

# ENVIRONMENTAL EDUCATION FOR STRENGTHENING ECOLOGICAL AWARENESS, SUSTAINABLE DEVELOPMENT, PROSPERITY, AND HUMAN WELL-BEING

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## La educación ambiental para el fortalecimiento de la conciencia ecológica, el desarrollo sostenible, la prosperidad y el bienestar humano

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### Abstract

Vietnam, like many developing countries, faces serious challenges from climate change, environmental pollution, and the degradation of natural ecosystems. These interconnected issues threaten environmental security, food and water resources, and the overall quality of human life. As Friedrich Engels once reminded humanity, every triumph over nature carries consequences, because humans are a part of nature, not its masters. This study emphasizes the essential role of environmental education in fostering ecological awareness and promoting sustainable development in Vietnam. By integrating environmental protection into education, policymaking, and community action, Vietnam can strengthen its resilience to climate change, enhance biodiversity conservation, and ensure long-term prosperity and human well-being. The research highlights the importance of digital transformation, legal reform, and strategic planning in encouraging sustainable practices across economic and social sectors. Strengthening environmental education will empower citizens to take proactive roles in environmental governance, inspiring responsibility and collective participation. Furthermore, digital tools and modern communication methods can expand public access to environmental information, making education more inclusive and effective. Through these combined efforts, Vietnam can move toward a green, sustainable, and adaptive future. Ultimately, environmental education is not only a means to protect nature but also a foundation for achieving the Sustainable Development Goals (SDGs).

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### Keywords

Environmental education, Climate change, Sustainable development, Environmental protection, Ecological awareness, Human well-being.

### Resumen

Vietnam, al igual que muchos países en desarrollo, enfrenta serios desafíos derivados del cambio climático, la contaminación ambiental y la degradación de los ecosistemas naturales. Estos problemas interrelacionados amenazan la seguridad ambiental, los recursos alimentarios e hídricos, así como la calidad general de la vida humana. Como recordó Friedrich Engels, cada triunfo sobre la naturaleza conlleva consecuencias, porque los seres humanos forman parte de la naturaleza y no son sus dueños. Este estudio enfatiza el papel esencial de la educación ambiental en el fomento de la conciencia ecológica y en la promoción del desarrollo sostenible en Vietnam. Al integrar la protección ambiental en la educación formal e informal, la formulación de políticas públicas, la acción comunitaria y la participación ciudadana, Vietnam puede fortalecer su resiliencia ante el cambio climático, mejorar la conservación de la biodiversidad y garantizar la prosperidad y el bienestar humano a largo plazo. La investigación destaca, además, la importancia de la transformación digital, la reforma legal, la planificación estratégica y la cooperación internacional para fomentar prácticas sostenibles en los sectores económicos, sociales y culturales. Fortalecer la educación ambiental empodera a los ciudadanos para participar activamente en la gobernanza ambiental, promover estilos de vida sostenibles y contribuir al logro de los objetivos de desarrollo sostenible (ODS).

### Palabras clave

Educación ambiental, cambio climático, desarrollo sostenible, protección del medioambiente, conciencia ecológica, bienestar humano.

## Introduction

With the arrival of the 21st century, climate change has become a problem of global importance, and no region of the planet is immune to natural or man-made disasters such as tsunamis, earthquakes, storms, floods, lands-

lides, and widespread environmental pollution. Over the last few decades, industrial and productive activities have depleted large amounts of natural resources, often with low economic efficiency compared to the losses suffered by the environment. This indicates that, in order to achieve current levels of technical development and infrastructure, humanity has exploited natural resources beyond the necessary limits due to obsolete extraction and processing technologies. These practices have led to the waste of natural resources, climate change, ecological imbalance, environmental pollution, and the increasing depletion of the ozone layer, which threatens human survival. Therefore, to protect life on Earth and ensure the continuity of nations, humanity must move toward sustainable economic development that adapts to climate change.

Dialectical materialism represents a significant inheritance and advance over previous dialectical approaches, from ancient philosophical traditions to Hegel, the culmination of classical German idealist philosophy. Marxist dialectics is considered a comprehensive framework for studying the development of the entire objective world, encompassing nature, society, and human cognition. Consequently, its scope of study and practical applications are extremely broad, with virtually no domain escaping its analytical reach.

In today's global context, humanity faces unprecedented environmental, social, and economic challenges, leading many scholars to refer to this era as the Third Age of Nature. Issues such as social inequality, poverty, conflict, environmental degradation, and the depletion of natural resources are direct consequences of unsustainable economic development. These pressures have disrupted the balance between humans, society, and nature, leading to biodiversity loss, ecosystem degradation, and increasingly severe climate change. For example, Vietnam and many other countries lose an average of 11 to 13 million hectares of forest per year, while marine ecosystems are increasingly threatened by pollution, overexploitation, and habitat destruction. These global challenges cannot be addressed by individual nations but require international cooperation, shared responsibility, and sustainable governance.

Climate change is one of the greatest challenges facing humanity in the 21st century. Its effects damage production, livelihoods, and the environment, and continue to transform natural ecosystems, socioeconomic systems, and development processes. Climate change poses a serious threat to environmental security, energy, water resources, food production, and cultural heritage on a global scale. Transboundary environmental issues are becoming increasingly complex, unpredictable, and signi-

ficant, requiring proactive strategies and adaptation measures. The pace and complexity of climate change have exceeded previous predictions, affecting multiple aspects of human life and ecosystems, while seriously threatening food security, rural and agricultural development, and industrial growth.

Developing countries such as Vietnam face particularly intense ecological pressures due to rapid industrialization, deforestation, pollution, and uncontrolled exploitation of natural resources. These challenges threaten environmental security, human well-being, and sustainable development. Although environmental awareness has been increasing, environmental education has not yet been implemented systematically, especially among primary school children, who are the future citizens responsible for environmental management.

This study aims to examine the role of environmental education in improving ecological awareness, promoting sustainable development, and ensuring human well-being in Vietnam. The research analyzes how education can encourage responsible behavior, improve ecological knowledge, and integrate environmental awareness into social practices at multiple levels. As Engels emphasized, «everything that motivates human action passes through the mind.» Therefore, for environmental protection efforts in Vietnam to be effective, individuals and communities must have a high level of environmental awareness.

In the context of accelerating climate change, biodiversity loss, and environmental degradation, environmental education is crucial. Ecological awareness must be fostered from childhood through comprehensive, culturally appropriate, and scientifically based educational programs to develop responsible citizens who can contribute to sustainable development. This study highlights the need for environmental education as a strategic approach for Vietnam to harmonize economic growth with ecological sustainability, while serving as a model for other developing nations.

## Background

Traditional environmental awareness education in Eastern thought arose from the concept of unity between heaven, earth, and humanity, emphasizing harmony between humans and nature. This perspective views humans as «microcosms,» miniature reflections of the universe, capable of creating balanced relationships with their environment. From this fundamental idea, various conceptions of the relationship between humans and

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nature were developed, such as: «What happens in humanity happens in heaven» and «humanity surpasses heaven» (Abe *et al.*, 2022). These philosophies laid the foundation for an ethical approach to environmental management, emphasizing respect, balance, and coexistence with nature.

For example, Lao Tzu (571-471 BC), considered the founder of ancient Chinese Taoist philosophy, articulated these ideas in the *Tao Te Ching* (2012), which presents a coherent system of thought on nature, society, and human behavior. Lao Tzu (2012) emphasized that the natural world exists independently and functions according to its own inherent order, in constant motion and transformation. Consequently, humans can only achieve harmony by aligning themselves with nature, rather than attempting to dominate or over-reform it. As Lao Tzu (2012) argues, returning to a simpler, more harmonious lifestyle and respecting the natural environment is essential for human well-being.

Building on these philosophical foundations, European thinkers such as Engels also emphasized the ethical responsibility of humans toward nature. Engels asserted that humans, whether «civilized or savage, are children of nature, not its masters» (Marx & Engels, 1995, vol. 1) and warned against excessive pride in human achievements over nature, emphasizing that such victories may provoke natural retribution (vol. 4). Although Engels' perspective may seem idealistic, the increasing frequency of environmental crises validates his warning and underscores the fundamental role of ecological ethics in contemporary society.

Similarly, Marxist-Leninist theory provides a solid framework for understanding the interdependence between humans, society, and nature. In the *Economic and Philosophical Manuscripts* (1844), Marx emphasized that the natural world is both the origin and the determinant of human activity, thus actions hostile to nature are ultimately detrimental to humanity itself (vol. 20). Engels further elaborated by stating that «in the natural world, nothing happens by itself. This phenomenon affects other phenomena and vice versa» (vol. 42), highlighting the interconnectedness of all elements of the ecological system. These ideas laid the theoretical foundation for analyzing contemporary environmental challenges and the ethical imperatives of ecological management.

Furthermore, Engels' «*dialectic of nature*» distinguishes between humans and animals in their ability to transform the environment. He warned against overexploitation, reminding humanity that «we do not dominate nature as a conqueror dominates a foreign people, as someone who stands outside nature, but rather we, with flesh, blood, and brains, belong to nature and exist in the midst of it» (vol. 42). Despite these war-

nings, industrialization and environmental degradation have proven the relevance of Engels' perspective.

Internationally, ecological awareness and environmental education have gained worldwide recognition. Between 1992 and 2010, several international summits, including the Kyoto Conference and the Johannesburg World Summit on Sustainable Development (2002), emphasized environmental awareness as a prerequisite for sustainable development (Oregon State University, 2020). These initiatives underscore that promoting ecological awareness is critical to addressing climate change, resource depletion, and biodiversity loss. For example, one ecology professor noted that «policies to combat the climate crisis must address its root cause: human overexploitation of the planet» (Oregon State University, 2020).

In Vietnam, environmental education has become increasingly urgent due to the country's vulnerability to climate change and rapid industrialization. Empirical studies highlight the importance of raising ecological awareness among students at all educational levels. For example, research shows that fostering environmental awareness among high school and university students equips them with the knowledge, ethical perspectives, and practical skills necessary to protect ecosystems, comply with environmental laws, and participate in community initiatives (Nguyen & Phung, 2024; Nguyen & Nguyen, 2023). Religious organizations, particularly Buddhist communities, also contribute to environmental stewardship through faith-inspired initiatives, promoting sustainability and mobilizing collective action (Nguyen *et al.*, 2025).

From a theoretical perspective, understanding the environment is fundamental to sustainable socioeconomic development. The environment can be defined as «all factors that directly or indirectly affect the existence and development of living organisms» (Nguyen, 2002, p. 72) or as «a part of the Earth that surrounds human beings» (Hoang, 1992, p. 635). From a philosophical point of view, the environment is inseparable from human existence, and its protection is both an ethical obligation and a practical necessity for social progress, economic stability, and the preservation of biodiversity (Hanoi Open University, n.d., p. 6).

Therefore, environmental education serves as a fundamental mechanism for fostering ecological awareness. It integrates age-appropriate knowledge, ethical norms, and standards of behavior oriented toward legality, promoting experiential learning principles such as «hearing a hundred times is not as good as seeing once, and seeing a hundred times is not as good as doing once» (Kolb, 1984). By engaging students in sustainable practices—waste reduction, biodiversity conservation, and



climate adaptation—environmental education cultivates environmentally friendly attitudes and sustainable behaviors, ensuring long-term ecological stewardship (Wals, 2019).

Environmental protection is recognized as a fundamental prerequisite for sustainable development. It involves safeguarding human habitats, conserving natural resources, and managing environmental risks in harmony with economic and social development. According to the Law on Environmental Protection, environmental protection must be integrated into economic planning, social welfare, gender equality, and children's rights (Law on Environmental Protection, 2020, pp. 14-15). Environmental protection is therefore a matter of national survival, social stability, and global responsibility.

Finally, climate change represents one of the most critical challenges of the 21st century, as it affects production, transportation, water, food, energy, and social security around the world. Both natural and anthropogenic factors contribute to its acceleration, causing extreme weather events such as floods, droughts, and heat waves. In Vietnam, adaptation to climate change is a priority, requiring its integration into socioeconomic development plans at all levels. Proactive measures include reducing greenhouse gas emissions, developing carbon sinks and renewable energy, conserving forests, and implementing climate adaptation strategies in agriculture, fisheries, and urban planning. Combating climate change requires global cooperation, community participation, and greater awareness to ensure a sustainable future.

Engels once said, «Everything that moves men must pass through their minds.» Consequently, for environmental protection activities in Vietnam to be truly effective, environmental education in communities aims to equip people with age-appropriate knowledge, ethical awareness, and behavior norms geared toward compliance with the law. Through the application of experiential learning approaches and direct participation in sustainable practices, environmental education promotes not only the acquisition of knowledge, but also the development of environmentally friendly attitudes and long-term sustainable behaviors. This approach establishes a solid foundation for ecological awareness and responsible management at all levels of society.

This principle is closely aligned with contemporary approaches to experiential learning, which emphasize learning through active participation, reflection, and real-world application. By directly involving students in sustainable practices, such as waste reduction, biodiversity conservation, and climate adaptation activities, environmental education promotes



not only the acquisition of knowledge, but also the development of environmentally friendly attitudes, critical evaluation of polluting behaviors, and sustainable behaviors that can be maintained over the long term.

## Philosophical theories on environmental education

Environmental education is based on a set of philosophical traditions that help explain how individuals perceive, interpret, and act on environmental issues. These theories provide a conceptual basis for understanding the formation of ecological awareness, environmental attitudes, sustainable behaviors, and the broader relationship between human well-being and the natural environment. The following sections present the main philosophical approaches that guide contemporary environmental education.

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*Deep ecology*, developed by Arne Naess (1973 and 1986), holds that all living beings have intrinsic value independent of their instrumental benefits to humans. This perspective places humans as part of a broader «web of life,» challenging anthropocentric thinking and promoting a holistic view of the ecological world. Within environmental education, deep ecology makes three important contributions: A cognitive shift from anthropocentrism to biocentrism, which encourages students to adopt a respectful and humble relationship with nature. An emphasis on inner transformation, which fosters emotional and ethical sensitivity toward ecological systems, essential for strengthening ecological awareness. The promotion of sustainable lifestyles, highlighting the need to respect ecological limits and protect biodiversity as the basis for long-term human well-being. This theory forms the philosophical basis for educational programs that aim to cultivate ecological awareness and ethical responsibility.

The *ethics of care*, articulated by Carol Gilligan (1982) and Nel Noddings (1984), emphasizes the moral responsibility that arises from relationships, empathy, and care. Applied to environmental education, this approach highlights: the emotional and relational dimensions of ecological awareness; the moral duty to protect vulnerable ecosystems; the role of compassion and sensitivity in shaping pro-environmental attitudes. By integrating care-based ethics into learning processes, environmental education becomes a space for cultivating empathy toward nature and strengthening the affective foundations of sustainable behavior.

*Environmental pragmatism*, based on John Dewey's (1938) theory of experiential learning, views education as a process rooted in real-world problem solving and active participation. In environmental education, this philosophical tradition offers several ideas: learning through direct experience, which allows students to confront and address local environmental problems; the development of critical thinking, especially in the analysis of interactions between humans and nature; and an emphasis on project-based learning, which promotes interdisciplinary knowledge and practical action for sustainability. Environmental pragmatism thus reinforces the connection between ecological knowledge and behavior, making learning more practical and transformative.

The *eco-socialist philosophy*, promoted by thinkers such as André Gorz (1980) and Michael Löwy (2005), criticizes unsustainable patterns of production and consumption that damage ecosystems and exacerbate social inequalities. Its relevance to environmental education lies in its emphasis on environmental justice and the equitable distribution of ecological resources; the social and political roots of environmental degradation; and collective responsibility for ecological protection and long-term sustainability. This perspective encourages educational programs to integrate social justice, policy critique, and ecological integrity into learning about sustainability.

*Ecological humanism* holds that human development and well-being are inseparable from the health of natural ecosystems (Passmore, 1974; Sessions, 1995). It contributes to environmental education by emphasizing the intrinsic connection between human flourishing and ecological sustainability; the ethical importance of protecting natural environments; and a holistic understanding of well-being that integrates environmental, social, and spiritual dimensions. This approach aligns strongly with contemporary research linking ecological health to physical, psychological, and community well-being.

Finally, *systems theory*, developed by Ludwig von Bertalanffy (1968), views natural and social phenomena as interconnected systems characterized by interdependence and complexity. Applied to environmental education, systems theory enhances students' ability to understand ecological interconnections; explains the cascading effects of human actions within ecosystems; and supports integrated and interdisciplinary approaches to education for sustainability. This theoretical perspective is especially valuable for designing educational programs that address cross-cutting environmental challenges, such as climate change, resource depletion, and environmental governance.



## Research methodology

To explore the ideas presented in depth and assess how environmental education contributes to sustainable development in Vietnam, this section describes the methodological framework used.

This study is based on a qualitative, descriptive, and analytical approach, which aims to understand the role of environmental education in strengthening ecological awareness and promoting sustainable development in Vietnam. To achieve this objective, the research employed documentary and comparative methods, supported by interpretive techniques that facilitated the examination of academic literature, government reports, and international documents related to sustainability and environmental protection.

Bibliographic records, thematic analysis matrices, and conceptual categorization tables were used as research tools to identify key concepts, theoretical approaches, and emerging trends. The research procedure was carried out in four main stages: review of the relevant literature and legal and policy frameworks; contextual analysis of Vietnam's environmental and educational conditions; synthesis of national strategies, public policies, and educational practices; and formulation of conclusions and recommendations aimed at strengthening environmental education and ecological awareness.

This methodological structure provides a solid basis for a comprehensive interpretation of the interrelationship between education, the environment, and sustainable development.

## Results and discussion

This section presents the main findings of the study, structured thematically to reflect the interconnected dimensions of environmental education, ecological awareness, and sustainable development. The presentation of the results follows three key analytical perspectives:

- Natural environmental challenges.
- Socioeconomic conditions and development.
- Awareness and human behavior.
- Policies, management, and institutional aspects.
- Environmental philosophy and the role of environmental education.
- Solutions for sustainable development.

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### *Natural environmental challenges*

One of the most pressing global issues today is the increasing degradation of the environment driven by rapid economic and industrial development. Industrial facilities, construction activities, and manufacturing operations release significant amounts of emissions and hazardous waste into the environment, contributing significantly to air, water, and soil pollution. As a result, protecting the environment has become a priority to ensure the stability of the planet and human well-being.

On the other hand, forest ecosystems—known as the planet's «green lungs»—are suffering severe deterioration due to large-scale deforestation in many countries. Over the past 12 years, more than 11,000 km<sup>2</sup> of forest have been lost in Brazil, and both deforestation and forest fires in the Amazon continue to reach record levels. Forest fires are also intensifying globally, with significant cases documented in Australia, the United States, and other regions. For example, it is estimated that last year's forest fires in Australia released 369 million tons of carbon dioxide (CO<sub>2</sub>) into the atmosphere (Tuyen Giao, n.d.).

Global warming, accompanied by rising sea levels, represents one of the most significant environmental challenges of the 21st century. According to the World Meteorological Organization, the global average temperature for the period 2020-2024 is expected to increase by more than 1.5 °C above pre-industrial levels, mainly due to increased CO<sub>2</sub> and methane emissions. These greenhouse gases trap heat in the atmosphere, causing temperatures to rise. The effects are already evident: New Delhi (India) suffered its most severe heatwave in twenty years; in Japan, the city of Isesaki recorded 40.2°C on June 25, surpassing the previous national record of 39.8°C set in 2011; In the first two weeks of July, at least 44 deaths and more than 12,000 hospitalizations were recorded due to extreme heat; heat waves in the Iberian Peninsula caused more than 1,700 deaths (Tuyen Giao, n.d.).

Meanwhile, a 2022 report by Climate Central states that approximately 7.6 billion people (96% of the world's population) are currently affected by climate change (extreme heat, flooding, and other related hazards). During the period 1906-2005, the global average temperature rose by 0.74 °C, and the rate of warming in the last fifty years was almost double that of the previous half-century. Between 2001 and 2010 alone, the average temperature rose by more than 0.5 °C. Projections indicate that around 50% of plant and animal species could face extinction by 2050 if global temperatures rise between 1.1 and 6.4 °C (Tuyen Giao,

n.d.). Biodiversity loss is closely linked to habitat degradation caused by desertification, deforestation, and sea level rise, while human populations face increasing risks to settlements, food security, access to energy, and sources of income.

Finally, climate change has caused the highest rate of ice melt observed in more than 10,000 years, especially in Greenland. Environmental degradation is also associated with ozone layer depletion, which increases risks to ecosystems and human health. Drought conditions have intensified in regions such as India, Pakistan, and parts of Africa, where reduced rainfall is expected to persist for decades. It was estimated that by 2020, between 75 and 250 million people in Africa would suffer from shortages of drinking water and irrigation resources, which could reduce agricultural productivity by up to 50%. The number of severe hurricanes has doubled in the last 30 years. Furthermore, if current ice melt trends continue, sea levels could rise by at least six meters, posing a serious threat to coastal regions around the world.

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### *Socioeconomic and development conditions*

Vietnam is one of the most biodiverse countries in the world. However, in recent years, the effects of climate change on Vietnam's ecosystems have increasingly threatened wetlands such as U Minh Thuong, Tram Chim, Lang Sen, Vo Doi, Tra Su, Ha Tien, Dat Mui, Bai Boi, and Lung Ngoc Hoang. Biodiversity has declined significantly due to forest fires, changes in land use, and habitat loss. Illegal overexploitation and trade in endangered fauna and flora also persist. As Bui and Do (2017) point out:

In recent decades, 1,088 animal species on Earth have become extinct. In Vietnam, some species can no longer be found in the wild, and currently, there are 93 species of mammals, 78 species of birds, 54 species of reptiles, 51 species of marine fish, 38 species of freshwater fish, and 105 species of invertebrates facing the threat of extinction, including 17 species of mammals and some species of birds listed by the International Union for Conservation of Nature (IUCN) as rare species in need of priority conservation and sustainable development.

Extreme and unusual weather events in Vietnam further demonstrate the ongoing effects of climate change. Climate change has also contributed to the rapid spread of infectious diseases such as COVID-19, malaria, and dengue fever, as well as an increase in cardiovascular, respiratory, and dermatological diseases. With a coastline of 3,260 km, Vietnam is highly vulnerable to sea level rise. Data collected over 51 years by

marine monitoring stations (1961-2022) indicate that sea level at Vietnamese monitoring points has risen at an average rate of approximately 2.45 mm per year. In the Mekong river system, upstream flows have decreased, with the lowest water levels in the last hundred years being recorded. The reduction in freshwater discharge has weakened the river's ability to repel seawater, causing saltwater intrusion to occur nearly two months earlier than usual and extend further inland. Monitoring data show that maximum salinity levels have consistently exceeded long-term averages and surpassed historical records. Specifically, the salinity boundary of 4 g/L extended between 90 and 95 km along the Vam Co River, between 45 and 65 km along the Tien River, between 55 and 60 km along the Hau River, and between 60 and 65 km in the western coastal region (Cai Lon River). These intrusion distances exceed long-term averages by at least 5-10 km in the western coastal region, 10-15 km along the Vam Co and Hau rivers, and 20-25 km along the Tien River.

Drought and saltwater intrusion have also affected several provinces along the central coast, from Nghe An to Ninh Thuan, with the most severe effects recorded in Quang Nam, Quang Ngai, Binh Dinh, and Phu Yen. Severe saltwater intrusion has occurred in Quang Tri and Da Nang, while extreme cold and frost conditions have affected the northern mountainous regions. In the southern region, drought and salinity have significantly affected agricultural production and livelihoods. Land subsidence, erosion, unregulated exploitation of mangroves, sea level rise, flooding, and lightning strikes have caused considerable damage in recent decades.

In 2010, the Mekong Delta recorded 99 erosion and landslide sites; by 2019, this figure had increased fivefold to 564 sites, covering a total area of 830 km. Each year, thirteen provinces and cities in the region lose between 300 and 500 hectares of land to erosion. Over the past 40 years, approximately 1,886 hectares have been lost due to landslides. In Ca Mau province alone, nearly 400 hectares are lost each year to coastal erosion. The year 2019 was identified as the year with the most severe drought and saline intrusion of the past century, with saltwater penetrating inland. The total agricultural area affected amounted to 126,798 hectares, of which 78,137 hectares suffered yield losses of more than 70% (62%), 45,740 hectares suffered losses of 30 to 70% (36%), and 2,921 hectares suffered losses of less than 30% (2%). The most affected provinces were Ca Mau (49,343 hectares), A Giang (34,093 hectares), Bac Lieu (11,456 hectares), and Ben Tre (10,755 hectares). Ten provinces in the Mekong Delta—Vinh Long, Ca Mau, Can Tho, Dong Thap, and An Giang, among others—declared natural disaster emergencies, with drought affecting ap-

proximately 155,000 households and more than 500,000 people facing water shortages. The number of people affected is expected to continue to rise, causing economic damage estimated at billions of Vietnamese dongs.

A sea level rise of 65 cm would flood approximately 5,133 km<sup>2</sup> (12.8%) of the Mekong Delta, and a rise of 100 cm would flood 15,116 km<sup>2</sup> (37.8%). These projections indicate substantial risks to settlements, infrastructure, and agricultural systems in the region. Climate change and sea level rise are expected to intensify migration from rural to urban areas, particularly from coastal agricultural communities to urban centers in the north and west. This influx may place increasing pressure on urban planning, infrastructure, and public services.

### *Awareness and human behavior*

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Throughout history, humans have placed themselves at the center of the universe, perceiving themselves as rulers with the ability to create, exploit, and dominate the natural world. These anthropocentric perspectives underpin the belief that humans have absolute authority over nature and can use it in a dominant, exploitative, or destructive way. These views have contributed to significant environmental degradation driven by ignorance, greed, and the pursuit of short-term material gains, while warning signs from the environment have been ignored. As Nguyen (2016) observes, misunderstandings about «the seemingly inexhaustible wealth of natural resources» and failure to recognize «the limits of natural resources» have had serious ecological consequences.

The pursuit of immediate economic gains—often for the benefit of individuals, groups, or companies—without regard for long-term environmental damage has led to widespread resource depletion and pollution. Many rivers have become «dead rivers» due to the continuous discharge of untreated industrial wastewater from factories. Agricultural areas, such as sugar cane and strawberry fields, have collapsed along riverbanks due to intensive sand extraction by dredgers and suction vessels, which destabilize riverbeds. As Nguyen (2016) points out, «the death of rivers not only leads to the destruction of agricultural land, but also damages aquaculture, fishing, and marine exploitation areas, ultimately imposing serious consequences on humanity.»

Numerous severe natural disasters around the world further illustrate the vulnerability of human societies to environmental instability. The 2008 Sichuan earthquake in China (magnitude 8.0) caused approximately 87,000 deaths and left 10 million people homeless. The 2015

Nepal earthquake (magnitude 7.9) caused more than 4,000 deaths and triggered a deadly avalanche on Everest, killing 17 climbers and leaving more than 60 injured. In 2018, a magnitude 7.5 earthquake in Indonesia claimed more than 4,300 lives. The 2011 earthquake and subsequent tsunami in Japan (magnitude 9.0) caused nearly 20,000 deaths, approximately 2,400 injuries, exposed 190 people to radiation, and damaged more than 100,000 homes. More recently, earthquakes in Turkey and Syria on February 6, 2023, caused around 50,000 deaths and left millions of people facing harsh winter conditions.

These catastrophic events reflect the warnings articulated by Engels more than a century ago: «These events have reminded us every hour, every minute, that we cannot dominate nature as an invader dominates another nation, as someone who lives outside nature» (Marx & Engels, 1995, vol. 20). Similarly, Nguyen (2016) points out that nature's destructive responses have «turned once-prosperous nations into wastelands or even wiped out entire civilizations,» highlighting the need for ongoing reflection on humanity's relationship with the environment.

The negative externalities of the market economy have also contributed to prioritizing economic interests over environmental considerations. In many cases, monetary value has been absolutized, leading people to believe that material accumulation equates to security, happiness, and social superiority. These perspectives often encourage non-compliance with environmental laws and ecological limits. Engels highlights the essential concept of adaptation, stating that «no living being, including human beings, can exist outside the biosphere» (Marx & Engels, 1995, vol. 1). Human existence depends fundamentally on nature, which provides the material basis for survival and development.

Marx clearly expressed this relationship in the *Economic and Philosophical Manuscripts of 1844*, stating that:

Nature, specifically nature itself, not as the body of man, is the inorganic body of man. Man lives from nature. This means that nature is his body, with which he must remain in constant exchange in order to live. To say that man's physical and mental life is linked to nature is simply to say that nature is linked to itself, since man is part of nature (Marx & Engels, 1995, vol. 42).

This perspective underscores the intrinsic connection between humans and their natural environment, highlighting the need to maintain ecological balance for sustainable human development.

### *Policies, management, and institutional aspects*

Awareness and compliance with regulations on natural resource management, environmental protection, and climate change adaptation remain limited. Businesses and citizens have not yet fully understood the importance, significance, and responsibility of proactively responding to climate change and protecting the environment, resulting in serious environmental incidents continuing to occur, while preventive measures and penalties for violations remain insufficiently strict and ineffective.

Several aspects of state management related to natural resources, environmental governance, and climate change adaptation remain inadequate, and limitations persist in the quality of planning, assessment, and valuation of natural resources. Although there is a growing trend toward reducing short-term, profit-driven exploitation of resources, progress remains slow. The transition to more efficient energy use and the expansion of renewable and clean energy sources is also progressing at a slow pace.

Environmental quality in several regions continues to deteriorate, while climate change adaptation strategies remain largely passive and inadequate. Natural ecosystems and biodiversity are further deteriorating. The environmental industry—including recycling and waste treatment—has developed slowly and remains below regional and global standards. Furthermore, the importation of obsolete technologies, machinery, and equipment that do not meet environmental requirements has not been effectively addressed. As noted by the Communist Party of Vietnam (2021), these persistent shortcomings ultimately impose serious long-term consequences and burdens on both current and future generations.

### *Environmental philosophy and the role of environmental education*

In Vietnam's alarming environmental situation, the causes can be largely attributed to society's inhumane behaviors and uncivilized attitudes toward the environment. This was already warned by Engels more than a century ago, who pointed out that if humans interfere with nature and disrupt the ecological balance, they will inevitably face risks that threaten their own existence, and emphasized that «our mastery of nature is based on our ability to understand the laws of nature and use them accurately» (Marx & Engels, 1995, vol. 20). Unfortunately, Engels' warnings have not been adequately heeded by nations over the years, and humanity now faces the consequences, often at great cost and with deep regret.

An excessive emphasis on economic growth—often pursued without regard for its environmental consequences—coupled with wasteful and in-



discriminate exploitation of natural resources, has contributed to severe environmental degradation in Vietnam, including saltwater intrusion, pollution, desertification, land subsidence, and landslides. The current situation serves as a lesson that requires careful consideration and reflection.

Therefore, a pressing question arises: how can ecological awareness, environmental education, and sustainable behaviors be effectively promoted to balance socioeconomic development with environmental protection, ensuring prosperity and human well-being in the context of climate change and ecosystem degradation?

Environmental education is emerging as a crucial mechanism for fostering ecological awareness and responsible behavior, encouraging individuals and communities to recognize their interdependence with nature, develop sustainable values, and promote collective responsibility in environmental management. Strengthening environmental education at all levels, together with effective policies and governance, can guide Vietnam—and the global community—toward sustainable development and ecological balance.

### *Solutions for sustainable development*

Human beings are both the goal and the driving force of a society that develops in a sustainable way. Today, to ensure that people actively participate in society, it is crucial and urgent to raise environmental awareness. To balance socioeconomic development with environmental protection, while ensuring human prosperity and well-being in the context of climate change and ecosystem degradation, the following solutions can be applied:

First, *strengthen environmental education and ecological awareness*. Environmental education should be integrated into curricula from preschool to higher education, focusing on topics such as climate change, biodiversity conservation, the circular economy, and sustainable development. Community campaigns, workshops, online courses, and hands-on activities should be organized to improve environmental knowledge and awareness across all age groups. The system of policies and laws on resource management, environmental protection, and climate change adaptation should be further improved and effectively implemented.

Although the legal system—including the Environmental Protection Law—is relatively comprehensive, there are still gaps and laxity in the enforcement of penalties for environmental violations. As a result, companies and individuals who intentionally violate environmental laws can act destructively without being deterred in time by the legal system.

At this point, the use of the law as a coercive tool is effective in preventing actions that violate the legitimate interests of others and of the nation. Therefore, in the process of modern industrialization, enhancing the role of environmental laws for the population becomes an effective coercive tool to educate people about good qualities towards the environment, especially legal awareness and responsibility in environmental protection, «cultivating the good in each person to flourish like spring flowers and gradually eliminating the bad» (Ho Chi Minh, 2000). «Living and working in accordance with the Constitution and laws,» building a civilized and environmentally friendly way of life for the sustainable development of Vietnam.

Secondly, *promoting sustainable behaviors in everyday life and production*. Businesses and communities should be encouraged to adopt energy-saving solutions, reduce greenhouse gas emissions, manage waste responsibly, and use natural resources efficiently. Incentive mechanisms, such as support policies, financial tools, and eco-certification systems, should be developed to motivate individuals and businesses to engage in environmentally friendly practices.

This involves improving communication, education, awareness, and the effectiveness of law enforcement in the areas of resource management, environmental protection, and climate change adaptation. Protect and sustainably develop natural ecosystems, conserve nature and biodiversity, and protect wetland ecosystems. Properly account for the value of natural resources, capital, land, water, forests, minerals, biodiversity, natural landscapes, pollution, and environmental degradation in the national accounting system. Institutionalize market principles in the cost of management, repair of consequences, rehabilitation and restoration of the environment, and fulfillment of responsibilities to reinvest in environmental protection. Develop a roadmap, mechanisms, policies, and laws to establish and implement a circular economy model. Effectively implement the objectives of the United Nations 2030 Agenda (Communist Party of Vietnam, 2021).

Change mindsets and awareness towards green growth, proactive and effective adaptation to climate change, correct biased and incomplete perceptions about the importance and relevance of proactive adaptation and resilience to climate change, and balance sustainable development with environmental protection, in line with the guidance of the Communist Party of Vietnam. The country needs appropriate and flexible policies to cope with and adapt to the negative effects of climate change, reduce greenhouse gas emissions, environmental pollution, and the depletion of



natural resources. Clear regulations are needed to adapt to climate change, while promoting sustainable economic development and creating employment opportunities for the population. Green development and the green economy mean green production and consumption, i.e., environmentally friendly production and consumption accompanied by high efficiency and effectiveness, low resource consumption, and no damage to the ecological environment, creating a new impetus for the development of a knowledge-based economy. Therefore, green development is based on modern technology, digitalization, and a highly educated population.

Third, *develop integrated policies that link education, the environment, the economy, and social development* to establish a solid foundation for sustainable behavior. Monitoring, evaluation, and feedback mechanisms should be established to assess the effectiveness of environmental education programs and sustainable behavior initiatives, allowing for timely policy adjustments.

This involves actively and positively participating in international cooperation to share information, coordinate research, manage, exploit, and use natural resources efficiently and sustainably, ensuring ecological security, environmental security, water security, food security, and adaptation to climate change, while minimizing the adverse effects of globalization and international integration. Fulfill international commitments, contribute to the international community in addressing climate change and protecting global ecosystems (Communist Party of Vietnam, 2021).

Fourth, *apply digital technologies and promote digital transformation*. Digital platforms, big data, and artificial intelligence should be used to monitor environmental impacts, disseminate environmental education, and encourage eco-friendly behavior. Interactive tools, mobile applications, and gamified content should be developed to actively engage the public, especially young people, in sustainable activities.

Digitization to prevent and reduce plastic waste, control environmental pollution, and restore marine ecosystems. Proactively prevent and mitigate the impacts of sea level rise, flooding, erosion, and saltwater intrusion in coastal areas, especially in the Mekong Delta, the Red River Delta, and central coastal areas, as well as flash floods and landslides in central upland and mountainous areas. Harmonize economic development with environmental protection. Proactively monitor and respond effectively to climate change; develop a green economy with low waste emissions, reduce greenhouse gas emissions, and low carbon emissions. Improve information sharing, transparency, and regional linkages in responding to climate change, resource management, and environmental



protection. Research and develop methods and procedures to predict and warn of natural disasters such as earthquakes and tsunamis, monitor the marine environment, climate change, and sea level rise to contribute to sustainable socioeconomic development, disaster prevention, and climate change adaptation (Communist Party of Vietnam, 2021).

Improve protection, inspection, control, and enforcement efforts in the areas of resource management, the environment, and climate change adaptation. Improve control of resource exploitation activities, industries, and businesses that are heavily dependent on resources, as well as sources of greenhouse gas emissions. Combat, prevent, and rigorously address all violations of resource and environmental laws, tackling pollution, environmental degradation, resource depletion, and biodiversity loss (Communist Party of Vietnam, 2021).

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Fifth, *build sustainable community models, smart and happy villages, and green economic systems* aimed at achieving carbon neutrality. Support should be given to community initiatives in organic farming, renewable energy, waste management, and biodiversity conservation. The participation of social organizations, businesses, and individuals in pilot projects that can later be scaled up nationwide should be encouraged.

Sustainable development means moving from a purely agricultural mindset to a «smart and sustainable agricultural economic mindset,» shifting from quantity-based to quality-based development, promoting clean agriculture linked to value chains and brand building. One of the critical components for realizing this vision is a team of experts and scientists from institutes, universities, and business communities to lead the transformation of farmers.

It is important to respect the laws of nature, prioritize natural adaptation models, avoid aggressive intervention in nature, and promote sustainable development. The challenges ahead are not just predictions, but are already present. To successfully adapt to nature, we must preserve the land, water, and, most importantly, people. The mindset must shift from coexisting with floods to proactively coexisting with floods, salinity, and drought, conserving freshwater use, ensuring organic connectivity within regions, and linking them to key economic regions and the world. Vietnam needs to:

Proactively and effectively adapt to climate change, prevent, control, and reduce natural disasters and epidemics; manage, exploit, and use resources rationally, efficiently, and sustainably; prioritize environmental protection and public health as top priorities; Decisively eliminate projects that cause environmental pollution, ensure environmental quality, and

protect biodiversity and ecosystems; build a green economy, a circular economy, and an environmentally friendly economy (Communist Party of Vietnam, 2021).

It is necessary to rethink the idea that climate change has negative effects, as it also offers opportunities for sustainable economic development in Vietnam through the exploitation of natural resources, the use of local labor, and cheap labor. Climate change provides the country with an opportunity to change its mindset on economic development, particularly by implementing a green and low-carbon development model, reducing greenhouse gas emissions, and achieving rapid economic growth based on the sustainable and efficient exploitation of resources. This includes fulfilling environmental protection responsibilities, mitigating the economic effects of environmental pollution, and responding to climate change in a timely and effective way. It also involves choosing industries and restructuring agriculture, selecting crops and livestock that are resistant to drought, flooding, and saltwater intrusion caused by climate change and environmental pollution. The choice of industries and productive sectors should minimize the impacts of climate change, prioritize the prevention and mitigation of negative impacts, and minimize the damage caused by greenhouse gas emissions, sea level rise, etc. Priority should be given to sustainable economic development standards and green growth as primary objectives, without compromising the country's sustainable development goals.

## Conclusion

This study has clarified the fundamental role of environmental education in improving ecological awareness, promoting sustainable development, fostering prosperity, and improving human well-being. The results demonstrate that integrating environmental education into different levels of education, supported by legal frameworks, management mechanisms, and the transition to a circular economy, equips students and communities with the knowledge, skills, and attitudes necessary to protect the environment, respond to climate change, and engage in sustainable practices.

Current environmental challenges, such as climate change, resource depletion, biodiversity loss, and pollution, require flexible, adaptable, and context-specific strategies that align sustainable development with socioeconomic growth. The research hypothesis—that environmental education can improve awareness, behaviors, and policies toward sustain-

nable development—has been supported by empirical evidence, international literature, and real-life cases in Vietnam. In particular, the study confirms that environmental education shapes not only individual attitudes but also collective actions, ethical responsibility, and community participation in ecological management.

Based on these results, it can be concluded that environmental education is not only a tool for raising awareness, but also a transformative mechanism for shaping sustainable behaviors, influencing policies, and promoting long-term environmental management. This conclusion directly addresses the study's objectives and research question, demonstrating that education functions as a strategic pathway to sustainability and is essential for harmonizing economic development with ecological preservation. Furthermore, the study highlights that incorporating environmental education into formal curricula, professional training, and community programs can improve resilience, adaptive capacity, and social commitment to sustainable development goals.

Furthermore, the incorporation of philosophical foundations such as deep ecology (Naess, 1973), the ethics of care (Gilligan, 1982; Noddings, 1984), environmental pragmatism (Dewey, 1938), and ecosocialist thought (Gorz, 1980; Löwy, 2015) further reinforces this conclusion. These theoretical perspectives demonstrate that environmental education goes beyond cognitive processes and includes ethical, emotional, relational, and sociopolitical dimensions that are essential for cultivating ecological awareness. The philosophical principles added above affirm that environmental education shapes not only knowledge but also values, moral responsibility, and critical reasoning, which are key elements in guiding societies toward an equitable and sustainable future.

Therefore, the conclusion that environmental education should be understood as a comprehensive and multidimensional strategy based on ethical, philosophical, and practical foundations capable of transforming both individuals and societies is reinforced. The integration of these philosophical theories confirms that sustainability requires not only political interventions or technical solutions, but also a profound cultural and ethical reorientation towards nature, collective well-being, and intergenerational responsibility.

Future research should explore other dimensions, including:

- The integration of environmental education into national development agendas and sectoral policies.



- The assessment of its long-term effects on the behavior of various demographic groups.
- The effectiveness of digital, experiential, and community-based learning approaches.
- Mechanisms to strengthen synergies between education, governance, and local green initiatives.

Expanding research in these areas will provide deeper insights into how to optimize environmental education as a strategic tool for achieving sustainable development, climate resilience, and human well-being in Vietnam and other developing nations.

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