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Geochemical Ecological Economic Triadic Harmonization: Sustainable Pathways for Earth System

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ABSTRACT

This study presents a framework for achieving global ecological civilization through the principle of 'Geochemical-ecological-economic triadic harmonization.' Facing escalating environmental challenges, rigorous implementation of this principle is crucial for fostering a green future that integrates Earth system integrity, environmental protection, and sustainable economic development. The framework emphasizes (1) a holistic understanding of Earth's interconnected ecosystems, (2) the urgent need for environmental conservation, and (3) the transformative potential of human economic evolution. By fostering enhanced Earth consciousness, unwavering environmental commitment, green economic transformation, and social equity, this approach aims to construct a world characterized by ecological civilization, economic prosperity, and social harmony. The paper argues that upholding 'Geochemical-ecological-economic triadic harmonization' and pursuing a green development pathway can realize synergistic outcomes for both economic advancement and environmental stewardship, securing a legacy of a healthy Earth for future generations. It advocates for moving beyond the conventional "pollute first, remediate later" paradigm and establishing a non-zero-sum relationship between environmental integrity and economic prosperity by focusing on achieving coordinated and sustainable development across Earth's systems, environmental stewardship, and human economic advancement.

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Introduction

'Geochemical-ecological-economic triadic harmonization' – this precept, imbued with Eastern philosophical insight, profoundly illustrates the non-zero-sum relationship between environmental conservation and economic prosperity, revealing a mutually reinforcing and interdependent dialectical unity [1,2]. Transcending the conventional linear paradigm of 'pollute first, remediate later,' it champions a sustainable and harmonious developmental trajectory. In an era characterized by escalating global climate change and increasingly stringent resource constraints, a critical re-evaluation and rigorous implementation of the 'Geochemical-ecological-economic triadic harmonization' principle is of paramount contemporary and enduring historical significance for achieving coordinated and sustainable development across Earth's systems, environmental stewardship, and human economic advancement. This paper, guided by the central tenet of 'Geochemical-ecological-economic triadic harmonization' will delve into the construction of a geochemically sustainable future, exploring the holistic nature of Earth's ecosystems, the exigency of environmental protection, and the transformative potential of human economic evolution across three interconnected dimensions.

The Holocene Earth System: Ecosystem Integrity as a Cornerstone of the Global Biome

Earth as an Integrated Biome: Interdependence of Environmental Subsystems

The Earth is not a discrete entity but rather a complex and dynamic global biome composed of interconnected subsystems, including the atmosphere, hydrosphere, lithosphere, and biosphere. These subsystems are intrinsically linked, exerting mutual influence to sustain Earth's ecological equilibrium and biodiversity [3]. Each subsystem performs an irreplaceable function, and disruption of any component can precipitate a systemic crisis. Ecosystem integrity, encompassing terrestrial and aquatic environments, constitutes a critical component of Earth's global biome and is foundational to biospheric prosperity. Pristine water resources, whether flowing rivers, placid lakes, expansive oceans, or nutrient-rich wetlands, serve as the cradle of life, supplying essential resources to both flora and fauna, as well as providing critical resources for human consumption, irrigation, and transport. Similarly, robust forests, expansive grasslands, and towering mountains function as the Earth's 'lungs,' actively sequestering excess atmospheric carbon dioxide via photosynthesis, liberating oxygen, modulating global climate patterns, conserving soil integrity, and maintaining biodiversity, thereby forming the structural framework of the global biome. The loss of ecosystem integrity portends the erosion of healthy ecosystems, the impoverishment of biodiversity, and ultimately, the loss of the natural foundation upon which human survival and development depend. Therefore, preserving ecosystem integrity extends beyond mere environmental protection; it safeguards the well-being of the entire global biome.

The Valuation of Ecosystem Services: Beyond Market-Driven Economics

Ecosystems provide far more than mere material resources; they yield a spectrum of critical services vital to human well-being, collectively termed ecosystem services [4]. These services are often undervalued by market economies, yet their intrinsic worth surpasses conventional economic metrics [5,6].

Ecosystem services broadly fall into four categories:

- **Provisioning Services:** Encompassing tangible resources derived directly from ecosystems, such as food (e.g., fisheries, agricultural products), freshwater, timber, fiber, and medicinal plants. For example, the Amazon rainforest provides timber and pharmaceutical resources, while marine ecosystems yield vital fisheries.
- **Regulating Services:** Including the modulation of climate (e.g., carbon sequestration by forests), air purification (e.g., pollutant filtration by wetlands), water purification (e.g., fluvial self-cleansing), flood attenuation (e.g., floodplains and reservoirs), and pest and disease regulation. Examples include the protection of coastlines by mangrove forests and the mitigation of flood impacts by wetland systems.
- **Cultural Services:** Encompassing recreational tourism, aesthetic value, cultural heritage, and opportunities for spiritual and intellectual enrichment. The aesthetic value of Mount Huangshan in China and the historical-cultural significance of Mount Tai are prime examples.
- **Supporting Services:** Underpinning all other ecosystem services, including soil formation, nutrient cycling, and primary productivity. The contributions of soil microorganisms to nutrient cycling and plant photosynthesis are key examples.

Traditional economic accounting systems prioritize market-based commodities and services, neglecting the non-market value of ecosystem services. This has historically led to the overexploitation of natural resources and the degradation of ecological environments during economic development, ultimately undermining long-term economic prosperity [7]. For example, while the excessive logging of forests for timber can generate short-term economic gains, it simultaneously impairs the forest's capacity for carbon sequestration, water retention, and biodiversity maintenance, thereby incurring significant long-term economic losses [8]. 'Geochemical-ecological-economic triadic harmonization' underscores the imperative of re-evaluating the worth of ecosystem services and integrating them into economic decision-making processes to achieve mutually beneficial outcomes for both ecological conservation and economic development [9]. This necessitates the establishment of a novel accounting framework to monetize the value of ecosystem services and incorporate them into national economic accounting systems, thereby guiding economic development toward a more sustainable trajectory.

Protecting Ecosystem Integrity: Safeguarding Human Survival and Development

Degradation of ecosystem integrity transcends the mere destruction of the natural environment; it fundamentally threatens human survival and development. Several key examples illustrate this critical nexus:

- **Water Resource Scarcity:** Overexploitation of water resources, such as excessive groundwater extraction for agricultural irrigation or industrial effluent contamination, results in water scarcity, impeding agricultural productivity, industrial operations, and residential well-being. For instance, over-extraction of groundwater in northern China once seriously affected the local agricultural and ecological stability.
- **Land Degradation:** Excessive deforestation, such as clearing forests to expand arable land, or overgrazing leading to grassland degradation, results in soil erosion, land desertification, and adverse impacts on agricultural output and ecological integrity. The desertification crisis in the Sahel region of Africa, for example, has precipitated severe food shortages and sociopolitical instability.
- **Climate Change:** Excessive greenhouse gas emissions, such as those resulting from the combustion of fossil fuels in industrial processes and transportation, coupled with the destruction of forest vegetation, such as deforestation for real estate development, contribute to global warming, triggering extreme weather events and threatening human safety. The increasing frequency of extreme heat waves, floods, and droughts globally has inflicted significant economic damages and loss of life.
- **Loss of Biodiversity:** Habitat destruction, such as over-development for tourism, and overfishing contribute to biodiversity loss, disrupt ecological equilibrium, and compromise ecosystem stability. The accelerating rate of biodiversity loss in the Amazon rainforest, for example, will have far-reaching consequences for the global climate and ecosystem function.

These aforementioned environmental issues ultimately exert detrimental effects on human economic development and social stability. Water resource scarcity leads to agricultural production declines, industrial shutdowns, and elevated food prices. Land degradation leads to food security concerns and potential social unrest. Climate change results in increased frequency of natural disasters, catastrophic economic losses, and potentially even conflict. The loss of biodiversity diminishes ecosystem service functionality, impacting human well-being, such as limiting pharmaceutical research and development [10-12].

Therefore, preserving ecosystem integrity is not merely an act of protecting the natural environment; it is an act of protecting humanity itself. Only through the maintenance of healthy ecosystems can sustainable economic development and social progress be achieved.

The Exigency of Environmental Protection: Environmental Degradation as a Fundamental Constraint on Economic Development

The Intensifying Global Environmental Crisis: A Convergence of Multiple Threats

Since the onset of the 21st century, global environmental challenges have escalated markedly, posing unprecedented threats to human survival and development. These challenges are not isolated phenomena; rather, they are interconnected and mutually amplifying, resulting in a complex and interwoven web of crises that intensifies the severity and complexity of environmental degradation. Global temperatures are consistently rising, now exceeding pre-industrial levels, leading to increased frequency and intensity of extreme weather events (e.g., floods, droughts, hurricanes, tsunamis), sea-level rise, and glacial melt, threatening the very existence of coastal cities and island nations. For instance, island nations such as the Maldives face the imminent threat of inundation. Reports from the Intergovernmental Panel on Climate Change (IPCC) underscore the catastrophic consequences of exceeding a 2°C increase in global temperatures for both Earth's ecosystems and human socio-economic systems. Increasing scarcity of water, land, and mineral resources is intensifying competition and fueling conflicts. Water shortages in the Middle

East, for example, have become a flashpoint for regional conflicts. The United Nations projects that by 2050, more than 40% of the global population will reside in water-stressed regions. Increasingly pervasive air, water, and soil pollution are threatening human health and impairing ecosystem functionality. Data from the World Health Organization (WHO) indicate that millions of people worldwide die each year from diseases linked to air pollution. Accelerating rates of species extinction and ecosystem degradation are undermining ecosystem stability and compromising the provision of ecosystem services. The rate of species loss in the Amazon rainforest, for example, has reached unprecedented levels. Reports from the United Nations Environment Programme (UNEP) indicate that the Earth is currently undergoing its sixth mass extinction event.

Land degradation and desertification are spreading, impacting agricultural productivity and disrupting ecological integrity. The desertification crisis in the Sahel region of Africa, for example, has precipitated severe food shortages and sociopolitical instability.

These environmental challenges are not fortuitous; rather, they are the direct consequence of prolonged and unsustainable human activity. Overconsumption of resources, excessive emissions of pollutants, overexploitation of land, and the degradation of ecological environments have collectively triggered the current environmental crisis.

The Current State and Challenges of China's Environmental Situation: A Developmental Conundrum

As the world's most populous developing nation, China's rapid economic expansion has been paralleled by significant environmental challenges. These challenges encompass both legacies of past practices and newly emerging issues, collectively forming a complex environmental predicament. Elevated concentrations of particulate matter, including PM2.5 and PM10, lead to frequent smog events, impacting both public health and urban aesthetics. For example, air pollution in major urban centers such as Beijing and Shanghai have once emerged as a significant factor affecting city competitiveness. The Chinese government has implemented various measures to mitigate air pollution; however, substantial challenges remain. Severe contamination of rivers, lakes, and groundwater resources compromises drinking water safety and agricultural productivity. For example, eutrophication of lakes such as Taihu and Dianchi has once significantly impacted local fisheries and tourism industries. The Chinese government is intensifying efforts to address water pollution; however, these efforts are constrained by both technological and financial limitations.

Soil contamination resulting from industrial waste, agricultural fertilizers, and pesticides poses risks to food security and ecological integrity. For example, the detection of cadmium in rice ("cadmium rice" incident) has raised public concerns regarding food safety. The Chinese government is undertaking soil contamination surveys and remediation efforts; however, these endeavors face temporal and financial constraints. Increasing scarcity of water, land, and mineral resources constrains economic development. Water resource scarcity, for example, has emerged as a significant impediment to agricultural and industrial growth. The Chinese government is implementing water conservation measures and developing new water resources; however, these efforts are challenged by the effects of climate change.

Deforestation, grassland degradation, and wetland loss impair ecosystem stability and compromise the provision of ecosystem services. For example, ecological degradation in the Sanjiangyuan region has affected the water retention capacity of the Yangtze, Yellow, and Lancang (Mekong) River headwaters. The Chinese government is intensifying efforts to protect ecological areas; however, these efforts are challenged by pressures from population growth and economic development. The origins of China's environmental problems are rooted in both historical and contemporary factors. Historically, China's economic development model has been characterized by high levels of resource input, energy consumption, and pollution generation, resulting in an over-reliance on resource depletion and environmental degradation to drive economic growth. While this model has yielded significant short-term economic achievements, it has also incurred substantial environmental costs. Additionally, China's large population, coupled with low per-capita resource availability, places immense strain on the environment.

Environmental Degradation as the Primary Impediment to Economic Advancement: The Imperative of Transformative Development

Environmental challenges are not merely environmental issues; rather, they constitute significant economic, social, and political constraints that have become the primary impediment to China's economic advancement, hindering sustainable economic development and social stability. Environmental pollution negatively impacts human health, leading to increased healthcare expenditures and reduced workforce productivity, thereby affecting economic growth. For example, respiratory illnesses resulting from air pollution increase medical burdens and decrease labor force efficiency. Resource scarcity constrains economic development, leading to elevated production costs, diminished industrial competitiveness, and impaired economic expansion. Water resource scarcity, for example, results in agricultural irrigation challenges, restricted industrial production, and increased food prices. Ecological degradation negatively impacts agricultural production, leading to food security concerns, social instability, and impaired social harmony. For example, land degradation leads to decreased crop yields, reduced farmer incomes, and intensified social tensions. Climate change leads to increased frequency of natural disasters, inflicting severe economic losses, impeding social development, and threatening national security. For example, floods, droughts, typhoons, and other natural disasters result in infrastructure damage, reduced agricultural output, and human casualties.

Accumulating evidence underscores the fact that environmental degradation has become the paramount constraint on economic development. Absent effective solutions to environmental challenges, sustainable economic advancement will prove unattainable and social progress will be jeopardized. The guiding principle of 'Geochemical-ecological-economic triadic harmonization' seeks to transcend the conventional "pollute first, remediate later" developmental paradigm, prioritizing environmental protection as a foundational prerequisite for economic advancement, thereby fostering a synergistic relationship between environmental stewardship and economic prosperity [13]. This necessitates a transformation of economic structures, the promotion of a green economy, the enhancement of resource use efficiency, the reduction of environmental pollution, and the pursuit of sustainable development.

The Transformative Imperative of Human Economic Evolution: Constructing a Green Economy as the Essential Pathway to Sustainable Development

The Inherent Deficiencies of Traditional Economic Development Models: The Unsustainable Price of Progress

For much of modern history, human economic development models have prioritized the pursuit of economic growth, frequently disregarding the concomitant environmental and social costs. While such models have yielded periods of prosperity in the short term, they harbor significant long-term risks and are fundamentally unsustainable. Excessive Resource Depletion: Unsustainable rates of extraction of natural resources, such as the over-extraction of coal, petroleum, natural gas, and other mineral resources, lead to resource scarcity and environmental degradation, including mine-site environmental pollution and ecological disruption. Severe Environmental Pollution: Unrestrained emissions of pollutants, such as industrial wastewater, gaseous emissions, and solid waste, result in air, water, and soil contamination, negatively impacting human health and compromising ecosystem functionality. Social Inequity: Uneven distribution of the benefits of economic development leads to widening income disparities and escalating social tensions, with marginalized communities disproportionately impacted by environmental pollution, exacerbating social inequalities. Unsustainable Development: Economic development that proceeds at the expense of the environment and social equity ultimately results in unsustainable development, as resource depletion and environmental degradation lead to economic decline and social unrest. This traditional economic development model, while generating significant economic achievements in the short term, has imposed substantial environmental and social costs. It not only threatens human survival and development but also disrupts Earth's ecological equilibrium and undermines biodiversity.

The Green Economy as the Trajectory for Future Development: Sustainable Prosperity

The Green Economy represents a novel economic paradigm characterized by a commitment to environmental protection, resource conservation, and enhanced resource use efficiency, with the overarching goal of achieving economic growth, social equity, and environmentally sustainable development. It emphasizes the harmonious integration of economic advancement and environmental protection, focusing on circular resource utilization and environmentally benign practices, ultimately representing a pathway to sustainable prosperity. The core principles underpinning the Green Economy encompass four fundamental aspects:

- **Sustainable Development:** Integration of environmental and social considerations into economic decision-making processes to achieve coordinated and sustainable development across economic, social, and environmental dimensions.
- **Efficient Resource Utilization:** Enhancement of resource use efficiency and reduction of resource consumption and waste generation, including the promotion of energy-efficient technologies and the enhancement of resource recycling rates. Promotion of clean energy and environmentally benign technologies: Deployment of clean energy sources, and energy-efficient and environmentally-friendly technologies to mitigate environmental pollution, including the development of renewable energy sources such as solar and wind power, and the implementation of clean production techniques.
- **Establishment of Circular Resource Utilization Systems:** Implementation of systems for resource recycling and the valorization of waste materials, including the establishment of systems for the recycling of end-of-life electronic devices and the promotion of urban mining initiatives.
- **Economic Compensation for Ecosystem Stewards:** Provision of economic incentives to promote ecosystem protection practices, including the establishment of ecological compensation funds and the provision of subsidies to forest conservation practitioners.

The Green Economy transcends the confines of a mere economic model, representing a broader developmental philosophy and value orientation. It compels a re-evaluation of the objectives and means of economic development, positioning environmental protection as an intrinsic driver of economic advancement, thereby fostering the synergistic prosperity of economic, social, and environmental systems.

Achieving a Green Transformation of Economic Development: A Systemic Overhaul

Realizing a green transformation of economic development necessitates a systemic overhaul across six key dimensions:

- **Shifting Developmental Paradigms:** Global nations must embrace the principle of 'Geochemical-ecological-economic triadic harmonization' prioritizing environmental protection as a prerequisite and foundation for economic advancement, thereby overturning the traditional prioritization of economic gains over environmental stewardship.
- **Fortifying Policy Frameworks:** Nations should establish robust environmental protection laws and regulations, refine environmental standards and monitoring systems, and intensify environmental law enforcement to provide an institutional framework that safeguards green development [14].
- **Restructuring Industrial Sectors:** Phasing out obsolete and inefficient industrial capacity, fostering strategic emerging industries, promoting clean production technologies, and steering industrial structure towards a green, low-carbon trajectory.
- **Fostering Technological Innovation:** Escalating investment in environmental science and technology research and development, promoting energy-efficient and environmentally sound technologies, and incentivizing corporate technological innovation to provide the technological underpinning for green development.
- **Enhancing International Collaboration:** Developing nations should actively participate in global environmental governance, strengthening international environmental collaboration to collectively address global environmental challenges and share experiences in green development.
- **Encouraging Public Participation:** Heightening public environmental awareness and encouraging public participation in environmental protection activities to cultivate a societal atmosphere that fosters collective engagement in environmental stewardship.

Green Industries as New Drivers of Economic Growth: Future Opportunities

The development of green industries represents a crucial pathway toward realizing a green transformation of economic development, as well as a future locus of economic growth. Green industries not only provide solutions to environmental challenges but also generate new employment opportunities, enhance economic efficiency, and promote a synergistic relationship between economic advancement and environmental protection. Green industries span various sectors, including energy conservation and environmental protection, clean energy, the circular economy, and ecotourism. The energy conservation and environmental

protection industry encompasses energy-efficient equipment manufacturing, environmentally friendly product production, and pollution remediation services, such as energy-efficient lighting, air purifiers, and wastewater treatment equipment. The clean energy industry encompasses the development and utilization of renewable energy sources, such as solar, wind, hydro, and biomass energy, exemplified by solar panels, wind turbines, and biomass power generation facilities. The circular economy industry encompasses resource recycling and utilization, waste management, and the production of recycled products, such as the recycling of end-of-life electronic devices, plastic recycling and reprocessing, and urban mining initiatives. The ecotourism industry encompasses ecotourism development, nature reserve construction, and the preservation of ecological cultural heritage, such as forest parks, wetland parks, and rural tourism initiatives. The development of green industries not only provides solutions to environmental challenges but also generates new employment opportunities, enhances economic efficiency, and promotes a synergistic relationship between economic advancement and environmental protection, thereby injecting new impetus into economic growth.

Constructing a Green Future: Harmonious Development of Earth, Environment, and Human Economy

Strengthening Earth Consciousness and Building a Community of Shared Future: A Collective Responsibility

Earth is the shared home of humanity, and safeguarding Earth's environment is the collective responsibility of all. It is imperative to strengthen Earth consciousness, foster the concept of a community of shared future for humankind, collectively address global environmental challenges, and achieve sustainable development. This requires:

- Strengthening international cooperation to establish a global environmental governance system, jointly addressing global environmental issues such as climate change, biodiversity loss, and resource scarcity, as exemplified by the United Nations Framework Convention on Climate Change and the Convention on Biological Diversity.
- Promoting green development by encouraging nations to transform economic development models, pursue green development pathways, and achieve coordinated and sustainable economic, social, and environmental development, as articulated in the United Nations Sustainable Development Goals (SDGs).
- Facilitating cultural exchange by strengthening intercultural dialogue to foster enhanced understanding and appreciation of environmental protection, as exemplified by the implementation of environmental-themed cultural exchange programs and the organization of environmental-themed exhibitions.
- Encouraging public participation by raising global public awareness of environmental issues and encouraging public engagement in environmental protection activities to cultivate a collective force for environmental stewardship, as exemplified by conducting environmental education campaigns and encouraging public participation in environmental volunteer initiatives.

Upholding Environmental Protection to Achieve Sustainable Development: A Fundamental Guarantee

Environmental protection serves as the prerequisite and foundation for achieving sustainable development. It is essential to uphold the principle of prioritizing environmental protection by integrating it into all facets of economic and social development to provide a fundamental guarantee for sustainable development. This requires:

- Strengthening laws and regulations by establishing comprehensive environmental protection laws and regulations, such as enacting stricter pollutant emission standards and increasing penalties for environmental violations, to provide legal safeguards for environmental protection.
- Intensifying law enforcement by strengthening environmental law enforcement, rigorously cracking down on environmental violations, upholding the authority of environmental laws, and ensuring effective implementation of laws and regulations.
- Raising environmental standards by increasing environmental quality standards to drive technological upgrades and transformations in enterprises to reduce pollutant emissions.
- Strengthening environmental monitoring by establishing robust environmental monitoring systems to promptly ascertain environmental quality conditions and provide scientific guidance for environmental management.
- Implementing ecological compensation by providing economic compensation to ecosystem stewards to incentivize environmental protection practices, such as providing economic compensation to forest conservation practitioners and wetland preservation practitioners.

Promoting a Green Transformation to Achieve Economic Prosperity: An Inevitable Choice

The green economy is the trajectory of future development and the essential pathway toward achieving economic prosperity. It is imperative to promote a green transformation of the economy to foster a synergistic relationship between economic development and environmental protection, thereby injecting new impetus into economic growth. This requires:

- Adjusting industrial structures by phasing out obsolete industrial capacity, fostering strategic emerging industries, promoting clean production technologies, and steering industrial structure toward a green, low-carbon trajectory.
- Promoting technological innovation by escalating investment in environmental science and technology research and development, promoting energy-efficient and environmentally sound technologies, and incentivizing corporate technological innovation to provide the technological underpinning for green development.
- Developing green industries by vigorously developing energy conservation and environmental protection, clean energy, circular economy, and ecotourism sectors.
- Encouraging green consumption by guiding consumers toward environmentally friendly products and services to promote the formation of a green consumption model, such as purchasing energy-efficient appliances, using public transportation, and reducing plastic consumption.
- Establishing a green financial system by developing green credit, green bonds, and green insurance products to provide financial support for green industries.

Promoting Social Equity to Share the Fruits of Development: The Ultimate Objective

Sustainable development encompasses not only economic development and environmental protection but also social equity. It is essential to promote social equity by ensuring that all people share in the fruits of economic development and environmental protection to achieve common prosperity. This requires:

- **Increasing Employment Opportunities:** Expanding green industries to create new employment opportunities, thereby

raising the income levels of residents, such as developing ecotourism and environmental service industries.

- **Improving Public Services:** Escalating investment in public services such as education, healthcare, and social security to enhance the living standards of residents, such as providing higher-quality educational resources and healthcare coverage.
- **Reducing Income Disparities:** Refining income distribution systems to narrow the gap between rich and poor to achieve common prosperity, such as raising minimum wage standards and strengthening tax regulation.
- **Protecting Vulnerable Groups:** Attending to the environmental rights of vulnerable groups and ensuring their access to clean air, water, and land, such as conducting environmental remediation efforts in impoverished areas and providing environmental subsidies.

Conclusion

The principle of 'Geochemical-ecological-economic triadic harmonization' serves as a fundamental guideline for ecological civilization construction worldwide. In the face of escalating global environmental challenges, the rigorous implementation of the 'Geochemical-ecological-economic triadic harmonization' principle is of paramount importance for constructing a green future characterized by the harmonious development of Earth, environment, and human economy. To achieve this objective, a three-pronged approach is required, focusing on the holistic nature of Earth's ecosystems, the exigency of environmental protection, and the transformative potential of human economic evolution, coupled with enhanced Earth consciousness, unwavering commitment to environmental protection, promotion of green transformation, and advancement of social equity, to collectively construct a beautiful world characterized by ecological civilization, economic prosperity, and social harmony. We are confident that as long as we uphold the principle of 'Geochemical-ecological-economic triadic harmonization' and steadfastly pursue a green development pathway, we can realize a synergistic outcome for both economic development and environmental protection, leaving a legacy of a beautiful Earth with blue skies, green landscapes, and clean waters for generations to come.

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