

Biodiversity and Sustainable Development: A Review

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Abstract

Biodiversity is being viewed in the context of sustainable development offers opportunities for poverty eradication, human well-being and the livelihood and socio-cultural integrity of people and in particular in developing countries which are rich in biodiversity but are poor and struggling to catch up with the globalization challenge. Biodiversity constitutes the living natural resources that are found inhabiting our aquatic (including marine and fresh water) and terrestrial (including all the major biomes like forests) ecological systems. The role of the UN Convention on Biological Diversity (CBD) as the key international instrument to ensure the integration of biodiversity-related issues into the Millennium Development Agenda has been examined and underscored. In order to ensure sustainable development, it is necessary to conserve biodiversity and use it sustainably.

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Introduction

Biodiversity plays a very important role in maintaining natural cycle and ecological balance. These are the basis of existence, wealth of human and sustainment of nature on the earth. At the moment due to many different reasons biodiversity resources have been decreasing in world. The term biodiversity or biological diversity describes the biological capital held within an area. It refers particularly to the differences between living organisms at different level of biological organization - gene, individual species and ecosystems. The Convention of Biological Diversity (CBD) defined biodiversity as the variability among living organisms from all sources including; *inter alia*, terrestrial, marine, and other aquatic ecosystems and the ecological complexes of which they are part. Biodiversity encompasses multiple values and is vital for the production of food and to conserve the ecological foundations needed to sustain people's livelihood. Besides, sustainable development is the development which meets the needs of the present generation without compromising the ability of future generations to meet their own needs. This includes taking into account the impact of present decisions on the options of future generations. Three goals of sustainable

development have been identified which includes; i) economic well being ii) social and human development and iii) environmental sustainability and regeneration (Dalal-Clayton and Bass, 2002).

The Context

Sustainable development, according to the Brundtland Report of 1987, is development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs.

Put in the new globalised order, sustainable development is the integration of economic, social and environmental development considered as the inter-dependent and mutually reinforcing pillars which operate at the local, national, regional and global levels. Poverty eradication the change in unsustainable patterns of production and consumption and the protection and management of natural resources base of economic and social development are constantly cited as the over-arching objectives and essential requirements for sustainable development.

One would question why these issues should be at the centre of all discussion on sustainable development. The reasons are easy to find:

1. There is a division of the human society into the rich and the poor, and there is an ever-increasing gap between the developed and the developing worlds.
2. The global environment is presently under stress because
 - (a) There are high population growth rates acting in concert with other human induced factors as

underlying causes for habitat degradation and destruction.

- (b) There is continuing loss of biodiversity at rates much higher than can be replenished.
- (c) With the use of modern harvesting and other new technologies essential biodiversity stocks continue to be depleted.
- (d) As a result of our own actions and inactions, desertification has claimed more and more fertile lands.
- (e) Adverse effects of climate change are being witnessed every day.
- (f) Natural disasters have become more frequent and more devastating.
- (g) Several developing countries have become more vulnerable to economic hardships and have several compelling reasons to mortgage their natural resources for debt relief, and
- (h) Air, water and marine environments continue to be polluted through our industrial activities.

3. The benefits and costs of globalization are unevenly distributed, and these have presented a new set of difficulties to developing countries to meet the globalization challenge.

If nothing is done to reverse these global trends, the disparities will become entrenched, and sustainable development as a final goal for the global order will not be achieved.

The World Summit on Sustainable Development from which emerged the Johannesburg Plan of Implementation and the United Nations Millennium Development Goals (MDGs) was meant to avert a global disorder. The focus of the Summit was to find consensus through dialogue on targets, time tables and partnerships to speedily increase access to such basic requirements of humanity as clean water, sanitation, adequate shelter, energy, health care, food security and the protection of biodiversity without compromising on environmental sustainability. These were aptly summed up in the UN Secretary-General's WEHAB Initiative of water, energy, health, agriculture and biodiversity.

All these basic requirements of humanity as well as access to financial resources and other provisions to developing countries were agreed at the summit. The result is highlighted in the eight MDGs which embrace all the three pillars of sustainable development with implementation targets, schedules and time lines.

The eight MDGs are summarized as follows:

- (1) Eradicate extreme poverty and hunger
- (2) Achieve universal primary education
- (3) Promote gender equality and empower women
- (4) Reduce child mortality
- (5) Improve maternal health
- (6) Combat HIV/AIDS, malaria and other diseases
- (7) Ensure environmental sustainability

- (8) Develop a global partnership for development

All the 8 MDGs are inter-linked to the WEHAB initiative. Water, Energy, Health and Agriculture are so well entrenched in cross-sectoral development plans and agenda of both developed and developing countries and their absence at any development process is immediately noticed. It is not so with biodiversity. Biodiversity as a political term, emerged just a little over a decade, and its assimilation into sustainable development agenda has been slow. The situation is different with the WEHAB initiative, whereby biodiversity is being looked at in the same way as the others, as integral part of any plans for sustainable development. The assembly of use indicators for biodiversity point to both sustainable and unsustainable use categories. The direction of the pendulum to sustainable use is now considered the only guarantee to ensure the integrity of economic, social and environmental development which are the essential re-enforcing pillars of sustainable development. Sustainable use of biodiversity is therefore a process to achieve the continual use of biodiversity for economic, social and environmental development for sustainable development. Sustainable use is defined as the use of components of biological diversity in a way and at a rate that does not lead to the long-term decline of biological diversity, thereby maintaining the potential to meet the needs and aspirations of present and future generations.

The Challenges of Sustainable Development on Biodiversity

In the message to the 2002 World Summit on Sustainable Development (WSSD) in Johannesburg, South Africa, the UN Secretary General introduced the WEHAB initiative which recognized water, energy, health, agriculture and biodiversity as the basic necessity for life. For the first time, outside the context of the Convention on Biological Diversity, biodiversity was recognized. This has led to the wider acceptance of the importance of biodiversity and ecosystem services in achieving the MDGs and it has also provided the basis to link the 2010 target more effectively to the global sustainable development agenda.

In April 2002 the 6th Conference of the Parties (COP) to the Convention on Biological Diversity holding in the Hague, the Netherlands, taking note of its existence for the past 10 years, noting that the rate of loss of biodiversity was still accelerating, and considering ways to address the threats to biodiversity, adopted a strategic plan, the purpose of which was to effectively halt the loss of biodiversity so as to secure the continuity of its beneficial uses through the conservation and sustainable use of its components and the fair and equitable sharing of benefits arising from the use of genetic resources. The CBD COP6 decision VI/26 committed Parties to achieve by 2010 a significant reduction of the current rate of biodiversity loss at the global, regional and national level as a contribution to poverty alleviation and to the benefit of all life on

earth. In a related event the ministerial segment of COP6 also made a declaration – the ministerial declaration – to strengthen efforts to put in place measures to halt biodiversity loss which is taking place at an alarming rate, at the global, regional, sub-regional and national levels by the year 2010. The ministerial declaration further called on the World Summit on Sustainable Development which was forth coming then to confirm the commitment to have instruments in place to stop and reverse the current alarming biodiversity loss at the global, regional, sub-regional and national levels by the year 2010.

Thus with the adoption of the Johannesburg plan of implementation of the WSSD, the summit reconfirmed the role of the Convention as the key instrument for the conservation and sustainable use of biological diversity and the fair and equitable sharing of benefits arising from its use. The summit also recognized the critical role played by biodiversity in overall sustainable development and poverty eradication and also recognized that the achievement by 2010 of a significant reduction in the current rate of loss of biological diversity will require the provision of new and additional financial and technical resources. Thus when in May 2003 the Secretariat of the Convention on Biological Diversity, the UNEP World Conservation Monitoring Centre (WCMC) and the United Nations Development Programme jointly convened a meeting in London to review the 2010 target, the Global Biodiversity challenge of 2010 had gathered momentum and the meeting was therefore

strategized to provide a better understanding of the 2010 target and how its achievement or otherwise could be assessed.

Biodiversity, as defined in the context of the Convention on Biological Diversity, is the variability among living organisms from all sources including, *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.

Biodiversity, literally, is the foundation upon which human civilization has been built. In addition to its intrinsic value, biodiversity provides goods and services that underpin sustainable development in many important ways, thus contributing to poverty alleviation. First it supports the ecosystem functions essential for life on Earth, such as the provision of fresh water, soil conservation, and climate stability. Second, it provides products such as food, medicines and materials for industry. Finally, biodiversity is at the heart of many cultural values. In total, biodiversity is life insurance for sustainable development.

Loss of biodiversity, therefore limits sustainable development and for a more general usage to address the 2010 target, it is the long term reduction of abundance and distribution of species, ecosystems and genes and the goods and services they provide.

The Response of Biodiversity Organizations to the challenge

The Convention on Biological Diversity, being the key international instrument on

biodiversity, has developed a strategy of 4 – goals and objectives to commit states Parties to the 2010 target to ensure the effective and coherent implementation of the three objectives of the Convention.

The four goals are that:

- 1) The Convention is fulfilling its leadership role in international biodiversity issues
- 2) Parties have improved financial, human, scientific, technical and technological capacity to implement the convention
- 3) National biodiversity strategies and action plans and the integration of biodiversity concerns into relevant sectors serve as an effective framework for the implementation of the objectives of the convention.
- 4) There is a better understanding of the importance of biodiversity and of the Convention, and this has led to a broader engagement across society in implementation. Each of these goals has a set of actions which parties are to embark upon to achieve at the local and national levels to reflect at the regional and international levels.

In the commitment, Parties are expected to embrace fully the multi-year programme of work of the conference of the Parties until 2010 which include ongoing programmes of work on both thematic areas and cross-cutting issues and implement these on the basis of national strategies and action plans and other national, regional and international activities.

The thematic areas are Dry and sub-humid lands biodiversity, Agricultural biodiversity, Forest biodiversity, Inland waters biodiversity, Marine and coastal biodiversity, and Mountain biodiversity.

The Island biodiversity is a new thematic area that is being earmarked for in-depth consideration in the near future. The cross-cutting issues include Access and benefit sharing (ABS), Communication, education and public awareness (CEPA), Article 8(j) and related provisions, Incentives, Invasive Alien Species, Climate change, protected areas Global taxonomy initiative (GTI), Global Strategy for Plant Conservation (GSPC), Tourism and Sustainable use. The Ecosystem approach, is the framework to implement the convention.

It has been agreed among parties that the strategy to evaluate progress and implementation support of the 2010 target should involve two issues, namely:

- Progress in the implementation of the strategic plan and follow-up actions involving the global targets and related measures such as monitoring and indicators and trends of biodiversity, and
- Refinement of the mechanisms to support the implementation such as financial mechanism, clearing-house mechanism, technology transfer, capacity building etc.

Many of these thematic and cross-cutting programmes of work referred to above are also handled by other multi-lateral

organizations, agreements and initiatives, which sometimes even go to greater depths to treat the items because of their mandates. The co-operation of all of these organizations is needed, and this calls for partnerships for various joint activities as in synergy promotion.

The Consequences of doing nothing

It has been established that sustainable development has, as its inter-dependent and mutually reinforcing pillars, the integration of economic, social and environmental development which operate at the local, national, regional and global levels. The absence of any one of the pillars brings disorder. The consequence of doing nothing to halt the loss of biodiversity affects all the three pillars. The cost of doing nothing therefore outweighs the cost of doing something. So something must be done. It is worth noting the contribution of biodiversity to human security and development issues in relation to the Millennium Development Goals of 1, 4-6 and 7. These contributions are captured in the economic, ecological and social (cultural and societal) areas of human existence. In the table, the delivery of the biodiversity service categories for livelihoods (MDG 1: poverty), food security (MDG 1: hunger), health (MDG 4-6) and the sustainability of the environment through the protection of biodiversity (MDG 7), show evidence of immense contribution of biodiversity to sustainable development. The eradication of poverty and hunger, reducing child mortality, improving maternal health

and combating HIV/AIDS, malaria and other diseases, and ensuring environmental sustainability through the protection of biodiversity, take a big chunk off the plan of implementation of the WSSD. It is argued that the remaining MDGs just fall in place when, through the biodiversity 2010 target, sustainable development is fully anchored.

The tools needed to attain the 2010 target

The following tools are needed for success in target-oriented biodiversity actions.

- Communication, education and public awareness of the 2010 targets and the related MDGs to involve all stakeholders including the many organizations and initiatives, both national and international, public and private, individuals and communities
- Use of selected, appropriate indicators that are
 - specific, measurable, achievable, realistic and time-related (SMART)
 - relevant and meaningful to diverse stakeholders
 - developed through a consultative process to ensure wide ownership
 - tested for their utility at different scales
 - formulated to take account of different timescales
 - cost effective and affordable
 - timely, both in terms of currency and sensitivity to change over appropriate timescales
- related to country-specific objectives including poverty reduction and meeting the MDGs
- integrated, constituting a set (or nested series) of increasingly aggregated indicators
- Use of existing mandates and processes to continue the collection of data but reporting and management of information should be harmonised and streamlined in order to reduce duplications and to identify and promote synergies.
- Capacity building efforts and technology transfer and co-operation should be vigorously pursued. The necessary capacities, supported by the appropriate technologies, must be available at the national level to develop and implement the required strategies, including a focus on ecosystem services, assessment of progress in achieving the target, and communication of biodiversity values to all sectors. The latter includes demonstrating the benefits of monitoring, assessment and reporting. The need to apply biosafety conditions in biotechnology to ensure food security and human and environmental health is also to be emphasized.
- Commitment on the part of a state party in ensuring that biodiversity-related issues are enshrined in all cross-sectoral programmes and that there is implementation of the national biodiversity strategy and action plans with

the provision of the necessary resources including finance.

- Partnership is necessary and should be encouraged to bring on board all stakeholders of biodiversity. This will constitute a useful tool to build co-ordination and synergy in achieving the 2010 target.

Through partnerships, duplication of efforts will be reduced and resources will be properly utilised.

What role is there for Botanic Gardens Conservation International?

The question is whether there is a role for the BGCI in this dialogue between Biodiversity and Sustainable Development. There is a role for BGCI in two initiatives of the CBD. The two initiatives are the Global Taxonomy Initiative (GTI) and Global Strategy for Plant Conservation (GSPC) which have been established by the Convention on Biological Diversity for specific purposes.

GTI is meant to underpin decision making in conservation of biological diversity by addressing the lack of taxonomic information on the identity of components of biological diversity in many parts of the world, and the need to build capacity for taxonomic activity in all regions, but especially developing countries, including reference materials, databases and taxonomic expertise relevant to the objectives of the Convention on Biological Diversity. GSPC, on the other hand, is meant to provide a framework for policy on 16 action-oriented targets for plant conservation in the areas of understanding

and documenting plant diversity, conserving plant diversity, using plant diversity sustainably, promoting education and awareness about plant diversity and building capacity for the conservation of plant diversity.

The BGCI can study the 5 operational objectives of the GTI and offer advice on these and the included planned activities for the benefit of Parties to the Convention. Equally the BGCI can also undertake projects in specific countries to help answer the call in the 16 action-oriented targets of the GSPC, such as has been produced recently in the UK: Plant Diversity Challenge – the UK's response to the Global Strategy for Plant Conservation.

There are other roles for the BGCI in the work programme of the agricultural biodiversity and the alien invasive species issue. For the agricultural biodiversity, the international pollinator initiative needs expertise in the taxonomy of plant species whose pollen are carried on the bodies of the pollinators as part of ensuring crop production. This calls for intensive research and training on the pollination-pollinator mechanism including pollen morphology; and for the alien invasive species, the role of BGCI is seen in the contribution to communication, information and education of alien species using the guiding principles developed.

Conclusion

In the foregoing, an attempt has been made to relate biodiversity to the global millennium goals in order to achieve sustainable

development. The long term perspective for sustainable development requires the broad-based participation of various stakeholders in policy formulation, decision-making and implementation at all levels in particular of issues of biological diversity and this must be encouraged.

The Botanic Gardens Conservation International, and other similar institutions, are considered as having major roles to play including to inform and educate their constituents on the tenets of biological diversity to sustainable development, and through this to support the efforts of the UN institutions and other processes such as the three Rio Conventions including the United Nations Framework Convention on Climate Change (UNFCCC), the United Nations Convention to Combat Desertification (UNCCD) and the United Nations Convention on Biological Diversity (UNCBD) to make a difference in the lives of those identified as vulnerable.

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