

Biodiversity Conservation and Sustainable Development Goals

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ABSTRACT

Sustainable Development is devoted to "protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss". At the Rio+20 Conference, Member States reaffirmed, through paragraphs 197- 204 of the outcome document, the Future We Want, that "intrinsic value of biological diversity, as well as the ecological, genetic, social, economic, scientific, educational, cultural, recreational and aesthetic values of biological diversity and its critical role in maintaining ecosystems that provide essential services, which are critical foundations for sustainable development and human well-being". Member States also recognized "the severity of global biodiversity loss and degradation of ecosystems" and stress the negative impact that this situation has on food security, nutrition, access to water, health of the rural poor and people worldwide". At the World Summit on Sustainable Development, held in Johannesburg 2002, biological diversity was addressed in Chapter IV, paragraph 44, of the outcome of the Summit, the Johannesburg Plan of Implementation. The Summit also endorsed the target to achieve, by 2010, a significant reduction of the rate of biodiversity loss at global, regional and national levels as a contribution to poverty alleviation and to the benefit of all life on earth, which had some months earlier been adopted by the sixth meeting of the CBD Conference of Parties (COP). Conservation of biological diversity is the subject of Chapter 15 of Agenda 21 which was adopted at the United Nations Conference on Environment and Development, in 1992, in Rio de Janeiro. On the same occasion, the United Nations Convention on Biological Diversity (CBD), was opened for signature and remained open for signature until 4 June 1993. By that time, it had received 168 signatures. The Convention entered into force on 29 December 1993, 90 days after the 30th ratification. The first session of the Conference of the Parties was scheduled for 28 November – 9 December 1994 in the Bahamas.

Keywords: biodiversity conservation, sustainable development, goals, ecosystems, convention, intrinsic

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1. INTRODUCTION

The Convention on Biological Diversity (CBD) has defined biodiversity as "the variability among living organisms from all sources including ... diversity within species, between species and of

ecosystems.". Biodiversity includes the existence of and interactions between various life forms. Scientists stated human health and welfare are directly linked to the ecosystem's health and abundance of biodiversity loss. Biodiversity is directly associated with the global economy, especially forestry, fisheries, agriculture, and

livestock rearing. A large percentage of the global population is directly dependent on natural resources for their livelihood. A healthy ecosystem and rich biodiversity are regarded as the "wealth of the poor." Advancements in scientific research have established a relationship between biodiversity loss and climatic changes. CBD strongly highlighted the repercussions of destruction or fragmentation of the ecosystem. Such events reduce carbon dioxide absorbance, leading to increased global greenhouse gas (GHG) emissions, which accelerates climate change. [1,2]

The importance of biodiversity in realizing SDGs :-

SDG1: Biodiversity provides resources and income, particularly in rural areas. A large percentage of the rural population, i.e., between 50% and 90%, depends on ecosystem services for their livelihood. Biodiversity supports humans by providing firewood, freshwater supply, a diverse range of medicinal plants, food, etc. Therefore, biodiversity conservation will help maintain the long-term economic, social, and environmental resilience of rural livelihood, which could help reduce poverty.

SDG 2: It intends to eliminate world hunger by ensuring food security and promoting sustainable agriculture. Scientists emphasized that biodiversity is the most important element of food security and enhances the nutritional levels of food products. Numerous individuals depend on food gathered from ecosystems such as rivers, grasslands, forests, etc. Biodiversity ensures food security by protecting agricultural production from various threats, such as pathogenic outbreaks, extreme climate, etc. Additionally, biodiversity enhances food production considerably by promoting crop pollination. Pollinator-dependent crops contribute to 35% of the global volume of crop production. Biodiversity conservation is strongly related to healthy agroecosystems, which have elevated agricultural production via the use of healthy seeds, fertile soil, and superior water management systems.

SDG 3: The main focus of SDG 3 is maintaining healthy lives for all age groups. Research has shown that one in four deaths is associated with environmental risk factors. A healthy ecosystem helps reduce pollution in the air, soil, and water. Sustainable agriculture ensures the minimal application of chemical fertilizers and pesticides and protects the soil and human beings from all the adverse effects of these chemical products.

SDG 4: As biodiversity has significantly inspired many fields of science, arts, and literature for centuries, continual exploration of biodiversity will promote lifelong education for all.

SDG 5: Scientists believe gender equality is essential for biodiversity conservation and the smooth functioning of a healthy ecosystem. Women play an essential part in agriculture, providing nutrition and supporting the family using ecosystem services, e.g., collecting firewoods and food from forests. Acknowledging the role of women as a manager of natural resources will help in sustainable development.[3,4]

SDG 6: Natural riparian ecosystems are important for a clean and constant water supply. Thereby, biodiversity conservation along the river catchment is an effective solution associated with the sustainable management of water. This could effectively replenish groundwater and regenerate drinking water.

SDG 7: It ensures an affordable and constant energy source for all. Hence, investing in biodiversity conservation ensures investing for billions of people who depend on natural resources for heating and cooking. Additionally, nature's contribution is key to producing biofuels. Scientists stated that implementing appropriate conservation measures would help enhance the longevity of the energy supply.

SDG 8: Healthy ecosystems (both marine and terrestrial) offer a large number of services that promote sustainable economic growth. Biodiversity conservation could help enhance agricultural productivity and ensure the long-term viability of natural resources.

SDG 9: Biodiversity and healthy ecosystems can promote the development of cost-effective, resilient natural infrastructures that could aid sustainable industrialization. For instance, mangrove forests and coral reefs protect the coasts from flooding, which occurs as a result of climate change. Natural infrastructure, which includes vegetation, can prevent soil erosion and restrict the soil pollutants from reaching the water bodies. These green infrastructures have proved to be a beneficial and cost-effective approach.

SDG 10: Investing in biodiversity conservation and promoting sustainable practices among local communities would considerably reduce inequality within and among countries. Sustainable practices would enhance employment opportunities in rural areas. An increased association with nature also improves mental and physical health.[5,6]

SDG 11: Biodiversity supports the functioning of cities, especially concerning improving air quality, reduction of water runoff, and provision of green areas for recreation. Therefore, investment to increase green areas around or within cities is extremely important.

SDS 12: It is crucial to maintain sustainable consumption and production patterns. Both production and consumption entail transforming natural resources, which impact biodiversity.

SDG 13: Climate change is the primary factor of biodiversity loss. Hence, the development of strategies or policies targeted at sustainable development, and restoring biodiversity and climate change, are significant for both nature and humans.

SDG 14 & 15: Conservation and sustainable use of marine ecosystems (SDG 14) and terrestrial ecosystems (SDG 15) are extremely important for sustainable development.

SDG 16: Promoting a peaceful, inclusive society where justice is provided to all will decrease violence and social insecurities. Transparent decisions over social and environmental issues will help develop a peaceful society.

SDG 17: Implementation of all SDGs and regenerating global partnerships for sustainable development will strengthen global biodiversity.

DISCUSSION

Biodiversity is currently being lost at up to 1,000 times the natural rate. Some scientists are now referring to the crisis as the 'Earth's sixth mass extinction', comparable to the last great extinction crisis 65 million years ago. These extinctions are irreversible and pose a serious threat to our health and wellbeing. Designation and management of protected areas is the cornerstone of biodiversity conservation. However, despite an increase in the total number of protected areas in the world, biodiversity continues to decline.

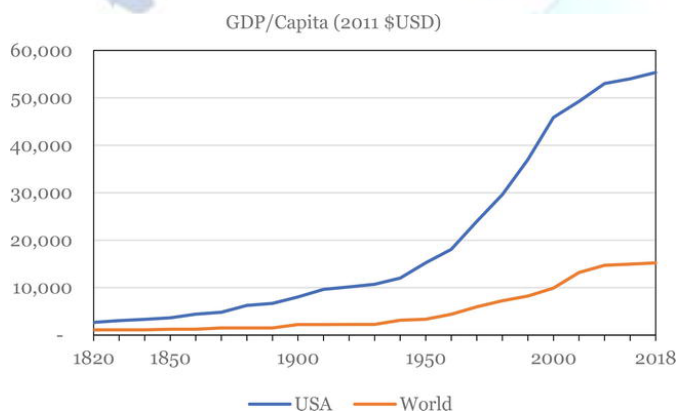
An integrated landscape approach to conservation planning plays a key role in ensuring suitable habitats for species. However, many protected areas are not functioning as effectively as originally intended, due in part to limited resources to maintain these areas and/or enforce relevant legal frameworks. In addition, current protected area networks may need to be re-aligned to account for climate change. Efforts to preserve biodiversity must take into account not only the physical environment, but also social and economic systems that are well connected to biodiversity and

ecosystem services. For protected areas to contribute effectively to a secure future for biodiversity, there is a need for measures to enhance the representativeness of networks, and to improve management effectiveness.[7,8]

- Growth in protected areas in many countries is helping to maintain options for the future, but sustainable use and management of territory outside protected areas remains a priority.
- Measures to improve environmental status within conservation areas, combined with landscape-scale approaches, are urgently needed if their efficiency is to be improved.
- Lack of adequate technical and financial resources and capacity can limit the upscaling of innovative solutions, demonstrating further the need for regional and subregional co-operation.
- Capacity building is a key factor in the successful avoidance and reduction of land degradation and informed restoration.
- Capacity development needs should be addressed at three levels: national, provincial and local.
- There is a need for capacity building to enable sources outside government to inform relevant departments and policies on biodiversity (e.g. through consultancies, academia and think tanks).

The word 'biodiversity' is new, of course, coined in the 1980s, but under various labels, wildlife or nature conservation was an important element in environmentalism through the twentieth century. For much of that time, the conservation of species was seen as something that required control of particular activities, such as hunting or fishing, by making regulations and setting aside land in protected areas. In the years after the second world war, as European colonial empires crumbled and were replaced by a world of aspiring developing countries, conservationists began to realise that such piecemeal was not enough. By the 1960s understanding was growing that development itself had serious ecological impacts. The problem was discussed at a conference on 'the ecological aspects of international development', held in Virginia in 1968. Its proceedings were published in 1973 as *The Careless Technology: ecology and international development*. In the same year, IUCN and the Conservation Foundation published

guidelines for development planners, Ecological Principles for Economic Development. In 1975 IUCN joined UNEP, UNESCO, and FAO in an 'Ecosystem Conservation Group' to develop a strategy for nature conservation. Early drafts were quite tightly focused on wildlife conservation, but on publication in 1982, the World Conservation Strategy proved more broadly focused. It argued that development could be made 'a major means of achieving conservation, rather than an obstruction to it'. Three objectives for conservation were identified, the maintenance of 'essential ecological processes and life-support systems' (food production, health, and other aspects of human survival and sustainable development) and the ecosystems on which they depended, the preservation of genetic diversity (both in wild and domestic species) and the sustainable utilization of species and ecosystems (fisheries, harvested wild species, forests and grazing land).[9,10]



The World Commission on Environment and Development Our Common Future had little specific to say about wildlife conservation, and perhaps for this reason a follow-up to the World Conservation Strategy, Caring for the Earth, was published in 1987, re-stating conservation concerns in the new language of sustainable development (North-South dialogue, community, poverty and inter and intra-generational equity).

The main focus of wildlife conservationists at the Rio Conference in 1992 was the Convention on Biological Diversity (CBD). Its roots went back long before preparations for the Rio Conference began – debate about the need for an international convention to preserve global biodiversity had been hot in IUCN, WWF, UNEP and other organisations since the mid-1980s.

Early drafts of the Convention reflected conservationist concerns about biodiversity loss. However, by 1992 the issues of bioprospecting and the exploitation of genetic resources through biotechnology had come to prominence, and the eventual Convention combined provisions for biodiversity conservation with the issue of benefit sharing from commercial exploitation of genetic resources. The Convention, signed by 156 countries at the Rio Conference, was therefore a slightly awkward marriage between conservation concerns and novel issues of biotechnology, held together by the new term 'biodiversity'. Signatory nations committed themselves to the development of strategies for conserving biological diversity, and for making its use sustainable.[11,12]

Since 1992, the CBD has become the main forum for international debate about biodiversity and development. The news has mostly not been good. The 6th meeting of the CBD Conference of the Parties in April 2002 adopted a strategic plan committing Parties to achieve, by 2010, a significant reduction in the current rate of biodiversity loss at the global, regional and national level. The 2010 meeting in Aichi noted that the '2010 targets' had not been met, and set new ones, variously extending

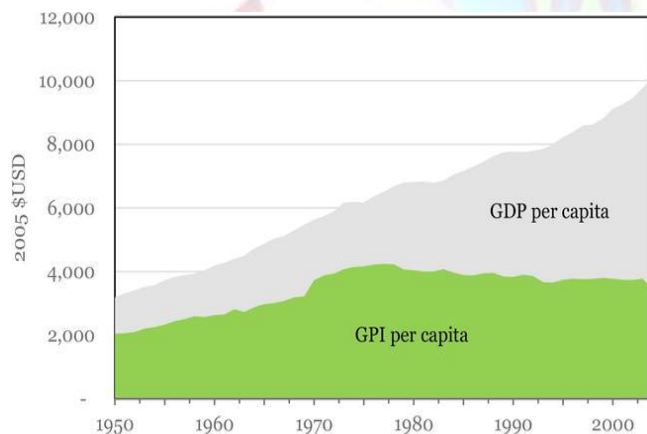
Perhaps the most interesting issue in debates about sustainability and biodiversity since Rio has been the relationships between conservation and poverty. There has been much concern about the impacts of displacement of indigenous and other rural people from protected areas, a concern reflected in the new thinking about protected areas at the 2003 World Parks Congress with which this article opened. There have also been many claims that 'win-win' outcomes are possible. To this end, biodiversity conservation was linked to the Millennium Development Goals in September 2000: two of the 48 indicators (relevant to Goal 7 'ensure environmental sustainability') are the proportion of land area covered by forest and the amount of land in protected areas. In September 2005, the Secretariats of the five biodiversity conventions argued that biodiversity underpinned all MDGs. Biodiversity could, they suggested, help alleviate hunger and poverty, promote good human health and 'be the basis for ensuring freedom and equity for all'. The the Millennium Ecosystem Assessment argued that ecosystem services

underpinning welfare and livelihoods, particularly (although not exclusively) of the poor.

Historically, wildlife conservation had an important role in the development of ideas about sustainable development. It has an inextricable element of debate about the future of the biosphere and humanity.

3. RESULTS

As regards relevant international instruments, the International Treaty on Plant Genetic Resources for Food and Agriculture, (ITPGRFA) states that the Contracting Parties should take measures to protect and promote farmers' rights, including the right to equitably participate in sharing benefits arising from the utilization of plant genetic resources for food and agriculture. The Voluntary Principles provide that responsible investment in agriculture and food systems respects traditional knowledge by, among other things, promoting fair and equitable sharing of benefits arising from the utilization of genetic resources for food and agriculture and that this should be done within applicable systems of access to genetic resources for food and agriculture, while respecting the rights of indigenous peoples and local communities under national law.



Growing economies consume natural resources and produce wastes. This results in habitat loss, air and water pollution, climate disruption, and other environmental threats, threats which are becoming more apparent as economic activity encounters more and more limits. The depletion of groundwater and ocean fisheries are examples as are shortages of fresh water, and the global spread of toxic compounds such as mercury, chlorofluorocarbons, and greenhouse gases.[13,14]

These conflicts are in part the result of the inescapable impact of an ever-growing human population. They are, however, exacerbated by market failures, including externalities and open-access resources, and in the case of biodiversity, the lack of markets altogether.

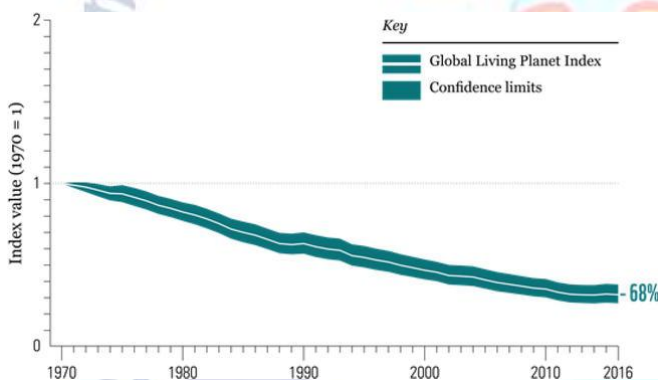
Externalities are the side-effects of commercial activities that impact third parties and are not reflected in the costs of production, and for this reason are "external" to the decision-making of both producers and consumers. Pollution from a factory is a negative externality. Intertemporal externalities (e.g., from climate change) impose costs on those in the future that are external to current generations. Externalities of all sorts undercut the ability of markets to produce sustainable outcomes.

Resources that are open to all without restriction, such as ocean fisheries, also invite unsustainable outcomes as is evidenced by the currently depleted state of the world's open-access fisheries.

Biodiversity suffers from a third market failure, the fact that it is generally not traded in formal markets. Though the popular conception of overexploitation is of resources plundered by the forces of markets, the absence of a market can be equally problematic. Things with no price end up being treated as if they have no value. Such is the fate of endangered species, tropical rainforests, coral reefs, and indeed much of wild nature.

Environmental impacts, of course, are not unconnected to society at large. Things like climate change and the extinction crisis have economic impacts and these in turn can threaten national security and international stability. Such threats are often made worse by inequality. Not everyone benefits equally from growth and some have arguably not benefitted at all. The problem of growing inequality is certainly an issue in the U.S. where the nation's top 10 percent now average more income than the bottom 90 percent [15]. But it is also clearly a problem globally. Sub-Saharan Africa is a case in point. Although the poverty rate there has fallen in percentage terms since 1990, it has not fallen fast enough to keep pace with population growth [16]. As a result, the number of poor in that region continues to rise and now accounts for nearly two thirds of the world's total population in extreme poverty.

Climate change, resource scarcity, and environmental degradation generally are certain to accentuate such inequalities in the future with unavoidable impacts on social unrest, national security, and international stability. The national security implications of these issues were starkly presented in a recent report commissioned by the U.S. Army [11]. According to the study, America could face a grim series of events triggered by climate change involving drought, disease, failure of the country's power grid and a threat to the integrity of the military itself, all within the next two decades. The report also projects that sea level rise in the future is likely to "displace tens (if not hundreds) of millions of people, creating massive, enduring instability" and the potential for costly regional conflicts [13]. The report cites in particular the role that drought has played in sparking the civil war in Syria and the potential for tensions stemming from sea level rise and large-scale human displacement in Bangladesh.



All of the above issues have clear implications for economic sustainability – a healthy environment and international stability, after all, are the foundations for a healthy economy. We need healthy soils for agriculture, healthy oceans for fisheries, clean air and water and a stable political environment for international trade, all of which are threatened by unrestrained growth

4. CONCLUSIONS

Increasing awareness of the limitations of growth has led to much discussion of sustainable development. This concept is most commonly associated with a report published by the World Commission on Environment and Development in 1987. In that report sustainable development is defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs".

Conservation agreements are performance-based agreements in which resource owners commit to a concrete conservation outcome – usually the protection of a particular habitat or species – in exchange for benefits designed to give them an ongoing incentive to conserve. [15] The type of benefits provided vary but can include technical assistance, support for social services, employment in resource protection, or direct cash payments. One of the great advantages of this approach is that the terms of agreements are flexible and can therefore be tailored to a particular setting. This flexibility makes conservation agreements a very scalable approach that can be implemented on private and indigenous lands outside traditional protected areas as well as on lands managed by national governments. In addition, whereas the creation of a traditional park or protected area requires a long, complex political process, conservation agreements, as a market-based approach, make park creation more akin to a standard business transaction, and this, in turn, makes park creation much more rapid and efficient. Since conservation agreements are a voluntary approach that addresses the underlying costs of conservation they are more politically acceptable than forced buyouts or eminent domain and are also often less expensive than other approaches since they focus on opportunity cost which in many cases is extremely low, particularly in developing countries

Carbon pricing is another example of an incentive-based policy that relates to biodiversity. While this approach does not target biodiversity directly, it is perhaps the most important single policy affecting all life on Earth. When it comes to conservation, and so much else, unless we effectively tackle climate change very little else will matter. Although there are many ways of putting a price on carbon, by far the simplest and most effective is a tax imposed on fuel suppliers (e.g., oil and gas producers). Once taxed, fuel suppliers raise their prices and in this way the higher prices ripple through the whole economy. There is no way to evade the tax and there is nothing to monitor or enforce (other than whether energy producers pay their taxes). Across the economy the cost of energy-intensive goods and services would rise giving both businesses and consumers an incentive to conserve. One of the many advantages of a carbon tax is that it ensures that emission reductions are achieved at least cost to society. The reason is that unlike regulations that require

everyone to adopt a particular technology or reduce their emissions by a certain amount, carbon taxes allow for the fact that some entities can reduce their emissions at a lower cost than others. This flexibility offers the opportunity for substantial cost savings.[16]

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