

## Article Review

# Addressing Biodiversity and Sustainability: Challenges and Opportunities in Asia

**Bahareh Rafiei<sup>1a</sup>, Hamed Kioumars<sup>2b\*</sup>, Hanif Amrulloh<sup>3c</sup>, Hadis Ahmadnia<sup>4d</sup>, Marzieh Alidoust Pahmedani<sup>5e</sup>, Zeynab Kazemkhah Hasankiadeh<sup>6f</sup>**

<sup>1</sup> Plant Protection Department, Gilan Agricultural and Natural Resources Research and Education Center. Agricultural Research, Education and Extension Organization, Gilan, Iran

<sup>2</sup> Department of Animal Science Research, Agricultural Research, Education and Extension Organization, Gilan, Iran

<sup>3</sup> Department of Islamic Primary School Education, Universitas Ma'arif Lampung, Metro, Indonesia

<sup>4</sup> Bahonar University of Kerman, Kerman, Iran

<sup>5</sup> Department of Horticulture Crops Research, Gilan Agricultural and Natural Resources Research and Education Center, AREEO, Center Education, Iran

<sup>6</sup> University of Western Ontario, Faculty of Engineering, Chemical and Biochemical Engineering Department, Canada

Email: <sup>a)</sup>rafiei.bahareh@gmail.com; <sup>b)\*</sup>h\_kioumars@yahoo.com; <sup>c)</sup>amrulloh.h@umala.ac.id;

<sup>d)</sup>hadis.ahmadnia97@gmail.com; <sup>e)</sup>m.alidoust@areeo.ac.ir; <sup>f)</sup>zkazemkhah@gmail.com

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## Abstract

*Asia is marked by high biodiversity. At the same time, it suffers from serious multi-factor threats to such biodiversity. Forest ecosystems and their species are threatened due to large-scale land conversion to plantations of agriculture. Land conversion to grasslands due to livestock activities leads to habitat destruction and loss of biodiversity. In addition, global warming is linked to the expansion of pest infestations, resulting in increased application of pesticides that negatively impacts biodiversity. Climate change also facilitates the dissemination of vector-borne disease, further endangering wildlife and human health. Besides, climate change has accelerated biodiversity loss in Asia through alteration of ecosystems, coral bleaching, and melting of Himalayan glaciers threatening freshwater ecosystems. Increased temperature and extreme weather conditions pose a great threat to species survival. Although the Sustainable Development Goals (SDGs) do emphasize the need for biodiversity conservation, this has been outlined in Goal 15, Life on Land, and Goal 14, Life Below Water. In tackling these goals, Asia has a Strategic Plan for Biodiversity 2011-2020 and Global Biodiversity Framework; in core protection ecosystems ensure sustainable development. Much more could be done in reversing, if not definitely halting, this ongoing loss in this region. In conclusion, agriculture, livestock, and climate change pose immense challenges to the biodiversity of Asia, which acts as a barrier to achieving sustainable development goals. Such challenges require enhanced conservation efforts and the adoption of sustainable practices in different sectors.*

**Keywords:** Biodiversity; Asia; Climate change; Sustainability; SDGs; Agriculture.

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## Introduction

Biodiversity underpins ecological sustainability in general, and Asia is singularly endowed with an exemplary array of species and ecosystems. The biodiversity of the region

maintains ecological balance, underpins cultural heritage, and ensures economic prosperity. Recent studies indicate that Asia lost a significant portion of its natural forest cover threatening not just its unique ecosystems but also the living of millions who rely on them [1]. However, rapid urbanization, climate change, and unsustainable practices pose unparalleled challenges to the natural resources of Asia [2]. It researches the biodiversity status in Asia, the hurdles against it, and the opportunities provided to adopt green practices to cope up with these threats. Asia contains nearly one-third of the world's hotspots of biodiversity, and ecosystems such as coral reefs and tropical forests provide critical services such as carbon sequestration, water purification, and habitat for numerous species.

These ecosystems contribute significantly to the health of the local communities and are vital to the regional economies, particularly in agriculture, fisheries, and tourism. Despite these advantages, the region is facing serious threats through habitat loss resulting from agricultural expansion and urbanization [3]. Studies indicate that the majority of Asian countries are lagging behind in the realization of biodiversity conservation targets, such as the Aichi Target 11, which aims for at least 17% of the terrestrial habitats to be effectively preserved by 2020. The concomitant issues of loss of biodiversity, climate change, and food insecurity necessitate an integrated approach to strengthen conservation efforts and promote sustainable practices across all industries [1], [4]. Ultimately, resolving the complex dynamics of threats to Asian biodiversity will require a multi-dimensional response. This response must integrate scientific research, technological innovation, policy response, and civic response.

Through fostering intersectoral cooperation between governments, corporations, research centers, and local communities, Asia can be at the forefront of innovative solutions that reconcile economic development with biodiversity conservation [5]. The success of such an endeavour is not only vital to the environmental well-being of the area, but also to the prosperity and health of its citizens. This review discusses the current status of biodiversity in Asia, describes the most significant threats to its survival, and discusses prospects for embracing sustainable practices and policies to preserve biodiversity and achieve long-term ecological sustainability.

## **Materials and methods**

This review combined information from over 200 peer-reviewed articles, reports, and assessments downloaded from databases like Google Scholar, Springer, Elsevier, Taylor & Francis, PubMed, and John Wiley & Sons. Study selection was on research examining the intricate relationships among biodiversity, climate change, agriculture, livestock, and sustainability within the context of Asia. Search terms used were "biodiversity in Asia", "climate change impacts on Asian ecosystems", "agricultural expansion and loss of biodiversity", "livestock production and biodiversity", "Sustainable Development Goals in Asia", "pest outbreaks and climate change", and others. Ultimately, 52 articles were selected.

The studies identified were assessed for the merit and relevance of their approaches, geographic coverage, and findings with regard to the principal topics of this review. Empirical-based studies, quantitative data, and overall analyses on threats to biodiversity, climate change effects, and the potential for sustainable practices were given priority. Articles were allocated to specific themes, including (1) the impacts of climate change on Asian species and ecosystems, (2) agricultural and livestock activities as causes of biodiversity loss, (3) the issue posed by the invasion of pests, and (4) mainstreaming biodiversity conservation through sustainable development paradigms.

Screening also entailed an examination of the evaluation of national biodiversity plans, international agreements, and regional plans focused on achieving the Sustainable Development Goals (SDGs). The information thus gathered was then consolidated to gain an in-depth analysis of the current state of Asia's biodiversity, the major risks facing it, and potential entry points for implementing sustainable development that can ensure ecological sustainability in the long term.

## Results and Discussion

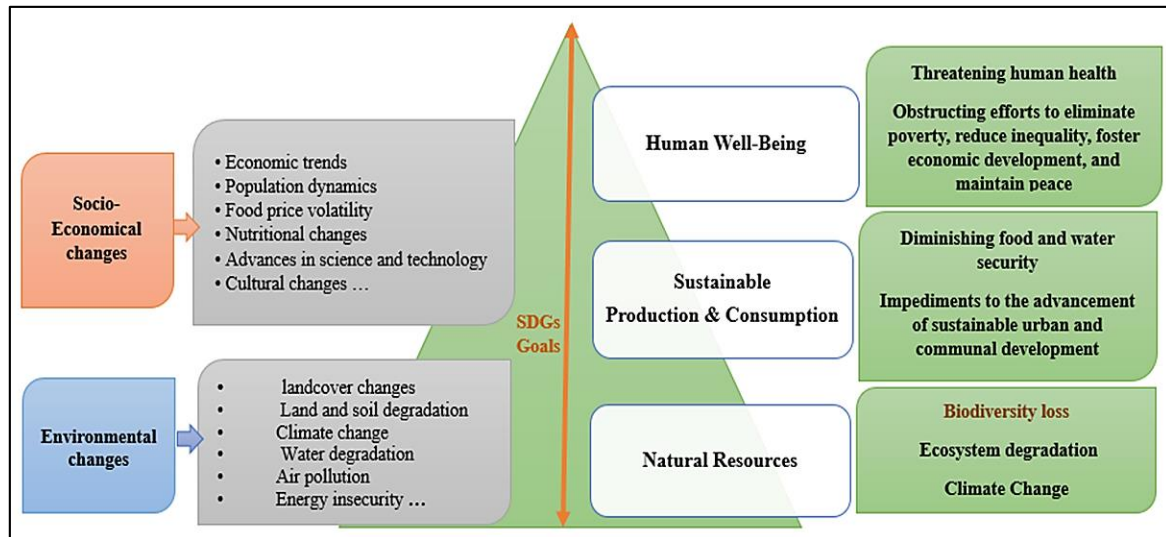
### 1. Current Challenges Facing Biodiversity in Aisa

With its teeming biodiversity, Asia faces enormous challenges in securing its natural heritage. High population density and rapid economic growth have resulted in considerable habitat loss in the region, much of it driven by expansion into agriculture and urban centers. One driver contributing to habitat loss throughout much of Asia includes conversion for increased agriculture. Surveys done depict a strong trend indicating agricultural land increase in 2015 has indeed impacted reduced protection area cover at this time. By 2050, Asia will have the highest rate of habitat loss due to conversion for agricultural land compared to other continents. Climate change further exacerbates biodiversity loss in Asia with increased temperature, changing precipitation patterns, and increased frequency of extreme weather conditions that result in coral bleaching and threats to freshwater ecosystems such as in the Himalayas [6].

Climate-induced species range shifts can also impact the efficacy of protection efforts of protected areas [7]. Urbanization is fast in Asia, causing habitat destruction, pollution, and altered ecological processes [8]. Air pollution, particularly particulate matter and carbon monoxide, has potential health risks and environmental damage [9]. One of the most significant challenges to Asian agricultural biodiversity is the increasing threat from agricultural pest and disease vector populations. The spreading influence of monoculture farming culture has encouraged population buildup of pest species, as well as crop yield loss and ecological degradation of agro-ecosystems. This reduction of the agricultural ecosystem lowers the variety of food sources, shelter, and overwintering sites for beneficial insects, disrupting natural pest regulation mechanisms. Farmers are therefore forced to turn to an increase in the application of chemical pesticides, further exacerbating biodiversity loss and potentially leading to pesticide resistance.

The economic cost is considerable, with invasive pests causing an estimated US\$23-34 billion in annual losses to Southeast Asian agriculture. The post-2020 Global Biodiversity Framework of reaching a target of protection of 30% land by 2030 is ambitious for Asia. The current rate of protected area establishment must be increased up to six times faster in some regions to meet this goal. Improvement in collaboration, effective conservation measures, and landscape restoration are key strategies to enhance biodiversity conservation in Asia [6]. Figure 1 presented effectively illustrates the cascading impacts of socio-economic and environmental change, ultimately on natural resources and, more specifically, biodiversity. The structure of the diagram highlights that environmental change, rooted in unsustainable activity, directly results in biodiversity loss and ecosystem degradation, which are positioned at the foundation of the "Natural Resources" category. This segment is naturally linked to SDG 13, SDG 14, and SDG 15 in emphasizing the global community's pledge to climate action and the protection of life below water and on land. The graphic presentation places particular focus on the significance of biodiversity in maintaining ecosystem integrity and stability of the natural resource base upon which societies depend. The figure 1, indicates that loss of biodiversity and ecosystem deterioration are not an isolated environmental issue but have implications for sustainable production, consumption patterns, and overall human well-being in the long run. Shifting food and water insecurity, which has been identified as an outcome of loss of biodiversity, directly impacts SDG 2 (Zero Hunger) and SDG 6 (Clean Water and Sanitation). Moreover, loss of species diversity and ecosystem functioning reduces agricultural yields, erodes food system resilience, and drains the natural resource stock required for economic development, eroding the gains toward SDGs on economic development, sustainable consumption, and urbanization. Therefore, the diagram is a good visual reminder of the strong imperative to address the drivers of biodiversity loss and ecosystem degradation in order to achieve the SDGs. It emphasizes the interlinkages between environmental, social, and economic dimensions of sustainable development and underscores the need for taking up integrated approaches with an emphasis on conserving biodiversity and restoring ecosystems.

Ignoring the conservation of biodiversity will not only result in irreversible loss of species and ecosystem processes but will also put the long-term sustainability of human societies at risk. Addressing these intricate challenges requires a comprehensive and coordinated response. This entails strengthening the resilience of protected area networks, promoting sustainable land use, mitigating greenhouse gas emissions and adapting to climate change, and promoting awareness and stakeholder participation, of particular significance, equally effective policy and governance settings are required to enable the sustainable use of natural resources and the conservation of biodiversity in Asia. In addition, there is a need for national and international collaboration for knowledge sharing and transboundary conservation measures [10]. Joint efforts and policy changes have the potential to enhance biodiversity conservation in Asia.



**Figure 1.** Interlinkages between environmental & socio-economic changes and the sustainable development goals.

## 2. Livestock

Animal husbandry in Asia is important and its relation to biodiversity intricate, featuring both positive and negative impacts. This review highlights the current pressures that biodiversity faces in the region, focusing on the rapidly changing pressures from livestock farming on ecological health. Livestock farming is considered one of the major drivers of biodiversity loss at a global scale and in Asia. Intensive grazing usually promotes habitat degradation, changes in vegetation structure, and soil compaction, which in the end reduce the richness and diversity of vertebrate species. These accumulated impacts change both the biotic and abiotic components of the ecosystem, contributing to declines in insect biomass and other species. Asia is particularly vulnerable to biodiversity loss, with approximately half of its biodiversity under threat. For instance, the coral reefs in the region are highly threatened, with potential losses as high as 88% because of climate change and other human activities. Overexploitation in general, such as illicit wildlife trade, also continues to enhance biodiversity decline in Southeast Asia—one of the hotspots for these activities. Climate change is one of the dominant drivers of biodiversity loss in Asia, while livestock farming enhances this problem by emitting significant amounts of greenhouse gases. This leads to a greater demand for animal products, which means an increase in livestock production, hence putting more pressure on the ecosystem with deforestation and habitat conversion, further increasing climate change. In spite of such challenges, opportunities for conservation are still immense. The application of sustainable livestock practices can provide mitigations to some of these biodiversity losses. The utilization of locally available feed resources and efficient grazing management practices can mitigate the impact of livestock farming on the environment. Other initiatives that are important to protect biodiversity within



the region include protected area networks and transboundary conservation. The implementation of rotational grazing schemes, in which livestock are moved regularly between different pastures, can prevent overgrazing, enable vegetation regeneration, and promote soil fertility. The promotion of the use of native grasses and legumes in pastures can also increase biodiversity and provide a more nutritious feed base for livestock. In addition, reducing livestock stocking rates in sensitive habitats, such as grasslands and wetlands, can reduce habitat degradation and protect vulnerable species. These techniques can lead to biodiversity equilibrium and animal and environmental well-being [11–15].

### ***3. Agriculture and Crops***

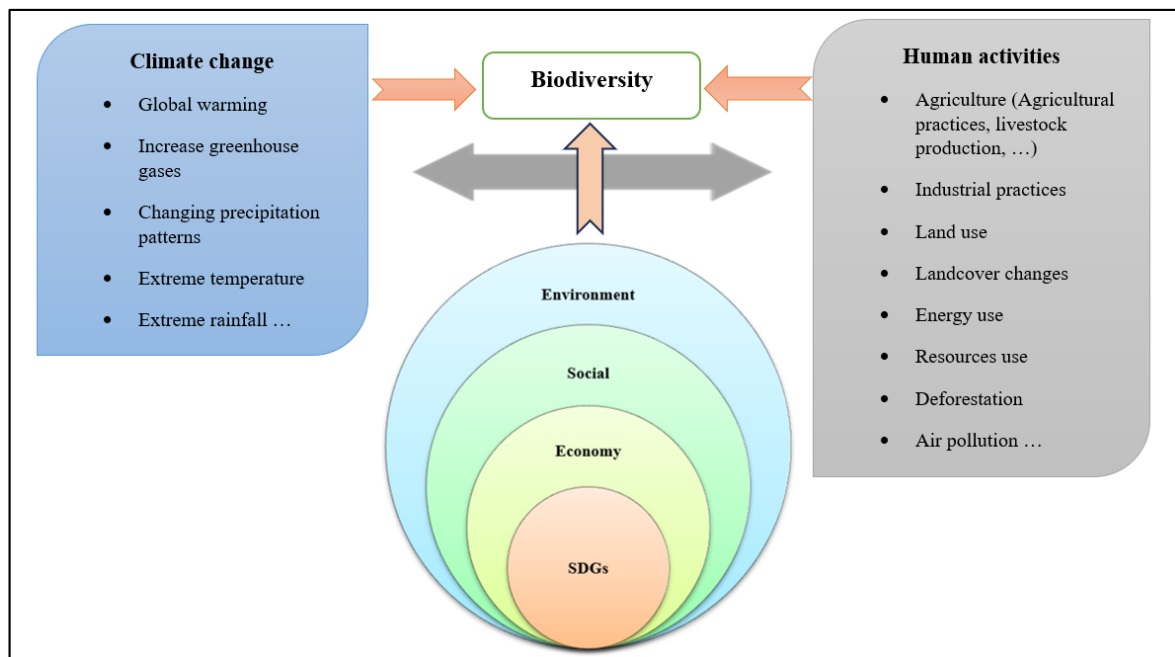
Asia is confronting a triple threat of climate change, biodiversity loss, and food insecurity, with agriculture playing a pivotal role in these challenges. This review highlights the current challenges facing biodiversity in Asia, focusing on agriculture and crops. Agriculture is a significant driver of biodiversity loss, contributing up to 80% of such losses. In Asia, agricultural expansion and intensification have led to habitat destruction and fragmentation, impacting ecosystems and species diversity. The expansion of crops like oil palm in Southeast Asia has been particularly detrimental, causing widespread habitat destruction. Crop expansion in Asia is driven by increasing food demand, with crops like rice, maize, and soybeans expanding rapidly. This expansion threatens biodiversity hotspots, such as the fringes of the Amazon Basin and Southeast Asian forests, which are critical for maintaining ecosystem services [16], [17].

Climate change exacerbates biodiversity loss by altering agricultural practices and productivity. Floods and droughts, common in Asia, disrupt food production and exacerbate food insecurity. Regenerative agricultural practices can help mitigate these impacts by enhancing biodiversity and ecosystem resilience. To address these challenges, a shift towards sustainable and regenerative agriculture is necessary. This involves diversifying crops, conserving natural habitats, and adopting practices that enhance ecosystem services like pollination and pest control. The integration of biodiversity into agricultural systems can support both food security and environmental sustainability. In conclusion, agriculture in Asia poses significant challenges to biodiversity, driven by crop expansion and unsustainable practices. Addressing these challenges requires a transformation in agricultural practices towards more sustainable and biodiversity-friendly systems. Beyond traditional agricultural intensification, a qualitative transformation towards agroecological approaches that focus on the increase of biodiversity and ecosystem services is necessary. This entails shifting away from reduced and simplified monoculture systems towards diversified agriculture systems that resemble natural ecosystems, including the use of crop rotations, intercropping, and agroforestry. These systems not only increase the climate change and pest disaster resilience of agricultural production but also offer habitat and resources to a large diversity of beneficial organisms, from pollinators, natural enemies of pests, to soil microorganisms. Through restoring and conserving biodiversity in agricultural landscapes, it is possible to decrease the dependency on synthetic inputs, increase soil health, and increase the long-term food production system sustainability in Asia [18], [19].

### ***4. Climate Change***

With nearly a third of the world's biodiversity hotspots, Asia is suffering from unprecedented ecological impacts due to the synergistic effects of climate change and human activities. The review has outlined the existing challenges and their far-reaching impacts on regional biodiversity. Climate change has been scaling up biodiversity loss in Asia through rising temperatures, changing precipitation patterns, and increased frequency of extreme events. Sea level rise and ocean acidification catastrophically affect mangroves and coral reefs, two of the most important ecosystems in marine biodiversity and shoreline protection. Degradation of the Himalayan glaciers threatens freshwater ecosystems and their associated biodiversity and human subsistence. Human modification of Asian landscapes through deforestation,

urbanization, and intensification of agriculture leads to habitat loss and imperilment of species. Agriculture at a global scale is one of the main drivers of biodiversity loss and produces large quantities of greenhouse gas emissions and huge volumes of natural resources use. Climate change, particularly increasing temperatures, radically alters the dynamics of pests, thereby threatening agricultural sustainability and biodiversity. Increasing temperatures enhance the expansion of pest geographical ranges, improve winter survival, and accelerate generation times, destabilizing established ecological interactions. This mechanism, coupled with the climate-driven range expansion of thermophilic pest species, can reduce the diversity of beneficial insect populations, accumulating pressure on agricultural systems. These disruptions produce ecosystem imbalances, which can lead to more reliance on chemical controls that can further increase biodiversity loss through increased pesticide residues in foods and the environment. In Asia, there exist threefold burdens-interrelated and self-reinforcing-on climate change, biodiversity loss, and food insecurity. The disturbance to agriculture caused by climate change can only further cause shortage of food, adding to worsen the condition in terms of loss of biodiversity and human welfare. This has been time and again underlined during the latest global congregations [20], [21].



**Figure 2.** Interrelationships between Climate Change, Human Activities, Biodiversity, and Sustainable Development Goals.

The illustration shows the complex interaction among climate change, human activities, and loss of biodiversity, their collective impact on achieving the Sustainable Development Goals (SDGs). Climate change, located on the left side, is one of the principal drivers of loss of biodiversity, and it results from global warming, increased greenhouse gas emissions, changes in precipitation patterns, extreme temperature, and intense rainfall events that contribute to habitat loss and ecosystem disruptions. These climatic changes create the appropriate environment for pest growth, which in turn depletes biodiversity by ravaging crops, forests, and natural ecosystems. As biodiversity declines, ecosystems lose their ability to withstand such threats, intensifying the negative feedback loop [22].

Biodiversity loss, located in the center of the figure 2, is the connecting link between environmental drivers and social impacts. Loss of biodiversity compromises ecosystem processes such as pollination, pest regulation, and soil health that are fundamental to agricultural productivity and food security. Climate change and habitat disruption in the dispersal of pest infestations further add to these challenges by reducing crop yield and augmenting the

application of chemical pesticides [23]. This not only harms ecosystems but also threatens human health and economic security. Biodiversity is essential to ecological stability, and loss of biodiversity erodes the efforts toward pursuing sustainability in Asia.

The nested hierarchy on the lower side of the figure 2, recognizes interlinkages between environmental health, society's well-being, economic stability, and SDGs. Biodiversity is the foundation of environmental sustainability, which in turn directly contributes to social equity and economic growth. The image underlines the fact that there is a necessity to respond to climate change and pressures generated by humans—deforestation and land conversion—in an effort to reverse loss of biodiversity as well as prevent pest infestations. Opportunities for greater long-term ecological and social resilience exist for Asian nations in including biodiversity conservation in climate adaptation efforts and sustainable development policy [24].

## **5. Economy**

To economy effect, Asia is highly grappling with acute challenges to its biodiversity with several trinomials economic repercussions. Biodiversity in the region, at increasing rates of deforestation, habitat conversion, and unsustainable practices, is threatened. This is exacerbated by a rapid expansion of economic activities and high consumption rates, as reported in recent research. Biodiversity loss in Asia creates huge economic risks: approximately 63% of the region's GDP—a total of US\$19.5 trillion in economic activity—may be disrupted by nature and biodiversity losses. On the other hand, addressing biodiversity and nature loss could be a driver of economic growth. For example, moving toward a nature-positive economy in the Asia-Pacific region could create as many as 232 million jobs annually by 2030, availing an opportunity worth US\$4.3 trillion. The main drivers of biodiversity loss in Asia include deforestation, unsustainable use of wildlife, habitat conversion, and pollution. Socioeconomic changes and demographic shifts serve as indirect drivers, exacerbating these issues. The rapid increase in demand for wildlife products fuels unsustainable trade, further impacting biodiversity. Asia faces significant hurdles in meeting biodiversity conservation targets, with only about 13.2% of terrestrial areas protected, far below the Aichi Target of 17%. Achieving the post-2020 Global Biodiversity Framework goal of protecting 30% of terrestrial environments by 2030 appears unlikely without drastic measures to increase protected area coverage. In conclusion, biodiversity challenges in Asia are deeply intertwined with economic activities. While biodiversity loss poses significant economic risks, addressing these challenges can also yield substantial economic benefits. It is essential for governments, businesses, and NGOs to collaborate on sustainable practices and conservation efforts to mitigate biodiversity loss and foster a nature-positive economy in the region [6], [25], [26].

## **6. Food Security**

The Asia-Pacific region faces a serious food security challenge in the context of escalating biodiversity loss and environmental degradation. Climate change, population growth, agricultural encroachment, and invasions of alien species are some of the drivers most critical to endangering both biodiversity and food production system stability. Loss of biodiversity impairs ecosystem services, like pollination, soil fertility, water regulation, and natural pest control, essential to agricultural productivity and ensure food security. Invasive alien species have increased, further threatening biodiversity and ecosystem stability. Climate change exacerbates the loss of biodiversity and impacts food security directly by altering species distribution, population sizes, and timing of reproduction or migration. Due to climate change, in South Asia, food availability reduces and food insecurity increases [27–29].

In Southeast Asia, climate-related issues such as drought and flood affect agricultural productivity and hence result in yield loss and crop failure. Agriculture in Asia often depends on narrow genetic bases in crops, a practice that wears down agricultural genetic resources. This lower level of genetic diversity puts crops at increasing risk of environmental stresses that

threaten food security. For instance, during the process of intensification, much traditional agrobiodiversity has already been lost in South Asia, compromising its long-term food sustainability. Land degradation and water scarcity are significant challenges in Asia, particularly in Southeast Asia, where urbanization and industrialization reduce arable land availability. Soil erosion and deforestation exacerbate land degradation, reducing soil fertility and productivity. Asia-Pacific biodiversity loss directly affects critical ecosystem services that underpin food production systems. Pollination, soil fertility, water regulation, and natural pest control, all critical for agricultural productivity, are inextricably linked with biodiversity. Agricultural landscape degradation and the reduction of crop and animal breed genetic diversity reduce the resilience of food systems to climate change, pests, and disease. Fostering food security in Asia then calls for an all-around effort with a synergy of biodiversity conservation at policy and practice levels merging with agriculture in order to stabilize and make food production sustainable [30–34].

### ***7. The United Nations Sustainable Development Goals***

With high biodiversity, the Asia-Pacific region faces tremendous challenges in accomplishing the UN's SDGs, especially on biodiversity conservation. Its high rate of population growth and economic development increases habitat loss and biodiversity decline across the region, acting as a huge obstacle to meeting global conservation goals. In Asia, agricultural expansion is one of the leading causes of habitat loss. For instance, studies have shown that having a larger area of agricultural land in a country in 2015 resulted in lower protected area coverage in the same country by 2020. It is expected that this trend will continue as Asia is projected to have the highest percentage of habitat loss due to conversion into agricultural land by 2050. Besides leading to a loss of biodiversity, such expansion undermines efforts towards attaining SDG 15 on terrestrial ecosystems. Despite PAs playing a very critical role in biodiversity conservation, PA coverage still lags behind the global target in Asia. It is estimated that 13.2% of the terrestrial environment in Asia was protected as of 2020, while most countries did not reach the Aichi Target to protect at least 17% of their land. Further, only 7% of these protected areas had management effectiveness assessments—a very important gap in conservation. The post-2020 Global Biodiversity Framework's aim to protect 30% of land by 2030 is unlikely to be met unless the rate of establishment of new PAs increases significantly. Climate change accelerates biodiversity loss in Asia through the disruption of critical ecosystems, such as mangrove forests and coral reefs. Increased temperatures and changed rainfall patterns amplify the intensity of threats like coral bleaching and glacier melting, affecting freshwater ecosystems. These changes not only harm biodiversity but also compromise ecosystem services essential for human well-being, aligning with concerns under SDG 13: Climate Action. South Asia, being a densely populated region, is uniquely challenged. Human population growth and urban expansion increase resource demands, further straining biodiversity. The interplay between population growth, poverty, and urban development threatens biodiversity in the region; therefore, a balance between fulfilling human needs and conservation is necessary to align with SDG 11 [6], [35], [36].

### ***8. Challenges and Solutions in Livestock Production***

It is important in maintaining ecosystem services, ensuring food security, and supporting sustainable development. It is of importance and hence should be regarded in respect to agriculture and livestock products, food security, and economy and climate changes. Biodiversity has been under severe threats due to several human activities, including agriculture and livestock production, accentuated by climate change in the present scenario. This review discusses strategies for biodiversity preservation in the context of livestock, agriculture, climate change, and the SDGs. Agriculture occupies about a third of the Earth's surface and is one of the main drivers of loss of biodiversity. Traditional agriculture practices often cause habitat destruction, pollution, and loss of crop and animal diversity [30], [37], [38]. These impacts can



be reduced by adopting regenerative agricultural practices that enhance biodiversity to ensure ecosystem services such as pollination, pest control, and climate regulation [33], [38]. Strategies for diversification at multiple scales within and among landscapes can enhance ecosystem processes underpinning resilient agriculture. Livestock production faces immense environmental challenges such as greenhouse gas emissions and habitat destruction. However, breeding livestock adapted to harsh environments enhances resilience to climate change. Integrated approaches that consider both production and environmental sustainability are essential for reducing the ecological footprint of livestock production. Climate change exacerbates biodiversity loss by altering ecosystems and disrupting species interactions [37], [39].

It also threatens food security by impacting agricultural productivity and livestock health. biodiversity in Asia is under severe threat from climate change and human activities. These are the challenges that must be addressed through a multi-sectoral approach that integrates biodiversity conservation with climate change mitigation and adaptation strategies. This calls for fostering sustainable practices, enhancing protected areas, and fostering regional cooperation to safeguard Asia's rich biodiversity heritage. Mitigating climate change requires the preservation of natural habitats and the fostering of biodiversity-based solutions to enhance ecosystem resilience. Biodiversity challenges in Asia are also intricately linked with food security. These call for integrated strategies that promote sustainable agriculture, biodiversity conservation, and climate change resilience. It is now time for policy makers to focus on investing in agricultural research, infrastructure, and sustainability practices if there will be long-term food security in the region. Integrating biodiversity conservation into agricultural and livestock practices remains highly relevant for the achievement of the SDGs-particularly SDG 2 (Zero Hunger) and SDG 13 (Climate Action). This will be achieved by embracing nature-based solutions that have environmental, social, and economic benefits while conserving biodiversity. The local-scale initiatives can trigger larger sustainability transitions by making use of biodiversity to improve food systems and environmental resilience. For future generations, biodiversity protection requires an approach that addresses interlinkages among agriculture, livestock production, climate change, and sustainable development. In the same manner, it promotes biodiversity-friendly practices, supports locally appropriate biodiversity-based solutions, and includes environmental sustainability in agricultural systems to guarantee food system resilience while protecting biodiversity [40–43].

## Conclusions

Asia's rich biodiversity faces significant threats from agriculture, livestock production, and climate change, all of which hinder progress towards achieving sustainable development goals. Large-scale land conversion for agricultural and livestock activities leads to habitat destruction and biodiversity loss, while climate change exacerbates these issues through ecosystem alterations, pest infestations, and the loss of freshwater ecosystems. Despite the emphasis on biodiversity conservation in the Sustainable Development Goals, more focused conservation efforts and the adoption of sustainable practices are essential to mitigate these challenges.

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