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## Buddho Journal

<https://so13.tci-thaijo.org/index.php/Buddho>

ISSN: 3057-1200 (ONLINE)

### Analyzing the Global Climate Crisis through the Perspectives of Philosophy and Science

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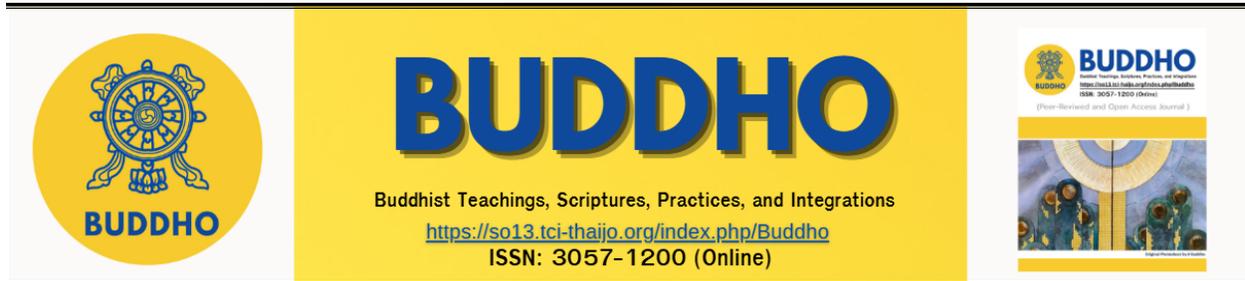
##### Article history:

Received: 14/10/2024, Revised: 12/12/2024,

Accepted: 25/12/2024, Available online: 01/01/2025

##### How to Cite:

Koolada, T. (2025). Analyzing the Global Climate Crisis through the Perspectives of Philosophy and Science. *Buddho Journal*, 4(1), 27-40.



Academic Review Articles

## Analyzing the Global Climate Crisis through the Perspectives of Philosophy and Science

Thanakrit Koolada\*

### Abstract

This article analyzes the global climate crisis through the perspectives of philosophy and science, highlighting the interconnections among climate change, environmental crises, and social inequality while proposing sustainable solutions. Climate change, driven by greenhouse gas emissions, has significant impacts on ecosystems and global societies. Concurrently, environmental crises reflect the overexploitation of natural resources, resulting in damage to nature and human health. Social inequality exacerbates these issues, with unequal distribution of opportunities and resources. The article emphasizes the critical role of philosophy in establishing ethical frameworks, such as intergenerational justice and responsibility toward the future, alongside the application of scientific advancements, including clean energy and genetic modification technologies, to address these challenges. Integrating knowledge from both disciplines is key to building a sustainable society and effectively tackling the global climate crisis.

**Keywords:** Global Climate Crisis, Climate Change, Environmental Crisis, Ethics, Clean Energy, Sustainable Development

### Introduction

Global crises refer to problems or situations that occur at the global level, severely affecting the environment, society, economy, and human livelihoods worldwide. These issues are often complex, interconnected, and require cooperation from multiple parties to address. The trends of global crises reflect the imbalance between human needs and the limits of natural resources. Notable examples of global crises include climate change, environmental crises, and social inequality (IPCC, 2021; United Nations, 2022). Data from the IPCC (2021) emphasize scientific evidence showing the impacts of climate change on ecosystems worldwide, while the United Nations (2022) presents sustainable development goals to mitigate these issues at the international level.

**Climate Change** Climate change is a problem caused by human activities, such as burning fossil fuels, deforestation, and unsustainable agricultural practices. These activities lead to an increase in greenhouse gases in the atmosphere, resulting in higher global temperatures. This phenomenon has widespread impacts, such as droughts, floods, melting polar ice, and the loss of biodiversity (NASA, 2022). Checking data published on NASA's website ensures accessibility and appropriateness of the information. Furthermore, climate change also affects the global economy and food security in many regions (World Bank, 2023).

**Environmental Crisis** Environmental problems arise from the irrational use of natural resources and the continuous release of pollutants. Air, water, and soil pollution not only destroy ecosystems but also directly impact human health (WHO, 2021). According to the WHO (2021) report, air pollution is a factor that causes respiratory diseases and heart diseases. This information is consistent with studies highlighting the importance of reducing pollution for better health outcomes. The loss of forest resources, farmland, and the decline of wildlife and biodiversity reflect the failure to maintain a balance between development and nature conservation (UNEP, 2022). The environmental crisis is an example of a global issue that cannot be solved by unilateral actions but requires international cooperation and the integration of knowledge from various disciplines.

**Social Inequality** Social inequality is another escalating global crisis. This issue is reflected in the unequal access to resources and opportunities, such as education, healthcare, and income. Poverty in many countries exacerbates social conflicts and human rights violations (Oxfam, 2023). Economic systems that prioritize profit without considering the impact on lower classes create a gap between the wealthy and the disadvantaged (Stiglitz, 2019). This crisis not only undermines social justice but also destabilizes countries and regions worldwide.

Global crises share key characteristics, including cross-border impacts and interconnections across multiple dimensions, such as climate change affecting the economy, food security, and social inequality (IPCC, 2021). These problems require structural solutions, necessitating cooperation between countries and the integration of knowledge from various fields. Furthermore, global crises challenge humanity to reconsider lifestyles and development ideas that form the foundation of development in order to create a balance between humans and nature and build a sustainable future (United Nations, 2022).

### **Ethics and Decision-Making Regarding Natural Resources**

Decision-making regarding the use of natural resources today is complex and must carefully consider ethical principles, as the actions taken may affect the environment, society, and economy in the long term. An important ethical principle in this context is Environmental Ethics, which focuses on considering the rights of other living beings and nature to be protected and the sustainable use of natural resources. Decisions involving natural resources often require consideration of the principle of Intergenerational Justice, which takes into account the impacts that current actions may have on the future and the need to take sustainable actions to ensure future generations are not deprived of essential resources for their survival (Rawls, 1999). In the case of climate change or the depletion of natural resources, consideration of justice can

encourage the development of environmentally friendly technologies or policies aimed at reducing emissions and conserving resources (UNDP, 2022).

In practice, decisions regarding the use of natural resources must also consider the principle of Sustainable Development, which is a way to meet present needs without compromising the ability of future generations to meet their own needs (United Nations, 2020). Applying this principle in decision-making will ensure that the use of natural resources does not harm ecosystems or society in the long term and that new value is created without causing environmental damage. Such decisions also involve maintaining a balance between economic and social benefits, such as ensuring equal and just access to natural resources, avoiding inequality or exclusion (Stiglitz, 2019). For example, managing water resources in arid areas may require sustainable management practices that not only address economic problems but also mitigate long-term resource scarcity impacts.

Decision-making regarding natural resources should not only consider the economic impacts or short-term resource use but also the ethics related to future responsibility, intergenerational justice, and sustainable development. Using these principles in decision-making will ensure that natural resources are used responsibly and can create sustainability in both environmental and social aspects.

### **Science and the Monitoring and Resolution of Problems**

Science plays a vital role in exploring facts across various fields, especially in studying and measuring carbon dioxide (CO<sub>2</sub>) levels in the atmosphere, which is one of the key factors contributing to global climate change. Measuring and studying the amount of carbon dioxide in the atmosphere not only helps us understand current changes but also allows accurate predictions of future impacts. Science uses various tools and advanced technologies to measure CO<sub>2</sub> levels in the atmosphere, such as infrared gas analyzers or remote sensing technologies, which can accurately and continuously monitor CO<sub>2</sub> levels in the air. Data from these measurements are collected and used to study trends in greenhouse gas emissions caused by human activities, such as burning fossil fuels, deforestation, and agricultural emissions, all of which significantly contribute to the increase in CO<sub>2</sub> levels in the atmosphere (Keeling et al., 1976).

One of the renowned stations for measuring CO<sub>2</sub> is the Mauna Loa station in Hawaii, which has been collecting data since 1958. This data is critical evidence showing the continuous increase in CO<sub>2</sub> levels in the atmosphere over nearly 70 years (Keeling et al., 1976). This data helps scientists' study and understand the impacts of increased CO<sub>2</sub>, such as global temperature changes, natural disasters like droughts, floods, and melting polar ice. Measuring CO<sub>2</sub> is not just about collecting data but also helps in developing mathematical models or climate models to predict future impacts and aid policy decisions. For example, it has led to the development of technologies to reduce emissions from industry and energy conservation policies, which can help reduce greenhouse gases and mitigate climate change impacts (IPCC, 2021).

At the international level, data from CO<sub>2</sub> measurements also raise awareness and encourage collective action at the national and global levels to reduce greenhouse gas emissions and promote sustainable development. Using scientific data in decision-making is therefore

crucial for protecting the environment and creating a sustainable future for future generations. Science is an essential tool in investigating facts about CO<sub>2</sub> changes in the atmosphere. Measuring CO<sub>2</sub> helps us understand the impacts of human activities and climate change clearly. This scientific data not only aids in research and development of new technologies but also supports policymaking and motivates joint actions toward sustainable development. The global crises today stem from multiple issues, including climate change, environmental degradation, and imbalances in the economic system, all of which impact both humans and nature. Technological development is a powerful tool in addressing these problems. Clean energy and genetic modification are significant examples of technologies that can help promote sustainability for the future world.

### **Clean Energy: Responding to the Climate Change Crisis**

Clean energy refers to energy sources that do not cause pollution or harm the environment, such as solar energy, wind energy, and biomass energy. These technologies are being rapidly developed due to the necessity of reducing greenhouse gas emissions, which are the main cause of climate change resulting from human activities. The use of clean energy has many benefits. For example, solar energy, which has been developed over the years, is more efficient in energy production, and solar panels are now cheaper and can be installed in a variety of locations, making clean energy more accessible in both urban and rural areas (Solar Energy Industries Association, 2021). The development of energy storage systems, such as clean energy batteries or solar power storage systems, ensures the continuous use of clean energy even when the sun isn't shining or the wind isn't blowing (Tesla, 2022).

Shifting from fossil fuels to clean energy is one of the main strategies to mitigate the impacts of climate change. In 2020, the United Nations called for global cooperation to achieve greenhouse gas reduction targets under the Paris Agreement framework (United Nations, 2020). Clean energy not only helps reduce CO<sub>2</sub> emissions but also reduces air pollution and helps preserve the environment in the long term.

### **Genetic Modification: Agricultural Development to Address the Environmental Crisis**

Genetic modification (GM) is a technology that allows humans to improve the genetics of plants and animals to adapt to rapidly changing environmental conditions. GM plays a crucial role in adapting agriculture and increasing agricultural productivity, especially in areas where climate change negatively affects crop yields. Developing crop varieties that are resistant to variable weather conditions such as heat or drought can help increase yields in regions with unsuitable climates. The CRISPR technology has been used to edit genes to create crops that can better resist natural disasters or diseases (Haug, 2020). Furthermore, genetic modification also reduces the use of chemicals in agriculture, such as developing pest-resistant crops, which allows farmers to use fewer chemical pesticides (Gurian-Sherman, 2009).

A clear example of this is the development of rice varieties that are resistant to diseases or salinity, such as the "salt-tolerant rice" variety, which is resistant to saline soil conditions found in areas with high salinity (Sato et al., 2017). Additionally, there has been the development of

plant varieties that can absorb more carbon from the atmosphere, helping to reduce greenhouse gas emissions that contribute to climate change (Haug, 2020). Clean energy technologies and genetic modifications are considered essential tools in addressing global crises caused by climate change and environmental degradation. The development and application of these technologies not only help reduce the impacts of pollution and greenhouse gas emissions but also contribute to future food and energy security. International cooperation and the development of sustainable technologies will be key to creating a sustainable and nature-friendly future.

### **The Intersection of Philosophy and Science**

1. Integrating Knowledge: Creating an Ethical Framework for Science Integrating knowledge in terms of creating an ethical framework for science is an essential process in developing science in a socially and environmentally responsible direction. Generally, science is viewed as a tool for discovering the truth and creating new knowledge, but sometimes scientific research can lead to both positive and negative consequences. Therefore, integrating knowledge between science and ethics is important in guiding research and the application of new technologies in a responsible manner. The ethical framework for science can be based on values such as justice, transparency, and accountability, which are principles that ensure research and technological development are beneficial to society and do not cause harm to humans or the environment. For example, the development of biotechnologies, such as the genetic modification of plants and animals to increase yield or resilience to changing environmental conditions, must consider the potential impacts on biodiversity. Using this technology without considering long-term consequences could lead to the extinction of certain species or changes in ecosystems (Pellizzoni, 2011). Thus, creating an ethical framework alongside research will help mitigate these risks.

2. Case Study: Considering the Sustainability of Nuclear Energy in Philosophy and Science Nuclear energy is one of the energy sources with significant ethical and scientific controversy. While nuclear energy offers advantages in terms of producing large amounts of power without emitting greenhouse gases during energy production, it also carries risks related to the management of hazardous waste, accidents, and safety issues in unexpected situations, such as the Chernobyl and Fukushima nuclear disasters. From a scientific perspective, nuclear energy is seen as an efficient source for continuous electricity generation, and it can be used to replace fossil fuels, which are a major contributor to climate change (World Nuclear Association, 2020). However, when considering the sustainability of nuclear energy, it is crucial to incorporate ethical considerations, particularly regarding the responsibility of managing radioactive waste resulting from energy production processes. Philosophically, the use of nuclear energy may be seen as relying on a high-risk technology, raising questions about the rights of future generations and decisions that impact the long-term sustainability of the Earth (Barton & Kinsella, 2013). Therefore, decisions regarding the use of nuclear energy should be considered from both scientific and ethical viewpoints to minimize the risks and impacts associated with this energy source. For instance, in the Chernobyl incident of 1986, the nuclear plant accident resulted in a massive release of radioactive material, which negatively affected the health of people in the

region and continues to impact the local environment today (Barton & Kinsella, 2013). Although nuclear energy is considered an environmentally clean energy source, as it does not emit greenhouse gases during electricity production, the management of radioactive waste remains a significant challenge with no sustainable disposal methods (World Nuclear Association, 2020). Philosophical consideration in this case highlights the complexity of decision-making. By applying ethical principles that aim for sustainability and global responsibility, it is necessary to evaluate the long-term impacts and the benefits that society would gain from nuclear energy.

3. Critique of Contemporary Scientific and Philosophical Ideas In modern times, both scientific and philosophical concepts have evolved and changed over time. Modern science focuses on the development of highly efficient technologies to solve various problems, yet there are critiques suggesting that some scientific ideas may be misaligned with maintaining natural balance and sustainability. For example, the development of technologies that exploit natural resources unsustainably or the dedication of resources to research and development of new technologies without considering their long-term social and environmental impacts.

Contemporary philosophy critiques the reliance on science as a tool to solve all problems, especially in terms of sustainability and ethics. These philosophical critiques serve as reminders to be cautious when applying science and technology in everyday life, particularly when making decisions regarding public policies and global development (Funtowicz & Ravetz, 1993). Philosophical critique also encourages an awareness of the need to integrate ethical dimensions into the development of science responsibly. Social and environmental values should be an essential part of the development of scientific and technological policies. For instance, the development of biotechnologies in agriculture to increase crop yields may lead to soil degradation or loss of biodiversity (Funtowicz & Ravetz, 1993). Philosophical critique thus calls for science to consider the social and environmental impacts at every stage of technological development, including questioning the rights of future generations who may be affected by current decisions.

### **The Limitations of Science in Addressing Structural Social Issues**

Science plays a crucial role in the development of technology and discoveries that can help solve many societal problems. However, science sometimes cannot provide complete solutions to deep and complex social issues, which arise from the intricate structure of society and involve psychological, cultural, political, and economic factors. Understanding these limitations can help make efforts to address social problems more effective.

1. Proposing a New Philosophy Focused on Balance Between Humans and Nature Solving social issues caused by environmental destruction and the imbalance of development cannot be accomplished through science alone. A philosophy that focuses on the balance between humans and nature is, therefore, an important alternative. For example, the concept of "sustainability" was developed to respond to environmental and social problems. This concept emphasizes development that does not destroy natural resources and promotes responsible use of those resources.

Example: In addressing environmental crises such as climate change, the use of renewable energy sources like wind and solar power can reduce greenhouse gas emissions. However, their

implementation requires appropriate social and economic adjustments. At the same time, the sustainability of social and cultural aspects that may arise from these changes must also be considered (Schneider et al., 2017).

2. Case Studies in Global Crises Global crises such as climate change, water shortages, and social inequalities show the limitations of science in solving structural problems. The causes of these issues are not only related to the lack of scientific knowledge but also to power distribution, politics, and economics, which are key factors in societal decision-making.

Example: The IPCC (2021) study indicates that climate change is not only a scientific issue but also involves policy changes and the distribution of responsibility among countries. The unwillingness of some countries to reduce greenhouse gas emissions due to economic impacts makes addressing this problem a significant challenge.

3. Climate Change: Ethical Considerations in Greenhouse Gas Emissions Climate change is a problem caused by greenhouse gas emissions, which mostly come from human activities such as fossil fuel burning, deforestation, and large-scale agriculture using chemicals. Although technologies that reduce greenhouse gas emissions, such as clean energy and electric vehicles, are effective in mitigating environmental impacts, decisions on this issue must also consider social justice and ethics.

Example: At the COP26 (2021) conference, global agreements to reduce greenhouse gas emissions were not accepted by all countries, particularly those that rely on fossil fuel industries as their primary income source. This highlights the limitations of adapting society within the framework of science (UNFCCC, 2021).

The ethical consideration here involves the rights of future generations, inequalities in access to greenhouse gas-reducing technologies, and the distribution of responsibility among countries contributing to emissions.

4. Water Resources Crisis: Using Technology Alongside Philosophical Awareness Water resources are one of the essential natural resources for human survival, but unsustainable use of water has led to water crises in many parts of the world. The development of technologies for water management, such as desalination or water-saving technologies, can help address this issue in some cases. However, relying on technology alone cannot resolve structural problems.

Example: In drought-prone countries, such as some in Africa, technologies like desalination are used to produce clean water to meet drinking needs. However, managing water resources at the community level remains a critical issue that must be developed alongside fostering individual and societal awareness about water conservation (Vörösmarty et al., 2010). Philosophical awareness is essential in promoting sustainable water resource use.

## Conclusion

Addressing global crises caused by environmental destruction, climate change, and complex social issues requires effective coordination between philosophy and science. The following approaches are proposed.

1. **Developing a Clear Ethical Framework:** Creating an ethical framework based on sustainability and justice will promote responsible decision-making at both individual and societal levels. Ethical considerations in greenhouse gas emissions and natural resource use can lead to sustainable behavior changes in society (Schneider et al., 2017).

2. **Technological Development for Resource Conservation:** Developing technologies that reduce the impact of natural resource use, such as clean energy or water-saving technologies, can help alleviate the severity of various crises. However, these developments must go hand-in-hand with fostering societal awareness to promote sustainable resource use (Vörösmarty et al., 2010).

3. **Introducing New Philosophical Concepts for Balancing Humans and Nature:** Promoting philosophical concepts that focus on creating a balance between humans and nature, such as sustainability and respect for nature, can help societies address crises in a sustainable way (IPCC, 2021).

### **The Role of Philosophy and Science in Creating a Sustainable Society**

Philosophy plays a crucial role in developing concepts and ethical frameworks that guide decisions with long-term environmental and social impacts. For example, the concept of "sustainability" combines the care for natural resources and the creation of a good quality of life for all members of society (Schneider et al., 2017). Science, on the other hand, is an essential tool for developing technologies that help address crises efficiently, such as clean energy sources, water storage technologies, and research on climate change. Science can be used to improve the environment and enhance quality of life in society.

The integration of philosophy and science is, therefore, the best approach to building a sustainable society. Philosophy will guide the direction and principles to follow, while science will provide practical methods and technologies for tackling global crises.

## Recommendations

### **Body of Knowledge**

**Integrating Ethical Frameworks for Sustainable Decision-Making** To address the global crises of climate change, environmental degradation, and social inequality, it is crucial to integrate ethical frameworks into decision-making processes. This approach ensures that decisions made today consider not only the immediate benefits but also long-term social, environmental, and economic consequences. A key element is adopting the principles of Environmental Ethics, which emphasize the responsibility humans have toward nature and future generations. Decisions should take into account Intergenerational Justice, ensuring that the

choices made today do not compromise the ability of future generations to meet their needs. Moreover, the ethical consideration of Sustainable Development is crucial, ensuring the balance between fulfilling present needs without compromising the ecosystem and future prospects (Rawls, 1999; United Nations, 2020). These frameworks will guide policies that foster social justice, reduce inequality, and protect the environment, while promoting economic growth.

#### **Fostering Global Cooperation and Multidisciplinary Solutions**

Global crises, such as climate change and social inequality, are interconnected and require collective action. No single country or entity can resolve these issues alone. There needs to be a concerted effort at the international level to ensure the equitable distribution of resources, share technological advancements, and implement policies that tackle these crises on a global scale. The integration of knowledge across disciplines—such as science, economics, and philosophy—will yield holistic solutions that address both the root causes and the resulting impacts of these crises. The IPCC (2021) report underscores that addressing climate change effectively requires the cooperation of all countries and sectors of society, recognizing the interconnectedness of the environment, economy, and human well-being.

#### **Investing in Clean Energy and Technological Innovation**

One of the most effective ways to mitigate climate change and reduce greenhouse gas emissions is by transitioning from fossil fuels to clean energy sources such as solar, wind, and biomass. Governments, businesses, and individuals must prioritize the development of renewable energy technologies to reduce emissions, decrease air pollution, and promote sustainable growth. Innovations in energy storage systems are also essential to make clean energy more reliable and accessible, even in areas with fluctuating energy demands (Tesla, 2022). Additionally, investments in energy-efficient technologies and green technologies can significantly reduce the environmental footprint of industries and households, creating a sustainable future.

#### **Applying Genetic Modification in Agriculture to Address Environmental Crises**

The use of genetic modification (GM) can play a vital role in addressing food security challenges exacerbated by climate change. By developing genetically modified crops that are resistant to drought, heat, or diseases, agricultural productivity can be significantly increased in areas vulnerable to environmental stressors. Furthermore, GM technologies can reduce the dependency on chemical pesticides, promoting a more sustainable and eco-friendly approach to agriculture (Gurian-Sherman, 2009; Haug, 2020). Research into GM should be conducted with caution, incorporating ethical considerations about biodiversity and ecosystem health, ensuring that the use of such technologies does not lead to unintended ecological consequences.

#### **Enhancing Scientific Research and Data Collection**

Science plays an instrumental role in providing the evidence necessary to understand and mitigate the effects of climate change and environmental degradation. Ongoing data collection, such as measuring CO<sub>2</sub> levels in the atmosphere at research stations like Mauna Loa, is crucial for tracking the progress of global environmental issues (Keeling et al., 1976). By continuously monitoring greenhouse gas emissions and their effects, science can inform policy decisions and lead to the development of technologies that mitigate climate impacts. Moreover,

interdisciplinary scientific approaches can help address complex global challenges, combining the expertise of climatologists, biologists, economists, and social scientists.

### **Philosophical Reflection on the Balance Between Humans and Nature**

The integration of philosophy into environmental decision-making is essential to ensure that scientific progress aligns with ethical principles that prioritize human well-being and environmental sustainability. Concepts such as sustainability and respect for nature offer a framework for creating a more harmonious relationship between humans and the environment (Schneider et al., 2017). Philosophical reflection can help guide public policies and societal behavior toward long-term sustainability, encouraging responsible consumption, equitable resource distribution, and the preservation of biodiversity. By incorporating ethical thinking into the design of technological and industrial systems, we can create more resilient societies that are mindful of their impacts on the environment and future generations.

### **Addressing Social Inequality Through Structural Reform**

Social inequality is often intertwined with environmental and economic challenges. Policies aimed at addressing social disparities must consider the structural issues that perpetuate inequality, such as unequal access to resources, healthcare, and education. Ensuring fair access to clean energy, healthcare, and education for marginalized communities is a crucial step in creating a more equitable society. Social justice should be an integral part of climate change policies, ensuring that the most vulnerable communities are supported and not left behind in the transition to a more sustainable future (Oxfam, 2023; Stiglitz, 2019).

**Summary Table 1**

<b>Topic</b>	<b>Knowledge Acquired</b>	<b>Application of Knowledge / Future Benefits</b>
<b>Global Crisis</b>	The global crisis is a complex problem interconnected with environmental, social, and economic issues.	Develop joint solutions at the international level and improve policies to create a balance between development and natural resource conservation.
<b>Climate Change</b>	Greenhouse gases from human activities are causing global temperatures to rise, impacting the environment and food security.	Develop policies to reduce greenhouse gas emissions, use clean energy, and adopt sustainable agricultural practices.
<b>Environmental Crisis</b>	Unsustainable use of natural resources and pollution are damaging ecosystems and affecting human health.	Promote the sustainable use of resources and reduce pollution through technologies such as waste management, clean energy, and reforestation.

Topic	Knowledge Acquired	Application of Knowledge / Future Benefits
<b>Social Inequality</b>	Inequality in access to resources, opportunities, and basic rights leads to social problems and conflicts.	Implement policies to distribute opportunities and resources equitably, and promote education and healthcare to reduce gaps between social groups.
<b>Technology and Solutions</b>	Clean technologies such as solar energy, genetic modification, and nuclear power can help reduce environmental impacts.	Develop innovations that can be widely adopted, such as energy storage, climate-resilient crops, and safe and sustainable energy systems.
<b>Ethics in Science</b>	Ethical principles, such as intergenerational justice and responsibility towards the future, are important for decision-making on natural resources.	Use these principles to develop policies and oversee research and development related to the environment and technology, to prevent long-term negative impacts.
<b>Role of Philosophy and Science</b>	Philosophy provides concepts and ethics, while science develops methods and technologies to address practical problems.	Create a balance between resource use and development through clear ethical concepts, promoting sustainable development in both society and the environment.

A summary table of knowledge related to global crises is organized into key topics such as the global crisis, climate change, environmental crises, social inequality, and the role of philosophy and science. Each topic includes an explanation of the relevant knowledge, such as the causes and impacts of the issues, along with approaches for applying this knowledge in the future. This includes policy development, the use of clean technologies, and the creation of a balance between humanity and nature. The table emphasizes the importance of integrating ethical principles with scientific advancements to achieve true global sustainability.

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