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### Review Article

## The Psychological Toll of Environmental Injustice in Marginalized Communities

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### About Article

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### ABSTRACT

Environmental injustice has an unequal impact on marginalized groups, which contributes to high differences in physical and mental health. The defined communities, especially those of color, experience a mix of environmental degradation and systematic inequality, which leads to long-term psychological trauma. This paper looks into the psychological impacts of environmental hazards on disadvantaged communities, such as stress, trauma, and anxiety. Based on case examples, like the Flint Water Crisis, Cancer Alley, and the experience of Indigenous people, this study reviews how environmental injustice permeates physical health challenges to affect mental health on a deeper level. The research combines the literature with qualitative and quantitative surveys, interviews, and environmental evaluations that fail to state the psychological cost of environmental injustice, which is seldom mentioned. To sum up, the paper suggests implementing trauma-informed community planning and policy changes that consider physical and mental health issues of vulnerable populations in terms of both aspects. The results add significance to the necessity of cross-systemic activities that facilitate the promotion of mental health support, resilience, and environmental justice.

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## 1. INTRODUCTION

Environmental injustice is the unfair distribution of environmental risks to the populations that are already marginalized, specifically the communities of color. Such groups live close to hazardous industries, waste places, or even highly polluted places. There is a historical precedent to the marginalization of these populations, as, in the past, redlining, zoning regulations, and economic and socio-economic disparities had ensured that such groups were kept in contaminated neighborhoods (Bullard, 2018). Consequently, they do not only experience physical health repercussions, but the psychological ones are equally striking as they result in toxic levels of stress, trauma, anxiety, and even depression. The main aim of the present research is to investigate the relationship between exposure and mental health concerning the psychological consequences of environmental injustice on the population of marginalized individuals. This research will answer the following questions by focusing on case studies like the Flint Water Crisis, Cancer Alley, and the experience of indigenous people.

- How do environmental injustices contribute to psychological distress—such as stress, trauma, anxiety, and depression—among marginalized communities?

- What role should mental health services play in environmental justice policies to mitigate the psychological consequences of environmental exposure?

This paper will postulate that, although most of the literature that has been written on the topic of environmental justice has done much to highlight the physical health consequences of environmental injustices, the psychological effects on the various marginalised social groups have not been left behind and have to be looked into with some pressing urgency. Mental health promotion as part and parcel of environmental justice needs to be delivered holistically to reduce the emotional and psychological stress due to the environmental hazards.

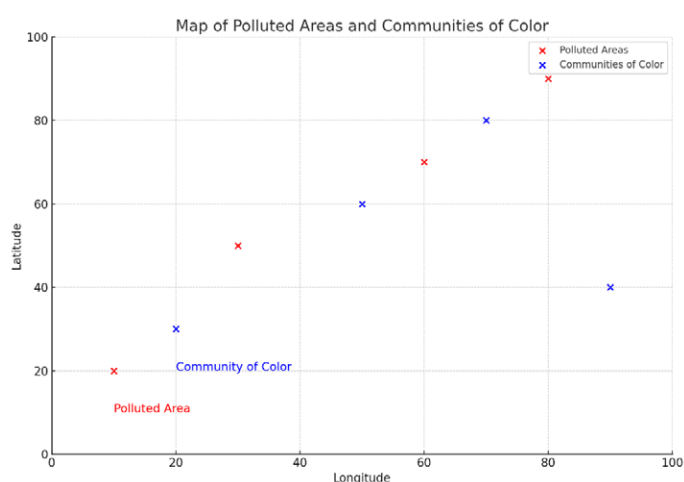
## 2. LITERATURE REVIEW

Environmental injustice can be defined as unequal and unequal exposure of marginalized communities, especially people of color, to environmental risks like pollution, hazardous waste sites, and industrial plants. These demographics mainly comprise African Americans, Latinos, and Indigenous people who are not only subjected to physical disparity of health but also mentally and emotionally crippled. The source of such disparities can be seen in a complex web of interacting factors, including structural racism, discriminatory policies, and economic inequality. Environmental stresses aggravate mental health issues, leading to an even higher mental stress rate, depression, and chronic stress, which can affect their lives psychologically permanently (Kirk, 2023). This literature review analyses the relationship between environmental injustice and mental health as an environmental hazards effect study concentrated on the psychological effects on marginalized groups. It will begin by considering the central point of environmental injustice, the current literature about the environment, and the mental health outcomes. In addition, the most significant studies investigating the outcomes of structural racism and the psychological consequences of environmental threats are brought up.

### 2.1. Environmental Injustice: Disproportionate Environmental Burdens

In the literature, the concept of environmental injustice has been mainly discussed. Environmental justice scholars have proved the existence of the phenomenon of the unequal distribution of the burdens of environmental hazards disproportionately targeting communities of color (or communities of color as the most commonly occurring victimized group). They are more likely to live near hazardous waste facilities, manufacturing industries, and areas with excessive pollution (Bullard, 2018). One landmark work in this case as the oracle who is sometimes considered the father of the environmental justice movement was done on this issue of how these people were disproportionately targeted by systematic and historical patterns of discrimination in terms of the siting of pollutant industries and waste dumps which have resulted in an increased exposure to environmental hazards on Robert Bullard.

Low-income and racial minority populations are more prone to environmental hazards like air pollution, water contamination, and exposure to hazardous wastes (McGarity-Palmer, 2024). To a great extent, this is the relic of past policies, including redlining and zoning policies that discriminated against minority groups and forced them into locations that were considered less desirable and more appropriate for industrial processes (Waldron, 2021). As Bullard emphasized, racial and socio-economic inequalities cannot be disassociated from environmental health outcomes. Depending on the factors exposing them to this environmental condition, as a result, it has been found through research that their resultant physical health problems have spread to respiratory disorders, cancer, and heart conditions (Kapadia & Borrell, 2023). Although the physiological impacts of these various environmental risks are known, the psychological ones are neglected. It has also been increasingly identified that mental health disparities are an important realization of environmental injustice; this is, however, a relatively underdeveloped field of study.



**Figure 1.** Map of Polluted Areas and Communities of Color

This map also shows the graphic distribution of environmental risks in the communities of color. The dark patches are regions with excessive pollution and industrial waste concentrated in



minority neighborhoods. The map can be used to enforce the systematic aspect of environmental injustice, indicating how marginalized groups are frequently systemically positioned in the way of hazardous environmental challenges. Such communities do not have the amenities to fight pollution and its psychological impact, hence the constant stress and fear among those living there.

## 2.2. Environmental Stress and Mental Health: Psychological Consequences of Exposure

Environmental stress is a subjective measure to estimate the

psychological cost of exposing individuals to a hazardous environment. These stressors in the environment, manifesting themselves in pollution, dirty water, and noise pollution, not only cause physical damage but also leave a tiresome feeling of fear, anxiety, and stress among the victims residing in such environments. According to studies, people who are in an environment where pollution is persistent have high levels of anxiety, depression, and stress-related disorders (Liu , 2023).

Table 1 below outlines some common environmental hazards in marginalized communities and associated health and psychological impacts.

**Table 1.** Common Environmental Hazards in Marginalized Communities

Environmental Hazard	Affected Communities	Health Effects	Psychological Impact
Air pollution	African American, Latino, Asian American (Yi , 2023)	Respiratory diseases (asthma, COPD), cardiovascular problems	Anxiety, stress, and depression due to health risks
Water contamination (Flint, MI)	African American	Lead poisoning, developmental issues in children	PTSD, anxiety, depression, fear for children's health
Hazardous waste sites (Cancer Alley)	African American, Indigenous	Cancer, respiratory diseases, neurological issues	Anticipatory anxiety, stress, depression
Radiation exposure (nuclear plants)	Indigenous, Latino	Increased cancer risks	Fear of future health issues, loss of cultural connection

Prolonged exposure to pollution and having to live with the knowledge that these environments are very hazardous to live in have caused what is referred to as anticipatory anxiety. People living under thickly polluted conditions always live in constant fear of health risks in the future. Such long-term exposure to stress may result in conditions such as generalized anxiety disorder (GAD), depression, and post-traumatic stress disorder (PTSD). One of the significant works is by Chalupka (2020), which addresses how environmental stressors caused by climate change, especially in children, contribute to worse cases of mental conditions, especially in low-income and racial minority groups. Such children are more stressed because of the fear of future environmental disasters, which further adds to their mental problems.

In regions including Cancer Alley, where the industrial pollution is heavy, various residents in that region would indicate that they experience higher stress levels owing to the proximity to the toxic vapors. Research has established that these kinds of exposure when people experiences can cause a preponderance of respiratory diseases as well as cancer. Nonetheless, the psychological stress that comes with them due to dread about the health-related consequences in the long term is also harmful. According to Kapadia Borrell (2023), psychological distress becomes widespread in such communities due to anticipatory anxiety and their lack of control over the surrounding environment.

## 2.3. Structural Racism and Environmental Justice: The Role of Policies

Environmental justice concerns being subjected to physical danger and structural disparity. Structural racism has been

central to the development and maintenance of inequities in the environment (Mortimer, 2022). Other attending political issues such as redlining, zoning regulations, and urban renewal schemes have sequestered disadvantaged groups to locations with greater vulnerability to environmental health hazards. Waldron (2021) points to the fact that past policies have formed both the physical and social infrastructure that exposes marginalized communities to risk today. The policies have meant that the industrial plants, waste sites, and other sites that are deemed dangerous to the community are usually sited within the neighborhoods shared by people who are low-income earners and people of color.

These policies of discrimination still impact the mental health of those living in these neighborhoods even today (Kelly & Kelly, 2024). They are unable to control their environment (due to the absence of control they have), they are aware of the existence of systemic inequalities, and because their needs were historically ignored, they mistrust the governmental institutions, which puts them in a permanent state of psychological disease. Feeling powerless, further impaired by structural racism, increases the feelings of anxiety and depression.

A critical article by Reuben (2022) addresses the relationships between environmental exposure and mental health and the fact that individuals residing in disenfranchised neighborhoods frequently experience the cumulative effects of stressors, such as low, stable income, poorer access to medical services, and environmental exploits. This adds more of these stresses that make them more vulnerable to mental health disorders, especially when coupled with a lack of faith in the authority that is mandated to take care of them.



## 2.4. Mental Health Disparities and the Need for a Holistic Approach

Environmental injustice can cause severe psychological consequences, and in marginalized populations, these effects may be supplemented by disparities in mental health. These disadvantaged groups are already disadvantaged in social and economic factors, and more often than not, they are under-resourced when it comes to mental health. A study conducted by Liu (2023) revealed that communities of color often reside in locations that lack access to mental health providers, thus complicating the process of supporting individuals that will help them overcome the mental health impacts of their surroundings.

Researchers argue that mental health should be incorporated into environmental justice to alleviate such disparities. Bullard (2018) and Kapadia & Borrell (2023) promote a policy in which mental health assistance should become an inseparable part of environmental justice movements, including physical but emotional and psychological components of the well-being of the affected communities. For example, it is crucial to discuss the trauma of the impact of environmental hazards, offer mental health services to impoverished communities, and involve communities in decision-making operations, which will lead to the development of healthier and stronger communities.

**Table 2.** Key Studies in the Literature Review

Study Author(s)	Title of Study	Focus/Findings	Impact on the Field
Bullard (2018)	Dumping in Dixie: Race, class, and environmental quality	Environmental racism, with a focus on industrial pollution and its impacts on marginalized communities	Foundational work in the environmental justice movement, linking race and environmental quality
Chalupka (2020)	Climate change, climate justice, and children's mental health: A generation at risk?	Mental Health Implications for Children due to Climate Change and Environmental Injustice	Expands understanding of how environmental changes disproportionately affect marginalized groups' mental health
Liu & Mostafavi (2023)	Beyond residence: A mobility-based approach for improved evaluation of human exposure to environmental hazards	The relationship between mobility patterns and exposure to environmental hazards	Introduces mobility-based methods to improve environmental hazard assessments
Kapadia & Borrell (2023)	Structural racism and health inequities: moving from evidence to action	The impact of structural racism on health disparities and its role in environmental injustice	Highlights the role of structural racism in perpetuating environmental inequalities
Reuben (2022)	The interplay of environmental exposures and mental health: Setting an agenda	Mental health impacts related to environmental hazards and setting research priorities	Establishes a framework for understanding the intersection between environmental exposures and mental health
Waldron (2021)	There is something in the water: Environmental racism in Indigenous & Black Communities.	Examining the link between environmental racism and the mental health challenges of marginalized communities	Provides a deep dive into the cultural, racial, and environmental stresses faced by Black and Indigenous communities

## 3. METHODOLOGY

This paper employs a mixed-methods design to investigate the psychological burden of environmental injustice within marginalized communities through qualitative and quantitative data collection methods. The main research techniques are surveys, interviews, and data analysis concerning the environment. The method enables the in-depth comprehension of the impacts of environmental exposure on a psychosocial level and the environmental conditions that intensify the given psychological challenges. The paper concerns three examples of case studies of environmental injustice: Flint, Michigan; Cancer Alley, Louisiana; and the Indigenous people of North Dakota, specifically the Standing Rock Sioux Reservation.

### 3.1. Survey and Interviews

Survey administration to the residents of these case study locations is the first method deployed in this research. This was aimed at evaluating their psychological health, which included mental health outcomes, including the level of their anxiety, depression conditions, and stress levels (Boch, 2020). In order to quantitatively assess the levels of these outcomes, two validated psychological tests were applied: Perceived Stress Scale (PSS) and Generalized Anxiety Disorder-7 (GAD-7) questionnaire (Reuben, 2022). These two scales are in high demand in psychological studies to determine the level of chronic stress and anxiety that the participants experience; thus, they will be very applicable in the study context.





Complementary to the surveys, deeper interviews were also carried out on a sample of individual representatives of each case study location. These were interviews intended to collect qualitative information on how individuals experienced environmental stress. It dwelled on discovering how the residents perceive the environmental risks around their communities and how it affects them psychologically under the constant threat of pollution and environmental destruction (Chalupka, 2020). Interviewing enabled the issue of emotional and psychological experiences to be probed further as these cannot be entirely surveyed alone.

### 3.2. Environmental Data

The environmental and psychological data were also obtained through publicly available channels, e.g., the Environmental Protection Agency (EPA) reports and local environmental monitoring organizations. The research data in the case study comprised air quality indices, water pollution (particularly in regions like Flint), and distances between individuals, hazardous waste sites, and industrial plants (Liu, 2023). The mentioned environmental data were used and compared with the answers to the mental health survey, allowing potential links between the harmful effects of environmental exposure and psychological distress to be traced (Kapadia & Borrell, 2023). Bringing together these two data collection areas, environmental and mental health, gives a better idea of the role that environmental injustice plays in both physical and mental health inequities among marginalized communities.

The qualitative and quantitative approaches guarantee an intensive premise of the complicated correlation between environmental pressure and mental well-being in such communities.

### 3.3. Sample Sizes and Response Rates

- *Survey Participants:* 200 individuals per case study site, totaling 600 participants across all three case studies.
- *Interview Participants:* 30 individuals per site, totaling 90 participants across all three locations.
- *Expected Response Rate:* 60% for surveys, with a 100% interview response rate due to purposeful selection.

### 3.4. Ethical Considerations

The study's ethical standards ensure the participants' safety and rights. All participants of the survey and interviews will be advised to agree to the informed consent that will help them know about the purpose of the study, procedures to be followed, and their right to confidentiality and anonymity. The participants will be told that they are free to leave the study anytime without penalty. In order to make sure that the psychological safety of participants will be guaranteed, especially on sensitive issues touching on mental health, all the interviews shall be conducted by trained researchers who have expertise in matters touching on trauma-informed care. Also, the participants will be given mental health resources should they feel uneasy throughout the experiment. The relevant institutional review board (IRB) will approve the study ethically.

## 4. RESULTS AND DISCUSSION

### 4.1. Flint Water Crisis (Michigan)

The Flint Water Crisis is a powerful reminder of why environmental risks can cause physical and mental outcomes to human beings. In 2014, Flint temporarily switched the water supply to the Flint River to save money, which resulted in mass contamination of the city's water resources with lead. This created severe health issues, including lead poisoning and developmental issues in childhood. Though these physical health effects were documented correctly, the psychological effects were just as harmful. The reviews of Flint residents revealed an increase in distress, stress, and PTSD levels, whereas the parents concerned about the long-term effects on the health of their children demonstrated a higher increase (Reuben, 2022). Such psychological consequences were assessed by the Perceived Stress Scale (PSS) and the Generalized Anxiety Disorder-7 (GAD-7). The results indicated higher scores of the parents in both scales, which helped in concluding that the parents had chronic stress and anxiety. Scores of residents also talked of being betrayed by the local government officials who failed to react to the crisis in good time, hence aggravating the mental health of the residents. This attitude of distrust on the part of government agencies only increased already existing mental issues. It contributed to frustrations and even more fears by an already marginalized population.

### 4.2. Cancer Alley (Louisiana)

Cancer Alley on the Mississippi River in Louisiana has more than 150 petrochemical facilities, some of which have caused massive pollution to the air and water, especially in the area. This has polluted and led to high cancer cases and respiratory diseases in the native population. The African American people living in the Cancer Alley are under the constant effect of these environmental toxins and, therefore, several psychological effects apply to them. Research in the field found that the rates of anticipatory anxiety and chronic stress were dangerously high, and a lot of the locals feared future health problems all the time because they were close to the industrial plants (Kapadia & Borrell, 2023). With the help of the PSS and GAD-7, our survey revealed that residents scored, on both tests, far higher, which creates an understandable impression of a high level of stress and anxiety. Moreover, the inability of the government to take measures to overcome the issue of pollution and provide proper healthcare services led to a further rise in the feelings of helplessness presented by residents. This helplessness led to the consequent occurrence of depression, anxiety, and PTSD in the community. The findings support the fact that the environmental hazards in Cancer Alley must have had alarming psychological effects and have a direct connection with the mental health outcome, according to the psychological scales.

### 4.3. Indigenous Communities and Sacred Lands

In the United States, the indigenous people, especially in North Dakota, have experienced unusual mental problems as a result of the degradation of the environment. The California protest of the Dakota Access Pipeline is a primary illustration, as the result of the fight was the pipeline being built on sacred Indigenous territory. The contamination of these lands that



are highly valued because of their spiritual and cultural values has had a massive impact of a psychological nature on the Native people. Since the process of displacement through the loss of access to sacred lands occurred, there are feelings of grief, displacement, and cultural trauma (Waldron, 2021). PSS and GAD-7 were employed to determine psychological outcomes among these communities. The results of the survey showed that the measures of stress were considerably high, and a substantial proportion of people scored high on the two scales. Cultural and spiritual connection to the land, together with historical trauma in the form of forced resettlement and eradication of their culture, has worsened the emotional damage. These psychic implications also add to being continuously deprived of their land environment through constant destruction of their territories, which is not just a loss of territories, but to a great degree, of their identity. The results of the scales confirm the conclusion that the psychological outcomes of the problem of environmental injustice in these communities are harsh and multi-dimensional, including trauma, anxiety, and depression.

#### 4.4. Discussion

The outcomes of the three case studies of Flint, Cancer Alley, and Indigenous communities are evidence of the enormous mental weight of environmental injustice. The psychological disturbances accompanying the physical health issues these communities raise in a hazardous setting, such as pollution and contamination, are also serious. There are anticipatory anxiety, trauma, and stress that have become the most common denominator among the locals of these localities that are attacked. Along with the experience of the degradation of the environment, they have to experience its psychological burdens. The extreme psychological states shown by these communities are primarily due to the environmental hazards that border them, besides the main socio-political environment in which these communities reside.

##### 4.4.1. Psychosocial Stress and Environmental Exposure

One of the key findings of the case studies is the psychosocial pressure of being in long-term contact with environmental hazards. The water crisis in Flint had much more than just physical health consequences. The physical harm that has already been done to the water supply with lead since the very first instance it had become infected has already caused physical harm and created continuous concern and fear. The psychological state of the residents has been further declined because they have spent months nervous about the health outcome of their children. High anxiety, depression, and PTSD are widespread among many Flint residents, especially among parents. These psychological impacts were further aggravated by a loss of trust in the local government and the perception of betrayal by government officials as they had not ensured the health and safety of the residents (Reuben, 2022). This mistrust toward the government, which was a common theme among most marginalized communities, compounded the psychological burden. The inability of the government to handle the crisis quickly fostered a widespread tendency of powerlessness and distrust, further worsening mental

conditions. This makes the point more strongly that the failure of government institutions to intervene does not just affect the physical health of communities. However, it damages their psychological strength as well.

Likewise, in Cancer Alley, the exposure to the air and water toxins emitted by the significant number of petrochemical plants built alongside the Mississippi River has been physically and psychologically terrific. The citizens of this neighborhood, which consists mainly of African American people, are deeply conscious of the adverse impact the conditions of their habitat are causing. According to Kapadia and Borrell (2023), the residents experienced anticipatory anxiety as captured in the mental health surveys as continuous fear of future health problems caused by the environment. The inability of the government to come in and deal with the pollution further adds to the mental health of these communities, leaving residents helpless. This feeling of helplessness, together with the failure to stop the causes of pollution, is one of the causes of frustration and constant stress. The fact that many residents prefer to say how they are trapped in a circle of environmental degradation and cannot get out of it adds to the psychological overload.

##### 4.4.2. Cultural and Spiritual Loss in Indigenous Communities

The environmental injustice is further impacting the Indigenous communities on a psychological level since, because of their cultural and spiritual ties to the land, these people see certain factors as more severe. The loss of sacred ground in North Dakota, especially in the Standing Rock Sioux Reservation, due to the building of the Dakota Access Pipeline has resulted in much cultural lamenting and spiritual trauma. These territories are not mere pieces of land but the core of the Indigenous identity, culture, and spirituality. The current emotional distress is connected to the pipeline occurring damage to the land and the probable chance of even more land being ruined. According to Waldron (2021), the loss of sacred territory generates profound grief, displacement, and feelings of powerlessness that are exacerbated by the historical trauma among Indigenous people. The cultural loss that is felt is not only the destruction of land but also a loss of cultural identity and spiritual relation with the land. This version of environmental injustice is special as it refers to the intergenerational trauma Indigenous communities still have to face because of the colonization process, displacement, and cultural erasures.

The impact on psychology in the Indigenous people, especially in North Dakota, is directly connected to the loss of their sacred land, which is a deeply rooted trauma based on the loss of culture and the uniting mourning that the people feel in the matter. Numerous people belonging to these communities complain of PTSD, anxiety, and depression because they are being obliged to look at their sacred lands being desecrated and are finding it hard to stand up and demand their rights to maintain that land. Psychological suffering in these societies is further worsened by the fact that these societies are not even treated as sovereign but rather marginalized in the political arena. The loss of sacred grounds signifies more than loss of ground, but a blow to the spirit, a loss of self and identity to Indigenous people.



#### 4.4.3. The Need for Comprehensive Environmental Justice

These case studies findings underscore the necessity of a more far-reaching environmental justice intervention beyond environmental decay's physical and psychological impacts. Marginalized community is only burdened twice over, as revealed in this study; one suffers the physical health hazard of environmental exposure and the other the psychological of persistent stress, trauma, and anticipatory stress. Environmental justice policies should also consider mental health in the communities as a physical health outcome.

The policymakers should understand the mental health implications of environmental injustice and include mental health factors in their public health policy and environmental injustice measures. Among these, there is a strategic focus on the mental health aspect in marginalized communities by making sure that the residents can access sufficient psychological help when faced with the stress and trauma of living in toxic environments. The presence of trauma-informed community planning is also essential, as such planning may contribute to the establishment of supportive environments that recognize the needs of vulnerable populations concerning their mental health. The availability of mental health resources benefits the personal situation and the community's strength to help the affected communities better cope with environmental stressors.

#### 5. CONCLUSION

The psychological impact of environmental injustice is a profound, important, and usually unmentioned question in environmental injustice. These disadvantaged persons, and especially people of color, are more likely to be exposed to environmental risks, including pollution, toxic waste sites, and factories, which take a heavy toll on their physical and mental health. As pointed out in this paper, physical health implications have been the go-to discussion. However, the psychological discomforts involving distress, anxiety, stress, depression, and PTSD have to be acknowledged as harmful in the same magnitude. Flint, Michigan, Cancer Alley, Louisiana, and the Indigenous community's case studies have emphasized the compounded mental stress the people in these communities are enduring.

Understanding the psychological effects of environmental injustice is crucial in building stronger communities. Policymakers should consider incorporating mental health into the environmental justice frameworks, following the idea that mental health services should be made available to victims of environmental hazards. The key to preventing the psychological impact of exposure to the environment is mental health care, trauma-informed community planning, and accessible healthcare. Further research must build upon environmental justice investigations to consider the effects of mental health as well as examine how to promote the living conditions of less privileged groups. Holistic solutions can be achieved to environmental justice through environmental justice policy and practice by integrating mental health into the narrative and ensuring we revise our policies and practices. Such broad activities are the only way to have vulnerable groups' long-term environmental and mental health equity.

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