



# Deforestation and climate change: Risks to children's environmental rights and policy implications

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Received Date: November 20, 2025

Revised Date: January 29, 2026

Accepted Date: February 26, 2026

## ABSTRACT

**Background:** There is a limitation on literature with comprehensive analysis for the association between environmental-related children's rights with the environmental degradation such as deforestation and climate change. This study aims to explore the potential harm from environmental damage for children's life and will be referred to the United Nations Convention on the Rights of the Child (UNCRC). **Methods:** This paper uses integrative literature review and will conduct three phases; synthesis, literature, and thematic. **Findings:** In the global context, there are environmental-related child rights violation from environmental degradation such as climate change and deforestation. The child rights violation included (1) life; (2) health; (3) adequate standard of living; and (4) play. This led to the policy implication for Indonesia addressing four general principles of UNCRC; non-discrimination; best interest of children; life survival, and development, and participation, specifically for provinces with high rate of deforestation and climate change. **Conclusion:** This paper presented an explanation on how environmental degradation such as deforestation and climate change have the impacts on the children's life. **Novelty of this article:** This article provides policy implications for Indonesia's government to tackle the issue of environmental-related child rights with child-centered, stressing on provinces with high level of deforestation.

**KEYWORDS:** climate change; deforestation; environmental-related children's rights; Indonesia.

## 1. Introduction

Globally, in the last thirty-years, 420 million hectares of forest have been pillaged through deforestation, which is equivalent to approximately more than 40% of the land area in The United States, and it occurred 90% from the total number in tropical developing countries. Tropical forests are the most species-rich wildlife habitat on the earth and forests are essential natural pilots against global warming (Kishida, 2025). Based on that number, it is clear that deforestation on the global scale is at an alarming level, specifically in the tropics, stressing concerns about possible effects on human health, ecosystems services, and biodiversity (Acharya, 2020).

Deforestation specifically in tropical areas transform human health risk for vector-borne diseases. For instance, natural habitat change due to increased urbanization and increased human population, roads and dams construction, and irrigation agriculture alter interactions between land, people, animal hosts and diseases vectors (Estifanos et al., 2024). In addition, deforestation and land use change are relevant to the food security, role of wild

### Cite This Article:

Dawiya, N. I. (2026). Deforestation and climate change: Risks to children's environmental rights and policy implications. *Lexovate: Jurnal Perkembangan Sistem Peradilan*, 3(1), 17-31. <https://journal-iasssf.com/index.php/Lexovate/article/view/3202>

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foods, and ecosystem services provision (Maseko et al., 2017). These processes include clearing forests and subsequent land transformation that change local ecosystems' component, such as flora and fauna ecology, soil and aquatic conditions, and microclimate (Pattanayak & Yasuoka, 2012).

The World Health Organization (WHO) stated that the greatest obstacle of the 21st century is climate change, alarming all aspects of the planet where we live (Vergunst, 2022). Climate change is one of the causes of earth destruction, which the earth is getting older and the damage is expanding (Kadafi, 2022). With concrete evidence of the possibility of how climate change impacts, the government from low- and middle-income nations yet implement the substantive government commitments (Willets, 2022). Human activities including deforestation resulted in the greatest dangers to the attainment of sustainable development globally, since climate change increased greenhouse gasses (GHG); nitrous oxide, carbon dioxide, methane, and ozone (Boshoff & Damtew, 2019).

Deforestation in Indonesia from 1950–2017 has affected 35% national territory, which is more than 66 million hectares with an average number of 985,200 ha/year (Santoro et al., 2025). In the period 2019 & 2020, deforestation fires in Indonesia produced 7% from total global GHG emissions (Datta & Krishnamoorti, 2022). Through timber removal and agriculture, rural villages contribute to the forest loss (Ferraro & Simorangkir, 2020). Though the Indonesian government has indicated its wish to implement Reducing Emissions from Deforestation and Forest Degradation (REDD+) by involving local communities, however, the plan is not yet to be developed (Ekowati et al., 2016).

Even though positioned as the largest economy in Southeast Asia, on the other hand, Indonesia faces alarming issues in deforestation, promoting sustainable food systems, and ensuring food security. With overall 272 million citizens, the nation's action to change the food system, protect tropical forest, and enhance nutrition should be priorities (Laborde, et al., 2024). Snow cover decreases, global temperature is increasing, the ice sheet is shrinking, the ocean is getting warmer, sea level rise is the way on how climate change is happening globally (Renuat et al., 2024).

One of the most vulnerable nations to climate change and disasters is Indonesia (Djalante, 2018). Disaster data in Indonesia shows an increase of 82% from natural-hazard in the period 2010-2020. Moreover, according to data from National Disaster Management Agency, in 2023, 5400 disasters happened including 1,255 floods and 1261 extreme weather events (Kiling et al., 2024). In 2100, the climate change in Indonesia could risk approximately 4.2 million citizens, with permanent effects on socio-economic inequality, poverty, health, and nutrition. However, Indonesia rate for readiness for climate change is at a lower- middle (Tang, 2024).

Child deaths because of malnutrition, malaria, and diarrhea might be the negative impact from deforestation and other environmental issues (Assaf, et al., 2018). This, in turn, accelerates that climate change puts children and other populations in danger (Helledén et al., 2021). The current estimation calculated that 1.7 million children per year face death as the avoidable environmental effects (Cowley-Cunningham et al., 2023). If the mitigation actions against climate change are not implemented, United Nations International Children's Emergency Fund (UNICEF) predicted that by 2030, more than 131,000 excess child deaths will happen annually (Williams et al., 2023). Children will get a severe impact from climate change due to their immaturity in cognitive, physical, and physiologic, specifically for children below 5 years old (Anderko et al., 2020).

Global health threat has been identified as a negative impact by climate change, and the most severe effect will risk those who are least able to defend themselves (Pramono, et al., 2025). Children and infants who are powerless will have multiple threats from climate change by several pathways (Perera & Nadeau, 2022). The planet is not the only one that is caused by the climate change crisis, children are also in danger from their conceptions until they grow up as an adult. They will be impacted by the environment where they live, such as their health and development (immune systems, brain, lungs, and critical functions) (UNICEF, 2023a).

Climate change also violates children rights such as education, play, child labour, exploitation, child marriage, female genital mutilation (FGM) (Donger, 2022; Pope et al., 2023). Children might get obstacles for their health, socioeconomic, and cognitive development, including their mental health (Thiede & Gray, 2020; Clemens, 2022). However, few studies reported about mental health risks as climate change, whereas the childhood period is highly developmentally vulnerable when majority psychiatric disorders are first developed (Vergunst & Berry, 2022). The example could be seen from extreme weather-driven disasters (EWDD) such as attachment disorders, depression, anxiety, PTSD, phobias, and sleep disorders. EWDD may have both indirect and direct impact on children's academic performance, emotional regulation, learning, behavior, and cognition (Baker et al., 2021)

The child's rights crisis is resulting from the climate crisis, it leads to crises on water, health education, participation, and protection, as it mentioned in the United Nations Convention on the Rights of the Child (UNCRC) (Rees, 2021). Climate change has an influence on the key rights of children to thrive, survive, and achieve their full potential. UNICEF reported that globally, half of the children population lack access to primary health and other facilities that can provide children, families, and communities to recover and mitigate from climate-related issues (Proulx et al., 2024). In August 2023, the United Nations Committee on the Rights of the Child directly mentioned children's right to a healthy, clean, and sustainable environment (UNICEF, 2024).

Developing countries are likely to have a disadvantage share of intense changes in weather since they have weaker institutional structures, infrastructure, and inadequate health systems (Hanna & Oliva, 2016). The last analysis states that deforestation in Indonesia has had short-run impacts on infants, predicting the impact of in utero vulnerability to forest loss on death rate in the first period of life (Chakrabarti, 2020). Indonesian children aged from 0 to 18 years consist around 32.81% (boys 51%; girls 49%) of the overall population, which is approximately 80 million people (UNICEF, 2023b).

There are international framework on international environmental law such as: The United Nations held the Stockholm Conference on the Human Environment in 1972, which was the number one in a serial of UN mega-conferences. In addition, the Rio Conference on Environment and Development in 1992 and the 2002 Johannesburg World Summit on Sustainable Development. Stockholm Conference had outcome in the UN General Assembly (UNGA) launching the first multilateral environmental institution, United Nations Environment Programme (UNEP), headquartered in Nairobi (Rajamani & Peel 2021). It could be seen that these frameworks emphasize the position of environmental protection as a core principle of global governance.

Alongside international environmental law, there are limited studies highlighting the impacts of deforestation and climate change on the children, specifically through The UNCRC lens. To be specific, The UNCRC has four fundamental principles: "(1) The right to non-discrimination; (2) The best interests of the child; (3) The right to life, survival, and development; and (4) The right of the child to be participated" (Pasaribu & Vanclay, 2021). This study will examine how deforestation and climate change risks children's life through UNCRC lens. This paper will be focused within Indonesia context and its policy implication with child-centered referred to four fundamental principles of UNCRC. In addition, this study attempts to inform policy implications for the Indonesian government in tackling environmental-related child rights obstacles through a child-centered lens, especially in provinces with high deforestation levels.

## 2. Methods

This paper will use qualitative methods and present integrative literature review to synthesize the data from relevant references. Figure 1. illustrates three phases will be conducted in this study, which are synthesis selection (phase 1), literature review (phase 2), and thematic synthesis (phase 3). Firstly, phase 1 includes selection on the study objectives which is redirection study, and examines available relevant sources. Redirection

aims to change the point of view on specific issues and this is suitable for integrative reviews and provides correctness. This review includes persuasive cases for the new insights based on the relevant resources. Using the redirection method could present questions about current studies, and the review focuses on the implications that are already mentioned in the literature (Cronin et al., 2020). This phase provides the review to set up clear analytical and prevents weak conceptual by excluding literature that is not align with the main intersection in this paper.

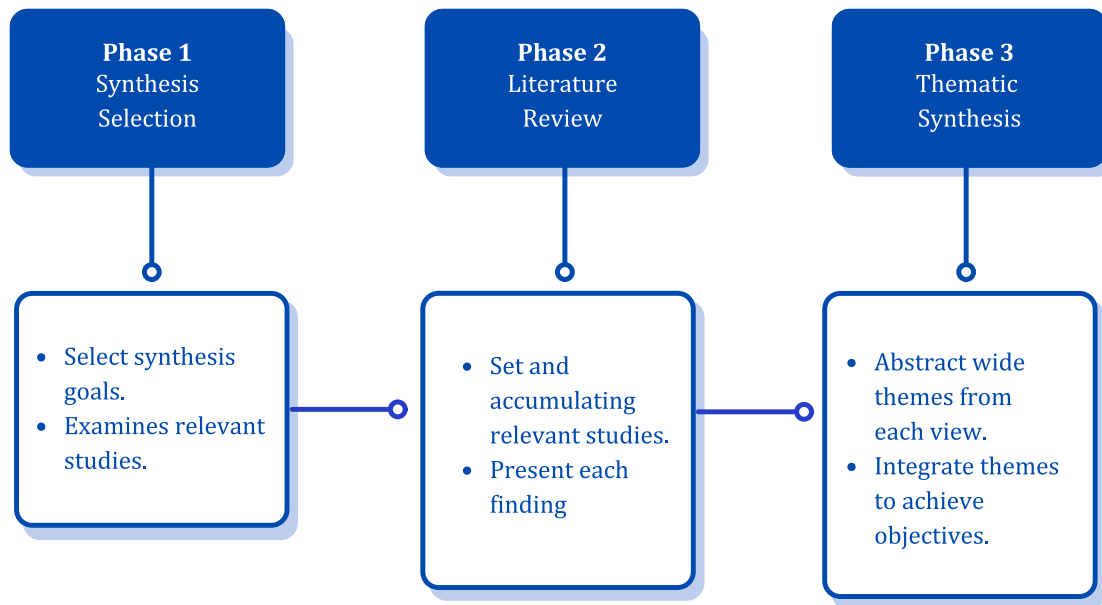


Fig. 1. Flow chart for each phase for synthesizing research (Cronin et al., 2020)

Secondly, this research will conduct phase two by setting and accumulating relevant data and present each argument from literature. The literature will focus on topics such as deforestation and climate change, specifically on how it will affect children's lives. There is a limitation for the period of the literature included which starts from 2020 to 2025. During this phase, the relevant article identified using Google Scholar, the terms used are "Deforestation Child Rights", "Deforestation Indonesian Children", "Deforestation for Children", "Climate Change and Child", "Climate Change and Child Rights", "Climate Change Indonesian Children". Articles were included were written in English, the published time within the last five years, and mentioned environmental degradation specifically climate change and deforestation, and relevant to child rights. This phase enables a comprehensive engagement with available source by situating environmental-related child rights both in national and international setting.

Thirdly, phase 3 will abstract broad themes from each result and integrate themes in aim to achieve the goals. The themes will be divided into two environmental issues that are mentioned, deforestation and climate change. In addition, to be more specific, the effect on children will be divided for each environmental issue, such as children's physical and mental health, nutrition, and education and child rights violation. The separation from each impact aims for the explanation to be more focused on each impact and present comprehensive review. This phase presents a deeper understanding of environmental degradation's continual patterns, gap, and policy implication, specifically with child-centred approaches.

Furthermore, this study will use The UNCRC framework. The theory will be used to examine the risks of children from deforestation and climate change and link it to the data collected from the relevant resources. It will explain which rights are possibly violated by climate change and deforestation. Moreover, The UNCRC has four fundamental principles: "(1) The right to non-discrimination; (2) The best interests of the child; (3) The right to life,

survival, and development; and (4) The right of the child to participate”. These principles will be used as a framework for policy recommendation for Indonesia.

This paper is expected to provide and collect all aspects related to climate change and deforestation that affects children’s lives extensively. It is aligned with integrative literature review aimed to lead to preliminary or initial conceptualization of the topic. With this method, the audience will gain new perspectives from the topic and the author will not just rewrite the result from the relevant literature (Torraco, 2005). To be specific, this paper will provide on how environmental-related children’s rights could impact each aspect of children’s life on the global scale. Then after synthesizing all aspects from the literature review on global context on how environmental degradation affects children’s life globally, this study will present policy recommendations for Indonesia to tackle the issues. Even though the scientific journals will be prioritized as the references in this study, the relevant sources from accountable organizations may be included to broaden the discussion.

### 3. Results and Discussion

On the global context, Appendix 1. presents data from the relevant sources on how environment issues including deforestation and climate change influence every aspect of children’s lives. Each aspect included in Appendix 1. is directly supported by and traced from specific research listed in the Source column. The Appendix 1. illustrates the whole features regarding how environmental degradation will be violated environmental-related children’s rights. To make it broader, the table will separate the effects from climate change and deforestation. In addition, Appendix 1. will divide each issue into categories such as children’s physical health, nutrition, and education; and environmental-related children’s rights. These impacts will be linked into UNCRC in aim to explain how these impacts from environmental degradation violate children rights. Furthermore, four principles of UNCRC will be included for policy recommendation in the Indonesia context.

The explanation below will refer to the data from relevant literature that shows in Appendix 1. and linked to four rights violations such as the child’s right to life, survival, and development; the child’s right to health; the right to an adequate standard of living; and the child’s right to play. Given the qualitative and integrative nature of the assessment, the findings highlight the scope of identified child rights violations rather than their numerical rate. The Fig 2. will be referred to Appendix 1. in aim to illustrate the problem analysis identified:

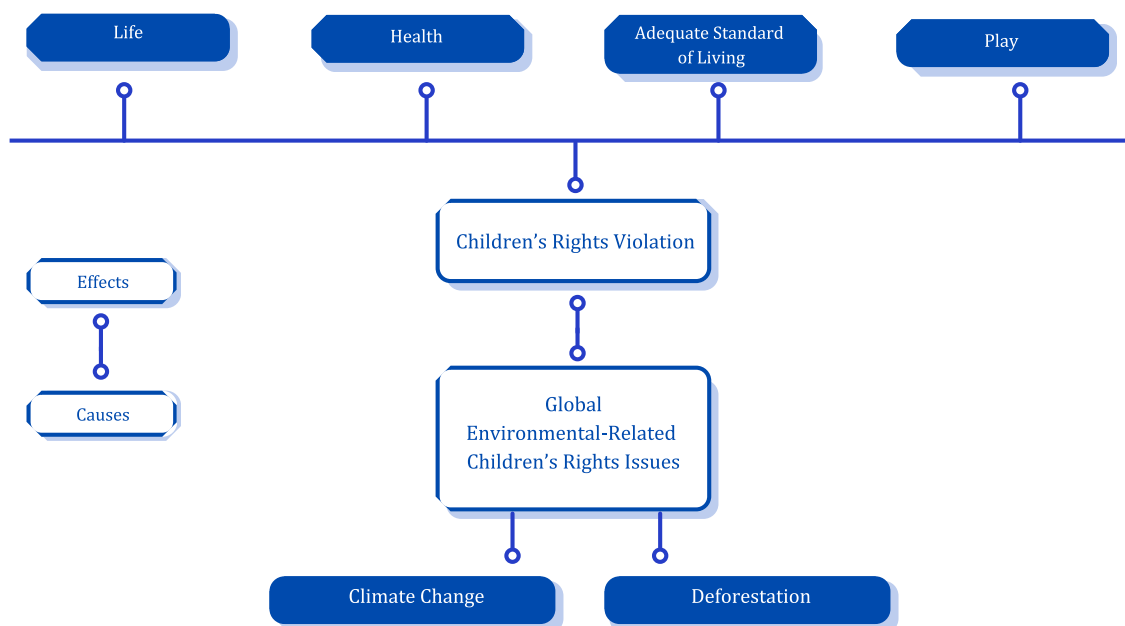


Fig. 2. Problem analysis of global environmental-related children’s rights issues

### 3.1 *The child's right to life, survival, and development violation*

As UNCRC Article 6 mentioned the mandate for state parties highlighting on how essential a child's right to life, survival, and development is. It is clear that based on the data from Appendix 1, on a global scale, majority countries violate this aspect, specifically in developing countries. Based on a study from Hanna & Oliva (2016), it stated that climate change may be terrible for children in developing countries; they have limited social safety nets, poverty, weak health care systems, and weak governmental institutions. Referred to field research data from UNICEF in 2011 that included Indonesia, Philippines, Mongolia, Vanuatu, and Kiribati to present trends and patterns of climate change and disaster effects on child survival and development. The result showed that there is a relation among climate change and some other issues that are encountering children. The climate change impacts for well-being and lives of children are factual and the decisions and policies regulated nowadays will set the tone for the future (Lawler & Patel, 2012). Article 6 of the UNCRC mentions that:

*"States Parties recognition that every child has the inherent right to life. States Parties shall ensure to the maximum extent possible the survival and development of the child"* (UNCRC, 1989).

### 3.2 *The child's right to health violation*

Environmental degradation such as deforestation and climate change could lead to the spread of illnesses that predominately kill children, which is violate the aspect of children's right to health that is stated in UNCRC Article 24. Based on the Appendix 1, it is clear that environmental issues lead to the negative impacts of children's health both mentally and physically. For instance, flooding broke water and sanitation infrastructure, possibly infectious water supplies and can cause high numbers of waterborne diseases, malaria, dengue fever, yellow fever, other water-borne illnesses, and the death of children below five years old. More than a thousand children under five years old die from illnesses caused by inadequate water, sanitation, and hygiene (UNICEF, 2023a).

Moreover, children who have inadequate health and malnutrition will face severe burdens from environmental degradation. These condition strengthen by the discoveries from the study in twelve countries in sub-Saharan Africa, Asia, and Latin America and the Caribbean that there is relationship among deforestation and forest cover with child health condition such as nutrition, diarrhea, and malaria (Assaf, et al., 2018). These conditions additionally with lack of health-care facilities, poor maternal health, urged the commitments to increase the quality of health and nutrition access for children all around the world (Rees, 2021). The UNCRC provide relations the environment with the right to health and stressing health dangers posed to children, which is mentioned in Article 24 :

*"States Parties recognize the right of the child to the enjoyment of the highest attainable standard of health and to facilities for the treatment of illness and rehabilitation of health. States Parties shall strive to ensure that no child is deprived of his or her right of access to such health care services. States Parties shall pursue full implementation of this right and, in particular, shall take appropriate measures"* (UNCRC, 1989).

### 3.3 *The right to an adequate standard of living violation*

The UNCRC mentioned the aspect of children's right for adequate standard of living violation in Article 27 and this right is clearly violated by environmental degradation. Appendix 1. shows how global dynamics fro, the countries violated this aspect. The environment issues could interrupt access to primary services for children, which are health care, education, social care, and services that cover their well-being including electricity and water supplies. For the region with inadequate service, this could influence long-term

impacts on children in mental, physical health, psycho-social well-being. The mental illnesses could result such as anxiety, chronic stress disorders, and feelings of instability among children, children's emotional regulation, and developmental outcomes. The world bank predicted that approximately 68 to 135 million individuals could end up in poverty in 2030 caused by climate change. Children also could have higher risk for facing neglect, violence, and mistreatment (UNICEF, 2024). The UNCRC assures children the right to a decent standard of living, it mentioned in Article 27:

*"States Parties recognize the right of every child to a standard of living adequate for the child's physical, mental, spiritual, moral and social development. The parent(s) or others responsible for the child have the primary responsibility to secure, within their abilities and financial capacities, the conditions of living necessary for the child's development. States Parties, in accordance with national conditions and within their means, shall take appropriate measures to assist parents and others responsible for the child to implement this right and shall in case of need provide material assistance and support programmes, particularly with regard to nutrition, clothing and housing"* (UNCRC, 1989).

### 3.4 The child's right to play violation

As children's right to play stated in Article 31 of UNCRC, it is essential for nations to make sure in this aspect fulfillment. However, Appendix 1. showed that environmental degradation violates children's right to play. Play is an essential and a vital part of children that could lead to their happiness, is fundamental to their healthy mental and physical development, it encourages their abilities to function in the society and culture in their hometown. Play could strengthen imagination, creativity, self-efficacy, self-confidence, social, physical, cognitive, and emotional, protective processes that lead to adjustment and resilience skills. A form of daily participation, interwoven into the social, cultural, and physical fabric of daily activities is the definition of children's play. Environmental degradation both in rural and urban areas could make it difficult to balance safety and risk-taking and influence caregivers to restrict children's free independence and play. The children's safety of outdoor play is impacted by detrimental environmental changes, it could lead to adverse asthma symptoms provoked by reactions from high temperature from children with sickle cell illness (IPA, 2016). The UNCRC mentioned the child's right to play in Article 31:

*"States Parties recognise the right of the child to rest and leisure, to engage in play and recreational activities appropriate to the age of the child and to participate freely in cultural life and the arts. States Parties shall respect and promote the right of the child to participate fully in cultural and artistic life and shall encourage the provision of appropriate and equal opportunities for cultural, artistic, recreational and leisure activity"* (UNCRC, 1989).

### 3.5 Policy recommendation for environmental-related children's rights in Indonesia

Based on the explanation above, Indonesia, which is one of the developing countries, shows the urgency for the government to tackle the environmental-related children's rights issues. Indonesia has regulated several policies in order to address environmental problems. For example, first, The Ministry of Environment and Forestry (MoEF) Regulation No. 27/2009 on Strategic Environmental Studies contains some commitments on social fields such as social policy, health, and disaster. Second, The MoEF Regulation No. 1/2021 on Performance Rating Programme in Environmental Management facilitates incentives for great water management in conservation areas. Third, Law No. 18/2013 on Management and Prevention of Forest Degradation includes eradication and prevention of forest destruction to create sustainable environmental quality. However, these current

regulations did not directly addresses children and youth aspects and the child-friendly regulations remain vague (UNICEF, 2023b)

Based on the mentioned issues and the fact that Indonesia is one of the nations that has high number of deforestation and climate change, the figure below will present solution tree and the explanation will be included for each principle of UNCRC in policy recommendation on how Indonesian's government should tackle the environmental-related children's rights issues, specifically deforestation and climate change.

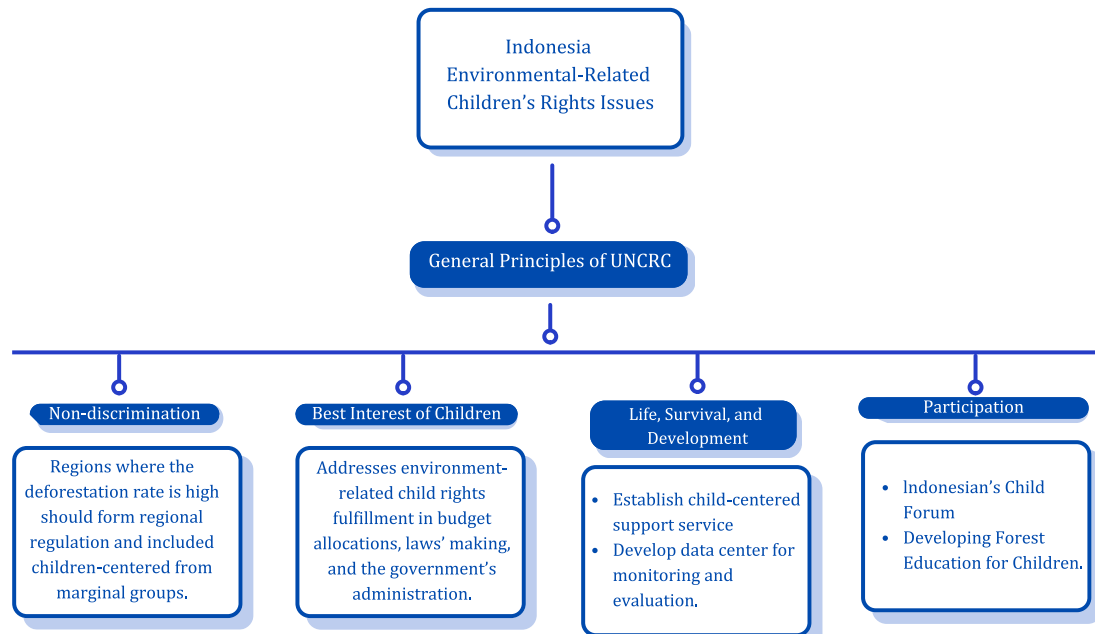


Fig. 3. Solution tree for Indonesia environmental-related children's rights issues

### 3.5.1 The non-discrimination principle

Article 2(1) of The UNCRC broadens all the rights set forth in the instrument to each child without any prejudicial or diverse or differentiation. For instance, in the context of climate change adjustment budgeting, it is essential to plan the budget referring to children's rights, so children from marginal groups could benefit from it and remove the inequalities. By implementing the non-discrimination principle, the UNCRC could be used as a legal framework to protect children from environmental damage and risks (Kaime, 2019). To be more specific, the regulation could be prioritized to the location with high rate of deforestation and severe level of climate change. Referred to Global Forest Watch (2023), since 2001 to 2024, 76% of tree cover loss happened in areas where the dominant drivers of loss resulted in Indonesia deforestation. During these periods, there are top 5 provinces were responsible for 59% of all tree cover loss; Riau (4.30Mha), Kalimantan Barat (4.21Mha), Kalimantan Tengah (3.86Mha), Sumatera Selatan (3.29Mha), and Kalimantan Timur 3.13Mha.

### 3.5.2 The best interests of the child

Article 3(1) of the UNCRC stated the best interest principle of the children. In the matter of environment-related children's rights, the best interests of the child need the answer to the environmental damage and risks be identified as soon as possible. Soon the solution could be found, it could help children's protection, survival, and development. This concept is implemented in budget allocations, in the laws' making, and the government's administration (Kaime, 2019). The regions where climate change and deforestation are severe should be included are child-centered while designing regulation in aim to fulfill environment-related child rights.

### 3.5.3 *The life, survival, and development principle*

Article 6(1) of the UNCRC mentions that every child has an inherent right to life and that it should be protected by law. Article 6(2) includes the commendation of this right by stressing states to guarantee to the maximal extent possible the development, protection, and development. For the issue related to environment-related children's rights, the states should protect each aspect of child survival and development equally. It is fundamental that the state goes further and monitors the procedural aspects for the protection of these rights (Kaime, 2019).

The current available data from the Indonesian government is an online information system for the protection of women and children/*Sistem Informasi Online Perlindungan Perempuan dan Anak (SIMFONI PPA)* from Indonesian's Ministry of Women Empowerment and Child Protection/*Kementerian Pemberdayaan Perempuan dan Perlindungan Anak (KemenPPPA)*. The data mostly presented gender-based violence. It is also essential for the government to develop the data environment-related child rights in order to monitor and evaluate the fulfillment. In addition, establishing child-centered support services for every child who is affected from deforestation and climate change is also fundamental.

### 3.5.4 *The participation principle*

There are various participation provisions in the UNCRC, and the main participants are mentioned in Articles 13(1) and 12(1). The other provisions in the UNCRC that mentions the principle of participation are also stated in arts. 2, 3, 5, 13, and 17. Determination about fundamental environment-related rights such as access to environmental education and right to play, will likely be improved by facilitating children participation. Even though there is limited environment-related children's rights in the UNCRC, it is still achievable to articulate the range of state responsibility in connection to environment-related children's rights (Kaime, 2019).

To include children and youth in policy making, Forum Anak Nasional (FAN) could participate and state their concerns about environment-related child rights issues they are facing. FAN is a children's forum supported by the Indonesian's Government through the KemenPPPA, to bridge communication and interaction among the government and children throughout Indonesia in order to fulfill the child participation. Currently, FAN is spread in all regions in Indonesia, with specification number; 215 forum in province level, 640 forum in district/city level, 432 forum in district level, and 310 forum in village level (Forum Anak, 2025). Moreover, Food and Agriculture Organization of the United Nations (FAO) launched the "Guidance on Developing Forest Education Programmes for Primary Schools" in 2024. This guidance could be used in developing programs for Indonesian children, to make sure their participation.

The implementation of policy recommendation above, is likely to vary for each region, specifically in provinces with high rates of deforestation. In addition, Indonesia's decentralized government structure grants significant control to provincial governments, resulting different environmental regulations, institutional political commitment, and capacities. Furthermore, persistent coordination obstacles among national, provincial, and district government have been known as a key challenge to effective policy implementation in Indonesia (Nasirin & Lionardo 2021).

## 4. Conclusions

Current studies still have limitations on the examination of the association between environmental damage with environment-related child rights. Referring to the gap, this study contributed in highlighting children's rights violation by climate change and deforestation. This research has identified how environmental degradation such as deforestation and climate change have the effects on the children's rights fulfillment. This paper discovered several main points from the literature and divided the result into two

main categories of environmental issues globally, which are climate change and deforestation.

It is found that there are four children rights violated by environmental degradation: (1) the child's right to life, survival, and development violation, such as disaster affect from environmental issues and it will be more severe on developing countries since they have limited social safety nets, poverty, weak health care systems, and weak governmental institutions.; (2) the child's right to health violation, which environmental issue could negatively influence children health both in physically and mentally and increase the risks of children's death; (3) the right to an adequate standard of living violation, it is could be seen that the climate change and deforestation lead to interruption access on health care, education, social care, and services for children; and (4) the child's right to play violation, the environmental degradation could influence on how parents/caregivers to limited children time to having outdoor playing time since the danger potential specifically in health.

Moreover, this study provides policy recommendations for Indonesia's government focusing on environmental-related child rights fulfillment, prioritized for regions with severe rates of climate change and deforestation. There are five provinces where high rate of tree cover loss; Riau, Kalimantan Barat, Kalimantan Tengah, Sumatera Selatan, and Kalimantan Timur. The policy implication included four principles of UNCRC, which are (1) the non-discrimination principle, prioritized in region with severe environmental degradation and included children-centered from marginal groups; (2) the best interests of the child, which is highlight environmental-related children rights fulfillment in budgeting, law's making, and administration from government; (3) the life, survival, and development principle, by develop child-centered support facilities and launch data center for monitoring and evaluation; and (4) the participation principle, such as included Indonesian's child forum and establish forest education, so children could participated in policy making.

The findings from this study could be used as potential future research direction in focusing for deeper policy design with four principles of UNCRC for each region with high number of deforestation outside Indonesia. In addition, the future research could explore specific on each region with severe environmental degradation, and on how environmental-related child rights could be addressed in Indonesia's decentralized government structure. Moreover, future research should build on these findings by exploring provincial-level regulation implementation. The scope of this research is limited to environmental-related children's rights issues linked with climate change and deforestation, and its policy implications situated within the Indonesian context. While the analysis emphasizes provinces with high deforestation rates, it does not develop province-specific policy interventions.

### **Acknowledge**

The author would like to express their sincere gratitude to the anonymous reviewers for their invaluable comments and insightful suggestions, which greatly contributed to improving the quality and clarity of this manuscript.

### **Author Contribution**

Author contributed to the literature search, interpretation, writing, and proof reading of the manuscript. All authors have read and agreed to the published version of the manuscript.

### **Funding**

This research received no external funding.

### **Ethical Review Board Statement**

Not Available.

### **Informed Consent Statement**

Not Available.

### Data Availability Statement

Supporting data derived from publicly accessible sources are available in an online database and can be accessed at [https://drive.google.com/file/d/1tcvHJrTFfSVCpU7iK0imRmA10WzkWwqC/view?usp=drive\\_link](https://drive.google.com/file/d/1tcvHJrTFfSVCpU7iK0imRmA10WzkWwqC/view?usp=drive_link)

### Conflicts of Interest

The author declares no conflict of interest.

### Declaration of Generative AI Use

During the preparation of this article, the author used Chat GPT to assist in the grammatical conformity. After using this tool, the author reviewed and re-edited the manuscript and takes full responsibility for the content of this manuscript.

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