

## EXPLORATION OF CLIMATE CHANGE ON MENTAL HEALTH IN INDONESIA: SYSTEMATIC ANALYSIS REVIEW

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### Abstract

Currently, the world is facing a serious challenge in the form of climate change. Climate change gives rise to more devastating weather anomalies and natural disasters. The impact can be felt directly through physical and indirect damage felt by humans, one of which is mental health problems. Climate change also poses a threat to sustainable development in Indonesia. In the 2021 Climate Transparency report, it is reported that Indonesia's climate is in the "highly insufficient" category or so inadequate in reducing greenhouse gas emissions that it is estimated that by 2030-2050, climate change will cause additional deaths per year of ¼ million people due to malnutrition (lack of nutrition), malaria, heat wave stress. This literature review aims to review existing journals regarding the relationship between climate change and mental health, as well as what methods have been used to deal with it. The research method used is a systematic analysis review. The results we found were that there is still little Indonesian literature that discusses the impact of climate change on mental health and that climate change in Indonesia has the opportunity to impact individual mental health.

Keywords: Climate, Mental Health, SLR.

## INTRODUCTION

Climate change is a big challenge facing the world today. Climate change refers to drastic changes in the balance of the earth's atmosphere, humidity, turbidity and rainfall that occur due to the interaction of the earth's climate systems such as the atmosphere (air), hydrosphere (water), cryosphere (ice and permafrost), biosphere (living things), and lithosphere (Earth's crust and upper mantle) (Chakraborty et al., 2014). Based on the PPLH (Environmental Protection and Management) Law Number 32 of 2009, climate change is caused by humans either directly or indirectly which causes changes in atmospheric composition and climate variability (KLHK, 2020), (Aldrian, 2011).

Climate change has accelerated in the last decade. According to the 2022 Global Climate Report from NOAA's National Centers for Environmental Information, every month of 2022 was among the ten hottest months. In a 2017 US Climate Science Special report, it projected that by the end of the century, global temperatures would be at least 5 degrees Fahrenheit warmer than the average temperature in 1901-1960 (Lindsey & Dahlman, 2023). The climate change that is occurring globally is **First**, Global Temperature is Increasing (NOAA, 2023). **Second**, the ocean is getting warmer. **Third**, The Ice Sheet is Shrinking (Velicogna et al., 2020). **Fourth**, Snow Cover Decreases (Robinson et al., 2017). 5). Sea Level Rise. (Nerem et al., 2018).

Climate change also poses a threat to sustainable development in Indonesia. The increasing frequency and intensity of extreme weather such as heat waves, floods, long droughts, landslides, forest fires will impact water management, reduce agricultural production and food security, increase health risks, damage critical infrastructure and disrupt the provision of basic services. In addition, the 2021 *Climate Transparency report* reports that Indonesia's climate is in the " *highly insufficient* " category or so inadequate in reducing greenhouse gas emissions that it is estimated that by 2030-2050, climate change will cause additional deaths per year of ¼ million people due to malnutrition, malaria, heat wave stress. Of course, this will hinder the achievement of sustainable goals (SDGs) in point 13, namely *climate action*.

In research entitled "*The Impact of Climate Change on Mental Health*" it is explained that environmental factors are becoming increasingly important in psychiatry. Climate can produce powerful phenomena with devastating impacts on human society. Disasters create different psychological and psychopathological stressors than typical seasonal weather changes, as seen in tornadoes, floods, and droughts. Rising temperatures, heat waves, floods, tornadoes, hurricanes, droughts, fires, loss of forests and glaciers, as well as loss of rivers and desertification, can directly and indirectly cause human pathology, both physical and mental (Cianconi et al., 2020 ).

Palinkas & Wong (2020) stated that climate change has a direct and indirect impact on mental health. Anxiety arising from climate change affects humans' emotional and functional cognitive conditions, both of which are closely related to the symptoms of *Generalized Anxiety Disorder*. However, humans' functional condition, namely their ability to carry out daily activities, is more related to *Major Depressive Disorder* , a more severe mental symptom. Mental health which is influenced by climate change also does not look at age, where people in the age range (18-24, 25-39, 40-54, and >55) admit that their mental health condition is affected by climate change which they experience directly or only just an overview (Gibson et al., 2020). Anxiety about climate change also affects children, where they report feeling anxiety and sadness that affects their daily lives (Hickman et al., 2021).

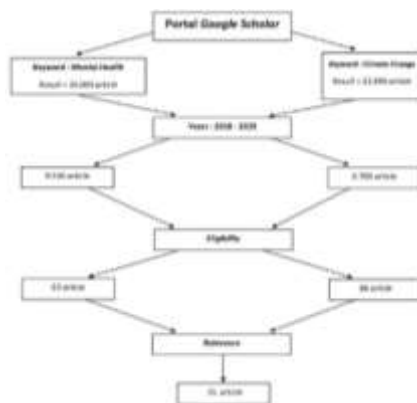
However, psychiatric research regarding mental disorders related to climate change in Indonesia is still limited, and needs to be researched further from time to time. The climate will always change over time. Prevalence estimates regarding the relationship between climate change and mental health need to be explored further, how effective therapy can be implemented, as well as society's resilience to this problem (Clayton, 2021). Currently, young

people are more susceptible to mental health disorders such as anxiety and depression (Shorey et al., 2022). Indonesia is predicted to have a demographic bonus in the future. Having sufficient research related to the impact of climate change on mental health will help in formulating solutions that will help Indonesia achieve the SDGs. Thus, this research aims to present an analysis related to the influence of climate change on mental health on a global scale, which we hope can be applied in Indonesia

## **RESEARCH METHODOLOGY**

A systematic literature review or systematic analysis review (SLR) is a structured methodology for conducting reviews. SLR is useful for identifying gaps in the literature and topics of interest. With 3 main phases which include planning, implementation and reporting (Palomino et al., 2019), (Latifa & Ritonga, 2020). In the first phase, determine journal requirements that are appropriate to the research topic. Next, a structured identification and review was carried out in journals with the keywords climate changes and mental health in Indonesia. In the second phase, researchers define research questions, search strategies, study selection processes, quality assessments and data selection and synthesis. Finally, the researchers wrote down the research results based on the literature that had been collected.

The data sources used come from journal literature on a national and international scale obtained electronically through a systematic process in the journal library, namely Google Scholar. The literature available on Google Scholar until early January 2024 was reviewed. With the keywords climate change and mental health, 15 journals were found that fit the scope of the research. Researchers are looking for a relationship between climate change such as forest fires, increasing hot temperatures and extreme weather changes with mental health such as schizophrenia, anxiety, mood disorders and depression, suicide, aggressive behavior. The literature review is then divided into specific specifications for synthesis.



**Figure 1. Systematic Overview Table**

## RESULTS AND DISCUSSION

### Research Results

The results obtained from the systematic literature review process are the results of the analysis and summary of 15 articles collected relating to the process of exploring the influence of climate change on mental health, the results are presented in the following table.

Researcher and Year	Journal	Research result
(Middleton et al., 2020)	Indigenous Mental Health in a Changing Climate - A systematic Scoping Review of the Global Literature	The results of several journal analyzes found that there was indirect pressure (vicarious distress) among indigenous community participants who felt afraid or empathized with this matter, especially those in their social networks such as family and friends, who experienced bad weather or other conditions. environment. In the context of engaging indigenous communities in research, it was found that there are important opportunities for global research efforts to engage indigenous communities in addressing the mental health impacts of rapid climate change.
(Clayton, 2020)	Climate Anxiety - Psychological Responses to Climate Change	Worry about climate change can lead to ongoing feelings of worry and concern, which in turn can harm mental well-being. The impact of climate change on mental health also suggests that

		environmental damage due to climate change may contribute to psychological stress and anxiety disorders.
<b>(Ebi et al., 2021)</b>	Extreme Weather and Climate Change - Population Health and Health System Implications	The negative impact on mental health due to climate change is starting to decrease, however, through building climate-resilient health systems through risk reduction, better preparation, response and recovery to reduce risks.
<b>(Rocque et al., 2021)</b>	Health effects of climate change - an overview of systematic reviews	Most systematic reviews of the impact of climate change on health indicate a link between climate.
<b>(Stanley et al., 2021)</b>	From anger to action - Differential impacts of eco-anxiety	This research implicates anger as a key adaptive emotional driver involved in the climate crisis, and an early warning regarding the mental health of a society increasingly worried and distressed by climate change.
<b>(Schwartz et al., 2023)</b>	Climate change anxiety and mental health - Environmental activism as a buffer	Climate change anxiety in the cognitive, emotional and functional forms is closely related to the symptoms of Generalized Anxiety Disorder, but climate change anxiety in the functional form is more closely related to the symptoms of Major Depressive Disorder.
<b>(Gibson et al., 2020)</b>	The mental health impacts of climate change - Findings from a Pacific Island atoll nation (1)	Stress triggers: climate change (experienced in the surroundings or just the image) was the cause of stress for all respondents except 5 people. 62.24% of respondents reported at least 1 feeling of extreme stress such as; sadness, worry/anxiety, anger, bodily unwellness. Of the 87% of respondents, their stress level regarding climate change affects their ability to carry out daily activities.
		Thinking about the impact of climate change on mental health, the positive

<p><b>(Dilman-Hasso, 2021)</b></p>	<p>The natural buffer - the missing link in climate change and mental health research</p>	<p>benefits of nature for mental health, and well-being separately makes it more difficult to understand both issues. Currently, there is no empirical research on the important question, namely: What are the mental health implications of natural buffers degraded by climate change?</p>
<p><b>(Clayton, 2021)</b></p>	<p>Climate Change and Mental Health</p>	<p>The evidence that climate change will have a detrimental impact on mental health is compelling. The effects can be direct and indirect caused by climate change events. The impact can be reduced and handled through social mechanisms, through support networks (family, close friends, etc.) and mental health services. Or people can also carry out environmental activism for those who are not too affected by mental health from climate change.</p>
<p><b>(Marazziti et al., 2021)</b></p>	<p>Climate change, environmental pollution, COVID-19 pandemic and mental health</p>	<p>Climate change, air pollution, and the COVID-19 pandemic may affect mental health • A review of the literature suggests that overall health, with disorders ranging from mild negative emotional responses to severe psychiatric conditions, climate change, pollution, and COVID-19 may increase risk mental disorders in particular, anxiety and depression, stress/trauma related disorders, and substance abuse.</p>
<p><b>(Hrabok et al., 2020)</b></p>	<p>Threats to Mental Health and Well-Being Associated with Climate Change</p>	<p>Climate change is a significant problem; in fact, it is one of the most significant dilemmas facing future generations. The impact of climate change on mental health is multifaceted, with anxiety (especially PTSD) and depression predominating.</p>

<p><b>(Lawrance et al., 2021)</b></p>	<p>The impact of climate change on mental health and emotional wellbeing, current evidence and implications for policy and practice</p>	<p>Climate change poses an under-recognized threat to mental health and emotional well-being. Extreme weather and climate events cause severe psychological trauma, which can be seen in the form of increasing suicide rates, new cases and worsening symptoms of mental illness, and worsening of people's mental health and emotional well-being.</p>
<p><b>(Cianconi et al., 2020)</b></p>	<p>The Impact of Climate Change on Mental Health, A systematic Descriptive Review</p>	<p>Climate change impacts a large portion of the population, in various geographic areas and with various types of threats to public health. In addition, climate change also impacts various population groups that are directly exposed and more vulnerable in their geographic conditions, as well as lack of access to resources and information. , and protection</p>
<p><b>(Charlson et al., 2021)</b></p>	<p>Climate Change and Mental Health, A Scoping Review</p>	<p>Climate change has a significant impact on people's mental health, and requires special attention, especially in low- and middle-income countries. The relationship between environmental exposures related to climate change, such as temperature, humidity, rainfall, drought, forest fires and floods, and mental health impacts.</p>
<p><b>(Palinkas &amp; Wong, 2020)</b></p>	<p>Global Climate</p>	<p>Based on research results on several findings on the impact of climate change on mental health, 1). Increased psychosocial pressure, 2). general anxiety. 3). Increased incidence of suicide.</p>

**Fig.2 Journal Analysis Table**

## Discussion

The results obtained show that there is an influence of climate change on mental health. Climate change will result in increasingly extreme weather conditions. Extreme weather such as large storms, floods, droughts and heat waves will then have implications for

psychopathological phenomena or the study of mental or behavioral disorders. Some natural disasters may become more frequent due to climate change. Notably, reactions to extreme events involving life disruption, such as loss of life, resources, social support and social networks, or extensive relocation, are post-traumatic stress disorder (PTSD), depression, and generalized anxiety, increased use or abuse of drugs . and suicidal thoughts. (Cianconi et al., 2020)

In Indonesia, there are factors that influence climate change. First, the unstable pattern of the sun's location will affect the rainfall that occurs in Indonesia. Second, the archipelago region in Indonesia, which causes the Indonesian climate to be moderate. Third, there are high mountains in several areas in Indonesia which have an impact on climate differences that occur in areas with close proximity. (Julismin, 2013) . Apart from that, the results of the Parallel Climate Change Conference (UN Climate Change Conference 2007) showed that climate change which often occurs in Indonesia is often related to the problem of deforestation which results in floods, forest fires which cause an increase in hot temperatures, and land damage which results in landslides.

From the journals analyzed, there are several climate problems that have an impact on mental health in Indonesia. **First**, Flooding is the occurrence of water overflowing onto land in large quantities and is caused by high rainfall, melting snow and other reasons. In the last ten years, flood levels in Indonesia had the highest frequency in 2020 with 1.5.31 cases. Furthermore, in 2021 it decreased to 1,181 cases, and in the following year it fell to 858 cases. Even though the level of flooding is decreasing from year to year, vigilance regarding the impact of flooding must be taken into account considering that flooding is the cause of 53,000 deaths in the last decade (Annur, 2023). Floods also have an impact on mental health, especially leading to post-traumatic stress disorder or what is also known as Mental disorders caused by feelings of trauma, anxiety and depression, one of which is caused by natural disasters (Ebi et al., 2021) . According to (Cianconi et al., 2020) , flooding has a direct correlation with the severity of mental health impacts. An Australian study qualitatively explored the experiences of individuals from rural communities, concluding that the threats of drought and flooding are interrelated and contribute to reduced well-being due to stress, anxiety, loss and fear. (Charlson et al., 2021)

**Second** , Drought. The frequency and intensity of droughts is increasing as global temperatures increase and rainfall patterns change. Internationally, over the past two decades,



droughts have impacted more than one billion people. , Indonesia is also often hit by drought due to erratic weather. It can be seen that the drought disaster ranks 6th, with 220 cases. (Perkim.id, 2023) . Research (Ebi et al., 2021) shows that drought has the potential to affect mental health due to a lack of clean water. Additionally, the mental health of Farmers around the world is more vulnerable to environmentally induced mental health risks due to drought. Long-term drought and erratic rainfall are associated with worsening economic conditions, reduced social functioning, and psychological distancing from perceptions of negative climate conditions (96). Emotional regulation and adjustment is disturbed by depression, demoralization, fatalism, passive resignation to fate, especially in women and adolescents or people with low socio-economic status, showing feelings of depression and helplessness (Cianconi et al., 2020)

*Third* , forest fires. In a survey conducted by the University of Cambridge and YouGov in 2019, it was stated that Indonesia had a percentage of climate change deniers that was 18% higher than Saudi Arabia and America. Apart from that, BMKG predicts that there will be an increase in air temperature of 0.5 degrees (Fakhri, 3019) . Long-Term Environmental Change and Critical Psychological Adaptation Climate change causes extreme events that have immediate and immediate impacts on society in terms of mental health. (Cianconi et al., 2020) . Furthermore, research conducted in America concluded higher levels of solastalgia, a term used to indicate stress caused by environmental change (measured using a scale adapted from [40]), and adverse financial impacts from fires. is associated with clinically significant psychological distress. (Charlson et al., 2021)

## CONCLUSION

Overall, the results from reviewing 15 journals show that climate change has an impact on individual mental health. The impact on mental health can be experienced directly or indirectly, and the levels vary from low to high. This is also determined by where they live, whether the place is directly or indirectly affected, and the individual's age range. There are several ways to deal with mental health disorders caused by climate change, such as climate activism, social mechanisms through interactions with other individuals, and mental health services.

From this, we assess that in Indonesia there is still a need to explore the relationship between climate change and mental health. Indonesia is a country with a wide demographic

range and varying environmental conditions. To support Indonesia's achievement of the SDGs, appropriate strategies are needed to overcome mental health problems caused by climate change. The strategy designed must be able to facilitate all demographic ranges.

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