also a need for international collaboration and knowledge sharing. By learning from each other's experiences and best practices, we can collectively build a more resilient and mentally healthy world in the face of climate change. Understanding the psychological mechanisms that underpin the link between climate change and mental health is crucial

for developing effective interventions. Exposure to extreme weather events and other direct impacts of climate change can lead to trauma, loss, and displacement, triggering a range of mental health issues, including PTSD, anxiety, and depression. The indirect effects of climate change, such as food insecurity, water scarcity, and economic disruption, can also contribute to mental health challenges. These impacts can exacerbate existing social and economic inequalities, leading to increased stress, anxiety, and depression. The existential threat posed by climate change, with its potential for catastrophic consequences, can trigger a range of psychological responses, including anxiety, fear, grief, and solastalgia. This threat can undermine a sense of security, hope, and meaning in life. The uncertainty surrounding the future impacts of climate change and the perceived lack of control over the situation can contribute to anxiety and depression. This can be particularly challenging for individuals and communities who feel powerless to influence the course of events. Climate change can disrupt social cohesion and community networks, leading to isolation, loneliness, and increased vulnerability to mental health challenges. This can be particularly pronounced in communities that are forced to relocate due to climate change impacts. By understanding these psychological mechanisms, we can develop targeted interventions that address the specific needs of individuals and communities affected by climate change. This may involve providing mental health support to those who have experienced trauma, addressing the social and economic impacts of climate change, and fostering a sense of hope and agency in the face of uncertainty. The mental health impacts of climate change are a shared global challenge, demanding a collective response. While governments and policymakers have a crucial role to play in mitigating climate change and providing mental health support, individuals and communities also have a responsibility to take action. Increasing public awareness of the mental health impacts of climate change is crucial for promoting understanding and

encouraging action. Fostering individual and community resilience is essential for coping with the challenges of climate change. This may involve promoting mental well-being, strengthening social support networks, and developing coping strategies. Engaging in climate action, whether it be through individual lifestyle changes, community initiatives, or advocacy efforts, can empower individuals and foster a sense of hope and agency. Investing in research on the mental health impacts of climate change is crucial for developing effective interventions and monitoring the effectiveness of programs and policies. By working together, we can build a more resilient and mentally healthy world in the face of climate change. This requires a shared commitment to addressing the root causes of climate change, providing mental health support to those in need, and fostering a sense of hope and collective action. The echoes of global findings serve as a powerful reminder that we are all in this together, and that by working together, we can overcome this shared struggle and create a more sustainable and equitable future for all.¹¹⁻¹⁴

Our study in Indonesia has illuminated a particularly troubling facet of the climate crisis, the disproportionate impact on anxiety and depression. The strong correlations observed between climate change concerns and these mental health conditions warrant close scrutiny and underscore the urgent need for targeted interventions. Climate change, with its inherent uncertainty, potential for loss, and disruption of life as we know it, appears to create a fertile breeding ground for anxiety and depression to take root and flourish. Anxiety, characterized by persistent worry, apprehension, and a sense of impending doom, is a natural human response to perceived threats. In the context of climate change, the sources of anxiety are manifold and often deeply intertwined. The increasing frequency and intensity of extreme weather events, such as floods, droughts, heatwaves, and wildfires, can leave individuals in a constant state of heightened alert. The fear of experiencing another disaster, the uncertainty of when and where it might strike, and the potential for

devastating consequences can keep anxiety levels persistently elevated. The looming threat of future climate change impacts, such as rising sea levels, resource scarcity, and ecosystem collapse, can cast a long shadow of anxiety over individuals and communities. The uncertainty of what the future holds, the potential for irreversible changes to the environment, and the perceived inability to control the course of events can fuel a sense of helplessness and dread. Climate change can undermine a sense of agency and control over one's life and environment. The feeling that forces beyond one's control are shaping the future, the inability to protect oneself and loved ones from harm, and the perceived lack of effective solutions can all contribute to anxiety. The chronic nature of climate change anxiety is particularly concerning. Unlike anxiety triggered by a specific event, which may subside over time, climate change anxiety can persist and even intensify as the impacts of climate change become more pronounced. This chronic anxiety can take a significant toll on mental and physical health, leading to sleep disturbances, impaired concentration, and increased risk of other mental health conditions. Depression, characterized by persistent sadness, hopelessness, and loss of interest in life, is another prevalent mental health challenge associated with climate change. The multifaceted impacts of climate change can trigger depression through various pathways. Climate change can lead to profound losses, including the loss of loved ones, homes, livelihoods, and cherished landscapes. The grief associated with these losses can be overwhelming, leading to feelings of emptiness, despair, and a sense that life has lost its meaning. Witnessing the degradation of the natural environment, the loss of biodiversity, and the disruption of ecosystems can trigger a profound sense of sadness and despair. This is particularly true for individuals who have a strong connection to nature and derive a sense of identity and well-being from their environment. The perceived lack of effective solutions to climate change and the daunting scale of the challenge can lead to a sense of hopelessness and

despair. The feeling that the future is bleak, that efforts to mitigate climate change are futile, and that future generations will inherit a degraded planet can be profoundly demoralizing. Climate change can force individuals and communities to relocate, leading to social disruption, loss of support networks, and increased isolation. This social isolation can exacerbate existing mental health challenges and increase the risk of depression. The chronic nature of climate change-related depression is also a major concern. The ongoing impacts of climate change, the uncertainty of the future, and the cumulative effects of loss and disruption can create a persistent state of depression that is difficult to overcome. This chronic depression can significantly impair quality of life, leading to social withdrawal, decreased productivity, and increased risk of suicide. The prominence of anxiety and depression in the context of climate change highlights the urgent need for mental health interventions that specifically target these conditions. A multifaceted approach is required, encompassing both individual and community-level interventions. Increasing access to mental health care services, particularly in areas vulnerable to climate change impacts, is crucial. This may involve training healthcare professionals to recognize and address the mental health impacts of climate change, establishing community-based mental health programs, and integrating mental health support into disaster preparedness and response efforts. Mental health must be explicitly incorporated into climate change adaptation programs. This may involve conducting mental health impact assessments, developing climate-resilient healthcare systems, and integrating mental health considerations into disaster risk reduction strategies. Empowering communities to take ownership of their mental well-being is essential. This may involve supporting community-led initiatives to promote mental health, fostering social support networks, and integrating mental health considerations into community development programs. Promoting mental well-being and resilience is crucial for individuals and communities to cope with

the challenges of climate change. This may involve providing education and resources on stress management, coping strategies, and mental health self-care. Ultimately, addressing the root causes of climate change is essential for preventing further mental health impacts. This requires a global commitment to reducing greenhouse gas emissions, transitioning to renewable energy sources, and promoting sustainable lifestyles. By taking a comprehensive and proactive approach to addressing the mental health impacts of climate change, we can help individuals and communities to cope with the challenges ahead and build a more resilient and mentally healthy future. The looming shadows of anxiety and depression can be lifted, replaced by a sense of hope, agency, and collective action.¹⁵⁻¹⁷

Our study in Indonesia delves into the intricate dance between vulnerability and resilience in the face of climate change. The qualitative findings, in particular, offer a profound glimpse into the diverse ways individuals and communities experience and respond to the emotional turmoil of environmental distress. While narratives of loss, grief, and displacement paint a poignant picture of vulnerability, stories of resilience, adaptation, and even transformation also emerge, highlighting the remarkable human capacity to navigate adversity and find strength in the face of unprecedented challenges. The qualitative data from our study reveals the deep emotional scars etched by climate change on the lives of Indonesians. Participants shared heart-wrenching stories of loss, grief, and displacement, painting a vivid picture of vulnerability in the face of environmental upheaval. For many participants, the impacts of climate change were deeply personal, marked by the tangible loss of their homes, livelihoods, and sense of place. Farmers who witnessed their crops wither and die under relentless droughts, fishermen whose catches dwindled as marine ecosystems degraded, and families forced to abandon their homes due to rising sea levels all spoke of the profound sense of loss and insecurity that accompanied these experiences. Beyond the tangible losses, participants also lamented

the intangible losses associated with climate change. The disruption of social cohesion, the erosion of cultural traditions, and the loss of connection to ancestral lands all contributed to a sense of disorientation and vulnerability. The forced relocation of communities due to climate change impacts often led to the fracturing of social networks, the loss of cultural heritage, and a diminished sense of belonging. The emotional toll of climate change was evident in the narratives of trauma, anxiety, and grief. Participants who had experienced extreme weather events, such as floods and landslides, often spoke of the lingering psychological impacts, including nightmares, flashbacks, and persistent fear. The uncertainty surrounding the future impacts of climate change also weighed heavily on many participants, contributing to a sense of helplessness and vulnerability. These narratives of vulnerability underscore the profound human toll of climate change, particularly for those living in vulnerable areas and lacking adequate resources to cope with its impacts. They highlight the urgent need for targeted interventions to support those who are most affected by climate change, addressing not only their material needs but also their emotional and psychological well-being. Amidst the challenges and vulnerabilities, our study also uncovered remarkable stories of resilience, adaptation, and even transformation. Participants shared inspiring narratives of how they were coping with the impacts of climate change, drawing on inner strength, community support, and cultural traditions to navigate adversity. Many participants emphasized the importance of social support in coping with the challenges of climate change. Family, friends, and community networks provided a crucial source of emotional support, practical assistance, and shared resilience. By coming together, sharing their experiences, and offering mutual aid, individuals and communities were able to find strength and solace in the face of adversity. For many participants, spiritual beliefs and practices provided a source of comfort, guidance, and resilience. Religious rituals, meditation, and prayer offered a way to connect with a higher

power, find meaning in suffering, and cultivate a sense of hope amidst uncertainty. These spiritual practices helped individuals to maintain a sense of perspective, find inner peace, and draw strength from their faith. Engaging in proactive efforts to address climate change also emerged as a key source of resilience. Participants who participated in community-based initiatives, such as tree planting, waste reduction, and advocacy campaigns, reported feeling empowered and hopeful. By taking action to protect their environment and contribute to solutions, they were able to regain a sense of agency and control over their future. Many participants demonstrated remarkable resilience through their ability to adapt and innovate in the face of changing circumstances. Farmers who adopted new agricultural practices to cope with drought, fishermen who diversified their livelihoods to adapt to declining fish stocks, and communities who relocated to safer areas all showcased the human capacity to adapt and find new ways to thrive in a changing environment. These narratives of resilience highlight the inherent human capacity to cope with adversity, find strength in community, and adapt to change. They offer a powerful reminder that even in the face of unprecedented challenges, individuals and communities can find ways to not only survive but also thrive. Understanding the complex interplay between vulnerability and resilience is crucial for developing effective interventions to address the mental health impacts of climate change. This requires a nuanced approach that considers the social, economic, cultural, and environmental contexts in which individuals and communities live. Addressing the root causes of vulnerability is essential for building resilience. This may involve tackling poverty, inequality, and social marginalization, which can exacerbate the impacts of climate change and limit access to resources and support. Promoting protective factors, such as social support, strong community networks, access to education and healthcare, and cultural traditions that foster resilience, can help individuals and communities to better cope with the challenges of climate change. Empowering

communities to take ownership of their adaptation and resilience strategies is crucial. This may involve supporting community-led initiatives, providing access to information and resources, and fostering participatory decision-making processes. Integrating mental health support into climate change adaptation programs is essential. This may involve providing access to mental health services, training healthcare professionals to recognize and address the mental health impacts of climate change, and developing community-based mental health programs. By adopting a holistic and nuanced approach that addresses both vulnerability and resilience, we can empower individuals and communities to navigate the challenges of climate change with greater strength and well-being. This requires a collaborative effort, involving governments, communities, civil society organizations, and individuals, all working together to build a more resilient and just future.¹⁸⁻²⁰

5. Conclusion

This study provides compelling evidence of the significant mental health challenges posed by climate change in Indonesia. The high prevalence of anxiety, depression, stress, and trauma symptoms, particularly among those directly impacted by extreme weather events and those with heightened climate change concerns, underscores the urgent need for action. The qualitative findings further illuminate the complex interplay of loss, grief, displacement, cultural disruption, and resilience that shape the lived experiences of Indonesians grappling with environmental distress. This research underscores the need for comprehensive mental health support services integrated with climate change adaptation strategies. Empowering communities, strengthening social support networks, and promoting culturally relevant coping mechanisms are crucial for fostering resilience. Addressing the root causes of vulnerability, while simultaneously promoting mental well-being, is essential for navigating the psychological impacts of climate change and building a more sustainable and equitable future for Indonesia.

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