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Executive summary

(a) Overall status and trends in biodiversity, and major threats

Biodiversity in Ghana is under severe pressure in some ecosystems and this has made it impossible to pronounce a uniform status situation. While forest and dry and sub-humid (savannah) biodiversity in protected areas are in very good condition, those in some reserves and off-reserve areas are in good through fair to bad conditions. This is the result of the intense pressure these ecosystems are made to experience on a routine basis.

There is evidence of declining trends, especially in forest, dry and sub-humid, marine and coastal and inland water biodiversity. Many biodiversity components including special species of these ecosystems have been noted to have declined in their composition, numbers, density, dispersion and distribution.

The major threats to biodiversity come largely from land-use conversions, habitat degradation, over exploitation, pollution, invasive alien species, climate change effects, predation, misapplication of chemicals into the environment, wild fires etc.

The land use conversions involve large scale farming, mono-cultural plantations e.g. for teak, settlement sitting, traditional farming practices of food and cash crops with the use of fire. Habitat degradation comes from such activities as pollution, misuse of fire, over harvesting of genetic resources, misapplication of chemicals,

Over exploitation involve excessive cutting of trees in stressed environments for fire wood as energy source, by-catch and use of inappropriate harvesting techniques such as pair trawling and beach seine.

Climate change effects include sea level rise leading to sea water intrusion into fresh water habitats, intense drought and flooding.

(b) ***Key actions taken in support of the Convention's three objectives and to achieve the 2010 target and goals and objectives of the Strategic Plan of the Convention***;

The long-term goal of Ghana's strategy is to achieve the conservation and sustainable management of the country's biological diversity. This must be achieved throughout the whole country and within all representative ecological zones. Consequently the implementation of the Convention has been geared towards the use of actions that are consonant primarily with the PAs that have been established to reflect the various ecosystems in the country. These PAs and their management strategies and plans support the Convention's 3 objectives

An observation of the 7 goals and 11 objectives, including their individual targets, of the 2010 biodiversity target provide a basis to understand how Ghana has unassumingly been addressing very important aspects of the global target. Reference can be made to all the seven goals of the biodiversity target, namely: protection of biodiversity components; promotion of sustainable use; threats to biodiversity; maintenance of goods and services from biodiversity to support human wellbeing; protection of traditional knowledge, innovation and practices; ensuring the fair and equitable sharing of benefits arising from use of genetic resources; and provision of adequate resources, from which one can easily appreciate and

understand the kind of contribution that are generated from Ghana, through the protected areas and other well conserved areas in off-reserves, which are considered substantial.

From the 4 goals and 19 objectives of the Strategic Plan of the Convention, some of which are to be considered at the level of the Convention itself, the conservation effort of Ghana as contribution to the global strategy is appreciable. Much of the information obtained from a consideration of the different conservation activities undertaken in the protected areas and other facilities are quite significant.

(c) ***Areas where national implementation has been most effective or most lacking***;

As has become obvious, the protected areas in the forests, dry and sub-humid lands as well as inland water and marine and coastal areas have been most effective areas for national implementation of the Convention. This achievement is the result of very good management practices used. It is hoped that the other areas, such as in off-reserves where no management regimes or plans are in place, will receive adequate attention to become good sources for national indication of successful implementation of the Convention. This achievement will clearly show how biodiversity has been mainstreamed into the society. Until that is done, biodiversity and ecosystem goods and services for human wellbeing will continue to be taken for granted and the status quo of habitat degradation and unsustainable use of biological resources will remain.

(d) ***Major obstacles encountered in implementation***;

The major obstacles in implementation stem from various sources including absence of and/or inadequate and inappropriate methods of mainstreaming biodiversity issues into sectoral and sub-sectoral programmes, plans and policies; lack or absence of monitoring and compliance culture; scanty availability and/or lack of information on biodiversity; the indiscriminate use of agrochemicals in farming and other agricultural activities; the unsustainable eating habits of some of the people; the preference for cash crop mono-cultural plantation activity in habitat rehabilitation as against the more ecologically acceptable multicultural
plantation activity; the inability to present convincing cost benefit analysis for long term benefits in the face of other land use options which offer short term benefits.

(e) Future priorities

Priorities for the future are hinged on Ghana's ability to contribute to the achievement of the three objectives of the Convention and the goals and objectives of both the 2010 biodiversity target and the Strategic Plan of the Convention.

Four areas are of immense priority, considering the current status and trends of Ghanaian biodiversity and ecosystem goods and services for human wellbeing. These areas have been found to hold the key to future progress in the conservation of biodiversity, sustainable use of its components and the equitable sharing of benefits arising from the use of genetic resources. The priorities for the future of biodiversity in Ghana are the following: Mainstreaming of biodiversity issues into sectoral and sub-sectoral plans, programmes and projects to involve all the stakeholders of Ghana; effective and independent national biodiversity governance structure with coordination, advisory and

advocacy roles; effective awareness raising campaigns on biodiversity and ecosystem goods and services for human wellbeing; research and training including infrastructural development of Ghanaian institutions for effective and constant monitoring and evaluation of biodiversity status and trends.

CHAPTER ONE

1.0 OVERVIEW OF BIODIVERSITY STATUS, TRENDS AND THREATS

An overview of the country's biodiversity (in terms of ecosystems, habitats, species and, where such information is available, genetic diversity) and the importance of these biodiversity components for human well-being;

The biodiversity of Ghana is contained in habitats distributed within a very large expanse of terrestrial and aquatic ecosystems. The terrestrial ecosystems are made up of forests and savannas in which are a large distribution of other land uses including protected areas, reserves, agricultural lands and settlements.

The aquatic ecosystems including their wetlands are made up of inland fresh water systems consisting of dams, ponds, rivers, streams, reservoirs, estuaries, and marine and coastal water systems made up of lagoons, tidal pools and the open seas.

Each of these ecosystems is characterised by very distinctive species which provide the genetic diversity base of the country. It is the utilization of these species and their accompanying genetic resources that has been the source of livelihoods for the people and contributing to the total wellbeing of Ghanaians. There is no doubt therefore about the importance of these biodiversity components for the survival of the people of Ghana.

1.2 Status and trends of important biodiversity components

1.2.1 Forest biodiversity

There is very heavy pressure on Ghanaian forests, stemming from various aspects of land use. Many forest reserves are a poor shadow of themselves as a result of excessive extraction of timber and other resources. Some forest reserves have undergone replanting with exotic species such as Teak (*Tectona grandis).*

While there is evidence of increase in populations of some forest species, there is also evidence of decline in populations of some other species, especially those that are over-utilized. Generally there is a decrease in the land area of forest estates.

1.2.2 Agricultural biodiversity

There is erosion of biodiversity of crops. Particular examples of this erosion can be seen in declining numbers of the local banana, cocoa and some yam species. Some yam species have completely disappeared from the system. For livestock, some cattle breeds are on the decline. The West African short horn cattle which used to constitute about 80% of the national cattle population in the 1990s now constitutes about 47% of the national cattle herd by the dawn of the millennium.
Generally, there is decline in biodiversity. However there are some positive developments that have contributed to encouraging increases in the quality of biodiversity.

Some crops have had their diversity enhanced as a result of introduction of other varieties from outside the country.

1.3 Dry and sub-humid lands biodiversity

1.3.1 Coastal savanna

.There is severe reduction in the production of ecosystems goods and services through loss of fishing grounds, housing materials, grazing lands, farmlands and productivity, wildlife habitats, energy sources, local displacement of species and scarcity of water sources
Consequent to the pressure on the ecosystem, there is loss of livelihood options and a decline in living standards of the people leading to worsening poverty.

1.3.2 Transition zone

This zone was formerly a forested area but now rapidly turning into savanna and expanding further into the moist forest zone. There is rapid deforestation and loss of watersheds. There is decline in soil fertility. All the other issues mentioned in coastal savanna also apply here. The trend is as has been recorded for the coastal savanna.

1.3.3 Northern savanna

The situation is as in coastal savanna with rapid deforestation. There is high intensity of wild fires and human emigration into the forest zone. There is also the increasing incidents of floods and droughts (leading to land degradation and desertification).

The trend leads to food insecurity, water scarcity, disruption of social structure (emigration) as the young ones desert home leaving the old people behind, loss of cultural heritage eg. totems, loss of energy sources, loss of lives and property. All the issues raised on coastal savanna biodiversity also apply here.

The trend is also leading to loss of habitats, decline in species populations, local species extinctions, increasing vulnerability to climate change impact, increasing incidence of alien invasive species, human emigration from savanna to southern forest zones, increasing transhumance leading to local and national insecurity, increasing poverty incidence as a result of loss of livelihood options, declining living standards, decline in soil fertility and productivity, increasing food insecurity, decline in the contribution to the GDP, increasing urbanizations leading to expansion in some areas and decline in others.

The trend that is general to all the savanna ecosystems are: Decline in species, Increasing poverty levels, Over-exploitation of natural resources (e.g. fuel wood harvesting), Vulnerability to Climate change and desertification and land degradation, Degradation and loss of water sources, Decline in agricultural productivity leading to agricultural land expansion, Population increase and pressure, Non application of improved agricultural and sustainable land management practices, land use conversions into mono-cultures for mango cultivation and other highly sought after agricultural produce, Increasing incidence of invasive species, Pollution of water bodies, High intensity of wild fires and, Increasing human migration into forest zone, Increasing incidents of floods and droughts.

1.4 Inland Water Biodiversity

1.4.1 Status

1.4.1.1 Rivers/Streams

Some data exist on fish, molluscs, insects,
Crustaceans, zoo-plankton, phyto-plankton and macrophytes.
Information is scanty on other groups such as arachnids and micro organisms

Information on fish is available at WRI, Universities, Volta Basin Research Project (VBRP) at Legon. More work should be done to update information.

1.4.1.2 Lakes/Reservoirs
Information is scanty e.g. Work on West African Manatee is on going to establish species diversity.

1.4.1.3 Lagoons/Estuaries
Apart from fish species and water fowls ,other species are unknown

1.4.1.4 Mangroves
Types of mangroves and distribution known.

1.4.1.5 Wetlands
Information on types of water fowls available at Legon Centre for African Wetlands.
More work should be done to update information

1.4.2 Trends

1.4.2.1 Rivers/Streams:

Generally the trend is declining, Fish-populations also declining Molluscs-
Aquatic Macrophytes -increasing eg. invasive aquatic weeds (such as water hyacinth).

1.4.2.2 Mangroves declining

Invertebrates-those that like clean water are decreasing e.g. mayfly and those that like polluted water are increasing e.g. chiranomids.
Phytoplankton-Blue –green algae are increasing

1.4.2.3 Lakes/Reservoirs, Lagoons/Estuaries and Wetlands are all declining

1.5 Marine and Coastal Biodiversity

1.5.1 Status

1.5.1.1 Marine Mammals

All species threatened. There is the need to confirm present occurrence; some information may be available with various institutions (CSIR-WRI, UG Department of Oceanography & Fisheries.

1.5.1.2 Water birds

Fifteen (15) species occur in internationally important numbers; Mixed trends with some species increasing, a few stable, others decreasing.

1.5.2.3 Marine turtles

Three species confirmed (Leatherback, Olive Ridley and Green; nesting on beaches and feeding offshore) threatened.

Some monitoring and some detailed studies carried out at various points in time over the last 35 years.

One species (Hawksbill) locally extinct; possible to make deductions on trends from nesting monitoring data (with Sources from: Centre for African Wetlands, Ghana Wildlife Society, Wildlife Division, Department of Oceanography & Fisheries - UG)

1.5.2.4 Fish

Three main marine groups (small pelagic, large pelagic and demersal species) and various brackish water species present.

Generally fish stocks are declining (data sources: Fisheries Research Division, Guinea Current Large Marine Ecosystem; O&F-UG; Fisheries & Aquatic Sciences of University of Cape Coast.

1.5.2.5 Invertebrates

Scattered information on a few species, Information available from O&F-UG; WD from Ramsar Sites, Fisheries Research Inst.)

1.5.2.6 Plants of the mangrove forests

Three species of mangroves are prominent, namely *Avicenia* sp., *Rhizophora* sp. and *Laguncularia* sp. There is rapid decline in extent of all three; *Laguncularia* is the most threatened (data sources: UG Oceanography & Fisheries; C. Gordon –mangrove Atlas; WD's Mangrove project in mid 1990s).

1.5.2.6 Algae

Species composition well documented;
Frequency of occurrence available for some species at specific sites (data source: UCC/UG) but not for all cases

1.6 Main threats to important biodiversity components, and the underlying drivers or causes of these threats

1.6.1 Forest and Agricultural biodiversity

- Traditional farming practices

Some traditional farming practices such as bush burning have adverse effect on biodiversity

- Climate Change

Variation in climate is a threat to biodiversity. Unpredictable nature of rainfall patterns and extreme temperatures lead to loss of some plant and animal species.

- Invasive Alien Species

Some Plant Species that come from foreign lands to our ecological system have vigor and out-compete our indigenous species. This has lead to declining numbers of our indigenous species. Examples of such invasive alien species are *Chromolaena odorata* and the water hyacinth.

- Adoption of Improved Varieties

Farmers are encouraged to use improved varieties of crops. This leads to complete neglect of the indigenous ones.

- Coping Strategies in energy search

Charcoal burning relies heavily on trees. Incessant charcoal burning in certain parts of the country leads to a decrease in tree numbers and ultimately affects biodiversity.

- Large Scale Farming

Most commercial farms only cultivate one type of crop on vast stretches of land. This has adverse effect on Biodiversity

- Settlements

Most Agricultural lands are being lost to settlements/urbanization. Animals now have less land to graze on and this is adversely affecting their numbers.

- Cultivation of teak trees

Teak trees do not allow other trees to thrive in their vicinity and therefore do not encourage biodiversity

1.6.2 Savanna ecosystem

The threats are: Decline in species**,** Increasing poverty level, Over-exploitation of natural resources (e.g. fuel wood harvesting)**,** Vulnerability to Climate change and desertification and land degradation**,** Degradation and loss of water sources, Decline in agricultural productivity leading to agricultural land expansion**,** Population increase and pressure**,** Non application of improved agricultural and sustainable land management practices**,** Global demand for certain agricultural commodities (e.g. mango, cocoa etc)**,** Increasing incidence of invasive species**,** Pollution of water bodies**,** High intensity of wild fires, Increasing human migration into forest zone**,** Increasing incidents of floods and droughts.

1.6.3 Inland water biodiversity:

Over-exploitation for economic reasons such as food (fish, crustaceans), fuel (mangrove wood) and medicine (shells of some crustaceans).
Pollution: Discharge of both solid and liquid wastes from domestic, agriculture and industrial sources affect water quality which ultimately cause decline in fish species. Increase in some aquatic macrophytes may create ecological imbalance.

Habitat degradation: Through construction works such as building of dams and roads, as well as mining including salt mining and farming activities turn to destroy habitations
Climate change impacts: such as sea level rise which leads to intrusion of sea water into fresh water; Drought – which can lead to displacement and death of living organisms and Flooding leading to the displacement of certain organisms
Misapplication of chemicals: For fishing, controlling aquatic weeds and disease vectors

1.6.4 Marine mammals

Threats come from Fisheries industry – by-catch; Over- Exploitation -- pair trawling; Marine pollution; Threats to water birds; Loss and degradation of wetland habitats, selective hunting (mainly by ducks and herons)

1.6.5 turtles

Threats come from Over-exploitation (for meat, eggs); Predation (by domestic animals especially dogs); Declining beach habitats for nesting and offshore feeding grounds; by-catch – resulting from inappropriate fishing gear; beach/Marine pollution; disturbance resulting from beach activities/tourism infrastructure developments

1.6.6 Fish

Threats come from over-fishing (incl. pressure from foreign fleets); use of unapproved fishing gear and fishing methods; marine pollution

1.6.7 Invertebrates

Threats from pollution and exploitation for food (shell-fish)

1.6.8 Mangrove plants

Threats come from Over-exploitation (for fuel wood, building material)

1.6.9 Algae (Algal plants)

Threats come from pollution; Use of wrong fishing gear (e.g beach seine); Built-up settlements of coastal habitats

1.7 Implications of observed changes in the status of biodiversity components, particularly in terms of threats to ecology, livelihood and social and economic development

1.7.1 Impact of changes on human wellbeing

Impact on fisheries productivity making fish resources scarce;
Ecosystem services for Flood control/ erosion/wind-storm breaks destroyed;
Declining wood sources;
Loss of livelihoods for rural people who directly depend on natural resources;
Curtailment of cultural festivities (e.g. Homowo, various traditions among communities living around lagoons) because of the absence of certain species;
Potential impact on wildlife based tourism as result of degradation;
Potential loss of income because of cessation of livelihood activities;
Increase in poverty levels as a result of loss of biodiversity;
Malnutrition becomes pronounced as people feed on unfamiliar food items;

Poor human health and health insecurity resulting from poor feeding sources;

Food insecurity accentuates as variability of food sources reduce;

Loss of livelihood options;

Changes in social structure as influence from traditional authorities, through cultural activities, reduce and sometimes become redundant;

National security implications related to health, social cohesion and livelihoods;

Food and water insecurity are implied;

Decline in biodiversity contribution to the national GDP;

Declines in ecosystem goods and services for human wellbeing;

Declines in the living standards of the people;

Resource use conflicts become apparent leading to violence;

Human wildlife conflicts become accentuated and more frequent;

CHAPTER TWO

2.0 Current Status of National Biodiversity Strategies and Action Plans

2.1 A brief description of the NBSAP, identifying the main or priority activities

The strategy document developed by Ghana did not specifically adopt an action plan. A number of actions were mentioned for further development into an action plan but this did not happen. These have been mentioned under key issues requiring action in the ***National Biodiversity Strategy for Ghana*** at chapter 7 from pp. 34 to 43.

The following are considered as ***High Priority activities***:

1. under **Protected Area systems** (slightly modified):

i) To include Marine parks in any future PA expansion

ii)To fully complete management plans of the protected areas under WD to complement those already done for the 30 GSBAs.

iii)To tackle the problem of inadequate capacity in ecosystem management

iv)To seriously consider building and strengthening data and information management capacities.

v) To ensure promotion of proper forest management, avoiding clear cutting of forests.

vi) to promote research to enhance ecosystem management and protection with special emphasis on science policy linkages

vii) To take stock and review traditional skills in management of Protected Area systems and incorporate these, where appropriate, into modern technologies

viii) To review and update existing legislations, and harmonise these with non-forestry legislation and ensure compliance

ix) To ensure full and active participation of traditional authority, landowners, communities and other stakeholders in protected area management.

x) To strengthen education and awareness creation at all levels of society especially among those whose livelihoods depend on the forests.

xi) To strengthen and ensure networking between and among various forestry and non-forestry institutions

xii) To promote gene flow through the creation of biological corridors to provide connectivity between forest fragments including the Important Bird areas and other protected areas.

xiii) To seek collaboration with both local and external institutions in information exchange, science and technology.

2.2 Off Reserve Areas.

All the 16 actions listed under this topic in the Strategy document are considered as high priority and are still being vigorously pursued. These are:

i) To adopt and practise cultural agronomic practices such as mixed cropping and Agroforestry, rotations and cover cropping.

ii) To promote minimal use of agricultural chemicals and adopt integrated pest management practices, as well as other agriculturally sound practices

iii) To Create urban forests or tree belts around farms, settlements, dams as refugia for various life forms in areas such as cemeteries, residential areas, sewage sites

iv) To restore aquatic systems by reclamation of sites, restocking with preferably indigenous species

v) To undertake basic and applied research intro the socio-economic and cultural importance and opportunities as well as the ecology and the dynamics of ecological process and how they affect the various systems and biodiversity

vi) To Study the impact of inter- and intra-specific interactions as well as alien species introductions on biodiversity

vii) To Educate and create public awareness about the importance of off-reserve areas for the sustainable use of biological resources and the conservation of biodiversity

viii) To develop policies to encourage the conservation of biodiversity and the sustainable use of biological and genetic resources on stool/skin and private lands

ix) To Introduce appropriate environmental management and monitoring tools

x) To minimize the conversion of forested off-reserve areas into non-forest land uses, such as for crop production, grazing etc.

xi) To encourage Biodiversity implementation/compliance units to liaise with other agencies/stakeholders to demarcate sensitive and fragile areas, such as slopes, fringe forests and wetlands and protect these

xii) To Empower grass root (local level) administration structures to enact bye-laws for the management, use and protection of biological resources and biodiversity

xiii) To promote economic and social incentive measures

xiv) To inventorize the biodiversity and biological resources status and prepare a Red Data List

xv) To build and manage databases on biodiversity and biological resources

xvi) To promote the protection of endangered and critically endangered species located in off- reserves.

Creation and strengthening of management of ex-situ conservation systems:

The 6 priority actions listed under this topic in the strategy document are at various stages of implementation:

i) To build new and strengthen capacities of existing institutions to be able to effectively conserve species, cultivars, landraces of plants and animals and micro-organisms

ii) To promote studies and research into micro-organisms in soil and water as well as the marine environment with regard to their importance in agriculture and forestry, health and welfare, food security et.

iii) To develop codes of conduct, standards and guidelines for the handling, storage, management and conservation of ex-situ resources especially genetically modified or engineered organisms.

iv) To ensure safe use of micro-organisms and genetically modified organisms to avoid their possible use in warfare

v) To encourage the use of *ex-situ* facilities to educate and create awareness among the public about threats to biodiversity conservation and sustainable use of its components

vi)To promote and ensure an effective network of ex-situ conservation facilities

2.3 Targets and indicators adopted under the Convention.

Targets and indicators adopted under the Convention have not been incorporated into the NBSAPs because the current document predates them. However, the Strategy document is currently under review and the targets and indicators will be incorporated as appropriate.

2.4 How have activities contributed to thematic areas of the Convention?

The activities listed in the Strategy document cover all the thematic areas of the Convention, from Agricultural Biodiversity, through Dry and Sub-humid biodiversity, Forest biodiversity, Inland Water biodiversity, Marine and Coastal biodiversity to Protected Areas. The activities also cover issues of Invasive Alien Species.
The progress or successes listed below attest to this.

2.5 An overview of progress made in the implementation of priority activities

The following have been achieved which can constitute progress:
i) Expansion of PA area from 100-117 million and upgraded the status of reserve
ii) Most management plans developed and some for wildlife areas
iii) Review of curriculum and internal restructuring of institutions such as FORIG to enable it to address emerging issues.
iv) Build capacity in GIS CERGIS, Training of FC/FORIG staff in GIS
v) Efficient fire management put in place through a number of projects such as the Wildfire project
vi) Voluntary partnership agreement and certification mechanism in place
vii) Over 80% of up to date information on GSBAs generated
viii) Inventories have been extensively carried out on most forest reserves
ix) Participation of local community has been improved with under CREMA, formation of CFCs and CBUGs.
x) A draft wildlife Bill has been submitted to cabinet since 2008 and expectations are that the new parliament will consider it.

2.6 The extent of Domestic and International funding dedicated to priority activities:

About 80% of funds for work on main/priority activity areas have been provided from international sources and these funds have been applied accordingly.

2.7 The nature of obstacles and successes in the NBSAP implementation and lessons learned.

On successes reference can be made to progress cited above. However, for obstacles, there have been a number of challenges and many of these take root from the basic misunderstanding of conservation and sustainable use of biodiversity. Lack of ability to use cost benefit analysis to make a case for biodiversity has often led to land use changes which are not in the interest of biodiversity conservation .

The following may be considered as lessons learned which can contribute to removal of obstacles:

- Need for proper coordination of all sectoral activities
- The status of the National Biodiversity Committee need to be seriously considered. There is a strong feeling for it to be made autonomous with its own budget line.
- Publicity given to the Strategy document was very low so when the revised one is completed it should be widely publicised.

2.8 Analysis of the effectiveness of the NBSAP

In attempting to provide the analysis, explanations are being provided to the following questions**:**

i) Whether the observed changes in status and trends in biodiversity are a result of measures taken to implement NBSAP?

A lot of the observed changes in status and trends in biodiversity are not the result of measures taken to implement the NBSAP. They are more the result of factors which militate against our ability to mainstream biodiversity issues into our sectoral plans, programmes; We certainly have the policies but a lot of these are not felt at the level where they are mostly needed**.**

ii) Whether the current NBSAP is adequate to address the threats to biodiversity?
The current NBSAP has been found inadequate to address the threats to biodiversity. This is the reason why an attempt has been made to revise the document altogether.

iii) How may the implementation of the NBSAPs be improved, where necessary, including suggestions of possible ways and means to overcome identified obstacles?
In our current thinking, all the issues that prevented the full implementation of the NBSAP should be analyzed objectively with the full participation of all stakeholders, including the key representatives of the sectors of the Ghanaian economy. It is believed that this approach will enable the acceptance and adoption of the concept of sectoral mainstreaming of issues of biodiversity and ecosystem services for human well-being into national or local plans, policies and programmes

2.8 What are the specific information requested in COP 8 decisions and how have these been addressed ?

VIII/5 (Article 8(j))

Para 2. *Invites* Parties to submit through their national reports, if appropriate, to the Executive Secretary, reports on progress in achieving national participation of indigenous and local communities, and associated capacity-building, and *requests* the Executive Secretary to compile these submissions and, as appropriate and with the assistance of Parties and of indigenous and local communities, prepare a statistical report thereon identifying, *inter alia,* participation in different bodies of the Convention, participation from different countries/continents, participation in government delegations as well as outside of government delegations, and those funded by voluntary mechanisms;

Question: Is there evidence that local communities participate in activities of biodiversity conservation and sustainable use?

Answer: there is evidence of the involvement of local communities in activities of biodiversity conservation and sustainable use. Refer to :

VIII/21 (Marine and coastal – deep seabed)

Para 3. *Concerned* about the threats to genetic resources in the deep seabed beyond national jurisdiction, *requests* Parties and *urges* other States, having identified activities and processes under their jurisdiction and control which may have significant adverse impacts on deep seabed ecosystems and species in these areas, as requested in paragraph 56 of decision VII/5, to take measures to urgently manage such practices in vulnerable deep seabed ecosystems with a view to the conservation and sustainable use of resources, and report on measures taken as part of the national reporting process**;**

Question: What activities and processes take place in our marine and coastal areas that have significant negative or adverse impacts on deep seabed ecosystem and species?

Are you aware of any actions taken to curb it? Have you any information on some of the effects these have on human well being?

Answer: One major activity that has captured government attention after several complaints from artisanal fishers is the case of pair trawling on Ghanaian coastal waters. This has received a lot of attention in the national media.
There is a ban on this activity of pair trawling and government has engaged the services of the Ghana Navy to enforce the ban and arrest offenders for punitive measure.

The effect of pair trawling has depleted fish stocks available to Ghanaian fishers and destroyed many fish habitats. The result is reduction in livelihoods of the fishers and their dependants.

VIII/22 (Marine and coastal – IMCAM)

Para 5. *Requests* Parties, in the course of reporting on implementation of the marine and coastal programme of work**,** to report on measures taken to enhance implementation of Integrated Marine and Coastal Area Management in their national reports, where relevant;

Question: Is Ghana undertaking any measures to enhance implementation of IMCAM? Are there any successes?

Answer: The measures taken by Ghana are ecosystem wide in the sense that the 16 countries in West and Central Africa that border the shoreline of the Gulf of Guinea have agreed on a regional plan to enhance IMCAM which is expected to be implemented by each country. Ghana has taken serious note of these measures which are being fully implemented.

VIII/24 (Protected areas)

Para 4. *Urges* Parties, other Governments and multilateral funding bodies to provide the necessary financial support to developing countries, in particular the least developed and small island developing States, as well as countries with economies in transition, taking into account Article 20 and Article 8 (m) of the Convention to enable them to build capacity and implement the programme of work and undertake the reporting required, including national reports under the Convention on Biological Diversity, to enable the review of implementation of the programme of work on protected areas in line with goal 2.2 of the programme of work.

Question: What levels of funding has Ghana received or about to receive to undertake these tasks?

Answer: Ghana has received over 80% of funds to undertake a comprehensive management of her protected areas.

VIII/28 (Impact assessment)

Para 5. *Urges* Parties, other Governments and relevant organizations to apply the voluntary guidelines on biodiversity-inclusive environmental impact assessment as appropriate in the context of their implementation of paragraph 1 (a) of Article 14 of the Convention and of target 5.1 of the provisional framework of goals and targets for assessing progress towards 2010 and to share their experience, *inter alia*, through the clearing-house mechanism and national reporting;

Question: What are the current thoughts in use of EIAs and SEAs in Ghana's planning processes?

Answer: EIAs and SEAs are effective tools that Ghana utilizes to control development and planning processes. The tools have been shared with the Convention through the CHM. In this report, aspects of it, especially to improve upon it for biodiversity conservation and ecosystem services, has been highlighted.

CHAPTER THREE

3.0 Sectoral and cross-sectoral integration or mainstreaming of biodiversity considerations.

3.1 Information concerning the extent to which biodiversity is included in environmental impact assessments and strategic environmental assessments undertaken at various levels.

There are two recognized sectors that operate in the Ghanaian economy. These are the private and public sectors. The private sector may be organised into the formal and informal. It is easy to deal with the former because of their organizational structure. Difficulties in biodiversity management usually stems from the informal private sector. However when this group is adequately sensitized the success rate in management is very high. It is usually at this level that NGOs and other civil society tend to increase their presence in the sphere of biodiversity management. The public sector is mainly formal, developing and promoting policies, plans and programmes which eventually, among others, promote management of biodiversity and genetic resources through Forestry, Fisheries, Crops and Livestock including poultry sub-sectors.

Within Ghana, there is a national programme called 'Coordinated Programme for Economic and Social Development of Ghana (2003-2012) which spells out strategies and enablers for accelerated growth for Ghana from 2003-2012. The document identifies science and technology research and development as among the enablers for accelerated growth and productivity of all sectors of the economy. Strategies for achieving the objectives within which issues of biodiversity conservation are covered are:

a) the promotion of science and technology activities that would facilitate conservation and sustainable utilisation and management of natural resources in support of national development through the promotion of research and measures to protect and conserve biological diversity;
b) the promotion and the enhancement and maintenance of the quality of the environment and the integration of environmental concerns into all development

policies by developing the capacity to monitor, predict and mitigate the adverse problems such as alien species colonisation.

It is against this background that activities to implement many of the international obligations stemming from such conventions as the UN Convention on Biological Diversity, the UN Framework on Convention on Climate Change, the UN Convention to Combat Desertification and the other biodiversity related and environmental agreements, take their root.

It should not have been a problem if this is taken seriously at the planning stages within the responsible ministries, departments and agencies as they conceive of activities for these projects and programmes.

3.2 A description of the extent to which biodiversity has been integrated into sectoral and cross-sectoral strategies and plans, providing concrete examples.

3.2.1 Forestry

Forestry sub-sector covers conservation, utilization, and resource mobilization.

(a) Policies for forestry

(i) The 1994 Forest and Wildlife Policies were established to take care of Wildlife Conservation and Resource Mobilizations.

(ii) Wildfire Policy

(iii) National Bio-safety in biotechnology Guidelines.

(b) Plans and Programmes for Forestry

(i) Northern Savanna Biodiversity which involved Ministry of Food and Agriculture, Forest Services Division and Environmental Protection Agency.

(ii) High Forest Biodiversity Conservation Project (HFBCP) which was established in 1998. Wildfire Management Project which was established in 2003Natural Resources and Environmental Programme which is established to run for 5 yrs.

(iii) Forest Protection Strategy, is the master plan from which all forest related policies, plans and programmes are derived.

The Forestry Commission is the foremost institution of state with a specific mandate to manage and develop the forest heritage of Ghana for the optimal sustainable flow of benefits to all segments of the Ghanaian society. In other words, the FC is the legal entity in Ghana responsible for the protection and management of the wild lands of Ghana and by implication and in consultation with other key stakeholders including traditional rulers and the public, hold the key to the effective implementation of the three objectives of the UN Convention on Biological Diversity which include the conservation, the sustainable use of biological diversity and the fair and equitable share of benefits arising from the use or utilization of genetic resources.

The current number of forest reserves (291) and wildlife protected areas (15) occupy more than 38,000 sq km (i.e. about 16% of the total land area of Ghana) and these constitute the permanent forest estate of Ghana which is under the control and watchful eyes of the Forestry Commission.

3.2.2 Fisheries

(a) Policies Available

There is a provision in the Fisheries ACT, 2002 which refers to the Management of Aquatic Ecosystem. The ACT makes provision for the type of fishing gear to use. (ii) There is a policy for Aqua-Culture which protects biodiversity and does not allow the importation of exotic species of fishes. There is enactment of bye laws which regulate small Scale fishing.

(b) Plans and Programmes – Impacts on the Environment

Aqua-culture is being practiced on the Volta Lake. A permit has been granted by EPA to practise aqua-culture and monitor the quality of the water from time to time but they have flouted this condition. During the assessment EPA did not take into consideration the carrying capacity of the lake. It is therefore being envisaged that the carrying capacity of the lake would be exceeded. Again, high tonnes of fishing feeds are being deposited into the lake to feed the fish. This is likely to enhance eutrophication leading to the depletion of available oxygen in the lake.

3.2.3 Livestock

Information on livestock policy is scanty and a recommendation has been made for the Ministry of Food and Agriculture to make these available in the revision of the strategy and action plan

3.2.4 Crops

The following information on Policies on crops are available:

(a) MoFA is very much interested in utilizing aspects of Genetic Modifications into the country's agriculture and has supported the development of guidelines for biosafety in biotechnology. However, these guidelines have not yet been approved by the Ghanaian parliament. It is expected that the current sitting parliament will look at the guidelines and make the necessary approval so that the recommendations can be utilized at the national level.

(ii) Another Policy is the Food and Agriculture Sustainability Development project (FASDEP) I and II. These are meant to support the Ghanaian Growth and Poverty Reduction Strategy (GPRS) for food security and poverty reduction through improved livelihood situations.

3.2.5 Obstacles to these policies

(i) Lack of Monitoring and compliance.
(ii) Scanty information available
(iii) The use of agrochemicals in farming
(iv) Eating habits of the people.

..

3.3 A description of the process(es) by which biodiversity has been integrated into these sectoral and cross-sectoral strategies and plans. This should include a description of measures taken by relevant government departments, levels of government (from national to local) and other stakeholders for achieving the objectives of the Convention, including:

i) Mechanisms or arrangements put in place to ensure that implementation of these strategies and plans will avoid or minimize adverse impacts on biodiversity or contribute to the objectives of the Convention; and

ii) The use of any positive incentives and removal of perverse incentives

The Activities of the Forest Services Division of the FC illustrate the process.
The forest protection strategy developed in the early 1990s from the time of the revised Forest and Wildlife Policy of 1994 and the emergence of the UN Convention on Biological Diversity, prescribes fine-grain to large-grain measures for the protection of forest flora and these are incorporated into management planning for all forest reserves.
All forest reserves are managed by the FSD.
The following actions have been ongoing:

a) Capacity building
b) Re-demarcation and pillaring of Globally Significant Biodiversity Areas (GSBAs) and Provenance Protection Areas (PPAs)
c) Legal descriptions and protection of GSBAs
d) Community Participation in Forest management in which over 150 community Biodiversity Advisory Groups have been established
e) Alternative livelihoods in which an amount of US$ 2.5 millions have been invested in a micro-finance scheme called Alternative Livelihood Investment Fund, for ecologically friendly livelihood programmes for forest-fringe communities. About 1200 persons have benefited from the scheme to date.
f) Extensive faunal and floral surveys have been carried out in the GSBAs to beef up field data on species composition.
g) A Wildfire management project has dispensed/invested a lot of resources to build the capacity of the Division for effective fire management, including fire prevention, early fire detection and fire fighting at the forest-community level. A large fleet of fire fighting equipment was out-doored last Thursday 30 October 2008

   In-situ targeted action at Endangered/threatened species eg. Primates, *Talbotiella gentii*.

   Under the High Forest and Northern Savanna Biodiversity Conservation Projects, a study was commissioned on primates towards the development of a survival plan. This was completed in 2006 and currently being implemented. A conservation plan has also been developed and implemented for the endemic plant species, *Talbotiella gentii*

   .
h) Awareness creation. Numerous awareness creation programmes using various formats such as drama, open discussion, forums and community durbars have been organized in the communities. Posters and information leaflets on biodiversity have also been employed.

The near absence of standardized procedures and guidelines to govern the exploitation of non timber forest products (ntfps) is a worrying area for the FSD as the availability of these resources in areas outside the forest reserves is increasingly becoming part of the history of Ghana. This is in direct reference to the Forest and Wildlife policy which guarantees…' the right of people to have access to natural resources for maintaining a basic standard of living and their concomitant responsibility to ensure the sustainable use of such resources'

3.4 A description of whether and how the ecosystem approach has been adopted and employed in mainstreaming biodiversity into sectoral and cross-sectoral strategies, plans and programmes.

The activities of the Wildlife Division of FC illustrate this.
The division has been pre-occupied with the promotion of the Protected Area The division has been pre-occupied with the promotion of the Protected Area Development Project (PADP). The first phase of the project PADP-I made significant contributions towards enhanced conservation of biodiversity. Under this phase, management plans for Ankasa and Bia PAs were prepared and limited infrastructure for conservation activities and tourism were developed. The community based programme called Community Resource Management Areas (CREMA) was piloted to improve the natural resource management capacity of fringe communities in off-reserve wildlife conservation.
The second phase of the project PADP-II has been planned and it will build on the results and work done under PADP-I. An elaborate listing of indicators and their sources of verification have been given in a comprehensive logical framework. The second phase is designed to, inter alia:

a) implement management plans for Ankasa and Bia PAs
b) improve services of WD and District Assemblies and build capacities
c) develop appropriate ecotourism attractions and facilities
d) establish sustainable livelihoods for populations adjacent to reserve through alternative natural resource use systems and income generating activities
e) establish participatory institutional structures peripheral to each area within the programme
f) improve conservation and management of natural resources within GSBAs , through the development of joint management procedures between WD and FSD for the GSBAs adjoining Bia PA and Krokosua Hill Forest Reserve. This particular activity will ensure coherence in future planning for the GSBAs.
g) control illegal activities within Pas
h) support conservation education programme

Another programme that has engaged the WD has been the Kyabobo Area Natural resources Development Plan (KANRDP). This was started in 2002 and designed to complete in five years but was extended and ended on 30 June 2008. The ultimate goal of KANRDP was to effectively conserve and manage Kyabobo National Park as part of a national/sub-regional system of Pas, conserve Ghana's biodiversity, reduce poverty and contribute to the well-being of women and men in local communities and other stakeholders.

The main outputs of the programme are:

a) adequate, well-trained WD staff effectively deployed
b) management plan formulated and implemented
c) adequate infrastructure in place and well maintained
d) tourist attractions in the Kyabobo Area identified, the appropriate supporting facilities in place and marketing and publicity provided for
e) cordial relationship with Togolese counterparts for trans-boundary management established
f) participation of rural communities adjacent to the park in natural resources and environmental management enhanced
g) relationships with clear agreements between the relevant stakeholders defined and respected and a Kyabobo Area Management Advisory Board established
h) viable additional economic activities for communities facilitated

3.5 Information concerning the extent to which biodiversity is included in environmental impact assessments and strategic environmental assessments undertaken at various levels.

No development project can take place in Ghana without an environmental impact assessment (EIA). Consequently some aspects of information on Biodiversity are included in the environment impact assessments. However the information to be captured are not adequate. The EIA application forms that are used, do not elaborate extensively on the kind of information on biodiversity that will indicate status and trends.

It is recommended that the basic EIA form should capture extensive information on Biodiversity including derivation of ecosystem services as well as ecosystem goods.

A strategic environmental assessment (SEA) was used to capture environmental issues in the national Growth and Poverty Reduction Strategy (GPRS) document. A copy of this was sent to the CBD secretariat as case study for the CHM.

Ghana has recently hit oil deposit on its western coastal shoreline and in doing the EIA for the drilling of this oil (discovered at Cape Three Points) an extensive SEA should be carried out to ensure that the biodiversity in the area are protected

3.6 An analysis of the outcomes achieved through implementation of these measures, in particular in terms of observed changes in the status and trends of important biodiversity components, and the extent to which these measures contribute to the implementation of NBSAPs.

As far as the protected areas are concerned, very little changes have taken place in the status and trends of important biodiversity components. Where significant changes have taken place are in some forest reserves and most of the off-reserve areas. As indicated in the priority activities suggested for the biodiversity strategy, several efforts are ongoing to ensure the three objectives of the Convention.

3.7 A description of whether and how the ecosystem approach has been adopted and employed in mainstreaming biodiversity into sectoral and cross-sectoral strategies, plans and programmes.

Ecosystem approach has been used in many forest and agricultural biodiversity programmes, without necessarily referring to it as such. The examples are more obvious in the management schedules adopted for the protected areas.

Obstacles to integrate biodiversity concerns into policies, plans and programmes

The following were identified.

(i) Decision making processes are not decentralized.

(ii) Lack of extension officers and logistics at the local level.

(iii) Biodiversity conservation is not seen to support economies of scale therefore investors tend to prefer mono-culture practices

CHAPTER FOUR

4.1 Progress Towards the 2010 Target and Implementation of the Strategic Plan

4.1 1 Progress towards the 2010 Biodiversity Target at the national level

The assessment of the progress has been based on the questionnaire titled **"***Provisional framework of goals, targets and indicators to assess progress towards the 2010 Biodiversity Target"* the result of which is reproduced below

Protection of Biodiversity Components

1. Conservation of biodiversity of ecosystems, habitats and biomes: The targets are to get at least 10% of such areas conserved; and areas of particular importance to biodiversity protected **:**

   Question: what % of total land area of Ghana is under PA?; how much is under plantations (cocoa, sheanut trees, others)?; how much is cultivated for agriculture, etc.? Do these reach the target? Develop indicators.

   Answer: *Over 15% of the total land area of Ghana is under some form of protection. Another 20 to 30% or more of the total land area is under plantation of predominantly cash and food crops. Thus Ghana contributes to the global target of at least 10% of total land area consisting of ecosystems and different habitats conserved.*

2. Conservation of species diversity: The targets are Restore, maintain, or reduce the decline of populations of species of selected taxonomic groups and the Status of threatened species improved.

   Question*: what efforts are in place to restore, maintain or reduce the decline of populations of wild fauna and flora of selected taxonomic groups?; are there any evidences of threatened species and what are their conservation status? Do these give an insight into reaching the target? Provide an indicator.*

   Answer: *There is designation of Pas to ensure protection of wild species of plants and fauna. This is ecosystem wide application sometimes with the intention to protect certain species of wild fauna. There are evidences of some species being threatened. The conservation status of many of these species have been determined. The indicator is the sighting of these species in the screens of the WD cameras.*

3. Conservation of genetic diversity: The target is Genetic diversity of crops, livestock, and of harvested species of trees, fish and wildlife and other valuable species conserved, and associated indigenous and local knowledge maintained.

> ***Question****: what is the status of agricultural crops, livestock diversity? What about commonly harvested species, (including plants, fish, wildlife bush meat), their diversity, use, abundance and distribution. Are the targets reached? Provide indicators.*
>
> ***Answer:*** *genetic resources of some agricultural crops and livestock are under severe pressure of erosion. These are stocks of crop plants and animals that are not often used for food because of the easy availability of some improved varieties. This is however not the case with those that are commonly harvested. These ones continue to be available all the time. The targets are reached and the indicators are the continued scarcity of little used genetic resources and the abundance of those commonly used.*

4.1.2 Promotion of sustainable use

1. Sustainable use promoted and biodiversity consumed. The targets are Biodiversity-based products derived from sources that are sustainably managed, and production areas managed consistent with the conservation of biodiversity; Unsustainable consumption, of biological resources, or that impacts upon biodiversity, reduced; and No species of wild flora or fauna endangered by international trade.

> ***Question****: Are these targets achieved? Explain. Provide indicators*
>
> ***Answer:*** *In a lot of products, harvesting have not been made from sustainable sources. There is severe pressure on wild species of plants and animals leading to scarcity and in some cases evidences of threat to extinction. The target is therefore not achieved. The indicators to this are that the businesses of workmen and traders who depend on these items for their livelihoods are often found without the raw materials for their activities.*

4.1.3 Threats to Biodiversity

1. Pressure from habitat loss, land use change and degradation: The target is Rate of loss and degradation of natural habitats decreased.

> ***Question:*** *Is this target achieved? Explain. Provide an indicator.*

Answer: *The pressure is increasing as a result of several social and economic factors. There is a difficulty to reach the target. Degraded landscape is an indicator.*

2. Control of threats from IAS: The targets are Pathways for major potential alien invasive species controlled; Management plans in place for major alien species that threaten ecosystems, habitats or species.

   Question*: Are these targets achieved? Explain. Provide an indicator*

   Answer: *These targets are being achieved. There is a major programme to deal with all aspects of IAS. The indicator is that IAS is under control.*

3. Address challenges to biodiversity from climate change, and pollution. The targets are Maintain and enhance resilience of the components of biodiversity to adapt to climate change; and Reduce pollution and its impacts on biodiversity.

   Question: *Are these targets achieved? Explain. Provide an indicator.*

   Answer: *Adaptation measures are being taken seriously all over the place. Sources of pollution are also identified and removed.*

4.1.4 Maintenance of goods and services from biodiversity to support human wellbeing.

1. Maintenance of capacity of ecosystems to deliver goods and services. The targets are: Capacity of ecosystems to deliver goods and services maintained; and Biological resources that support sustainable livelihoods, local food security and health care, especially of poor people maintained.

   Question*: Are these targets achieved? Explain. Provide an indicator.*

   Answer: *Many Ghanaian ecosystems are being maintained to their carrying capacities. However, there are some serious encroachments that are disturbing the ecological balance. Part of this is from selfish individuals. The indicator is ensuring a proper policing of the ecosystems to allow them to provide their goods and services.*

4.1.5 Protection of Traditional knowledge, innovations and practices

1. Maintaining socio-cultural diversity of indigenous and local communities. The targets are: Protect traditional knowledge, innovations and practices; and protect the rights of indigenous and local communities over their traditional knowledge, innovations and practices, including their rights to benefit-sharing.

Question: Are these targets achieved? Explain. Provide an indicator**.**

Answer: *all aspects of traditional knowledge, innovations and practices are embodied in the national cultural aspirations. This signifies that there is provision for protection. What is challenging is the study, understanding, documentation and protection of these. The indicator therefore is the increase in the number of documented information under protection through a sui generis procedure.*

4.1.6 Ensuring the fair and equitable sharing of benefits arising out of the use of genetic resources.

1. Ensure fair and equitable sharing of benefits .The targets are :All access to genetic resources is in line with the Convention on Biological Diversity and its relevant provisions; and Benefits arising from the commercial and other utilization of genetic resources shared in a fair and equitable way with the countries providing such resources in line with the Convention on Biological Diversity and its relevant provisions.

Question*: Are these targets achieved? Explain. Provide indicators.*

Answer: *Guidelines to govern access to genetic resources and benefit sharing arrangements are in preparation. The indicator is that the guidelines are in print, approved by the legislative body and given adequate publicity through various forms of awareness creation.*

4.1.7 Ensuring provision of adequate resources

1. Ensure adequate resources. The targets are: New and additional financial resources are transferred to developing country Parties, to allow for the effective implementation of their commitments under the Convention, in accordance with Article 20; and Technology is transferred to developing country Parties, to allow for the effective implementation of their commitments under the Convention, in accordance with its Article 20, paragraph 4.

Question*: Are these targets achieved? Explain. Provide indicators.*

Answer: *External sources of funding continue to pour into the country to support different implementation schedules of sectoral activities, some of which have bearing on biodiversity. With new ideas emerging on how to mainstream biodiversity and ecosystem services into sectoral plans, programmes and policies, much of the funds should be directed to implementing Convention related activities in the National Biodiversity Strategy and Action Plans.*

The indicator is the development and implementation of the revised NBSAP.

4.2 Goals and objectives of the Strategic Plan and provisional indicators for assessing progress

(a) ***A brief description of national goals established to achieve the Strategic Plan's goals and objectives, where appropriate***;

The long-term goal of Ghana's strategy is to achieve the conservation and sustainable management of the country's biological diversity. This must be achieved throughout the whole country and within all representative ecological zones

The immediate objectives for achieving the goals are:

i) No species must be threatened with extinction

ii) Areas critical for the conservation of biodiversity must be properly conserved, with the4 active participation of all stakeholders

iii) The use of components of biodiversity must be in a sustainable manner, with due consideration being taken of the sharing of benefits arising from the use of these resources

iv) The public must be sensitized as to their rights and responsibilities

b) ***Information on the overall state of progress made towards these goals and objectives***.

In doing so, reference can be made to chapters II and III in which information has been provided on the assessment of the extent to which actions taken to implement the national biodiversity strategy and related sectoral and cross-sectoral plans have contributed to progress towards these goals and objectives, using relevant indicators as appropriate;

c) ***An analysis of obstacles encountered***;

The obstacles encountered in implementing the national biodiversity strategy have been variously described under lessons learned and analysis of the effectiveness of the National Biodiversity Strategy in chapter II and also under the various sectoral plans in forest, fisheries and crop policies in chapter III.

d) ***Progress at the national level towards the Goals and Objectives of the Strategic Plan of the Convention***

The progress is being assessed on the basis of national performance and implementation of the strategic plan at the national level.

Goal 1: The Convention is fulfilling its leadership role in international biodiversity issues

1.1 The Convention is setting the global biodiversity agenda.
Biodiversity issues are taken seriously at the national level. This is because of the people's dependency on it for their livelihoods. Ghana therefore fully supports the Convention role in the setting of global biodiversity agenda

1.2 The Convention is promoting cooperation between all relevant international instruments and processes to enhance policy coherence.
At the national level this objective is fully supported in our current approach to underscore synergies as a way to make impact on project and programme implementations.

1.3 Other international processes are actively supporting implementation of the Convention, in a manner consistent with their respective frameworks.
This is noticed in local implementation of activities of UNFCCC, UNCCD, the Ramsar Convention, CITES, CMS and other environment and biodiversity-related agreements

1.4 The Cartagena Protocol on Biosafety is widely implemented.
Plans are in place to implement the provisions of the protocol.

1.5 Biodiversity concerns are being integrated into relevant sectoral or cross-sectoral plans, programmes and policies at the regional and global levels.
This is being vigorously pursued at the national level and some modest achievements have been made in some sectors.

Parties are collaborating at the regional and sub-regional levels to implement the Convention.
From the Ghanaian perspective, the signing of the NEPAD programme on development in particular of its reference to the African environment, the ECOWAS protocol especially on the environment and the implementation of the Guinea Current Large Marine Ecosystem (GCLME) and several other joint projects serviced by GEF and implemented by the development agencies including UNEP, UNDP, UNIDO and the World Bank are evidence of desire to collaborate at the regional and sub-regional levels.

Goal 2: Parties have improved financial, human, scientific, technical, and technological capacity to implement the Convention

2.1 *All Parties have adequate capacity for implementation of priority actions in national biodiversity strategy and action plans*. ***Some levels of capacities exist in Ghana.***

2.2 *Developing country Parties, in particular the least developed and the small island developing States amongst them, and other Parties with economies in transition, have sufficient resources available to implement the three objectives of the Convention*. ***This is an area that creates a challenge because of very meagre amount allocated for the implementation of the Convention at the national level. Much has been achieved through foreign financial assistance****.*

2.3 *Developing country Parties, in particular the least developed and the small island developing States amongst them, and other Parties with economies in transition, have increased resources and technology transfer available to implement the Cartagena Protocol on Biosafety.*
This is yet to be realised as the full implementation of the Protocol is dependent on the legal outlay for it which is currently being awaited*.*

2.4 *All Parties have adequate capacity to implement the Cartagena Protocol on Biosafety.* ***Through a national sensitization effort some level of capacity has been prepared to undertake implementation.***

2.5 *Technical and scientific cooperation is making a significant contribution to building capacity.* ***Ghana is poised in the years to come to receive technical and scientific cooperation to build capacities. This is reflected in the level of cooperation the country has established with many countries including development partners and other international organizations.***

Goal 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

Every Party has effective national strategies, plans and programmes in place to provide a national framework for implementing the three objectives of the Convention and to set clear national priorities.

Ghana has undergone an initial level of developing appropriate strategies, plans and programmes. These are being considered strongly to be incorporated into national life*.*

*3.2 Every Party to the Cartagena Protocol on Biosafety has a regulatory framework in place and functioning to implement the Protocol****. Ghana has developed a regulatory framework which is presently being considered for provision of the necessary legal backing.***

3.3 Biodiversity concerns are being integrated into relevant national sectoral and cross-sectoral plans, programmes and policies. ***To a very large extent, this is being pursued in Ghana.***

3.4 The priorities in national biodiversity strategies and action plans are being actively implemented, as a means to achieve national implementation of the Convention, and as a significant contribution towards the global biodiversity agenda.

Many of the action plans are actively implemented. With the desire to revise the strategy document and incorporate the necessary action plans, the achievement of this objective is only a matter of time.

Goal 4: There is a better understanding of the importance of biodiversity and of the Convention, and this has led to broader engagement across society in implementation.

4.1 *All Parties are implementing a communication, education, and public awareness strategy and promoting public participation in support of the Convention.* ***Some efforts are underway to ensure that this is achieved.***

4.2 Every Party to the Cartagena Protocol on Biosafety is promoting and facilitating public awareness, education and participation in support of the Protocol. ***This objective is part of the package of the national implementation schedule and will be vigorously pursued when due.***

4.3 Indigenous and local communities are effectively involved in implementation and in the processes of the Convention, at national, regional and international levels. ***The implementation of this objective is ongoing in Ghana.***

4.4 Key actors and stakeholders, including the private sector, are engaged in partnership to implement the Convention and are integrating biodiversity concerns into their relevant sectoral and cross-sectoral plans, programmes and policies.

This is one key objective which has seen some levels of success which are slightly encouraging, though more efforts are required to ensure an absolute integration

4.3 Conclusions:

(a) **An overall assessment of whether the implementation of the Convention has had an impact on improving conservation and sustainable use of biodiversity, and the fair and equitable sharing of benefits arising out of the utilization of genetic resources, in their country** ;

Yes, the overall assessment of whether the implementation of the Convention has had an impact. The assessment has enabled the implementers of the Convention in Ghana, notably the Ministry responsible for environment under whose mandate this falls, to fully understand their limitations to enable it to develop ways to mainstream biodiversity in all the sectors of the Ghanaian economy and to fully engage all stakeholders.

(b) ***An analysis of lessons learned regarding implementation, highlighting examples of successful and less successful actions taken***;

There is evidence of good intentions for the actions taken. The success stories need to be amplified and communicated as part of package for education and awareness raising, so that those actions which were not taken and or frustrated in implementation can be fully taken on board in the future.

(c) ***A summary of future priorities and capacity-building needs for further national-level implementation of the Convention***;

High priorities have been identified for actions on protected areas, off-reserve areas and other parts of the country that need conservation actions and special attention. For capacity needs, there is no end as new people have to be trained all the time and new equipment including infrastructure become necessary.

(d) ***Suggestions for actions that need to be taken at the regional and global levels to further enhance implementation of the Convention at the national level, including:***

i) refining existing programmes of work or developing new ones to address emerging issues;

There are several programmes of work that need synergistic approach to enhance proper utilization of resources

ii*) suggesting goals and objectives that may be included in the future Strategic Plan of the Convention*;

Since the current pre-occupation of the Convention is focused on the biodiversity 2010 target and there are efforts to look beyond this, perhaps the suggested goal could be to consider events beyond 2010 to 2016 to reflect an outcome of the 2015 MDG implementation, and;

iii) ***identifying mechanisms that need to be established at various levels***.

There are mechanisms in place which will need to be fully utilized and there will be no need to establish new ones which may complicate the existing ones.

In conclusion, the following can be stated:

a) That the activities listed in the Strategy document cover all the thematic areas of the Convention, from Agricultural Biodiversity, through Dry and Sub-humid biodiversity, Forest biodiversity, Inland Water biodiversity, Marine and Coastal biodiversity to Protected Areas. The activities also cover issues of Invasive Alien Species.

b) That the progress or successes listed above in Chapter II attest to this. A lot of the observed changes in status and trends in biodiversity are not the result of measures taken to implement the NBSAP. They are more the result of factors which militate against our ability to mainstream biodiversity issues into our sectoral plans and programmes; We certainly have the policies but a lot of these are not felt at the level where they are mostly needed**.**

c) That the current NBSAP has been found inadequate to address the threats to biodiversity. This is the reason why an attempt has been made to revise the document altogether.

d) that in our current thinking, all the issues that prevented the full implementation of the NBSAP can be analyzed objectively with the full participation of all stakeholders, including the key representatives of the sectors of the Ghanaian economy.
It is believed that this approach will enable the acceptance and adoption of the concept of sectoral mainstreaming of issues of biodiversity and ecosystem services for human well-being into national or local plans, policies and programmes

e) It is noted that the targets and indicators adopted under the Convention have not been incorporated into the NBSAPs. Since the Strategy document is currently under review, the targets and indicators will be incorporated.

That there is evidence of progress made in the implementation of priority activities indicated in the Strategic Plan which has been recounted under chapter II under the implementation of the NBSAP.

It has been established that about 80% of funds for work on main/priority activity areas have been provided from international sources and these funds have been applied accordingly.

That reference can be made of a number of progress cited above on the nature of obstacles and successes in the NBSAP implementation. However, for obstacles, there have been a number of challenges and many of these take root from the basic misunderstanding of conservation and sustainable use of biodiversity. The lack of ability to use cost benefit analysis to convince or make a case for biodiversity has often led to land use changes which are not in the interest of biodiversity conservation.

Additionally, the following lessons have been learned:

i. that there is need for proper coordination of all sectoral activities

ii. that the status of the National Biodiversity Committee need to be seriously considered. That there is a strong feeling for it to be made autonomous with its source of funding.

iii. that very high and wide publicity should be given to the Strategy and Action plan document which is being revised

Also, since levels of quantitative information and documentation on ecosystems and their components have been found to be varied, it is necessary to ensure that adequate efforts are made to collect and document these. This effort will help provide basis for assessment for status and trends. In such disciplines as invertebrate zoology and soil and water microbiology (involving micro-organisms) where information is either scanty or completely lacking, special attention will need to be made.

APPENDICES

Appendix I - Information concerning reporting Party and preparation of national report

A. Reporting Party

Contracting Party	GHANA
NATIONAL FOCAL POINT	
Full name of the institution	**Ministry of Local Government, Rural Development and Environment**
Name and title of contact officer	**Mr D. A. Nyankamawu, Chief Director**
Mailing address	***P.O.Box MB 50***
Telephone	***+233-21-682002***
Fax	
E-mail	
CONTACT OFFICER FOR NATIONAL REPORT (IF DIFFERENT FROM ABOVE)	
Full name of the institution	**Ministry of Environment, Science and Technology**
Name and title of contact officer	***Mr. Eric A. Okoree, Assistant Director***
Mailing address	***P.O.Box MB 232***
Telephone	***+233-21-662264/***
Fax	***+233-21-666828***
E-mail	***eriokor@yahoo.com***
SUBMISSION	
Signature of officer responsible for submitting national report	
Date of submission	

Appendix II- Process of preparation of national report

Please provide information on the process used to prepare this report, including information on stakeholders involved and material used as a basis for the report.
The process involved two steps

a) identification of consultant to prepare draft documents.
b) national consultation involving various stakeholders at a workshop

The following documentation were used for the workshop:

i) Questionnaires for preparing the 4th National Report to the CBD was provided by consultant
ii) Search for existing biodiversity information

Questionnaires:

The following questionnaires were used:

I. Overview of biodiversity Status, Trends and Threats

1. **What is the overall picture of biodiversity status, trends and its implications on human wellbeing in Ghana? Use the major biomes or ecosystem types in Ghana eg. Agricultural ecosystem, Forests, Inland waters, Marine and Coastal areas, Dry and sub-humid lands, Islands and Mountain ecosystems to answer this question.**
2. **What kind of trends (ie. Changes in status) are obvious in these ecosystems?**
3. **What are the main threats (Direct/causes of change) to biodiversity in these ecosystems?**
4. **What kind of implications are obvious from changes in biodiversity status on human wellbeing in Ghana?**
5. **Are there any quantitative information and data available to illustrate the changes in status and trends of biodiversity in Ghana?**

II. Current Status of NBSAPs

1. **What are the main or priority activities of the NBSAPs?**
2. **Have targets and indicators (both global and national) adopted under the convention been incorporated into the NBSAPs?**
3. **How have activities under the NBSAPs contributed to the implementation of the articles of the Convention and the thematic programmes and cross cutting issues?**
4. **Focusing on concrete results what kinds of progress have been made in the implementation of priority activities or actions?**
5. **To what extent have domestic and or international funding been dedicated to priority activities?**

6. **What kinds of successes and obstacles have been encountered in the implementation of the NBSAP?**
7. **What sorts of lessons have been learned?**
8. In an analysis of the effectiveness of the NBSAP, explain the following**: whether the observed changes in status and trends in biodiversity are a result of measures taken to implement NBSAP; whether the current NBSAP is adequate to address the threats to biodiversity; how the implementation of the NBSAPs may be improved, where necessary, including suggestions of possible ways and means to overcome identified obstacles?**
9. **What are the specific information requested in COP 8 decisions and how have these been addressed?**

III. Sectoral programmes

The Sectors of the Ghanaian economy

1. **Which sectors operate in the Ghanaian economy?**
2. **What kinds of policies, plans and programmes do these sectors undertake?**
3. **How do these policies, plans and programmes impact on the environment?**
4. **Are there any specific considerations for biodiversity in the policies, plans and programmes?**
5. **What obstacles are there to integrate biodiversity concerns in the policies, plans and programmes?**

National and Sub-national Strategies and Programmes

(GPRS, MDGs, National Sustainable Development Plans, Action Programmes to combat desertification). For each of these national strategies and programmes, indicate:

1. **whether the strategy and programme has environment or biodiversity focus?**
2. **how issues of environment or biodiversity are captured?**
3. **whether there are any evidences of success in the implementation of these environment/ biodiversity issues?**
4. **what kinds of obstacles prevent focus on environment/ biodiversity?**
5. **what mechanisms/ arrangements are in place to ensure that implementation of these strategies and plans avoid or minimize adverse impacts on biodiversity?**
6. **whether there are any use of positive incentives and removal of perverse incentives?**
7. **whether the strategy and programme encourages integration with sectors and the other biodiversity-related conventions (CITES, CMS, Ramsar, WHC) and the Rio Conventions (UNFCCC, UNCCD)?**

The Ecosystem Approach

1. **Has this approach been adopted and employed in mainstreaming biodiversity into the nation's sectoral/ cross sectoral strategies, plans and programmes? Yes/ No?**
2. **If Yes, how has it been adopted and employed?**
3. **If No, what have been the obstacles?**

Environmental Impact Assessment and Strategic Environmental Assessment

1. **Are information on biodiversity included in EIA procedures? Yes/ No?**
2. **If Yes, how is it captured?**
3. **If No, how can it be introduced?**
4. **Are information on biodiversity included in SEA procedures? Yes/ No?**
5. **If Yes, how is it captured?**
6. **If No, how can it be introduced?**

Analysis:

1. **What kind of outcomes, in terms of observed changes in the status and trends of important biodiversity components, are seen to be achieved through the implementation of these measures including the processes of integration of policies, plans and programmes, the EIAs and SEAs as well as the Ecosystem approach? Any indicators?**
2. **To what extent do these measures contribute to the implementation of the NBSAPs? Provide indicator**

IV. Provisional framework of goals, targets and indicators to assess progress towards the 2010 Biodiversity Target

Protection of Biodiversity Components

4. conservation of biodiversity of ecosystems, habitats and biomes: The targets are to get at least 10% of such areas conserved; and areas of Areas of particular importance to biodiversity protected **: what % of total land area of Ghana is under PA?; how much is under plantations (cocoa, sheanut trees, others)?; how much is cultivated for agriculture, etc.? Do these reach the target? Develop indicators.**
5. conservation of species diversity: The targets are Restore, maintain, or reduce the decline of populations of species of selected taxonomic groups and the Status of threatened species improved. what efforts are in place to restore, maintain or reduce the decline of populations of wild fauna and flora of selected taxonomic groups?; are there any evidences of threatened species and what are their conservation status? **Do these give an insight into reaching the target? Provide an indicator.**
6. conservation of genetic diversity: The target is Genetic diversity of crops, livestock, and of harvested species of trees, fish and wildlife and other valuable species conserved, and associated indigenous and local knowledge maintained: what is the status of agricultural crops, livestock diversity? What about commonly harvested species, (including plants, fish, wildlife bush meat), their diversity, use, abundance and distribution. **Are the targets reached? Provide indicators.**

Promotion of sustainable use

1. sustainable use promoted and biodiversity consumed. The targets are Biodiversity-based products derived from sources that are sustainably managed, and production areas managed consistent with the conservation of biodiversity; Unsustainable consumption, of biological resources, or that impacts upon biodiversity, reduced; and No species of wild flora or fauna endangered by international trade. **Are these targets achieved? Explain. Provide indicators**

Threats to Biodiversity

1. pressure from habitat loss, land use change and degradation: The target is Rate of loss and degradation of natural habitats decreased. **Is this target achieved? Explain. Provide an indicator.**

2. control of threats from IAS: The targets are Pathways for major potential alien invasive species controlled ; Management plans in place for major alien species that threaten ecosystems, habitats or species. **Are these targets achieved? Explain. Provide an indicator**

3. Address challenges to biodiversity from climate change, and pollution. The targets are Maintain and enhance resilience of the components of biodiversity to adapt to climate change; and Reduce pollution and its impacts on biodiversity. **Are these targets achieved? Explain. Provide an indicator.**

Maintenance of goods and services from biodiversity to support human wellbeing

1. maintenance of capacity of ecosystems to deliver goods and services. The targets are: Capacity of ecosystems to deliver goods and services maintained; and Biological resources that support sustainable livelihoods, local food security and health care, especially of poor people maintained. **Are these targets achieved? Explain. Provide an indicator.**

Protection of Traditional knowledge, innovations and practices

1. maintaining socio-cultural diversity of indigenous and local communities. The targets are: Protect traditional knowledge, innovations and practices; and Protect the rights of indigenous and local communities over their traditional knowledge, innovations and practices, including their rights to benefit-sharing. **Are these targets achieved? Explain. Provide an indicator.**

Ensuring the fair and equitable sharing of benefits arising out of the use of genetic resources.

1. ensure fair and equitable sharing of benefits .The targets are :All access to genetic resources is in line with the Convention on Biological Diversity and its relevant provisions; and Benefits arising from the commercial and other utilization of genetic resources shared in a fair and equitable way with the countries providing such resources in line with the Convention on Biological Diversity and its relevant provisions. **Are these targets achieved? Explain. Provide indicators.**

Ensuring provision of adequate resources

1. ensure adequate resources. The targets are: New and additional financial resources are transferred to developing country Parties, to allow for the effective

implementation of their commitments under the Convention, in accordance with Article 20; and Technology is transferred to developing country Parties, to allow for the effective implementation of their commitments under the Convention, in accordance with its Article 20, paragraph 4. **Are these targets achieved? Explain. Provide indicators.**

V Progress towards Goals and Targets of POW on Protected Areas

Goal 1.1. To establish and strengthen national and regional systems of protected areas integrated into a global network as a contribution to globally agreed goals. Target: By 2010, terrestrially 1/ and 2012 in the marine area, a global network of comprehensive, representative and effectively managed national and regional protected area system is established as a contribution to (i) the goal of the Strategic Plan of the Convention and the World Summit on Sustainable Development of achieving a significant reduction in the rate of biodiversity loss by 2010; (ii) the Millennium Development Goals – particularly goal 7 on ensuring environmental sustainability; and (iii) the Global Strategy for Plant Conservation. **Question: Has Ghana developed and established a network of comprehensive representative and effectively managed national PA system? Yes/ No**

Goal 1.2. To integrate protected areas into broader land- and seascapes and sectors so as to maintain ecological structure and function. Target: By 2015, all protected areas and protected area systems are integrated into the wider land- and seascape, and relevant sectors, by applying the ecosystem approach and taking into account ecological connectivity 5/ and the concept, where appropriate, of ecological networks. **Question: Is ecosystem approach applied to maintain ecological structure and function? Yes/ No. If Yes, are there any successes or failures? If No, indicate any plans to get it done by 2015**.

Goal 1.3. To establish and strengthen regional networks, transboundary protected areas (TBPAs) and collaboration between neighbouring protected areas across national boundaries. Target: Establish and strengthen by 2010/2012 6/ transboundary protected areas, other forms of collaboration between neighbouring protected areas across national boundaries and regional networks, to enhance the conservation and sustainable use of biological diversity, implementing the ecosystem approach, and improving international cooperation. **Question: Are there any transboundary operations in place? Yes/ No. If yes, where are these and will these be operational by 2010 and 2012? If No, are there any obstacles?**

Goal 1.4. To substantially improve site-based protected area planning and management. Target: All protected areas to have effective management in existence by 2012, using participatory and science-based site planning processes that incorporate clear biodiversity objectives, targets, management strategies and monitoring programmes, drawing upon

1/ Terrestrial includes inland water ecosystems.

5/ The concept of connectivity may not be applicable to all Parties.

6/ References to marine protected area networks to be consistent with the target in the WSSD plan of implementation.

existing methodologies and a long-term management plan with active stakeholder involvement. **Question: Are there any site-based PA planning and management? Yes/ No. If Yes, are these in operation and who are responsible? Is there stakeholder involvement? Are there any biodiversity objectives, targets, management strategies, monitoring programmes in place? If No, are there any plans to get this done by 2012?**

Goal 1.5. To prevent and mitigate the negative impacts of key threats to protected areas. Target: By 2008, effective mechanisms for identifying and preventing, and/or mitigating the negative impacts of key threats to protected areas are in place. **Question: Have negative impacts of key threats to PA identified and prevented and/or mitigated? Yes/ No. If Yes, what are these key threats and their negative impacts. If No, what steps are being undertaken to overcome these?**

Goal 2.1. To promote equity and benefit-sharing. Target: Establish by 2008 mechanisms for the equitable sharing of both costs and benefits arising from the establishment and management of protected areas. **Question: Is there any established mechanisms for equitable sharing of both costs and benefits arising from the establishment and management of PAs**..

Goal 2.2. To enhance and secure involvement of indigenous and local communities and relevant stakeholders. Target: Establish by 2008 mechanisms for the equitable sharing of both costs and benefits arising from the establishment and management of protected areas. **Question: Is there full and effective participation of local communities? If Yes, how has this been achieved? If No, what obstacles are present?**

Goal 3.1. To provide an enabling policy, institutional and socio-economic environment for protected areas. Target: By 2008 review and revise policies as appropriate, including use of social and economic valuation and incentives, to provide a supportive enabling environment for more effective establishment and management of protected areas and protected areas systems. **Question: Has there been a review and a revision of policies including use of social and economic valuation and incentives to provide a supportive enabling environment for more effective establishment and management of PAs and PA systems? Yes/ No. If No, mention any obstacles.**

Goal 3.2. To build capacity for the planning, establishment and management of protected areas. Target: By 2010, comprehensive capacity-building programmes and initiatives are implemented to develop knowledge and skills at individual, community and institutional levels, and raise professional standards. **Question: Have there been any implementations of comprehensive capacity-building programmes and initiatives to develop knowledge and skills at individual, community and institutional levels and raise professional standards? Yes/ No. If Yes, is it likely to be operational by 2010. If No, mention any obstacles**.

Goal 3.3. To develop, apply and transfer appropriate technologies for protected areas. Target: By 2010 the development, validation, and transfer of appropriate technologies

and innovative approaches for the effective management of protected areas is substantially improved, taking into account decisions of the Conference of the Parties on technology transfer and cooperation. **Question: Have there been any attempts to develop, validate and transfer appropriate technologies and innovative approaches for the effective management of PAs? Yes/ No. If yes, is it likely to be operational by 2010? If no, mention obstacles**.

Goal 3.4. To ensure financial sustainability of protected areas and national and regional systems of protected areas. Target: By 2008, sufficient financial, technical and other resources to meet the costs to effectively implement and manage national and regional systems of protected areas are secured, including both from national and international sources, particularly to support the needs of developing countries and countries with economies in transition and small island developing States. **Question: Have sufficient financial, technical and other resources, both national and international, to meet the costs to effectively implement and manage national system of PAs been secured? Yes/ No. If yes, indicate these. If no, mention any obstacles**.

Goal 3.5. To strengthen communication,education and public awareness. Target: By 2008 public awareness, understanding and appreciation of the importance and benefits of protected areas is significantly increased. **Question: Have public awareness, understanding and appreciation of the importance and benefits of PAs significantly increased? Yes/ No. If yes, how? If No, why?**

Goal 4.1. To develop and adopt minimum standards and best practices for national and regional protected area systems. Target: By 2008, standards, criteria, and best practices for planning, selecting, establishing, managing and governance of national and regional systems of protected areas are developed and adopted. **Question: Have standards, criteria and best practices for planning, selecting, establishing, managing and governance of national system of PAs been developed and adopted? Yes/No. If yes, when? If No, any obstacles?**

Goal 4.2. To evaluate and improve the effectiveness of protected areas management. Target: By 2010**,** frameworks for monitoring, evaluating and reporting protected areas management effectiveness at sites, national and regional systems, and transboundary protected area levels adopted and implemented by Parties. **Question: Have processes for developing, adopting and implementing framework for monitoring, evaluating and reporting PAs management effectiveness at sites, national systems and transboundary PA level been started? Yes/ No. If yes, is it likely to be operational; by 2010? If No, any obstacles?**

Goal 4.3.To assess and monitor protected area status and trends. Target: By 2010, national and regional systems are established to enable effective monitoring of protected-area coverage, status and trends at national, regional and global scales, and to assist in evaluating progress in meeting global biodiversity targets. **Question: Have processes for national systems to enable effective monitoring of PA coverage, status and trends at national level and to assist in evaluating progress in meeting global biodiversity**

targets been established? Yes/ No. If Yes, is it likely to be operational by 2010? If No, any obstacles?

Goal 4.4 To ensure that scientific knowledge contributes to the establishment and effectiveness of protected areas and protected area systems. Target: Scientific knowledge relevant to protected areas is further developed as a contribution to their establishment, effectiveness, and management. **Question: Are there programmes to ensure that scientific knowledge relevant to PAs are further developed as a contribution to PAs establishment, effectiveness and management? Yes/ No. If Yes, which institutions will be responsible for this? If No, suggest how this can be done**.

VI. Targets of the Global Strategy for Plant Conservation

For each of these 16 targets of the GSPC listed below**, provide an answer as to any attempts made to reach the target. Briefly provide the necessary information. It is also important to provide the institution whose responsibility it is to achieve the target**.

Target 1: A widely accessible working list of known plant species, as a step towards a complete world flora

Target 2: A preliminary assessment of the conservation status of all known plant species, at national, regional and international levels

Target 3: Development of models with protocols for plant conservation and sustainable use, based on research and practical experience

Target 4: At least 10 per cent of each of the world's ecological regions effectively conserved

Target 5: Protection of 50 per cent of the most important areas for plant diversity assured

Target 6: At least 30 per cent of production lands managed consistent with the conservation of plant diversity

Target 7: 60 per cent of the world's threatened species conserved in situ.

Target 8: 60 per cent of threatened plant species in accessible *ex situ* collections, preferably in the country of origin, and 10 per cent of them included in recovery and restoration programmes

Target 9: 70 per cent of the genetic diversity of crops and other major socio-economically valuable plant species conserved, and associated indigenous and local knowledge maintained

Target 10: Management plans in place for at least 100 major alien species that threaten plants, plant communities and associated habitats and ecosystems

Target 11: No species of wild flora endangered by international trade

Target 12: 30 percent of plant-based products derived from sources that are sustainably managed

Target 13: The decline of plant resources, and associated indigenous and local knowledge innovations and practices, that support sustainable livelihoods, local food security and health care, halted.

Target 14:The importance of plant diversity and the need for its conservation incorporated into communication, education and public awareness programmes.

Target 15: The number of trained people working with appropriate facilities in plant conservation increased, according to national needs, to achieve the targets of this Strategy.

Target 16: Networks for plant conservation activities established or strengthened at national, regional and international levels

VII. COP 8 Decisions requesting Parties to submit information through national reports

For each of these decisions listed below, answer the questions provided.

VIII/5 (Article 8(j))

Para 2. *Invites* Parties to submit through their national reports, if appropriate, to the Executive Secretary, reports on progress in achieving national participation of indigenous and local communities, and associated capacity-building, and *requests* the Executive Secretary to compile these submissions and, as appropriate and with the assistance of Parties and of indigenous and local communities, prepare a statistical report thereon identifying, *inter alia*, participation in different bodies of the Convention, participation from different countries/continents, participation in government delegations as well as outside of government delegations, and those funded by voluntary mechanisms; **Question: Is there evidence that local communities participate in activities of biodiversity conservation and sustainable use?**

VIII/21 (Marine and coastal – deep seabed)

Para 3. *Concerned* about the threats to genetic resources in the deep seabed beyond national jurisdiction, *requests* Parties and *urges* other States, having identified activities and processes under their jurisdiction and control which may have significant adverse impacts on deep seabed ecosystems and species in these areas, as requested in paragraph 56 of decision VII/5, to take measures to urgently manage such practices in vulnerable deep seabed ecosystems with a view to the conservation and sustainable use of resources, and report on measures taken as part of the national reporting process**; Question: What activities and processes take place in our marine and coastal areas that have significant negative or adverse impacts on deep seabed ecosystem and species? Are you aware of any actions taken to curb it? Have you any information on some of the effects these have on human well being?**

VIII/22 (Marine and coastal – IMCAM)

Para 5. *Requests* Parties, in the course of reporting on implementation of the marine and coastal programme of work**,** to report on measures taken to enhance implementation of Integrated Marine and Coastal Area Management in their national reports, where relevant; **Question: Is Ghana undertaking any measures to enhance implementation of IMCAM? Are there any successes?**

VIII/24 (Protected areas)

Para 4. *Urges* Parties, other Governments and multilateral funding bodies to provide the necessary financial support to developing countries, in particular the least developed and small island developing States, as well as countries with economies in transition, taking into account Article 20 and Article 8 (m) of the Convention to enable them to build capacity and implement the programme of work and undertake the reporting required, including national reports under the Convention on Biological Diversity, to enable the review of implementation of the programme of work on protected areas in line with goal 2.2 of the programme of work. **Question: What levels of funding has Ghana received or about to receive to undertake these tasks?**

VIII/28 (Impact assessment)

Para 5. *Urges* Parties, other Governments and relevant organizations to apply the voluntary guidelines on biodiversity-inclusive environmental impact assessment as appropriate in the context of their implementation of paragraph 1 (a) of Article 14 of the Convention and of target 5.1 of the provisional framework of goals and targets for assessing progress towards 2010 and to share their experience, *inter alia*, through the clearing-house mechanism and national reporting; **Question: What are the current thoughts in use of EIAs and SEAs in Ghana's planning processes.**

VIII. Thoughts into the future

Assemble all the lessons learned in this review of implementation of the CBD in Ghana. Provide examples of successful and less successful actions.

Provide a list of priorities and other needs including capacities for national-level implementation of the Convention

Suggest actions that will enhance the development and full implementation of a revised NBSAPs

CONSULTANCY REPORT:

2010 Biodiversity Target: National Assessments for Ghana
1.0 Introduction

There is no doubt that the development and implementation of national biodiversity strategies and action plans (NBSAPs) constitute the corner stone of national implementation of the Convention on Biological Diversity. In many instances, this chance is missed because of the manner in which they were developed and have been implemented.

The need to revise the existing strategy and action plans has been expressed currently and this expression stems from three different decisions of COP; namely decision VI/26 on the Strategic Plan for the Convention, decision VI/27 A on implementation of the Convention, and most recently in decision IX/8 on the review of implementation of goals 2 and 3 of the Strategic Plan.

The reflection in goal 3 of the Strategic Plan which states that "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" is enough to make Parties to the Convention to think seriously on the approach to revise the NBSAPs. This can be viewed against the backdrop of 2010 Biodiversity Target which is aimed at halting the loss of biodiversity by 2010.

The development and implementation of the NBSAPs is an obligation of Parties to the Convention under Article 6 and it is meant to ensure that all the three objectives of the Convention are met and implemented through their integration into the relevant national sectoral or cross-sectoral plans, programmes and policies. Among others, it is also meant to promote mainstreaming of gender issues, promote synergies between activities to implement the Convention and poverty eradication, identify priority actions at the national (in particular) or regional level, and develop a plan to mobilize national, regional and international financial resources in support of priority activities, considering existing and new funding sources.

This current exercise is therefore expected to take into account the ecosystem approach, highlight the contribution of biodiversity and ecosystem services to poverty eradication, national development and human well-being, as well as the economic, social, cultural and other values of biodiversity. It is also expected that the main threats to biodiversity,

including direct and indirect drivers of biodiversity change, are identified and actions to contain or address them are established.
All of these are meant to contribute, from the Ghanaian perspective, to the global action in the understanding and assessment of progress towards the 2010 Biodiversity Target and Implementation of the Strategic Plan of the Convention.
It is therefore expected that the revised NBSAP, taking into consideration the three objectives of the Convention while recognising the 2010 biodiversity target and beyond as the focal area for reporting, will ensure that the ecosystem approach is undertaken, will make provision for effective internal stakeholder engagement and support, and will re-sharpen national mechanisms including indicators through proper monitoring and periodic reviews. It is also expected that this exercise will take a long-term view of biodiversity of Ghana, and will be structured as to ensure monitoring and proper use of indicators, assessments and reporting efforts on a sound funding basis.

2.0 Terms of Reference

Obtain, as far as possible and appropriate, information pertinent to the country as far as the 2010 targets are concerned. The NBC shall ensure that the following specific tasks, which should be addressed, include:

a) Identify stakeholders in biodiversity arrangements in Ghana including government departments/agencies, national NGOs, private sector entities/commercial interests, academic institutions, international NGOs,
b) Conduct a review of existing information on biodiversity activities including, regulatory and administrative arrangements in Ghana, and identify any significant gaps. Information gathered should be as detailed and accurate as possible.
c) Conduct an inventory of biodiversity projects in the country, including those supporting the everyday functioning of government departments, agencies and any significant biodiversity-based proposed projects.
d) Organize and conduct consultative workshops with the view to finalising the 2010 Biodiversity Target National Assessments for Ghana.

3.0 Identification of Stakeholder groups in Biodiversity arrangements in Ghana.

A careful look at the stakeholder community of biodiversity in Ghana uncovers a large body which includes government ministries, departments and agencies; civil society organizations consisting of non-governmental organizations operating at the community and national levels, and other pressure groups; the private sector; the UN Agencies and other development partners. The full list is provided in Appendix II.
The concept of stakeholders is taken in its broadest sense and it includes all groups whose activities directly or indirectly have a positive or negative effect on biodiversity.

4.0 Existing information on biodiversity activities

In annexes 2 to 4 there is a review of existing information on biodiversity activities currently going on in Ghana.

The Forestry Commission with its two agencies of Forestry Division and Wildlife Division have demonstrated their commitment to undertake their mandate with vigour. Both divisions have outlined their contributions towards overcoming all odds to ensure the protection of biodiversity in the forest and wildlife estates under their care. This gives a lot of confidence to the conservation effort of the country.

The Ministry of Food and Agriculture through a number of projects including the AgSSIP (Agricultural Sub-Sector Implementation Project) which has been implemented jointly with the CSIR and other research and academic institutions (through the National Agriculture Research Committee), has ensured food security through progress in research in a number of agro-biodiversity crops including cassava, plantain, cocoyam, rice and other food crops. A database exists at the CSIR, part of it reproduced in annex 5, which gives a breakdown of scientists working on the various crop plants in Ghana which is a good step.
Cocoa Industry and production. Apart from the efforts by Cocoa Research Institute of Ghana (CRIG) to improve the cocoa crop against the numerous production problems including pests and low productivity, a number of individuals and organizations including the universities, are also engaged in various research topics to sustain current cocoa plantations for higher yields and prevent the march of cocoa plantations into virgin forests

Mass spraying. This is an ongoing exercise meant to rid the cocoa industry of unwanted pests. Initial results showed marked increase in cocoa production, but the effect on other insect fauna is yet to be assessed.

Regulatory Bodies
Fertilizer and chemicals (pesticides) applications. The registration and issuance of licenses for these applications are under the control of regulatory bodies; namely Standards Board for fertilizers and EPA for chemicals.

5.0 Other stakeholder contributions
a) Individual researches contributing to agro-biodiversity

Animal production to increase cattle, poultry, sheep, goats and their products on the Ghanaian market is being strengthened. The CSIR ARI and the Faculties/Schools/Colleges of Agriculture of Ghanaian Universities are currently vigorously engaged in these activities.

Fisheries research into production, biology, economics and processing is currently ongoing. The CSIR institutes-WRI and-FRI, as well as the Fishery, Food Science and Technology Departments of Universities are fully engaged in various researches into these issues.

Soil Science from point of view of fertility of Ghanaian soils, their surveys and other features are currently part of the research agenda of the CSIR-SRI and Soil Science

Departments of Universities. The CSIR-SRI has developed soil feasibility maps for various Ghanaian crops to guide proper utilization of land.

Production of certain essential food plant commodities including onion, plantain, sorghum, soybean, yams are being vigorously undertaken by the CSIR-CRI and the Agriculture departments, Universities

Plant Breeding involving aspects of regeneration, conservation of genetic resources of such crops as mangoes, Avocado pear, cow pea, groundnuts, maize, millet, sorghum, oil palm, papaya, rice, etc. have remained the research focus of CSIR institutes of SARI, CRI, OPRI etc. and the Universities.

Forestry research involving rehabilitation of degraded forest lands and decommissioned mining fields and other silvicultural, inventorial, entomological and plantation researches have been spearheaded by the CSIR-FORIG, mostly in response to stakeholder demands and requests.

Plant protection against viral and other infestations of coconut, citrus, cotton, groundnuts, maize, mangoes, oil palm, papaya, onions, soy bean, sorghum, tomatoes have continued to receive attention from the CSIR institutes, Agriculture faculties and other departments of Universities.

b) Some individual researches contributing to general biodiversity undertaken by staff and students of Ghanaian universities.

Phenological sequences of Ghanaian plants
Behaviour of animals in degraded landscape
Effect of fire on biodiversity
Changes in vegetation in the transition zones of Ghana: forest-savanna interface
Rheophyte (riverbed) flora of Ghana
Structure of Ghanaian savanna vegetation
Medicinal plants survey of Ghana
Useful plants of Ghana
Biology of very useful crops of Ghana

6.0 GEF Projects executed in Ghana

The following projects are currently being executed.
The Northern Savanna Biodiversity Conservation Project (NSBCP) which, among others, has developed a draft policy on Traditional Knowledge related to Plant Genetic Resources to ensure formal recognition of traditional knowledge related to plant genetic resources and to strengthen the organization and infrastructure for its development and use, including quality and safety, integration into the national health care and agricultural systems. Other details are contained in the Forestry Commission information in annex 2.

The Invasive Alien Species regional project involving Ghana, Zambia, Ethiopia and Uganda, called '*Removing barriers in the management of invasive alien plant species'* has made remarkable progress in identifying and characterising the notorious plant invasive species in the participating countries. The Ghanaian component of the Project is hosted by the CSIR-Ghana and it is seriously addressing the issue of some 4 problematic plant invasive species in Ghana, notably *Chromolaena odorata, Broussonetia papyrifera*, *Salvinia molesta* and *Eichhornia crassipes.*

The project on *Sustainable Land Management for mitigating land degradation, enhancing agricultural biodiversity and reducing poverty* (SLaM) in Ghana, is hosted by the University of Ghana within the Department of Geography and Resource Development. It addresses sustainable land management to stem the accelerated land degradation, which threatens the global environment and the very livelihoods of humanity, especially by deforestation, soil erosion, biodiversity loss and climate warming. Updates are provided in the annex 2.

7.0 NGO contributions

Some NGO contributions to Ghanaian biodiversity are captured in Annex 3. The projects which are being undertaken by these organizations are described. A majority of the funding for these projects have been provided by the GEF Small Grants Project. Many NGOs who have benefited from these funds describe the SGP as the local face of GEF in Ghana even though many of them are not aware of what/who GEF is.

The Ghana Biodiversity Committee with Ghana Wildlife Society and Yilo Krobo District Assembly, in 2005 undertook educational and awareness campaign on the rehabilitation of the banks of the river that feeds the Boti Falls. This was meant to ensure perennial flow of the river and the falls for tourism attraction and biodiversity conservation.

The Ghana Biodiversity Committee with Friends of the Earth and the Bosomtwe-Kwanwoma District Assembly, in 2008 undertook another educational and awareness campaign on the rehabilitation of the shoreline of Lake Bosomtwe. This activity was meant to protect the lake from siltation, eutrophication, excessive fishery exploitation and excessive evaporation from the water surface.

8.0 Consultative Workshop considerations on elements for identifying indicators to monitor progress towards the 2010 biodiversity target in Ghana

There are several ways in which the information gathered on various aspects of biodiversity of Ghana, can be utilized and this will depend on the end product for the exercise. This exercise is meant to provide basis for determining indicators to monitor progress towards the 2010 biodiversity target of substantially reducing biodiversity loss and promoting the millennium development goals, notably poverty alleviation and sustainable livelihoods. The workshop will have to be designed to engage all stakeholder groups to make contributions towards understanding the drivers of land and water degradation and its attendant biodiversity loss, to provide knowledge on what has to be done to contain the current spate of degradations and to suggest the best ways to ensure conservation and sustainable use of biological diversity for effective sustainable development of Ghana.

The following questions, though not exhaustive, are considered quite critical during the stakeholder consultations to identify Ghanaian 2010 biodiversity target indicators, in order to bring up areas of need for more elaboration and information gathering for achieving the desired output:

What and where are the missing gaps in our knowledge of the status of the health of the Ghanaian biodiversity and what kind of trends are emerging? A gap analysis on areas where information is lacking or limited will have to be conducted.

How can issues of biodiversity be mainstreamed in all national sectoral plans, programmes and projects? *What kinds of barriers are there that may limit mainstreaming*? The involvement of all development sectors of the Ghanaian economy will be required to provide inputs on the way forward towards identifying these barriers and suggesting ways to overcome them in order to achieve this goal of integration.

How can issues of biodiversity be made common place debate among the youth and the general public? This will require a proper understanding of the provisions of the communication, education and public awareness (CEPA) programme promoted within the CBD.

How can policy- and decision-makers be informed about the need to have scientific overview of resource exploitation before such activities can take place? An understanding of science-policy interface procedures and capacity to develop brief, salient, convincing and objective assessments are important.

How can current environmental impact assessment (EIA) exercises be assumed within the general overview of strategic environmental assessments (SEAs) to ensure a proper understanding and utilization of the provisions of ecosystem approach? There will be the need for EPA to conceive this as a workable solution to the current EIAs which fall short of implicitly providing adequate environmental standards by way of provision of ecosystem services.

What kind of strategies and approaches are urgent and which ones need careful thought in order to engage the public on consequences of biodiversity loss as a result of land degradation, habitat changes, overexploitation and other unsustainable land use activities. Public engagement on issues of national character demand specific outlook. The previous exercises that fully engaged the public, for example, the recent currency re-denomination exercise is an experience which can be copied.

Review of existing information on biodiversity issues from government agencies

The Forestry Commission (FC) of Ghana

The FC is the foremost institution of state with a specific mandate to manage and develop the forest heritage of Ghana for the optimal sustainable flow of benefits to all segments of the Ghanaian society. In other words, the FC is legal entity in Ghana responsible for the protection and management of the wild lands of Ghana and by implication and in consultation with other key stakeholders including traditional rulers and the public, hold the key to the effective implementation of the three objectives of the UN Convention on Biological Diversity which include the conservation, the sustainable use of biological diversity and the fair and equitable share of benefits arising from the use or utilization of genetic resources.

The current number of forest reserves (291) and wildlife protected areas (15) occupy more than 38,000 sq km (i.e. about 16% of the total land area of Ghana) and these constitute the permanent forest estate of Ghana which is under the control and watchful eyes of the Forestry Commission.

Activities of the Forest Services Division of the FC

The forest protection strategy developed in the early 1990s from the time of the revised Forest and Wildlife Policy of 1994 and the emergence of the UN Convention on Biological Diversity, prescribes fine-grain to large-grain measures for the protection of forest flora and these are incorporated into management planning for all forest reserves. All forest reserves are managed by the FSD.

The following actions have been ongoing:

i) Capacity building
j) Re-demarcation and pillaring of Globally Significant Biodiversity Areas (GSBAs) and Provenance Protection Areas (PPAs)
k) Legal descriptions and protection of GSBAs
l) Community Participation in Forest management in which over 150 community Biodiversity Advisory Groups have been established
m) Alternative livelihoods in which an amount of US$ 2.5 millions have been invested in a micro-finance scheme called Alternative Livelihood Investment Fund, for ecologically friendly livelihood programmes for forest-fringe communities. About 1200 persons have benefited from the scheme to date.
n) Extensive faunal and floral surveys have been carried out in the GSBAs to beef up field data on species composition.
o) A Wildfire management project has dispensed/invested a lot of resources to build the capacity of the Division for effective fire management, including fire prevention, early fire detection and fire fighting at the forest-community level. A large fleet of fire fighting equipment was out-doored last Thursday 30 October 2008

   In-situ targeted action at Endangered/threatened species eg. Primates, *Talbotiella gentii*.

   Under the High Forest and Northern Savanna Biodiversity Conservation Projects, a study was commissioned on primates towards the development of a survival plan. This was completed in 2006 and currently being implemented. A

conservation plan has also been developed and implemented for the endemic plant species, *Talbotiella gentii*

p) Awareness creation. Numerous awareness creation programmes using various formats such as drama, open discussion fora and community durbars have been organized in the communities. Posters and information leaflets on biodiversity have also been employed.

The near absence of standardized procedures and guidelines to govern the exploitation of ntfps is a worrying area for the FSD as the availability of these resources in areas outside the forest reserves is increasingly becoming part of the history of Ghana. This is in direct reference to the Forest and Wildlife policy which guarantees…' the right of people to have access to natural resources for maintaining a basic standard of living and their concomitant responsibility to ensure the sustainable use of such resources'

Activities of the Wildlife Division of FC

The division has been pre-occupied with the promotion of the Protected Area Development Project (PADP). The first phase of the project PADP-I made significant contributions towards enhanced conservation of biodiversity. Under this phase, management plans for Ankasa and Bia PAs were prepared and limited infrastructure for conservation activities and tourism were developed. The community based programme called Community Resource Management Areas (CREMA) was piloted to improve the natural resource management capacity of fringe communities in off-reserve wildlife conservation.

The second phase of the project PADP-II has been planned and it will build on the results and work done under PADP-I. An elaborate listing of indicators and their sources of verification have been given in a comprehensive logical framework. The second phase is designed to, inter alia:

i) implement management plans for Ankasa and Bia Pas
j) improve services of WD and District Assemblies and build capacities
k) develop appropriate ecotourism attractions and facilities
l) establish sustainable livelihoods for populations adjacent to reserve through alternative natural resource use systems and income generating activities
m) establish participatory institutional structures peripheral to each area within the programme
n) improve conservation and management of natural resources within GSBAs , through the development of joint management procedures between WD and FSD for the GSBAs adjoining Bia PA and Krokosua Hill Forest Reserve. This particular activity will ensure coherence in future planning for the GSBAs.
o) control illegal activities within Pas
p) support conservation education programme

Another programme that has engaged the WD has been the Kyabobo Area Natural resources Development Plan (KANRDP). This was started in 2002 and designed to complete in five years but was extended and ended on 30 June 2008. The ultimate goal of KANRDP was to effectively conserve and manage Kyabobo National Park as part of a national/sub-regional system of Pas, conserve Ghana's biodiversity, reduce poverty and

contribute to the well-being of women and men in local communities and other stakeholders.
The main outputs of the programme are:

i) adequate, well-trained WD staff effectively deployed
j) management plan formulated and implemented
k) adequate infrastructure in place and well maintained
l) tourist attractions in the Kyabobo Area identified, the appropriate supporting facilities in place and marketing and publicity provided for
m) cordial relationship with Togoles counterparts for trans-boundary management established
n) participation of rural communities adjacent to the park in natural resources and environmental management enhanced
o) relationships with clear agreements between the relevant stakeholders defined and respected and a Kyabobo Area Management Advisory Board established
p) viable additional economic activities for communities facilitated

Review of NGO contributions

Conservation International (CI)
The project: TCP/GHA/2905 'Ensuring Farmer's Livelihoods and Food Security around Kakum Conservation Area', undertaken in 2004, was organized and funded by FAO and CI.
The project goal was ' to mitigate the impact of human-elephant conflict upon rural farmers, first by introducing strategies to protect crops, and second through land-use planning to reduce vulnerability of farms at the edge of forest reserves'.
Outcome of project is a technical training manual, a farmer's manual and a 30-minute documentary.
The technical manual has been designed for use in training field staff in principles and procedures of the techniques for protecting crops from damage by elephants and improving crop yield on farms. It includes exercises suggested for practice by trainees.

Ghana Wildlife Society
Afadjato Community Forest Conservation The biodiversity and aesthetics of selected areas of the Afadjato and Agumatsa Ranges, including the proposed Afadjato Community Nature Reserve, conserved and sustainably managed by local communities and alternative income sources developed to improve local livelihoods **Amansuri Conservation and Integrated Development** The objective of the project is to promote tourism through enhancing the scenic beauty and natural attraction, historically interesting places and the village on stilts, Nzulezu.
Income generating activities based on a well functioning wetland ecosystem and cultural richness will also be developed to contribute to the socio-economic development of the area paying particular attention to women who are the main users of biodiversity
Save the Shorebirds Project. This has been GWS landmark project. It was through this project that attention was focused on coastal wetlands including numerous coastal lagoons and estuaries and the eventual demarcation of 5 coastal sites as Ramsar sites.

West African Primate Conservation Action

Endangered Primates Centre. Conservation of primates in the world through an international breeding programme. Currently the Accra breeding programme includes two breeding groups of white-naped mangabeys and one breeding group of Roloway monkey

Protection of Habitat and Wildlife. Research projects in the monkeys' natural habitat enable us to evaluate the situation of the remaining populations of the endangered monkey species. Long term surveying and monitoring provides data which then can be used to concentrate conservation efforts on particular areas

Butterfly Conservation Ghana (BC Ghana)

Inventory of Butterflies and Prime Butterfly Areas in Ghana: The aim of this long-term project is to map the distribution of all butterfly species in Ghana and their natural habitats. The project consists of multiple elements, as it is a scientific research project focused mostly on conservation. We would like to identify areas with the highest biodiversity, as well as areas with high concentration of endemic species and designate those areas as Prime Butterfly Areas. Unfortunately, this doesn't mean that these areas will automatically be protected, but they will provide a good incentive for the conservation authorities to focus on important areas with rich wildlife other than the formally designated national parks and nature reserves. This program is expected to reveal several species new to Ghana as well as a few more new to science. At the same time we will learn more about the ecology and habitat requirements of many species, and this study will help with the identification of indicator species for different habitat types. It will also raise public awareness of butterflies and their habitats and will hopefully increase the eco-tourism potential of the country.

The Forest Ecotourism and Conservation Project' The Forest' is an 80 acre area situated on the boundary of the Kakum National Park (Central Region), between the villages of Abrafo and Gyaware, with a planned eco-tourism centre aimed at providing suitable habitats for local wildlife and shelter for nature lovers. The area constitutes a small patch of virgin rainforest as well as secondary habitats, abandoned farmland and parkland. BCGHANA is contributing to the project through habitat reconstruction (afforestation, forest regeneration), monitoring of the butterfly fauna in the area, and developing butterfly view-spots for tourists: constructing butterfly tables where the big nymphalids can be seen feeding on fermented fruit. They also construct information boards, describing 0the places where the tourists can see butterflies (mud-puddling, forest undergrowth, ant-trees for blues etc.). Establishment of a butterfly garden with flowery bushes and plants is also planned

Atewa Butterfly Reserve and Research. This is BC Ghana's most important conservation project, as it is aimed to protect one of the last remaining upland rainforests in West Africa. The project will be launched in September 2008 and will be conducted in full collaboration with the Sagyimase community, which is situated on the slopes of the Atewa Range Forest Reserve. This program's aim is to help the conservation of the Atewa Range in several ways: firstly, we plan to establish a research station and tourism centre which could host a wide range of visitors from birding groups to Lepidoptera scientists, backpackers, weekend tourists from Accra etc. We would also like to introduce

butterfly farming, which proved profitable and sustainable in other countries (Costa Rica, Uganda) and it helped provide jobs for community members, who formerly depended entirely on forest products. Beside research and tourism, BC GHANA has also recognised the importance of youth education. Therefore, local teachers will be trained in nature conservation and sustainable development, so that later nature conservation could be taught in the primary and secondary schools around the Atewa Range

Green Earth Organization (GEO): The Green Earth Organisation is an environmental NGO located in Ghana. Since its establishment in 1983, GEO has focused on conservation and rational use of natural resources, development of disadvantaged communities, environmental, social and economic activities, education and training, empowering of women, promoting voluntary action and global peace. One of GEO's projects, "Green Culture" is an environmental education programme designed to present the traditional Ghanaian way of natural resources conservation, to promote eco-tourism and Ghanaian culture.

World Wide Fund for Wildlife: *Climate Witness Programme*
Global Forest and Trade Network (GFTN).The GFTN is WWF's initiative to eliminate illegal logging and improve the management of valuable and threatened forests. By facilitating trade links between companies committed to achieving and supporting responsible forestry, the GFTN creates market conditions that help conserve the world's forests while providing economic and social benefits for the businesses and people that depend on them. The GFTN seeks to form forest and trade networks (FTNs) in markets and production areas where they can have the greatest beneficial impact on valuable and threatened forests

Information from Biodiversity Projects

1. The project: **Sustainable Land Management for Mitigating Land Degradation, enhancing agricultural biodiversity and reducing poverty (SLaM) in Ghana**
The project goal is to contribute to sustainable ecosystem-based integrated land management in globally, nationally and locally significant land resources in agricultural areas under threat of land degradation, for greater ecosystem stability, enhanced food security and improved rural livelihoods.
The project expects 2 major outcomes, namely:

a) A participatory methodological framework for identifying and prioritizing threatened lands, and criteria for identifying sustainable (good/best) land management practices plus land use plans developed and applied by appropriate methodologies;
b) Sustainable ('good/best') land management practices applied to recover degraded lands, protect those under threat, and enhance their ecological functions, agricultural production capacity and rural livelihoods improvements role;
c) Capacity and enabling environment for mitigating land degradation and promoting sustainable land management enhanced.

The following key activities have been or will be undertaken towards planned outputs:

a) formulation and application of framework for identifying threatened lands and criteria for identifying 'good/best' land management practices
b) evaluation of barriers to best practices
c) stakeholder workshops and seminars
d) baseline conditions determination
e) database development
f) environmental and social impact assessment
g) disseminating sustainable land management approaches
h) influencing and triggering policy reform that gives greater recognition to sustainable integrated land management and role of local farmer knowledge and participatory approaches.

Since project inception in 2005, and by use of participatory approach which brings together farmers, scientists, extension agents and other stakeholders in a network for concerted action in five pilot project areas in Ghana by demonstrations with close collaboration of MOFA and UNDP backstopping, ten lessons are reportedly learned. This is within the initial period of work programme. It is expected that by the end of the project period, the expected outcomes would be fully achieved, presumably at the dawn of the 2010 biodiversity target.

2. The project: **Guinea Current Large Marine Ecosystem (GCLME)**

The need or desire to develop a regional biodiversity action plan for the Guinea Current Large Marine Ecosystem (GCLME), among other needs, was borne out from four major trans-boundary environmental problems/issues identified in a Trans boundary Diagnostic Analysis (TDA) within the Gulf of Guinea. These were:

1 decline in GCLME fish stock and unsustainable harvesting of living resources
2 uncertainty regarding ecosystem status, integrity and yields in a highly variable environment including effects of global climate change.
3 deterioration in water quality (chronic and catastrophic) from land and sea based activities, eutrophication and harmful algal blooms.
4 habitat destruction and alteration including inter alia modification of sea bed and coastal zone, degradation of coasts capes, coastline erosion etc.

Thus recalling the overall development goals of the GCLME as conceived presently which are to

- recover depleted fish stocks
- restore degraded habitats
- reduce land and ship based pollution

- create an ecosystem wide assessment and management framework for sustainable use of living and non-living resources in the GCLME

It is important that a new approach is adopted. It is for this reason that the latter goal i.e. the ecosystem-wide or ecosystem based assessment and management is seen as appropriate as it brings focus to the management of the coastal and marine ecological systems and ecosystem function. In this wise therefore attention is shifted from concentrating on protecting fisheries and maintaining sustainable yields of marine resources and being focused more on the biological diversity represented at multiple scales at the coastal and marine areas. This refers to a range of species targets, varied ecosystems and surrogate targets within the coastal and marine areas. This is why the Regional Biodiversity Action Plan has been conceived for the 16 GCLME countries.

For species targets, reference is made to threatened or keystone, rare and or endemic species, paying attention to their life-cycle stages, and the habitats in which these stages take place.

For ecosystem targets, reference is made on corals reefs (especially in the archipelagos of Equatorial Guinea and Sao Tome & Principe) where they are suspected to be present, shell fish beds, sea grass meadows, salt marshes and inter-tidal wetlands, kelp and mangroves forests as ecological systems. Each of these ecological systems performs specific roles in providing the necessary services and energy sources and nutrients in the form of matter needed by organisms living in these ecosystems.

For the surrogate targets, reference is made to the following three distinct profile classes; namely:

Inter tidal system – referring to shore line geomorphology and other submerged biological features forming sea grass meadows, shell fish beds etc.

Benthic topology or sea bed topography - referring to the substrate and land form types correlating with special species assemblages inhabiting them.

Pelagic models - referring to the nature of the food web in the water column or at the sea surface which characterize the different habitats and utilization patterns..

In developing the biodiversity action plan, the problem of the GCLME has been captured with a strategy of using an ecosystem based actions, using the coastal geographic scale of the GCLME countries. The problem identified is three-fold, namely unsustainable

fisheries, unsustainable use of other marine resources and degradation of coastal and marine ecosystems.

The strategy adopted is in the development of goals and actions within an ecosystem-wide assessment and management within the globally adopted targets. The scale of the programme of action is to involve all the 16 GCLME countries in west, central and south west Africa.

Four goals, each with its own targets and actions have been suggested. The goals conform to the world agreed timetable of the millennium which point to the eight millennium development goals (MDGs).

The targets of 2010, 2012 and 2015 have been stressed respectively to cover terrestrial including coastal area biological diversity, aquatic including marine area biological diversity and general sustainable development.

It is understood that by following these targets, the countries of the GCLME would be implementing globally agreed targets and contributing to some of the work programmes developed for coastal and marine areas.

Appendix III -The biodiversity stakeholder community in Ghana

a) Government Ministries, departments and agencies
The following are listed:

Ministry of Lands, Forestry and Mines
. Forestry Commission
. Forestry Division
.Wildlife Division
. Lands Commission
. Minerals Commission

Ministry of Local Government, Rural development and Environment
. Environment Directorate
. Metropolitan, Municipal and District Assemblies
. Environmental Protection Agency
. Town and Country Planning Department
. Department of Parks and Gardens

Ministry of Health
. Centre for Scientific Research into Plant Medicine
. The Teaching Hospitals and associated Colleges of Medical Sciences

Ministry of Education, Science and Sports
. Council for Scientific and Industrial Research
. Ghana Atomic Energy Commission
. National Commission for UNESCO

Ministry of Energy
. Energy Commission
. Electricity Company
. Volta River Authority

Ministry of Trade, Industry and PSI
. Export Promotion Council
. Export Drive Investment Fund (EDIF)
. Non Traditional Export Directorate
. Ghana Standards Board
. Food and Drugs Board
. Cocoa Board
. Cocoa Research Institute of Ghana

Ministry Justice and Attorney General's Department
. Registrar General's Department
. Copyright Administration
. Commission on Human Rights and Administrative Justice

Ministry of Food and Agriculture
. Crops Services
. Extension Services
. Veterinary and Animal Production Services

Office of the President
. National Development Planning Commission
. Scholarships Secretariat

Ministry of Ports, Railways and Harbours
. GPHA
. Maritime Authority
. Maritime Academy

Ministry of the Interior
. Ghana Immigration Service
. Ghana Police Service
. Ghana Prisons Service
. Ghana Customs, Excise and Preventive Service
. National Disaster Mobilization Organization

Ministry of Finance and Economic Planning

Ministry of Chieftaincy Affairs and Culture
. National Commission on Culture
. Ghana National Museums and Monuments Board

Ministry of Fisheries
. Fishery Commission

Ministry of Works and Water Resources
. Irrigation Development Authority
. Ghana Water Company

Ministry of Information
. Ghana News Agency
. Ghana School of Journalism
. Media Commission
. The Graphic Communications
. The New Times Corporation

Ministry of Communications
. Ghana National Communications Authority
. Ghana Telecom
. Ghana-India Kofi Annan Centre for IT

Ministry of Tourism and Diasporan Affairs
. Ghana Tourism Board

Ministry of Aviation
. Ghana Airports Company
. Ghana Civil Aviation Authority

Ministry of Defence
. Ghana Army
. Ghana Air Force
. Ghana Navy

b) The national Universities, other higher institutions and their various colleges, faculties, departments, research institutes and centres.

University of Ghana
University of Cape Coast
Kwame Nkrumah University of Science and Technology, Kumasi
University for Development Studies, Tamale
University of Education, Winneba

University of Mines, Tarkwa
Ghana Institute of Management and Public Administration

c) NGOs including CBOs and representatives of foreign NGOs

. Conservation International (Ghana office)
. Ghana Wildlife Society
. Friends of the Earth
. Green Earth Movement
. WWF
. Bird Life International
. Arocha Ghana

d) UN Agencies
. The UNDP country Office
. The UNIDO country office
. The WHO country office
. The FAO country office
. The UNHCR country office
. The UNICEF country office
. The UNESCO cluster office
e) Development partners
. The EU office in Ghana
. The World Bank Country office
. Embassies of countries that provide development assistance to Ghana

d) Private Sector organizations and institutions
. Various vegetable oil mills
. Various timber and veneer mills
. Various mining and other extractive industries and companies including salt and sand
. Various leather and tanning industries
. Various fishery industries
. Various Canneries
. Various Food processing industries
. Various Pulp and Paper industries
. Various Furniture and upholstery industries
. Various automotive industries
. Various Engineering and manufacturing industries
. Various Water extractive industries
. Various power generation industries

e) Traditional Authorities
. National House of Chiefs
. Regional Houses of Chiefs

f) Civil Society organizations

. Pharmaceutical Society of Ghana
. Ghana Institute of Architects
. Institute of Engineers
. Ghana Science Association
. Ghana Federation of Traditional and Alternate Medicine (GHAFTRAM)
. Ghana Medical Association
. Ghana National Association of Teachers
. Ghana Bar Association
. Ghana Farmers and Fishers Association
. National Association of Graduate Teachers
. Vegetable Growers Association
. Bee keepers Association
. Plant Exporters Association
. Fruit Exporters Association
. University Teachers Association of Ghana
. Religious groups
. Silk Producers association
. Ghana Journalists Association

g) Private individuals
. Men and women
. Adults, youth and children
. Workers, unemployed

Appendix III - Progress towards Targets of the Global Strategy for Plant Conservation and the Programme of Work on Protected Areas

A. **Targets of the Global Strategy for Plant Conservation**

For each of these 16 targets of the GSPC listed below**, an answer has been given briefly to provide information to any attempts made to reach the target. In providing the information, it has also been found important to provide the institution whose responsibility it is to achieve the target**.

Target 1: A widely accessible working list of known plant species, as a step towards a complete world flora:
Adequate knowledge of plant species, but no complete list. E.g Woody Plants of Ghana; Herbaceous Plants of Ghana, Useful Plants of Ghana, Floristic and medicinal plants of Ghana and Identification of timber trees of Ghana;

Target 2: A preliminary assessment of the conservation status of all known plant species, at national, regional and international levels :

Attempts have been made for some known species, especially of those of economic importance which are being exploited but not all.

Target 3: Development of models with protocols for plant conservation and sustainable use, based on research and practical experience: Yes GSBA, and all In-situ conservation programmes ***Institutions: FC, Traditional Authorities and botanic gardens***

Target 4: At least 10 per cent of each of the world's ecological regions effectively conserved***: Yes, 16% achieve in Ghana Institutions: FC, TA, Botanic gardens***

Target 5: Protection of 50 per cent of the most important areas for plant diversity assured

Target 6: At least 30 per cent of production lands managed consistent with the conservation of plant diversity

Target 7: 60 per cent of the world's threatened species conserved in situ.
Unknown

Target 8: 60 per cent of threatened plant species in accessible *ex situ* collections, preferably in the country of origin, and 10 per cent of them included in recovery and restoration programmes;
Yes, within the PGRRI and CRI

Target 9: 70 per cent of the genetic diversity of crops and other major socio-economically valuable plant species conserved, and associated indigenous and local knowledge maintained :
An unknown percentage of known plant species conserved: Institutions:- PGRRI and CRI

Target 10: Management plans in place for at least 100 major alien species that threaten plants, plant communities and associated habitats and ecosystems:
Management plans for known alien species (e.g. Chromolaena ordorata,Pistia

Target 11: No species of wild flora endangered by international trade:
Regulatory laws in place with the following institutions responsible: FC and PPRD

Target 12: 30 percent of plant-based products derived from sources that are sustainably managed : **Yes, timber from forest reserves Institution: FC**

Target 13: The decline of plant resources, and associated indigenous and local knowledge innovations and practices, that support sustainable livelihoods, local food security and health care, halted.
Not halted

Target 14: The importance of plant diversity and the need for its conservation incorporated into communication, education and public awareness programmes.
Training institutions and NGOs develop and implement CEPAs

Target 15: The number of trained people working with appropriate facilities in plant conservation increased, according to national needs, to achieve the targets of this Strategy.
Training undertaken but the beneficiaries do not return to work in the appropriate sectors to facilitate plant conservation.

Target 16: Networks for plant conservation activities established or strengthened at national, regional and international levels
Yes, Traditional Medicine practitioners.

B. Progress towards Goals and Targets of POW on Protected Areas

Goal 1.1. To establish and strengthen national and regional systems of protected areas integrated into a global network as a contribution to globally agreed goals. Target: By 2010, terrestrially 2/ and 2012 in the marine area, a global network of comprehensive, representative and effectively managed national and regional protected area system is established as a contribution to (i) the goal of the Strategic Plan of the Convention and the World Summit on Sustainable Development of achieving a significant reduction in the rate of biodiversity loss by 2010; (ii) the Millennium Development Goals – particularly goal 7 on ensuring environmental sustainability; and (iii) the Global Strategy for Plant Conservation.

Question: Has Ghana developed and established a network of comprehensive representative and effectively managed national PA system?

Answer: Yes*, A comprehensive PA network system is in place. Execept that the Upland Evergreen Forest Ecosystem is not well represented in the PA system*

Goal 1.2. To integrate protected areas into broader land- and seascapes and sectors so as to maintain ecological structure and function. Target: By 2015, all protected areas and protected area systems are integrated into the wider land- and seascape, and relevant sectors, by applying the ecosystem approach and taking into account ecological connectivity 5/ and the concept, where appropriate, of ecological networks.
Question: Is ecosystem approach applied to maintain ecological structure and function?

Answer: Yes*, Concepts and programmes on biodiversity corridors developed. Two internal corridors covering Mole-Bui National and Ankasa-Boi-Tano-Bia Group of forest reserves and protected areas are in concept stage. Marine PAs in the Cape Three Point to Half-Assini also conceptualised,*

Goal 1.3. To establish and strengthen regional networks, transboundary protected areas (TBPAs) and collaboration between neighbouring protected areas across national

2/ Terrestrial includes inland water ecosystems.

5/ The concept of connectivity may not be applicable to all Parties.

boundaries. Target: Establish and strengthen by 2010/2012 6/ transboundary protected areas, other forms of collaboration between neighbouring protected areas across national boundaries and regional networks, to enhance the conservation and sustainable use of biological diversity, implementing the ecosystem approach, and improving international cooperation..
Question: Are there any transboundary operations in place?

Answer: Yes*, Transboundary programmes developed for Ghana-Togo (Kyabobo-Fazao-Malfakessa, Ghana-Cote d'Ivoire* (*Bia-Goaso-Diambarakrou*) and Ghana-Burkina Faso (Sisili-Leo, Red-Volta) *Only Ghana-Burkina-Faso corridor is operational. The others are still in concept stage*. Are there any obstacles? *Yes, lack of funding*

Goal 1.4. To substantially improve site-based protected area planning and management. Target: All protected areas to have effective management in existence by 2012, using participatory and science-based site planning processes that incorporate clear biodiversity objectives, targets, management strategies and monitoring programmes, drawing upon existing methodologies and a long-term management plan with active stakeholder involvement.
Question: Are there any site-based PA planning and management?

Answer: Yes*, There are management plans and management advisory boards and participatory natural resource management programmes such as CREMA, CFC, CBAGs, FRMA. Forest Division and Wildlife Division are responsible.*

Goal 1.5. To prevent and mitigate the negative impacts of key threats to protected areas. Target: By 2008, effective mechanisms for identifying and preventing, and/or mitigating the negative impacts of key threats to protected areas are in place.
Question: Have negative impacts of key threats to PA identified and prevented and/or mitigated?

Answer*: Yes. Agricultural expansion* and their negative impacts *Deforestation and loss of species and habitats.*

Goal 2.1. To promote equity and benefit-sharing. Target: Establish by 2008 mechanisms for the equitable sharing of both costs and benefits arising from the establishment and management of protected areas.
Question: Is there any established mechanisms for equitable sharing of both costs and benefits arising from the establishment and management of PAs.

Answer*: Yes. Concepts for equitable benefit sharing developed by the Forestry Commission but not yet implemented. However, a Trust Fund has been established for Kakum and the interest accruing in addition to income from the use of the other tourist facilities are supposed to be used to meet some needs of the fringing communities.*

6/ References to marine protected area networks to be consistent with the target in the WSSD plan of implementation.

Goal 2.2. To enhance and secure involvement of indigenous and local communities and relevant stakeholders. Target: Establish by 2008 mechanisms for the equitable sharing of both costs and benefits arising from the establishment and management of protected areas.
Question: Is there full and effective participation of local communities?

Answer*: Yes with regards to some of them where MABs, CREMAs, CFC and CREMAs are in place*.: If Yes, how has this been achieved? *Livelihood support programmes such as the CIF for communities around the GSBAs and limited harvesting of some non-timber forest products.*

Goal 3.1. To provide an enabling policy, institutional and socio-economic environment for protected areas. Target: By 2008 review and revise policies as appropriate, including use of social and economic valuation and incentives, to provide a supportive enabling environment for more effective establishment and management of protected areas and protected areas systems. **Question: Has there been a review and a revision of policies including use of social and economic valuation and incentives to provide a supportive enabling environment for more effective establishment and management of PAs and PA systems?**

Answer*: Yes,a draft bill has been prepared to provide legal backing for the implementation of the CREMA concept, aimed at devolving the ownership and management of natural resources to forest fringe communities.*

Goal 3.2. To build capacity for the planning, establishment and management of protected areas. Target: By 2010, comprehensive capacity-building programmes and initiatives are implemented to develop knowledge and skills at individual, community and institutional levels, and raise professional standards.
Question: Have there been any implementations of comprehensive capacity-building programmes and initiatives to develop knowledge and skills at individual, community and institutional levels and raise professional standards?

Answer*: Yes for both the forest and wildlife protected areas to empower the forest fringe communities to effectively manage the CREMAs.*.

Goal 3.3. To develop, apply and transfer appropriate technologies for protected areas. Target: By 2010 the development, validation, and transfer of appropriate technologies and innovative approaches for the effective management of protected areas is substantially improved, taking into account decisions of the Conference of the Parties on technology transfer and cooperation. **Question: Have there been any attempts to develop, validate and transfer appropriate technologies and innovative approaches for the effective management of PAs?**

Answer*: Yes, Training in monitoring and record keeping and skills to manage the CREMA. Also capacity-building to mitigate elephant crop-raiding using dung mixed with chilli pepper and burnt*.

Goal 3.4. To ensure financial sustainability of protected areas and national and regional systems of protected areas. Target: By 2008, sufficient financial, technical and other resources to meet the costs to effectively implement and manage national and regional systems of protected areas are secured, including both from national and international sources, particularly to support the needs of developing countries and countries with economies in transition and small island developing States.

Question: Have sufficient financial, technical and other resources, both national and international, to meet the costs to effectively implement and manage national system of PAs been secured?

Answer*: Yes, some funding secured from GoG, Donor support (WB), and Grants (GEF, EU, CI).* .

Goal 3.5. To strengthen communication, education and public awareness. Target: By 2008 public awareness, understanding and appreciation of the importance and benefits of protected areas is significantly increased.

Question: Have public awareness, understanding and appreciation of the importance and benefits of PAs significantly increased?

Answer: *Yes, through CREMA*

Goal 4.1. To develop and adopt minimum standards and best practices for national and regional protected area systems. Target: By 2008, standards, criteria, and best practices for planning, selecting, establishing, managing and governance of national and regional systems of protected areas are developed and adopted.

Question: Have standards, criteria and best practices for planning, selecting, establishing, managing and governance of national system of PAs been developed and adopted?

Answer*: Yes, in the selection and establishment of the PAs and the stakeholder involvement in the MAB and CBAGs.*

Goal 4.2. To evaluate and improve the effectiveness of protected areas management. Target: By 2010**,** frameworks for monitoring, evaluating and reporting protected areas management effectiveness at sites, national and regional systems, and transboundary protected area levels adopted and implemented by Parties.

Question: Have processes for developing, adopting and implementing framework for monitoring, evaluating and reporting PAs management effectiveness at sites, national systems and transboundary PA level been started?

Answer*: Yes, Management information system (MIST for monitoring animal distribution and illegal activities) has been developed and being piloted in three of the*

16 protected areas. Forest Services Division has also developed GIS and Remote Sensing techniques for monitoring forest coverage

Goal 4.3. To assess and monitor protected area status and trends. Target: By 2010, national and regional systems are established to enable effective monitoring of protected-area coverage, status and trends at national, regional and global scales, and to assist in evaluating progress in meeting global biodiversity targets.

Question: Have processes for national systems to enable effective monitoring of PA coverage, status and trends at national level and to assist in evaluating progress in meeting global biodiversity targets been established?

Answer: ***Yes, FSD and CERSGIS has the capacity to use GIS and Remote Sensing techniques to support effective monitoring of PA coverage and encroachment***

Goal 4.4 To ensure that scientific knowledge contributes to the establishment and effectiveness of protected areas and protected area systems. Target: Scientific knowledge relevant to protected areas is further developed as a contribution to their establishment, effectiveness, and management.

Question: Are there programmes to ensure that scientific knowledge relevant to PAs are further developed as a contribution to PAs establishment, effectiveness and management?

Answer***: Yes, Institutions such as FORIG, CSIR-CRI, and the Universities (both foreign and national)***.