

# Systematic Study Literature Review: Climate Change, Mental Health and Mitigation Efforts in Indonesia

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## Systematic Study Literature Review: Climate Change, Mental Health and Mitigation Efforts in Indonesia

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**Abstract:** Climate change has been occurring since 1970 and has been felt by all countries, causing disasters such as waves of health, floods, droughts, the greenhouse effect that triggers global warming. The impact of climate change increases the frequency of extreme events such as droughts and floods, and is one of the causes of crop failures, harvests and even causes puso. Climate change is forcing changes in lifestyle, consequences in regulations, harm to people, and social adjustments. This phenomenon has not been identified to what extent it can endanger the quality of human life. Environmental factors are important in relation to psychiatry, such as inducing birth defects, disrupting neurodevelopment, endogenous depression, and triggering psychomatic and neurological disorders. Climate has a strong relationship value to the social-community impact of disasters. Disasters that occur can create psychological and psychopathological stress on humans compared to the normal phenomenon of weather changes. This study uses a systematic review narrative method that is used to identify study topics selectively on interesting and recent issues. Indonesia's climate change control is carried out using the national resilience approach.

**Keywords:** Climate Change, Mental Health, Mitigation.

### Introduction

Climate change is an issue that has occurred since 1970 in the studies of several international scientists until now. Climate change is occurring in all countries, eventually causing disasters such as waves of health, floods, droughts, increases in greenhouse gases, all of which trigger global warming as the beginning of climate change. The complexity of climate change factors and fluctuations in environmental conditions lead to the development of harmful effects on mental health (P. Cianconi et al., 2015). Climate change is mostly caused by human activities. Anthropogenic activities such as the use of fossil fuels, deforestation and air pollution. In addition, tropogenic activity can also trigger climate change such as solar irradiation and activities in the earth (volcanic eruptions) (P. Cianconi et al., 2015).

Global warming is the main indicator of climate change, global warming has a high level of danger in the future (Diffenbaugh & Scherer, 2011). Several supporting indicators for global warming phenomena such as extreme heat (an increase in the average temperature of the earth's surface, heat waves). water-related disasters (sea level rise (Clayton et al., 2017), floods, hurricanes and sea storms), droughts, wildfires, winter storms, reduced available

convective potential energy, and thunderstorms (supercells, tornadoes and windstorms). A phenomenon is said to be "extreme" if the phenomenon is rare or outside the normal limits of an event (Seneviratne et al., 2012).

The impact of climate change in Indonesia, especially in the rice farming sector, has been seen and felt by farmers. The impact of climate change increases the frequency of extreme events such as droughts and floods, and is one of the causes of crop failure, harvesting and even causes puso (Rochdiani et al., 2017). One of the effects that can be felt from climate change in Indonesia is the El Nino phenomenon that hit several regions and is the cause of vulnerability in the food sector. This EL Nino phenomenon causes climate change and has an impact on the fisheries sector, which is the cause of rising sea levels and disrupting cultivation activities in coastal areas. Rising sea levels can inundate coastal areas so that they can destroy fish ponds scattered in the islands of Java, Kalimantan and Sulawesi. Another impact felt by the fishermen is the reduction in the intensity of fishing due to the uncertain weather and resulting in a reduction in the number of catches. This happened because there was a change from the dry season to the wet dry season as a result of climate change (Akbar & Huda, 2017).

The complexity of climate change factors and fluctuations in environmental conditions are factors that hinder future climate projections (Rochdiani et al., 2017). Climate change is forcing changes in lifestyle, consequences in regulations, harm to people, and social adjustments. This phenomenon has not been identified to what extent it can endanger the quality of human life. These phenomena can have direct impacts (during or during "extreme" events or indirect impacts such as reduced food availability or stock, hunger, water scarcity, lack of places to grow crops or hunting, and land dysfunction (Abel et al., 2019).

Environmental factors are important in relation to psychiatry, such as inducing birth defects, disrupting neurodevelopment, endogenous depression, and triggering psychomatic and neurological disorders (Paolo Cianconi et al., 2020). Climate has a strong relationship value to the social-community impact of disasters. Disasters that occur can create psychological and psychopathological stress on humans compared to normal phenomena of weather changes (Septiani, Chaerina Putri Wulandari, 2020), as in the cases seen in floods, droughts, and hurricanes. Subsequent climatic events, generally neglected populations exposed in a study such as ocean acidification, acid rain, superfog, glacier melt and biomass extinction, and can have a wider impact on mental health.

Research studies are being conducted worldwide regarding climate change and mental health. This research is a review study that can be used as a reference for studies of climate change and mental health in Indonesia. As the highest evidence based with a low risk of bias.

## Methods

This research is a systematic review with the type of systematic review narrative, a systematic review narrative is used to identify the topic of the study selectively on interesting and recent issues. The objective of a systematic review is to obtain a literacy study that can be

used as a literature review or reference in a descriptive or explanatory-based study. The articles used in this study amounted to 15 with the PRISMA 2009 method as below;

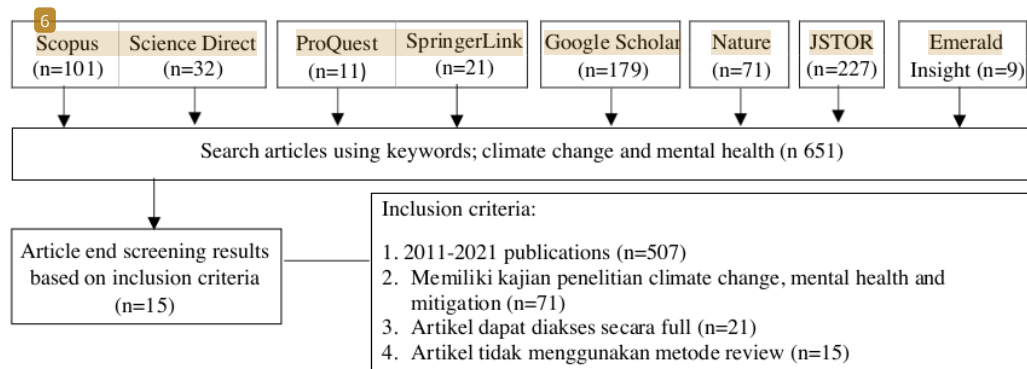


Figure 1. PRISMA Article Diagram 2009

## Results and Discussions

### 1. Mental Health and Climate Change

Studies of climate change research on mental health have begun to emerge in recent times (Bourque & Cunsolo Willox, 2014). An extreme event is an initial phenomenon that can affect mental health, before or after an extreme event (Ursano et al., 2017). Mental health impacts caused by climate change include anxiety, sleep disturbance (Abe, 2016), depression, post-traumatic stress and even suicidal thoughts (Clayton et al., 2017). Another thing is that the impact of climate change on mental health does not occur directly, but through extreme events or disasters. Tropogenic or anthropogenic disasters can significantly affect a person's psyche. Especially disasters that can cause loss of life for one family member, home, job, social support, natural resources, and others (Assessment, 2010).

Disasters can cause Post-Traumatic Stress Disorder (PTSD) to the victims. PTSD is divided into three periods, pre-traumatic, peri-traumatic and post-traumatic. A research study showed that peritrauma was closely related to acute stress during post-disaster (Gruebner et al., 2017). Other risks to disaster victims are reduced activities of daily living and social anxiety. These two conditions worsen a person's mental health. There is a need to increase disaster preparedness for each individual (Firmansyah, 2020), because research studies explain that news about climate change makes people feel unsure, stressed, depressed, and lose feelings of power. The real impact in life changes causes psychopathological reactions and can occur acutely in floods, hurricanes, forest fires and others.

The post-disaster condition became the hardest phenomenon for the victims, the feeling of trauma experienced during the disaster was still there, the environmental conditions around the place of residence were destroyed, the loss of their homes and all the materials they owned (Hsiang et al., 2013). Post-disaster will add a new sense of anxiety such as, adapting

to a new environment, whether in temporary or permanent housing, the evacuation process, to chronic stress seeing the old environmental conditions (Acharibasam & Anuga, 2018).

## **2. Rising Temperatures and Heat Waves on Mental Health**

Rising temperatures and heat waves have significant value on human physical, mental and well-being. An increase in temperature can directly cause heat stress which also originates from a heat wave. Heat stress has a close relationship with disturbed mood, anxiety, and other consequences. People with mental disorders have 3 times the risk of dying from heat waves than people without mental disorders (Ursano et al., 2017). Exposure to heat waves in pregnant women in the second and third trimesters can cause low birth weight and premature birth. In children, exposure to heat waves causes home schooling, reduced economic activity (buying and selling), motor problems and decreased IQ (NASA, 2013).

Individual susceptibility to heat waves is also influenced by gender, the percentage of deaths in women is higher than in men in Europe. Heat wave exposure to groups of women, young people, and people with socio-economic status are more prone to experiencing anxiety and mood disorders in disasters. Exposure to heat waves is also associated with waterborne disease (Gronlund et al., 2019). People who do activities in the summer can increase the risk for conflict. In hot temperatures, there is increased discomfort that can lead to hostile feelings, aggressive thoughts, to violent action (Bartolome, 2019).

Exposure to extreme heat can cause physical and psychological exhaustion (Blanc, 2019). There are two types of extreme temperature increase, the first is warming temperatures during the early summer which causes an increase in suicide rates and the second is alcohol consumption which can lead to aggressive actions. The increase in temperature basically occurs in June and July, so it is often associated with an increase in aggressive crime rates such as an increase in shooting crimes (Towers et al., 2018). With this review, it is hoped that the development and improvement of research studies, prevention of health and climate change that occur in Indonesia.

## **3. Climate Change Mitigation Efforts in Indonesia**

Indonesia's climate change control is carried out with the national resilience approach. Previously, there were many shifts in the rainy and dry seasons, related to climate change (Padhy, 2015). Changes in the frequency of rainfall also occur in Indonesia, rainfall with low intensity with a longer duration will occur in the southern part of the island of Java and Bali. Meanwhile, high-intensity rainfall with a shorter duration is predicted to occur in northern Sumatra and Kalimantan. It is predicted that in the 2100s, there will be an increase in annual rainfall, except in southern Indonesia (Legionosuko et al., 2019).

Indonesia has signed the Paris Agreement as a form of contribution to climate change. Indonesia is rich in natural resources, such as vast forests. However, Indonesia's commitment to its own natural resources is still low (WHO, 2014). Several cases were found of illegal forest clearing and forest fires for the benefit of the commercial industry. A hope in the future



for Indonesia, to be able to maintain its forests by doing reforestation, forest land expansion as an effort to minimize climate change and oxygen supply.

## Conclusion

Climate change causes mental health problems such as anxiety, sleep disorders, depression, and stress. Another thing is that the impact of climate change on mental health does not occur directly, but through extreme events or disasters. These things are caused by climate change which increases the frequency of extreme events such as natural disasters. Climate change control in Indonesia uses the National Resilience Approach by signing the Paris Agreement as a form of contribution to climate change. However, there are still some problems in Indonesia which indicate that Indonesia's commitment to natural resources is still low.

## Suggest

Several cases were found of illegal forest clearing and forest fires for the benefit of the commercial industry. The Government should make policies related to environmental maintenance and carry out regular monitoring. The public must be aware of weather changes that have entered this extreme phase because it can cause many problems, both environmental and mental problems.

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