MINISTRY OF ENVIRONMENT, SCIENCE AND TECHNOLOGY



NATIONAL ENVIRONMENTAL POLICY

DRAFT

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ACRONYMS

AAGDS: Accelerated Agricultural Growth and Development Strategy
AFDB: Africa Development Bank
AMEHI: Accra Metropolitan Environmental Health Initiative
BOD: Biological/Biochemical Oxygen Demand
CAP: Community Protected Areas
CBAG: Community Based Advisory Groups
CDB: Convention on Biological Diversity
CLF: Compact Florescent Lamp
COMAP: Comprehensive Mitigation Analysis Process
CSIR: Council for Scientific and Industrial Research
CTI: Climate Technology Initiative
CWSA: Community Water and Sanitation Agency
ECOWAS: Economic Community of West African State
EIAs: Environmental Impact Assessments
EIS: Environment Impact Statement
EMPs: Environment Management Plans
EPA: Environmental Protection Agency
FAO: Food and Agriculture Organization
FC: Faecal Contamination
GHI: Genetic Heat Index
GIS: Geographic Information System
GOG: Government of Ghana
GSBAs: Globally Significant Biodiversity Areas
GSD: Geological Survey Department
ICT: Information Communication Technology
IWRM: Integrated Water Resources Management
MDAs: Ministry and Departments and Agencies
MEST: Ministry of Environment Science and Technology
NADMO: National Disaster Management Organization
NAP: National Action Programme
NDPC: National Development Planning Commission
NEAP: National Environmental Action Plan
NEP: National Environmental Policy
NFPDP: National Forest Plantation Development Programme
NRMP: Natural Resources Management Programme
NSBCP: Northern Savanna Biodiversity Conservation Project
OECD: Organization for Economic Co-operation and Development
PADP: Protected Areas Development Project
SOE: State of the Environment
TNA: Technology Needs Assessment
UNCCD: United Nations Convection to Combat Desertification
UNEP: United Nation Environmental Programme
UNFGCC: United Nation's Framework Convention on Climate Change
WDSP: Wildlife Division Support Project
WRC: Water Resources Commission

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1.0 INTRODUCTION

Ghana's participation in the Stockholm Conference in 1972 signified the beginning of the country's desire and willingness to make concerted and conscious efforts at the management of its environment. At the Earth Summit in Rio twenty years later, Ghana and the world moved closer to the objective of living in harmony with our environment by signing the Rio Conventions. By signing the agreements, Ghana and the world at large affirmed the reality and truth that development and environmental issues and goals are one. Environmental challenges have increased since Rio, and problems in the critical areas of pollution, urban congestion, loss of biodiversity and climate change have worsened. Since these concerns are of public goods nature, the Government of Ghana has played its due role in the management of these environmental concerns.

The 1992 Constitution was adopted just about the time the 1992 Environmental Policy was formulated. The new Constitution has made government accountable to the people of Ghana. It identifies the Legislature, the Executive and the Judiciary as the different arms of government within the framework of cooperative governance. The starting point for developing this new environmental policy for Ghana, therefore, is the Constitution from which derives the powers of government and the Ghanaian population at large.

Ghanaians are entitled to an environment that is not harmful to their health and well-being and are enjoined to have the environment protected for the benefit of present and future generations through reasonable legislative and administrative measures. In order to achieve this and to meet the development needs of our people, sustainable development is essential. Sustainable development requires an integrated and coordinated environmental management policy. In formulating a new environmental policy for Ghana therefore, all stakeholders were involved throughout the process at the local, district, regional and national levels.

Ghana is endowed with abundant natural resources which have played very important roles in the agricultural, industrial, economic and social development efforts of the country. However, as a result of incessant exploitation of these natural resources to meet the socio-economic aspirations of the people, adequate care has often not been taken to guard against the depletion and mismanagement of the resources. Consequently, this process of unsustainable development has caused irreparable damage resulting in deforestation, land degradation, air and water pollution, soil erosion, overgrazing, and destruction of bio-diversity among others. These areas affected constitute the totality of the country's environmental base. Their damage therefore affects the very foundations of the livelihood of Ghanaians.

Successive governments and people of Ghana have come to realize that the process of democratic governance can only be guaranteed if it is based on a sound socio-economic framework that is environmentally sustainable. The conservation of resources by all Ghanaians is therefore crucial to our survival as a country. Consequently conservation and sustainable use of these environmental resources and their protection depends on attitudinal and behavioral change by all individuals, households, and private and public sector institutions. The formulation of the environmental policy is expected to facilitate such change.

Ghana's first Environmental Policy enacted in 1992 emphasized these tenets. The 1992 Policy was based on a broad vision founded on and directed by respect for all relevant principles and themes of environment and sustainable development.

Since then, it has become obvious that environmental degradation is not only a function of failing world markets and poverty but also of institutional shortcomings at the household, district, regional and national levels.

The 1992 Policy identified a restructured lead agency (The Environmental Protection Agency, EPA) to drive the process towards sustainable development. Almost two decades later, the lead agency has spearheaded the process of change from narrow conservation orientation to sustainable development paradigm. However, the principal challenge confronting the environmental management process in the country is ineffective enforcement of the policies and laws that exist to achieve the desired results.

The current policy attempts to restructure and redirect the implementation strategy to achieve the desired results.

1.1 Vision

The new vision for environmental management is to manage the environment to sustain society at large. This vision is based on an integrated and holistic management system for the environment in Ghana. It is aimed at sustainable development. The policy seeks to unite Ghanaians in working toward a society where all residents of the country have access to sufficient and wholesome food, clean air and water, decent housing and other necessities of life. That will further enable them to live in a fulfilling spiritual, cultural and physical harmony with their natural surroundings.

This new paradigm of sustainable development based on integrated and coordinated environmental management will ensure:

- citizens' quality of life and their living and working environments;
- equal access to land and other natural resources;
- more efficient use of social, cultural and natural resources;
- public participation and environmental governance.

1.2 Mission

The goal of the Government of Ghana is to improve upon the foundations laid by the previous policy and activities implemented under the Ghana Environmental Action Plan. The goal is based on integrated and holistic environmental management practices and processes over the next ten years. In this regard, government is committed to:

- utilize all available resources at its disposal in the most effective way to achieve the aims of the policy
- promote the integration and coordination of its approach to environmental management among all the MDEs to facilitate the enforcement of people's environmental rights.

The Ministry of Environment, Science and Technology and the Environmental Protection Agency (EPA), the official government institution shall be responsible for ensuring the integrated and coordinated implementation of the policy and the associated activities during the stipulated period. EPA in particular shall ensure that:

- people's environmental rights are enforced;
- the challenges of environmental sustainability are adequately addressed;
- a follow-up on the priorities and goals of government policy are implemented.

The EPA shall further undertake to:

- promote better understanding of sustainable development in all spheres of national endeavour and what it takes to achieve it;
- play a lead role in securing the implementation of integrated, equitable, participatory and effective environmental management practices;
- pursue constant improvement in government's commitment to environmental sustainability;
- develop mechanisms to engage effectively in international agreements and cooperation in environmental governance;
- monitor and report biannually on the state of the environment (to be revised).

1.3 Policy Formulation Process

The policy was formulated through a participatory process involving a wide range of stakeholders including MDAs, Academia, Financial Institutions, MMDAs, informal sector, professional and trade associations, There were Key Persons and Focus Group Consultations at the national and regional levels in Tamale, Kumasi, Akosombo, Takoradi etc

Furthermore the draft policy was subject to validation workshops through which the document was refined. In addition the product was subjected to an ex-post Strategic Environmental Assessment through which the environmental opportunities and risks associated with policies strategies were identified and mitigation measures proposed.

1.4 Purpose of the Environmental Policy

This policy document is to:

- guide environmental governance in Ghana
- serve as a reference material for research and development.
- guide the country's development along sustainable path and
- ensure the country's commitment to conventions, protocols and international agreements.

1.5 Structure of the Policy

The policy document is prefaced by a preamble. Chapter one is the introduction, which provides the vision and mission of the Government of Ghana with regards to environmental management. Chapter two is an analysis of the current environmental situation including an

overview of the major environmental challenges facing Ghana and the corresponding management interventions, It concludes with a summary of key environmental issues defined under institutional and legal framework, sustainable resource use, environmental mainstreaming, participation and coordination, environmental education and awareness, environmental information management and international cooperation. The analyzed key issues under the four pillars of sustainability (i.e. Natural Resources, Socio-cultural, Economic and Institutional pillars) have also been incorporated in chapter two. This is followed by chapter three which contains the environmental policy statement and guiding principles. Chapter four covers the strategic goals, objectives and strategies. Chapters five and six defines key .sectoral and cross cutting policies. Chapter seven is a presentation of the policy implementation arrangements. Chapter eight is the conclusion.

2.0 CURRENT ENVIRONMENTAL SITUATION

2.1 Analysis of Current Environmental Situation

Environment is multi-dimensional, and it is necessary to refer to many geographic components and variables, which contribute to the 'environment' of Ghana. Therefore, the policy adopted a broad definition of 'environment'; embracing not only the biophysical environment but also the social, cultural, micro-economic and institutional conditions that constitute the human habitat. This definition is in line with the EPA Act 1994, Act 490 and Legislative Instrument 1652 of 1999

Environmental degradation can be ascribed to the dynamic interplay of a number of factors related to socio-economic activities, technological advancement and institutional arrangement. It is not clear how technological advancement and institutional arrangements lead to environmental degradation. In Ghana, poverty and inadequate environmental awareness and poor attitudes towards the environment represent the major underlying factors of environmental degradation.

The nexus between poverty, inadequate environmental awareness and poor attitudes on one hand and environmental degradation on the other can be described as a cycle. The poor in any society tend to rely more directly on natural resources causing further depletion and deterioration of the environment. On the other hand degraded environments can accelerate and exacerbate impoverishment. The Bruntland Commission Report which has been accepted as the blue print for environmental conservation, identified poverty as a major cause of Environmental problems. Ghana is no exception to this phenomenon.

There is the need therefore for a multi-disciplinary and inter-sectoral approach in addressing this phenomenon to ensure sustainable development. Major environmental challenges confronting Ghana can be related to the four pillars of sustainability namely: Natural Resources Management, Socio-Cultural Issues, Economic and Institutional Dimensions.

The environmental challenges are therefore defined under these pillars in the Table 1 below.

Table 1: Environmental Issues and Sustainable Development Pillars

Natural Resources	Socio-Cultural Issues	Economic Issues	Institutional Issues
• Land degradation (including drought) • Desertification • Deforestation • Loss of biodiversity • Water pollution • Soil erosion	• Poor Land Use Planning • Hazardous waste (including E-waste) • Environmental Health and Sanitation • Waste management • Noise Nuisance	• Industrial Development • Agricultural Practices • Tourism • Unemployment and Poverty	• Weak Institutional Capacities for Environmental Management • Ineffective Institutional Coordination • Conflicting and unclear mandates for environmental

Natural Resources	Socio-Cultural Issues	Economic Issues	Institutional Issues
• Marine and coastal degradation • Air pollution • Sand winning • Wild fires • Climate Change • Invasive Alien Species • Illegal Mining	• Chemicals proliferation and use • Slum Development		management • Weak Enforcement Capacity • Weak capacity (human, technical and financial) for negotiating and implementing international conventions, protocols and agreements • Transboundary Issues

2.2 Natural Resources Management Challenges

2.2.1 Land Degradation

With a total land area of 238,533sq.km, about 95% of land in Ghana is suitable for agricultural use. Agriculture therefore constitutes the major land use of the country, accounting for 62.9% of the land. The major agricultural uses are: (a) cultivated annual crops, (b) cultivated tree crops, (c) rangeland use/pasture and (d) bush fallow.

Land degradation resulting in declining productivity of the land in the face of mounting population pressure is one of the most serious environmental problems facing the country. Agricultural practices, both the traditional practice of slash and burn, shifting cultivation and modern practice of mechanization have led to declining soil quality. This has resulted in deforestation, accelerated erosion, sub-soil compaction, reduced crop yields, increasing desertifying conditions, particularly in the savannah areas, and destruction of watersheds.

The estimated percentage of total land area of Ghana prone to desertification is 64.97% which is about 165,000km^2. The Upper East and eastern part of the Northern Region face the greatest hazard with an area of about 78,718km^2 prone to desertification.

Some measures and initiatives put in place to reduce land degradation and other land use cover related problems include the preparation of land use and land cover plans and mapping and environmental information systems of the Natural Resources Management Programme (NRMP) for effective land and biodiversity management; the preparation of a National Soil Fertility Action Plan to arrest decline in soil fertility; and the National Forest Plantation Development Programme (NFPDP) launched in 2001 to plant 20,000 hectares of trees annually. The Environmental Protection Agency (EPA) also published National Action Programme to Combat Drought and Desertification (April 2002).

2.2.2 Deforestation

Ghana's forest resources are mainly utilized for production of logs for export, mechanical wood industries, fuel wood extraction, building, charcoal production and agriculture. Within the country, there is not an adequate system for monitoring the rate and extent of deforestation.

There has been marked deterioration of the condition and status of these forests as a result of human-induced interventions including illegal and excessive logging activities, destruction through mining, bushfires and other poor silvicultural management practices. Current estimates show that the country is still experiencing an alarming rate of decline in its forest cover. Out of the 8.3 million ha of high forest that existed at the beginning of the 20th century a mere 1.6 million of forest remains as at 2010.This suggests that there is an annual forest cover decline of about 70,000ha which is transformed into other land use forms notably, conversions into croplands (especially cocoa, rubber, coffee, palm, kola, etc.), over-exploitation for timber and fuel wood, mining and, of late, rampant uncontrollable bushfires.

The main cause of deforestation has been the quest for agricultural land, rather than the quest for timber or fuel wood. Bush fires caused mainly by farmers through slash-and-burn agriculture, hunters, palm wine tapers and honey collectors have also contributed to deforestation.

The Forestry Commission has since 1970 been implementing comprehensive forest protection strategy intended to restore the forests, maintain their environmental protection functions as well as to halt the loss of genetic diversity within them. The strategy termed 'large-grain forest protection' was to put about 352,000 ha (21 percent) of the forest estate into permanent protection across the forest and savanna zones.

The ancient culture of environmental protection in the form of community-protected areas (CPAs) also called "sacred forest grooves" are significant in most communities. Community Protected Areas (CPAs) are patches of traditionally protected primary forests that contain large portion of biodiversity. They are traditionally protected ecosystems and their exploitation is strictly regulated by customary laws, serving as repository of numerous endemic species. The responsibility for their protection is vested in the entire community. Currently, EPA has recorded 145 CPAs in Ghana and their ecological importance is being assessed.

A more recent forest policy and management system such as the Forest and Wildlife Policy 1994 and the National Certification Standards and Criteria, National Forest Plantation Development programme, and currently bidding processes have witnessed effective stakeholder participation and shared benefits. From early 1990s, Ghana's forest policies have turned from excessive centralization in policy formulation and implementation to a more stakeholder inclusion and shared benefits approach.

Government has responded to the deforestation campaign by promoting the use of liquefied petroleum gas to reduce the use of trees for energy purposes.

2.2.3 Desertification

In recognition of the menace of desertification, the Rio Earth Summit in 1992 recommended that an inter-governmental Negotiating Committee be established by UN General Assembly to prepare a convention to combat desertification for countries experiencing serious drought and desertification particularly in Africa.

- The Convention was opened for signature in Paris from October 14-15, 1994 to member States, of the United Nations or any of its specialized agencies that are Parties to the Statute of the International Court of Justice and Regional Economic Integration Organizations.
- Ghana signed the United Nations Convention to Combat Desertification (UNCCD) on June 17, 1994 and ratified it on December 27, 1996.
- It is a unique instrument that has brought attention to land degradation in the drylands where some of the most vulnerable ecosystems and people in the world live.

The Parties shall implement their obligations under this Convention, individually or jointly, either through existing or prospective bilateral and multilateral arrangement or a combination thereof, as appropriate, emphasizing the need to coordinate efforts and develop a coherent long-term strategy at all levels. In pursuing the objective of the Convention, the Parties shall;

- Adopt an integat3d approach addressing the physical, biological and socio-economic aspects of the processes of desertification and drought
- Give due attention, within the relevant international and regional bodies, to the situation of affected developing country.

Ghana developed the National Action Program (NAP) on desertification in 2002. The NAP was completed in April 2002 as part of the environments component of the Natural Resource Management Project (NRMP) with support from the World Bank.
The NAP specified the respective roles of government, local communities and land users and the resources available and needed. It ensures environmentally sound, sustainable and integrated development programme for drought prone, semi-arid areas based on stakeholder participation. It emphasizes integration of strategies for poverty reduction and other sector programmes including forestry, agriculture, health, industry and water supply into efforts to combat the effect of drought.

2.2.4 Loss of Bio-diversity

Biological diversity (i.e. genetic species and ecosystem diversities) is an indispensable component of the natural resource base. There is rich biodiversity in different parts of Ghana. These comprise mammals, birds and plants located in forest, mountain, freshwater and marine ecosystems and gene pools.

Biodiversity is known to provide three core types of services: (a) a source of the raw materials vital for all human activities; (b) a sink for waste and residue generated by human activities; and (c) a means of maintaining essential life support functions by maintaining quality ecosystem health (UNEP 1999, Millennium Ecosystem Assessment 2005). There are direct and indirect values of biological diversity.

By 2004 there were about 249 species of known mammals and 729 bird species within the country. However, about 15 mammals and 8 bird species are threatened. Some of these mammals are the giant forest hog, giant pangolin, leopard, golden cat, bongo and the elephant. The Red colobus monkey and hunting dogs have been declared extinct (Oates et al. 2000) and the birds include the White-breasted guinea fowl, which is now rare.

The changes in the environment with the attendant climate variability, drought and arid conditions are proximate drivers of loss of diversity including deterioration of habitat conditions of wild plants and animals through high temperatures and scanty rainfall. Bushfires have also contributed to the destruction of wild plants and animals in the country. Wild fires are used as tool for hunting by local people and deliberate burning resulted in some species facing risks of extinction.

Rapid loss of biological diversity has also taken place as a result of economic development and urbanization. For example, the construction of the Akosombo Dam led to the inundation of large tracts of land, flora and fauna. Today, plant species such as Gacinia kola, Afromosia and Calamus are very rare. Animal species such as the Red and White – Thighed Colobus and the Diana Monkey, and a number of small antelopes are also on the endangered list.

Over-fishing of rivers, lagoons and the sea has led to destruction of spawning grounds and a reduction of fish life. The use of small mesh nets, dynamites and poisonous chemicals such as DDT also account for the loss of species.

In a bid to conserve biodiversity, government and development partners are taking concrete steps. The country is party to many international conventions on biodiversity. Some of them are:

- Convention on Wetlands of International Importance, especially as Waterfowl Habitat;
- Convention on International Trade in Endangered Species of Wild Fauna and Flora
- Convention on Biological Diversity
- International Convention for the conservation of Atlantic Tuna
- Convention on the conservation of Migratory Species of Wild Animals

There are various domestic policies, laws and regulations related to the conservation and use of biodiversity, e.g. the forestry and wildlife policy and the water policy which promotes rational use of water resources, but most of the policies are sector based. The country has designated some areas as protected where biodiversity can flourish. The protected areas consist of six Resource Reserves, two Wildlife Sanctuaries, seven National Parks, one Strict Nature Reserve, six Ramsar Sites, one Zoo, Botanical Gardens and many community-based sanctuaries. The total area protected is 1,104 thousand hectares which is 4.6% of total area of Ghana.

There are various projects in progress aimed at conserving the country's biodiversity resources. Several initiatives have been made including:

- Northern Savanna Biodiversity Conservation Project (NSBCP)
- Wildlife Division Support Project (WDSP)

- Protected Areas Development Programme (PAAD)
- National Forestry Development Master Plan (1996-2020)
- National Biodiversity Strategy and Action Plan
- Guinea Current Large Marine Ecosystems Project
- Natural Resources Management Programme (NRMP)

2.2.5 Pollution

2.2.5.1 Water Pollution

The major sources of water pollution are domestic and municipal wastes, agricultural wastes, industrial wastes and inappropriate use of land. The discharge of the various forms of wastes into water bodies creates major environmental health problems such as diarrhoea, cholera, guinea worm and hook worm; water-hygiene diseases due to inadequate water to maintain personal cleanliness such as scabies and typhoid; and water-habitat diseases such as schistosomaisis, malaria, filariaris, arbovirus, oncoceciasis and trypanosomiasis.

Information on water quality analysis shows marked variation in river water quality for urban to rural settlements. This is particularly so in rivers close to settlements with population above 5000 where records of high faecal contamination (FC) and Biological/Biochemical Oxygen Demand (BOD) levels have been observed. This is due to the disposal of liquid and solid waste and human excreta directly into water courses. The underlying reason for this is the inadequate urban waste disposal systems.

The impact of water pollution on its availability will be aggravated by dwindling water resources

The Community Water and Sanitation Agency (CWSA) is assisting communities in constructing boreholes and promoting community management or rural and small towns water systems. The African Development Bank (AFDB) has sponsored the provision of safe water in six regions of the country. The provision of safe water in guinea worm endemic communities especially is being accelerated. NGOs are lobbying for increased expenditure of government on water delivery in the country. Awareness creation campaigns are being embarked upon for the protection of watersheds by organizations such as Environmental Protection Agency and Friends of Rivers and Water Bodies. Impoundments are being created covering an area of more than 7,500 hectares to improve water availability for irrigation, livestock watering, domestic use, construction and other uses.

2.2.5.2 Air Pollution

Ambient air pollution originating from anthropogenic sources is one of the most prevalent public health problems of modern society. Persistent emissions of air pollutants have resulted in very poor air quality in the major cities of Ghana; Accra, Kumasi, Tema and Takoradi. Concerns about poor air quality in Ghana relate not only to the human health impacts but also to the adverse impacts on biodiversity and the health of the ecosystem as a whole.

The key sources of emissions are road transport, deforestation, energy production, agriculture, bush burning and industry (manufacturing and construction) waste management and mining. The air pollutants of major concern include: particulate matter (PM10 and PM2.5), and Ground level ozone (O3), nitrogen oxides (NOx) including nitrogen dioxide (NO2), carbon monoxide (CO), sulphur dioxide (SO2), carbon dioxide (CO2), Ammonia (NH 3), volatile organic compounds (VOC s) and heavy metals (lead, Mercury, cadmium) and Persistent Organic Pesticides.

Evidence from epidemiological studies indicates significant association between poor air quality and the occurrences and frequencies of a range of health complications such as arrhythmias, myocardial infarction, stroke, respiratory symptoms. Others physiological and psychological disorders include: Asthma, chronic obstructive pulmonary disease (COPD), lung cancer, low birth weight, pre-term delivery and adverse cognitive development in infants. There is therefore the need to develop a comprehensive policy to address air quality related challenges

2.2.6 Marine and Coastal Degradation

Ghana has a coastline stretching for a distance of approximately 550 km. The marine coastal ecosystems in Ghana are richly endowed with important resources for tourism, fisheries, manufacturing and mineral extraction. The beaches, cliffs, lagoons, wildlife, cultural and historical sites and coastal landscapes also provide immense potential for tourism development.

The marine and coastal areas of Ghana are under considerable pressure as a result of human settlements, intensive agricultural activities, industrial development, salt production, mining and quarrying. The main sources of pollution in these areas are municipal and industrial effluents, agricultural runoffs which are usually untreated either in the immediate coastal zone or from inland drainage. Migration of people to the coastal areas, because of the industrial activities means high and direct discharges of industrial and human wastes into the coastal environment.

Several measures are being taken to address the problem of coastal erosion to create opportunities for the proper utilization of the coastal and marine resources. They are:

- Direct investments in building of control structures (Keta Sea Defence Project). Coastal defence works aimed at protecting the Keta area from further erosion as well as flooding from the Keta lagoon were initiated in 2000 and completed in early 2004. This has effectively stopped the erosion at Keta and reclaimed land for rehabilitation;
- In areas where erosion is threatening important settlements and infrastructure, a combination of gabions and boulder revetments have been employed to stop the phenomenon, e.g. the Tema beach road and Ada township;
- Mangrove re-planting and planting of other vegetative cover;
- Economic or regulatory incentives, which are in the form of imposition of fines for illegal mining and introduction of sand-winning licensing;
- Educational initiatives on sand winning awareness;

- Institutional or policy reforms in land-use planning and coastal zone management coordination;
- Economic or regulatory incentives (involving legislative or administrative changes for fines for polluting, recycling incentives and subsidies for retrofitting or equipment modernization;
- Land-use and industrial planning agencies and the District/Municipal Metropolitan Assemblies are strengthened to monitor and regulate industries;
- Direct investments in small scale waste collection;

2.2.7 Wildfires

Fire has been used as a tool for land management and plays important roles in the maintenance of many natural ecosystems. However, wildfire has considerable adverse impact on the natural environment and has been identified as one of the most important threats to the integrity of forests in Ghana. Wildfire is projected to increasingly contribute to substantial loss of Ghana's Gross Domestic Product (GDP). There is therefore the need to implement the National Wildfire Management Policy developed in 2006 adopting multidisciplinary and multi-sectoral approaches, and taking cognizance of the roles of traditional authorities and local communities.

2.2.8 Illegal Mining

Mining has been a very important industrial activity in the economy of Ghana dating back from the last century when the country was known as the Gold Coast through the independence period. The main minerals mined on a large scale today are gold diamonds, bauxite and manganese (mined since 1924). Currently, there are several large scale mines operating in the country.

Traditionally, small-scale mining for gold and diamond has also been a major economic activity in the country for centuries. Until recently, the small-scale mining operations were largely illegal and most of the gold and diamond production was smuggled out of the country and hence could not be included in officially quotable statistics. However in 1989, legislation was passed and its implementation has been successful in legalizing some forms of small-scale mining – mainly gold and diamond mining. The main environmental problems associated with the mining industry in the country include land devastation, soil degradation, water and air quality deterioration, noise, solid waste, land subsidence problems, and visual intrusion.

2.2.9 Climate Change

Ghana believes that although the issue of climate change is a global problem, which therefore demands a global solution, the consequences of the phenomenon will affect the lives of its citizens either directly or indirectly. Ghana therefore, signed the United Nation's Framework Convention on Climate Change (UNFCCC) in 1992 and ratified the same in September 6, 1995. As party to the Convention, Ghana has participated in most of the activities designed to enhance capacity of members to meet their commitments under the Convention.

The examination of environmentally sound technology as a means of averting the threat of the climate change in Ghana was an initiative by UNFCCC. Ghana has therefore, in fulfillment of the above relevant decisions of the COP of the UNFCCC, prepared a needs assessment report. There is enough scientific evidence to prove that the potential negative impacts of climate

change are immense, and Ghana is particularly vulnerable due to lack of capacity to undertake adaptive measures to address environmental problems and socio-economic costs of climate change. These include climate change associated health problems, climate induced disruption of agricultural systems, flooding of coastal areas which are already undergoing erosion and low operating water level of the major hydro-generating dam in the country. Apart from fulfilling Ghana's commitment to the UNFCCC, the preparation of the technology needs and needs assessment report emphasizes Ghana's preparedness to join efforts with the global community to avert the climate change threat.

Ghana was assisted by the Climate Technology Initiative (CTI) of the OECD and has put together a report. The report listed a number of desired technologies, which have been prioritized and further developed into a Technology Transfer and Acquisition Plan (TAAP). Within the TAAP three priority technologies have been selected based upon national set of criteria. The three priority technologies selected are:

a. Energy Efficient Lighting using Compact Florescent Lamps (CFL);
b. Industrial Energy Efficiency;
c. Landfill Methane Gas Recovery.

The technology needs assessment (TNA) report is intended to specifically highlight the nation's climate change relevant technological requirements and also give some indication as to the efforts the country is making towards sustainable development. Moreover, it emphasizes the support Ghana needs if she is to contribute meaningfully towards finding solutions to the global problem of climate change.

2.2.10 Invasive Alien Species

Invasive Alien Species (IAS) refers to plants, animals and micro-organisms introduced to ecosystems outside their natural habitat. IAS is a global threat to the conservation of biological diversity through their proliferation and spread, displacing or killing native flora and fauna and affecting ecosystem services. The environmental costs of invasive species can be staggering. These species typically have high reproductive rates, disperse easily and can tolerate a wide range of environmental conditions. Often, they lack predators in their new environments.

Over 250 species of exotic plants have become naturalized in Ghana, and over 20 of these can be categorized as invasive. These include the water weeds, *Eichornia crasippes, Salivina molesta, Pistia strategies* and *Azollo filiculoides*. They are known to have occurred on the Volta Lake and Tano River Basin as a result of infestation of water hyacinth (*Eichornia crasippes).*

They are known to have occurred on the Volta Lake and Tano River Basin as a result of infestation of water hyacinth (*Eichornia crasippes).* Major terrestrial invasives include *Chromolena odorata, Broussonetia pappyrifera* and *Leucaena leucophala*. These colonize disturbed forest and savanna woodlounds throughout the country where they prevent reservation and displace indigenous species. The Afram Headwaters Forest Reserve is threatened by invasion of *Broussonetia* and *chromolaena.*

There are other faunal invasive species which pose environmental problems to agriculture and public health. These include fire ants, spiraling whitefly, giant land snails, cassava mealy bug, and larger grain borer among others.

The government has over the years, through programmes, policies and legislative instruments sought to protect the environment from IAS. There are many institutions that play different roles in the prevention of IAS. While the number of institutions and existing legislations seems adequate, the uncoordinated nature of the policies and law's creates conflicts and leaves gaps in the control of IAS.

Some of the projects implemented or being implemented includes the following:

- Biocontrol of *Chromolaena odorata,* implemented by the Crop Research Institute of CSIR, Kumasi and funded by the Government of Ghana.
- Integrated Mycoherbicide Programme for Water Hyacinth Control in Africa (IMPECCA), Implemented by CAB International and funded by DANIDA
- Waterweed management in West Africa – implemented by EPA and FAO in Ghana.
- Integrated management of the Volta River Basin implemented by EPA and funded by GEF
- Integrated management of invasive aquatic weeds in West Africa (IMIAW) implemented by EPA and funded by ADF. This involves seven other ECOWAS member states.

2.3 Socio-Cultural Issues

2.3.1 Poor Land use Planning

The environmental problems associated with urban overpopulation in Ghana are those that have direct bearing on human health, such as basic sanitation and disposal of waste, the shortage of essential facilities and disregard for approved land use allocations. Other problems are overcrowding, poor and inadequate transportation facilities

The rapid population growth rate in Ghana is presently exerting immense pressure on the natural resources, as well as creating waste management problems in the major towns and cities. .

Urban settlements in Ghana experience the highest housing demand needs which often outstrip housing supply in the country. It is estimated that Ghana needs about 70,000 housing units annually to cope with housing demand. Meanwhile, an estimated accumulated housing delivery deficit of 250,000 has to be cleared in order to reduce housing occupancy rate of 13 to 7 persons.

Besides these housing deficits, the rapidly growing urban areas lack important social services such as access roads, good drinking water, sewage treatment plants and health services. Health delivery systems and other social services are inadequate while most of the existing social service infrastructures are unevenly distributed. For example, government health facilities, which account for 70% of the entire health service delivery system in the country, cater for

only an estimated 30 – 40 % of Ghana's population. Furthermore, most of these health facilities are located in large urban centres, regional and district capitals.

The encroachment on reserved open spaces is a major issue for settlements especially in the urban areas, hence the resulting proliferation of unapproved settlement areas including squatters or slums. Fragile ecosystems have been invaded and agricultural lands have been over-cultivated thereby affecting production and good arable lands are being turned into construction of buildings and roads. Cost of housing is a big problem in the large towns and cities and has become an excuse for settlements in unapproved environments otherwise referred to as spontaneous settlements.

Within the past decade, a number of policies and programmes have been initiated to tackle the needs of the rural and urban areas. For example, the provision of electricity has improved tremendously as the percentage of the rural population with access to electricity rose from 8.7 percent in 1992 to 17.6 percent in 1999.Also, there have been notable successes in areas of privatization and cost recovery measures for the provision and maintenance of selected urban services such as water and waste management.

2.3.2 Environmental Health and Sanitation

A direct relationship exists between the biophysical environment and human health. Pollution of air is known to be an important source of respiratory tract infections whilst polluted water is a source of water-borne diseases. Slowing of the flow of certain rivers for example as in the lower Volta area has resulted in harbouring the hosts of bilharzias, and river blindness. Research has established that the health status of a community is a function of the environment of the locality. In Ghana, environmental sanitation and general improvement in environmental management is gaining wider recognition among policy makers.

Rural areas and fragile urban slums with high incidence of poverty suffer most from environmental degradation and hazards, consequently these are the centres of most communicable diseases such as malaria, tuberculosis, HIV/AIDS and STDs, buruli ulcer and guinea worm infestation. Water-related diseases such as diarrhoea and typhoid are also of great importance.

A lot of training and public education is in progress to strengthen surveillance and response as well as identify the early stages of these communicable diseases before they advance to latter stages. Inter-sectoral networking will be important in managing the diseases and the programme being embarked upon by the University of Ghana Volta Basin Research Project and similar models will have to be introduced in other areas of the country.

2.3.3 Noise Nuisance

Noise control and enforcement of appropriate noise levels at various places have become a major environmental concern particularly in urban settlements in Ghana. The main sources of noise pollution include the following:

- motor vehicles and traffic, particularly from diesel operated vehicles and machines;
- unnecessary blowing of sirens and horns;
- noise generated from traders, hawkers and commercial activities at lorry parks and markets;
- Places of worship and funeral activities

Other sources of noise pollution are textile mills, weaving plants, sawmills, flour mills and activities such as blasting in the mines, quarries and printing houses.

Noise produced at entertainment and social gatherings such as churches, mosques, funerals and parties has become a great source of concern in many residential areas. Machinery such as generators, corn mills, musical instruments at shops and used by itinerant vendors do generate noise above permissible and acceptable levels.

The EPA has produced guidelines indicating the permissible ambient noise levels for the country. The guidelines describe the areas (zones) and the permissible noise levels during the day and at night. The areas described include residential, educational, commercial and industrial, places of entertainment, public assembly or worship.

The guidelines also include decibel rating of various sounds as follows: extremely loud sounds – 110-180, very loud – 80-100, moderately loud – 50-70, quiet – 30-40, very quiet 10-20.

The EPA has set ambient noise level guidelines but statistics available indicate that noise is still a nuisance in human settlements because the enforcement process has not been effective due to the inability of Metropolitan/Municipal and District Assemblies to play their role.

2.3.4 Waste Management

All human activities produce solid and liquid wastes. Littering of landscape with polyethylene bags, waste packaging materials, finished canned and boxed take away foods boxes make the environment unattractive and may have health implications on both humans and animals. Pollution of surface and ground water resources resulting from improper disposal of waste water in the community could adversely affect development of the tourism sector. Policy strategies will look at how best our solid and liquid wastes can be disposed of in an environmentally friendly manner.

- Hazardous waste
- Municipal waste
- Agriculture waste
- Wood Processing waste
- Etc

Waste Hierarchy

- Reduce
- Re-use
- Recycle
- Recover
- Disposal

2.3.5 Hazardous Chemicals, Hazardous Waste and E-Waste

A hazardous chemical (substance or material) is that which can cause harm to humans or the environment, having one or more of the following characteristics: ignitability, corrosiveness, reactivity (or explosiveness), toxicity and eco-toxicity. Hazardous chemicals may be classified are (i) industrial chemicals which are large scale commercially manufactured chemical compounds, either organic or inorganic, which may be used directly or made to undergo further transformation in the production of detergents, drugs, fertilizers, perfumes, plastics and other synthetic finished chemical products; (ii) consumer chemicals, which are industrial chemicals whose products are meant for the direct or immediate use by the consumer public, particularly for such areas as household cleaning, hygiene, water treatment, etc and are usually stable under normal conditions of temperature and pressure; and (iii) Pesticides which are substances or mixture of substances intended for the prevention, destruction or control of any pest, embracing vectors of human or animal disease, unwanted species of plants and animals causing harm during or otherwise interfering with the production, processing, storage, transport or marketing of food, agricultural commodities, wood and wood products or feed stuffs. The term pesticide also includes substances intended for use as a plant growth regulator, defoliant and desiccant. Hazardous chemicals also include persistent organic pollutants (POPs), which are carbon-containing chemical substances that persist in the environment, bioaccumulate through the food web, and pose a risk of causing adverse effects to human health and the environment. There is the continuous need to regulate the use of hazardous chemicals in the entire life-cycle in order to maximize their usefulness whilst minimizing their potential impacts on human health and the environment.

Hazardous wastes are by-products of industrial, business, or household activities for which there is no immediate use and pose substantial or potential threats to public health and the environment. These wastes may be found in different physical states such as gaseous, liquids, or solids. A hazardous waste is a special type of waste because it cannot be disposed of by common means like other by-products of our everyday lives but must be disposed of in an appropriate manner and there should be stringent regulations pertaining to their production, storage, and disposal. Hazardous wastes range from materials contaminated with dioxins and heavy metals (such as mercury, cadmium, lead) to organic wastes. Electronic waste is a generic name for waste electronic and electrical equipment. They include large household appliances, small household appliances, IT and telecommunication equipment, medical devices, automatic dispensers, electrical and electronic tools among others. Development of legislation to regulate the management of hazardous waste in general and waste electronic in particular is in progress. This is particularly critical as the growing cost of managing hazardous waste in industrialized countries is providing incentive for illicit transfers to developing countries including Ghana. The need to develop infrastructure to manage hazardous waste using best available techniques which currently includes incineration, waste to energy, waste reduction, reuse and recycling will have to be explored.

2.3.6 Natural Disasters and the Environment

Ghana is a relatively stable region and major earthquakes are therefore rare. The Accra District and some coastal areas have previously experienced earthquakes and minor tremors. The most severe of these occurred close to 70 years ago. The shock lasted for 20-30 seconds.

The intensity of the shock was greatest between Accra and Gomoa Fete, particularly around Nyanyanu.

Ghana rarely experiences severe droughts. The period 1968-1973 is recorded in the sub-region as bizarre as severe drought and desiccating conditions in the Sahelian belt (Mali, Chad, Burkina Faso, Mauritania) and in the northern part of Ghana killed an estimated 250,000 people and millions of wild and domestic animals. In 1982/83 Ghana experienced the worst drought ever. Lack of rains, severe desiccating conditions culminating in bushfires, destroyed forests, cocoa farms, wildlife reserves and farms and resulted in a lot of hardships on Ghanaians. The effects of climate change de-vegetation and other anthropological factors are acting in concert to move the Sahara desert southwards.

A major activity in reversing drought induced desertification is the establishment of permanent and temporary vegetative cover on the land. Considering that most economic activities in Ghana are land-based, community participation in all activities designed to combat desertification is critical to the achievement of the desired impact.

Though the country is well drained, flooding occurs in all the river basins but their effects are more devastating in the basins where human settlements are close to or in river courses and flood plains. Some of the major causes of flooding in this country include:

- Settlements, farms and other properties located in flood plains, low-lands and valleys including obstruction of waterways by unauthorized buildings and other structures
- Inadequate drainage systems as well as choked drains and stream channels
- Creation of impervious surfaces through urbanization
- Water spillage from dams and reservoirs and the lack of flood control measures upstream

The flood usually occurs in the south in May/June and in August/October in the north. These months correspond to the peak rainfall periods in the two halves of the country. The floods in the country, especially in the capital city, result from intense storm rainfall or persistent rainfall of low intensity.

The flooding is generally moderate but occasionally very serious floods occur in some parts of the country. This occurs as a result of lack of proper drains along existing roads, physical obstruction in drains, unchanelled surface run-off etc.

In the Odaw basin, flooding has been occurring annually since 1983 resulting in the loss of several lives and property worth billions of cedis. In the White Volta basin, there is periodic flooding and the resultant socio-economic loss to the nation is colossal. The flooding in this basin is due mainly to cross-border dam spillage from Burkina Faso, which is quite a recent phenomenon with devastating consequences. This may partly explain why flooding ranks as a

significant problem in Ghana. Flooding may also introduce diseases (such as diarrhea) and change the biodiversity.

The opening of the Akosombo Hydro-electric dam threatens communities in the Eastern and Volta Regions.

In Ghana, the frequency and the devastating effects of floods have become annual events felt mostly in Accra. Relatively minor flooding events have been recorded in Kumasi, Tamale and Sekondi-Takoradi. In 2010 and 2011 for example, there was heavy downpour in Accra that resulted in the flooding of several parts of the city; more than twenty-four (24) people lost their lives and several properties were destroyed. The Odaw River is heavily silted and the Korle Lagoon is perpetually chocked due to the large amount of garbage that is thrown into the Odaw. The provisions of the National Building Regulations, particularly those relating to the location of buildings must be strictly enforced.

The Geological Survey Department (GSD) has installed seismological stations at Weija, Shai Hills, and Kukurantumi and in Accra to record seismic activities such as tremors and quakes. The National Disaster Management Organization (NADMO), in collaborating with the GSD has organized various educational programmes to create awareness among the general public about the environmental effects of earthquakes and what to do to reduce loss of human life and property. Under the auspices of NADMO, a new building code is being developed that will take into account the potential of an earthquake event occurring and to reinforce structures and make them resistant to the impacts of the quakes.

The following activities have been initiated to manage natural disasters:

- Sustainable management and conservation of natural resources per government and NGO-led programmes to protect forest reserves and promote tree planting have been launched
- Integrated watershed management approach for the preparation and implementation of plans to combat desertification in Ghana is in place.
- The Korle-Lagoon Ecosystem Restoration Project is aimed at constructing a wider and proper drainage channel for the Odaw River and desilting the Korle Lagoon to allow free flow of water into the sea.
- City authorities have realized the need to enforce the bye-laws on building structures and residential facilities in floodplains, waterways, wetland environment, etc.
- Several of the basins are being desilted and proper drains constructed on them to allow free flow of water in them to the sea.

2.4 Economic Issues

The attainment of the environmental policy objectives can best be realized through effective use of natural resources. The key areas of concern for environmental management relate to:
Unsustainable mining (particularly illegal mining), industrial and agricultural practices leading to pollution of land, water and air.

- The development of the tourism sector is also associated with serious environmental impacts on fragile ecosystems such as beaches, mangroves, etc

- There is a direct correlation between poverty and the environment. The poor depend largely on environmental resources such as non-timber forest products for their livelihoods. This eventually impacts on the effective sustainance of these resources. In Ghana, areas of acute poverty are associated with extreme environmental challenges.

2.4.1 Petroleum and the Environment

Ghana's total energy production has to grow significantly to facilitate the country's development agenda. The vision of the energy sector is to develop an "Energy Economy" to secure a reliable supply of high quality energy services for all sectors of the Ghanaian economy was to become a major exporter of oil and power by 2012 and 2015 respectively.

In July 2007 the Ghana National Petroleum Company (GNPC) and its partners discovered oil and gas in commercial quantities in the offshore basin of the Western Region of Ghana. In addition to the Jubilee field, there have been subsequent discoveries in the area and exploration activities are being intensified elsewhere in the country.

With the prospect of becoming a major oil and gas producing country, the following areas of concern have been identified among others:

- pollution of air, water and land;
- oil spills at sea;
- discharge of ballast water;
- transportation concerns – pipelines, tankers;
- coastal ecosystem destruction;
- international relations;
- local capacity to manage oil and gas.

Major national developments related to the oil and gas sector include the following:

- Establishment of Petroleum Commission and Ghana National Gas Company;
- EPA Guidelines for Environmental Assessment and Management in the Offshore Oil and Gas Development
- Petroleum Exploration and Production Bill;
- Petroleum Revenue Management Act, 2011, Act 815
- Conduct of SEA on oil and gas development

2.4.2 Tourism and Environment

Since the late 1980s, tourism has received considerable attention in the economic development strategy of Ghana. Currently, it ranks as the third largest foreign exchange earner, after cocoa and mineral exports. Specifically, Government has identified tourism as a priority area in the overall developmental programme of the economy and one of the areas for diversifying and expanding the base for foreign earnings.

The first major step in the formal development of tourism in Ghana was the evaluation of the country's resources in 1970 (Obuam Committee, 1972). The objective was to catalogue and classify the potential tourism resources for a 5-year development plan. Based on this study as

well as others, there was the general consensus that Ghana had the potential to develop a viable tourism industry, however, there was the need to formulate a more comprehensive national tourism development plan to guide long-term sustainable development.

The national development policies and objectives establish the framework for development planning including planning for tourism. These development policies and objectives are outlined in Ghana – Vision 2020. This vision seeks over the long term to make Ghana a middle-income country. It is also to make Ghana attain a sustainable economic growth rate of eight (8) percent annually.

Vision 2020 identifies tourism as providing an important opportunity for economic development based on the natural, historic and cultural resources of the country. The National Tourism Development Policy and Structure Plan provide a basis for developing integrated and sustainable tourism over the long term in Ghana.

The tourism policy goal of Ghana is to develop tourism as a leading socio-economic sector of the country and good quality, internationally competitive tourist destination, within the framework of maintaining its permanent sustainability. The following among others is the basis of the policy framework:

- Tourism will be developed as one of the major socio-economic sectors of the country, generating substantial foreign exchange earnings, income, employment, and government revenues and appreciably raising the living standards of the Ghanaian people equitably. Tourism will be used as a means to strengthen the economies of both the urban and the rural areas.
- In addition to direct benefits accruing from tourism, it will serve as a catalyst for the expansion of other sectors of the economy, and help pay for improvement of the country's infrastructure.
- Tourism must be developed in a manner that helps achieve preservation of the country's cultural, historical, and environmental heritage. It thus serves as a means to present Ghana's unique cultural and historical heritage to the international community and to educate Ghanaians about their own heritage.

2.4.2.1 Developing the Tourism Industry for Jobs and Revenue Generation

Over the medium-term, the priority interventions in this focus area are aimed at increasing the sector's contribution to GDP and foreign exchange earnings, as well as high value employment and incomes. This is expected be achieved through: diversifying and expanding the tourism industry for revenue generation; promoting domestic tourism to foster national cohesion as well as redistribute income; and promoting sustainable and responsible tourism in such a way as top reserve historical, cultural and natural heritage. The attainment of these broad objectives will be anchored on improving the legal and institutional framework for managing the sector, improving human resource capacity of the industry, improving the infrastructure base of the industry, and reducing credit constraints associated with the sector.

The specific strategies identified to achieve the policy objectives outlined above are as follows:

i) ***Diversify and expand the tourism industry for revenue generation:*** To diversify and expand the tourism industry for revenue generation, Ghana will be marketed as a competitive tourist destination; new, high-value options in the leisure market, and the culture, heritage and ecotourism sub-sectors will be developed, while enhancing the attractiveness of the existing products. Tourism services and standards will be enhanced through inspection, licensing and classification of formal and informal tourism establishments; and human resource capacity of skilled and unskilled personnel in the hospitality industry will be enhanced. Programmes will also be designed to promote the development of more high value accommodation and condominiums by the private investors; attract health care entrepreneurs to establish medical facilities offering clinical and surgical services to promote wellness facilities (i.e. natural SPAs) in order to ensure long-term stay of convalescents at selected tourism sites.
These are expected to improve and strengthen the infrastructure base of the industry.

To improve the overall financing of the sector, interventions will be designed to reduce the credit
constraint facing operators in the sector including granting "export" status to hotels so that tourism sub-sector players can also enjoy the benefits and concessions enjoyed by other exports. The overall legal and institutional framework to support the industry, and the development of national parks and other high-rated natural attractions will be enhanced and strengthened.

ii) Promote Domestic Tourism to foster National Cohesion as well as redistribution of income:
To promote domestic tourism and foster national cohesion, the specific strategies identified for implementation include: vigorous promotion of domestic tourism to encourage Ghanaians to appreciate and preserve their national heritage and create wealth in the communities; and develop domestic tourism infrastructure including tourist receptacles.

iii) Promote sustainable and responsible tourism in such a way to preserve historical, cultural
and natural heritage: The specific strategies identified under this policy objective include developing sustainable ecotourism, culture and historical sites; and ensuring the elimination of incidence of sex abuse and the spread of sexually transmitted diseases via the tourism industry.

2.4.3 The Transport Sector and the Environment

The main components of the transport sector in Ghana are road, air and water (lake) transport. Road transport is by far the dominant carrier of freight and passengers in Ghana's land transport system. In 2010, Ghana's road network consists of 66,220 kilometres of roads. This is made up of 42,192 km of feeder roads, 12,400km of urban roads and 11,628 km of trunk roads (GSGDA, 2010).. The network is comprehensive and links all districts and regions, and also provides access to a large number of settlements. Extensive use of road transport in relation to other forms of transport and poor maintenance of roads have however, led to pre-mature deterioration of the road network, congestion on roads and highways, especially in the urban areas, and an increase in road traffic accidents. Currently, 41% of the road network is in good condition, 27% is in fair condition and 32% is in poor condition (GSGDA, 2010).

However, Ghana's transport system in general lacks comprehensive measures for minimizing environmental damage. Noise and dust are not given much attention; measures to control construction damage are weak; and safeguards against hazardous spills are not well enforced. Right-of-way encroachment in rural and urban areas is causing congestion, raising the risk of accidents and leading to costly relocation and resettlement.

Vehicular congestion in our urban areas, especially Accra-Tema and Kumasi is causing concern. The make and use of vehicles imported into the country needs more rigid control. High pollution levels are being generated by old vehicles which are poorly maintained. Very little has been done to reduce vehicular pollution in our cities. As a result, a substantial percentage of carbon monoxide, lead, hydrocarbons, nitrous oxides and particulate matter are emitted into the atmosphere posing considerable health hazards. Noise pollution generated from these vehicles cannot go without being mentioned.

The location of airports in Accra and Kumasi is another source of worry. These airports are now surrounded by residential areas and noise pollution and potential for accidents are of major concern. The increasing use of the Volta Lake as a medium of transport has also resulted in regular, at times very disastrous boat accidents. The resultant loss of lives and oil pollution caused by these constitute environmental concerns in the country.

The rising demand for transport is also harming the environment and people's health. Any policy aimed at correcting environmental problems should involve environment impact assessments and mitigation measures based on cost-benefit analysis. To address these problems, Ghana must first enforce existing laws and regulations, then revise, formulate and consolidate measures to minimize environmental damage done during construction and use of transport infrastructure. At the same time, the costs and benefits of expensive environmental measures must be balanced. The impact of infrastructure construction and operation can be improved gradually by including environmental impact assessments (EIAs) in design stages. Design should consider energy efficiency and environmentally friendly options, the suitability for transport of hazardous materials, and means for reducing noise and pollution.

2.5 Institutional Issues

The attainment of the environmental policy objectives can best be realized through effective institutional collaboration. The current institutional arrangement for environmental management in Ghana is characterized by the following:

- Weak Institutional Capacities (laws, skills, processes, resources) for Environmental Management
- Ineffective Institutional Coordination
- Decision Making Processes
- Weak Enforcement Capacity

There is also the need to recognize the importance of bilateral, regional and multilateral cooperation in the protection and management of the environment. Differences between countries in terms of socio-economic development, institutional arrangements infrastructure

and political orientation may represent coordination challenges to effectively manage and address transboundary environmental challenges.

The identification of appropriate regional and international environmental agreements to provide the framework for addressing transboundary environmental challenges represent one strategy. Other strategies involve collaboration in advancing transboundary environmental research and implementation of joint projects to create avenues for discussing relevant policies with focus on critical areas of international concern such as land and water use planning, regional growth management, trade and transportation corridors. Sustainable collaboration among countries in addressing transboundary environmental challenges should aim at promoting exchange of information and joint monitoring and assessment in participatory and integrated approaches of environmental governance.

These are environment-related issues that have assumed prominence following the adoption of the 1992 policy. They now constitute the body of the environmental challenges in Ghana.

2.6 Summary of Issues

The Table 2 below illustrates the key environmental policy issues that require interventions.

Table 2: Summary of Issues

Focus Area	Issues
Institutional and Legal Framework	• Weak institutional capacity for environmental management • Weak compliance and enforcement of environmental law • Ineffective institutional coordination • Conflicting mandate for environmental management • Weak capacity (human and financial) for negotiations and implementing International Conventions, Protocols and Agreements • Inadequate environmental laws and legislations for emerging environmental issues
Sustainable Resource Use	• Over exploitation of natural resources (land, water, etc) • Pollution • Rapid population growth, migration and urbanization • Unsustainable consumption and production practices

Focus Area	Issues
Environmental Mainstreaming	• Low level of environmental mainstreaming into national, regional and district development policy planning processes • Weak integration of environmental considerations in the implementation of national, regional and district plans and programmes. • The absence of environmental managers at the district and community levels
Participation and Coordination	• Inadequate institutional structures and mechanisms for participation in environmental governance at all levels. • Fragmented, Conflicting and unclear mandates for environmental management
Environmental Education, Training, Awareness and Communication	• Low level of awareness on environmental issues. • Poor attitudes towards environmental issues. • Inadequate funding for environmental awareness creation and training.
Environmental Information and Management	• Inefficient management of environmental information • Lack of an integrated and coherent environmental information management system. • Inconsistency in the definition of environmental indicators.
International Cooperation	• Inadequate institutional framework for negotiations and implementation of international environmental agreements. • Lack of political will in implementing some international environmental agreements.

3.0 ENVIRONMENTAL POLICY STATEMENT AND PRINCIPLES

This chapter deals with the environmental policy statement and principles that would guide the operationalization of the policy strategies.

3.1 Environmental Policy Statement

Government's support for the environment has grown over the past 30 years and the general performance of the environment has improved considerably. . This has been largely driven by the broad national environmental policy statement contained in Chapter 6, Article 36 (9) of the 1992 Fourth Republican Constitution of the Republic of Ghana, stated as follows:

"The State shall take appropriate measures needed to protect and safeguard the national environment for posterity; and shall seek co-operation with other states and bodies for purposes of protecting the wider international environment for mankind"

and Article 41(k), which states:
"The exercise and enjoyment of rights and freedoms is inseparable from the performance of duties and obligations, and accordingly, it shall be the duty of every citizen - to protect and safeguard the environment."

However, environmental challenges such as pollution, urban congestion, loss of plant and animal species and climate change among others still persist. These concerns must be given increased operational priority, in recognition that long-term economic growth, social transformation, poverty reduction and environmental sustainability are inter-linked and must therefore constitute the foundations of this policy.
This policy is to ensure sound management of the environment and the sustainable use of resources to avoid irreparable damage to the environment.
The policy also takes account of the national environmental priorities while sufficient attention is also given to longer-term sustainability concerns. Government ownership of the national environmental objectives is indeed important, but ministries, departments and agencies (MDAs), as well as other institutions including non-governmental organizations (NGOs) and civil society organizations (CSOs) must be part of the policy implementation process to ensure overall success."

The policy aims at:

- Improving the commitment to environmental objectives, policies and interventions;
- Controlling rapid population growth, promoting economic growth, reducing poverty, promoting good governance and strengthening institutional capacity. improving quality and flow of information;
- creating an understanding of the nature and causes of environmental problems;
- defining the national environmental agenda and linking it to economic growth, poverty reduction, legal and institutional capacity;
- mainstreaming international relations into the national environmental agenda;
- improving environmental quality monitoring programme to ensure that the appropriate mitigation measures are implemented;

- taking appropriate measures to control pollution and the importation and use of potentially hazardous and toxic chemicals;
- taking appropriate measures to protect sensitive ecosystems;
- Improving collaboration and coordination among MDAs and other key actors.

3.2 Operational Principles

The National Environmental Policy shall be implemented on the basis of principles for environmental management. These principles are the fundamental premises which will be employed by government to direct actions including decision making, legislation, regulation and enforcement.

3.2.1 Accountability

Government is accountable for policy formulation, project implementation, monitoring compliance and enforcement. In this regard, government will allocate roles to selected institutions in accordance with the Constitution of the Republic of Ghana.

3.2.2 Allocation of Functions and Coordination

Government of Ghana will allocate functions within the framework of the Constitution to institutions and other arms of government that can most effectively achieve the objectives of the particular function within the context of the environmental policy. Furthermore, environmental concerns affect all aspects of human endeavour and must be integrated into the work of all government institutions.

This requires intergovernmental harmonization of policies, legislation, monitoring, regulation and other environmental functions in accordance with the requirements of this policy.

3.2.3 Capacity Building and Education

Every Ghanaian must have the opportunity to develop and strengthen skills, competencies and abilities to effectively participate in the process of achieving the sustainable development goals.

Environmental education plays a critical role in addressing these concerns. Education promotes attitudes and values that influence environmentally ethical behavior by developing understanding, skills and values that enable people to participate as active and informed citizens who can contribute to the development of an ecologically sustainable and socially just society.

3.2.4 Conflict of Interest

Any actual or potential conflicts of interest between responsibilities for resource exploitation, and any responsibilities or powers affecting environmental quality or impact management, must be resolved with dispatch. Solutions to such conflicts of interest must ensure effective implementation of the environmental policy and make provision for the role of the lead institution in maintaining the norms and standards.

3.2.5 Due Process

Due process must be applied in all environmental management activities. This includes adherence to the provisions in the Constitution with respect to just administrative regulations and public participation in environmental governance.

3.2.6 Equity

There should be equitable access to all environmental resources, benefits and services to meet basic needs in order to ensure human well being. Each generation of Ghanaians has the duty to avoid impairing the ability of successive generations to ensure their well being.

3.2.7 Environmental Justice

In order to ensure environmental justice, government must integrate environmental considerations with social, political and economic justice in addressing the needs and rights of all communities, sectors and individuals. In this regard, policy, legal and institutional framework must:

- redress environmental injustice
- address the need to protect and create employment
- Consistent with the relevant provisions of the Labour Act 2002 a work has the right to remove himself or herself from imminent and serious danger to his or her life, safety or health.
- recognize the right of every citizen to expose any environmental or health hazard without fear
- uphold the equitable representation and participation of the poor and the marginalized in society

3.2.8 Global and International Cooperation

The Government of Ghana recognizes its responsibilities for regional, African and global environmental issues and upholds the principles and regulations contained in international agreements and conventions, including those pertaining to the ECOWAS protocols and agreements.

3.2.9 Environmental Governance

Good governance is a function of mutual trust and reciprocal relations between government and the citizens. This must be based on the fulfillment of constitutional, legislative judicial and executive functions, the acceptance of authority, probity, transparency and accountability.

Successive democratically elected governments in Ghana are the legitimate representatives of the people. In the pursuit of good governance, therefore, governments must honour their obligations to give effect to peoples' environmental rights enshrined in of the Constitution. This includes:

- taking responsibility for developing and implementing environmental policy
- exercising the legal authority to take decisions and carry out actions vested in government by the supreme law of the country

- acting in accordance with the basic values and principles governing public administration contained in the Constitution.
- being accountable to the Ghanaian citizenry
- responding to public needs by encouraging public participation in environmental governance
- monitoring and regulating actions that impact on the environment.
- creating/providing the space for all people both state/public and private institutions, non-governmental organizations, civil society organizations and indeed individuals to participate in the planning, decision making processes, execution in development

3.2.10 Inclusivity

Environmental management processes must take into consideration the interests, needs and values of all interested and affected parties in decision making in order to achieve sustainable development. This recognition should cover all forms of knowledge including traditional and conventional knowledge systems.

3.2.11 Integration

There is a close relationship between and among all elements of the environment and management must recognize this relationship. Mainstreaming environmental concerns in all areas of human endeavour is central to the achievement of sustainable development. This integration must be done at policy, planning, programme and project levels.

3.2.12 Access to Environmental Information

Every Ghanaian must have access to relevant environmental information to enable them to:

- protect the environment;
- protect their health and well-being;
- participate effectively in environmental governance;
- comply with environmental policy, legislation and regulation.

3.2.13 Prevention

Government must anticipate problems and prevent negative and undesirable impacts on the environment and on people's environmental rights. In the process, management tools such as environmental assessment must be applied and enforced.

3.2.14 Precaution

In accordance with principle 15 of the Rio Declaration, Government will ensure that where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost effective measures to prevent environmental degradation

3.2.15 Polluter Pays

Those responsible for environmental damage must be held liable for the repair caused both to the physical and human environments. They must also be held responsible for the costs of preventive measures to reduce or prevent further pollution and environmental damage.

3.2.16 Waste Management

Management of waste must aim at minimizing the generation of waste at source. . Government, metropolitan, municipal and district administrations must practice recycling, separation at source, waste-to-energy practices and safe disposal of unavoidable waste. Particular attention should, however, be given to toxic and hazardous wastes.

3.2.17 Poverty Reduction

The government is leading a crusade in poverty reduction through the implementation of the Ghana Poverty Reduction Strategy (GPRS). It is believed that the poor depend directly on the natural resources thus depleting them. There is therefore the need to tackle poverty and environment hand in hand. Consequently, the government has exploited the Ghana Poverty Reduction Strategy (GPRSII), the Draft Medium Term Plan and the Better Ghana Agenda to set out measures and initiatives for economic growth and improvement in the standard and quality of life of all Ghanaians.

Government must also foster developmental agenda that will contribute to sustainable economic development, economic empowerment of Ghanaians, poverty alleviation and improvement of quality of life in Ghana. In addition, the government should develop targeted social interventions for vulnerable and marginalized groups.

3.2.18 Economic Efficiency

Government's focus in the medium-term is to build the foundation for an efficiency-driven economy from the current factor-driven economy. This will be achieved by anchoring industrial development on the conversion of Ghana's natural resources into value-added products with emphasis on agro-based manufacturing, down-stream oil and gas and mineral processing and manufacturing, tourism and creative arts.

3.2.19 Research and Development

Government has prioritized Science, Technology and Innovation (STI) as a principal vehicle to Ghana's development agenda. It will therefore provide support for research activities in tertiary and research institutions (private and public) and urge businesses to adopt research and development as a critical component of production. Government will also provide incentives to strengthen research and industry linkage and collaboration.

3.2.20 Monitoring and Evaluation

Government will ensure that development projects are efficiently monitored in order to inform national development planning, support sectoral policy programme designs, inform the budget allocation process, enhance transparency and accountability in the management of national resources, and encourage continuous improvement in public policy management as well as policy dialogue within government and with civil society organizations and development partners.

3.2.21 Green Economy

Green economy focuses on broad assessment and challenges at the macro-economic level through macro-economic assessments and policy analysis with a view to better understand how government policies and public and private investment can help achieve the fundamental

macroeconomic objectives of income growth, economic development/diversification, job creation following a path that also contributes to social equity and environmental improvement. A major concern in Green economy is the multifaceted relationship between the natural environment and the economy, including the addition of natural capital to accounting for produced capital and intangible capital, as a source of income flows, as well as the material basis of economic activity and the potential to improve its efficiency. Sound macroeconomic policy and management should contribute to higher-order objectives such as improved wellbeing, social equity and reduction of environmental risks among others.

3.2.22 Information Communication and Technology (ICT) and Environment

It is currently estimated that ICTs in themselves contribute around 2 to 2.5 per cent of global greenhouse gas emissions and this is likely to grow as ICTs become more widely available in terms of television and computer use in homes, offices and schools worldwide. ICTs are integrated into almost all parts of the world society and economy. Yet while the increasingly widespread use of ICTs has changed people's lives dramatically and boosted economic growth, ICTs themselves, due to this success, are a growing contributor to green house gas emissions. On the other hand they probably provide the most significant opportunity to reduce green house gas emissions in the major high emissions industries of energy generation, waste disposal, building and transport.

3.2.23 Sustainable Consumption and Production

Sustainable production and consumption (SCP) is generally defined as *"The production and use of goods and services that respond to basic needs and bring a better quality of life, while minimizing the use of natural resources, toxic materials and emissions of waste and pollutants over the life cycle, so as not to jeopardize the needs of future generations." (*United Nations Commission on Sustainable Development (UNCSD) Symposium on Sustainable Consumption, Oslo, 1994.2)

SCP can also be broadly defined as a holistic approach to minimizing negative environmental impacts from production and consumption in society. It can be considered as a practical implementation of strategies to achieve sustainable development and can be viewed as the two legs on which sustainable development stands. It focuses on addressing needs, quality of life, equity, resource efficiency, (environmentally-improved) goods and services.

The call for sustainable consumption and production is justified by the conclusions of studies showing that two-thirds of the Earth's ecosystem services are in decline. Nature provides essential resources to the system of production and consumption, including provisioning services, or products, such as timber and fish, and regulation services, such as climate control, pollination, irrigation and flood regulation. According to the Millennium Ecosystem Assessment (MA), 60% are being degraded or used unsustainably, including 70% of provisioning and regulating ecosystem services.

Again the ecological impact of activities in various sectors is significant to warrant some critical attention. For instance WWF states that each US$ 1 million spent by consumers on food has an ecological footprint of approximately 1,500 hectares.

4.0 ENVIRONMENTAL POLICY GOAL, OBJECTIVES AND STRATEGIES

This section provides a brief description of the priorities for achieving the vision and the means of focusing government actions on environmental management for the next ten years. These priorities are expressed in the form of a broad goal supporting objectives and strategies to achieve the objectives.

4.1 Policy Goal

The goal of this policy is to ***bring economic development in balance with ecological processes,*** consistent with the provisions under the Directive Principles of State Policy of the 1992 Fourth Republican Constitution of the Republic of Ghana as they relate to the environment This indicates the direction government will follow in meeting the ultimate target of sustainable development through integrated and holistic systems of environmental management.

4.2 Policy Objectives

The objectives outlined to be achieved by this policy are to:

i. improve effectiveness of Institutional and Legal Framework
ii. promote Sustainable Resource Use and Impact Management
iii. develop Holistic and Integrated Planning
iv. enhance Participation and Coordination in Environmental Governance
v. promote Environmental Awareness Creation and Empowerment.
vi. increase access and use of Environmental Information for decision making
vii. enhance International Cooperation

These objectives can best be achieved through the recognition that environmental concerns cut across all sectors of human endeavour. The policy objectives therefore address the concerns of all sectors of the economy, and the cooperation and commitment of all these sectors are required for effective implementation.

4.3 Policy Strategies

The over-arching goal of this policy will be achieved through the following strategies defined under the various focus areas:

4.3.1 Institutional and Legal Frameworks

4.3.1.1 Specific Objective

The objective is to improve effectiveness of Institutional and Legal Framework

4.3.1.2 Policy Strategies

Government will create an effective, adequately resourced and harmonized institutional framework, centred on the Ministry of Environment, Science and Technology, the Environmental Protection Agency, and the National Development Planning Commission

(NDPC) and an integrated legislative system, and improve institutional capacity in both areas by:

- Ensuring the deployment of resources to build capacities . and develop skills
- Revision of existing legislation and introduction of new laws to deal with emerging environmental challenges;
- Establishment of appropriate mechanisms and structures for institutional coordination
- Development of subsidiary policies for the National Environmental Policy;
- Ensure the development of a comprehensive and coordinated national system for environmental monitoring and compliance enforcement
- Ensure self regulation through promotion of compliance
- Strengthening the capacity of relevant institutions for monitoring and evaluation
- Ensure the integration and coordination of all environmental management functions within MDAs;
- Ensure coordination and negotiation of relevant international environmental agreements,
- Establishment of Dispute Resolution Mechanisms for local and international disputes;

Internalization of international environment al agreements

4.3.2 Sustainable Resource Use

4.3.2.1 Policy Objective

The policy objective is to ***"Promote Sustainable Resource Use and Impact Management".***

Government will promote equitable access to, and sustainable use of the country's natural and cultural resources, promote environmentally sustainable lifestyles, and mainstream environmental impact management practices into all development activities to achieve sustainable development

4.3.2.2 Policy Strategies

The following strategies would be implemented to achieve the above objective:

- Ensure equitable access to natural and cultural resources.
- Promotion of life cycle approach in the management of the natural and cultural resources
- Mainstreaming environmental considerations/issues into National development processes.
- Promotion of sustainable consumption and production practices
- Ensure balanced spatial development
- Development and enforcement of proper land use planning and management at all levels.
- Promotion of sustainable land management practices

4.3.3 Environmental Mainstreaming

4.3.3.1 Policy Objective

The policy objective is to ***develop Holistic and Integrated Planning***

4.3.3.2 Policy Strategies

Under the aegis of the National Development Planning Commission, Government will develop mechanisms to ensure that environmental considerations are adequately integrated into all government policies, programmes and projects.

Mainstreaming environmental conditions into the development of policies and programmes by the Environmental Protection Agency and the sector Ministry, in close collaboration with the National Development Planning Commission and other relevant government and non-governmental organizations; and

Subjection of all spatial and economic development planning processes to strategic environmental assessment techniques and other relevant impact assessment methodologies to ensure:

- that integrated environmental principles and methodologies are mainstreamed into spatial development planning including the use of natural and cultural resources;
- the development of management instruments and mechanisms for the integration of environmental concerns in development planning and land allocation;
- that standards for environmental management systems, environmental impact managements, monitoring and evaluation procedures and reporting for all activities that impact on the environment are set and enforced;
- that appropriate indicators to measure performance in all areas of the national, regional, district and local levels are developed and applied;
- the improvement in the current review processes for all aspects of environmental management;
- that MEST and the EPA as the lead agency review policies, government responsibilities and decision making processes and effectively coordinate these between government administrative sectors;
- that state institutions, NGOs, CBOs, traditional authorities and local unions are all involved in the planning and implementation of environmental programmes and projects.

4.3.4 Participation and Coordination

4.3.4.1 Policy Objective

The objective is to ***"enhance Participation and Coordination in Environmental Governance"***

4.3.4.2 Policy Strategies

The lead institutions in environmental governance will establish mechanisms and processes to ensure active public participation in all environmental matters. Levels of coordination must be clearly identified to avoid interference in the affairs of other institutions through the establishment of clearly defined mechanism and processes to ensure public participation in environmental governance by:

- Establishment of multi-sectoral advisory structures (e.g. Inter-Ministerial Committee) at all levels of environmental governance;
- Development of effective public participation mechanisms
- Allocation of resources, to build institutional capacity at all levels for effective environmental management;
- ensuring that national communication strategies address public participation needs
- Promotion of public private partnership for sound environmental governance.
- Promotion of the participation of CSOs in environmental management
- Development of benefit sharing mechanisms for environmental programmes

4.3.5 Environmental Education, Training, Awareness and Communication

4.3.5.1 Policy Objective

The objective is to "**P*romote Environmental Awareness Creation and Empowerment*"

4.3.5.2 Policy Strategies

Government will promote education and awareness creation among the Ghanaian population from the basic level. They will be empowered through the development of knowledge, skills, values and commitment required for sustainable development by:

- Mainstreaming sustainable environmental management concepts into school curricula
- Revision of national environmental education, training and communication strategies.
- Ensuring the allocation of adequate funding for environmental awareness creation and training.
- Promotion of traditional indigenous knowledge systems to achieve overall sustainable development.

4.3.6 Environmental Information and Management

4.3.6.1 Policy Objective

The policy objective is to ***increase access and use of Environmental Information for decision making.***

4.3.6.2 Policy Strategies

Increasing access to environmental information will be achieved through relevant state and private sector institutions will be resourced to develop and maintain mechanisms to increase access to information, especially environmental information, through the application of modern tools such as ICT and GIS. A State of the Environment (SOE) Report will be produced at regular intervals to provide accurate and timely information on the environment by the EPA.

The development and improvement of existing information management systems to supply reliable data and information that will support environmental management. For this purpose, government shall:

- Provide resources to relevant public institutions and support private sector institutions to develop and sustain mechanisms to increase access to environmental information.
- Develop and improve of existing environmental information management systems to supply reliable data and information.
- Develop appropriate environmental indicators to facilitate informed decision making.

4.3.7 International Cooperation

4.3. 7.1 Policy Objective

The objective of this policy is to enhance International Cooperation..

4.3.7.2 Policy Strategies

Ghana's role in the implementation of Multilateral Environmental Agreements including regional and sub regional (ECOWAS) agreements must be sustained and enhanced. The country's obligations under international environmental conventions shall be respected and nurtured.

In negotiating international agreements, government representatives shall ensure adequate and professional familiarity with the themes and shall ensure adequate opportunity for consultation with relevant parties before entering and signing these agreements.

Government shall cooperate on shared international concerns that are of environmental nature, especially in the ECOWAS Region. Steps will be taken to prevent transboundary environmental harm, especially as a result of transhuman and trans-boundary movement of hazardous and toxic waste. In this regard government shall:

- Establish an institutional framework for the negotiation and implementation of international environmental agreements.
- Establish an effective cooperation mechanism on internationally shared environmental concerns, with particular reference to the ECOWAS Region.
- Internalize international environmental agreements, protocol and conventions.

5.0 SECTORAL ENVIRONMENTAL POLICIES

This section deals with resource specific policies. The various sectors have developed their individual policies or will be required to develop policies which will control and guide the use of the sectors in a suitable manner. The sectoral policies include the following:

5.1 Land

Land lies at the heart of social, political and economic life in Ghana. Land and its resources are the principal source of livelihoods for the majority of Ghanaians and therefore, affect lives of most people. Its degradation has serious consequences for sustainable economic and agricultural growth and productivity. The government of Ghana has therefore, been taking important steps to ensure its sustainability as well as collaborating with the international community on land degradation issues to enhance policy and programme responses to land degradation.

5.2 Agriculture

In order to ensure sustainable practices in the agricultural sector the national agricultural policy should incorporate policies:

- To ensure the sustainable use of the land in an agricultural economy
- To regulate the use of toxic and hazardous chemicals (pesticides and herbicides) to safeguard human life and the environment.
- To ensure that planning for agricultural development incorporates in its cost-benefit analysis the potential costs of soil degradation through erosion and other degrading factors including soil and water pollution.
- To undertake environmental existing irrigation projects and environmental impact assessment (EIA) for future irrigation projects, especially in the savanna areas in accordance with LI 1652

5.3 Transport

Transport is considered important to economic growth and experience has shown that it is difficult to "decouple" from sustainable economic growth. Transport therefore impacts our lives in a variety of ways and the challenge for us is to balance transport's role in promoting development whilst reducing its carbon emissions, maintaining safe and secure networks that also promote health, equality of transport opportunity, quality of life and the natural environment.

It has been established that the transport sector places particular stresses in our quest for sustainable development through increasing dependence on oil, which exposes us to potential energy price shocks or shortages due to supply constraints or political instability; increasing emissions of greenhouse gases (especially CO_2) and local pollutants (NO_x, SO_2, PM); and the increasing costs of congestion, loss of "social capital" – "social networks and interactions that inspire trust and reciprocity among citizens" – which is degraded in a car-dependent society, increasing number of transport accidents etc. This situation indicates that transport systems in most countries are not on sustainable paths. It does not meet all our current needs and in its current form will most certainly not meet the needs of future generations.

In Ghana transport is one of the key challenging areas for achieving sustainable national development. The growth in the transport sector is accompanied by increasing problems like congestion, local air pollution, greenhouse gas emissions, land degradation, noise pollution, rising transport related energy demand and uncontrolled urban sprawl..

The development and implementation of a sustainable transport policy would have enormous beneficial impact on the economy through reduced pollution, reduced time, and an increase in quality of life. Transport policies should integrate strategies that aimed at:

- Improving integration of transport with land use planning and development.
- Reduction in environmental emissions (CO_2, NO_x, VOCs, PM, noise)
- Reduction in transport congestion and accidents
- Increasing the share of efficient and less used modes of transport such as mass transit, rail
- Promoting more efficient fuel use and strategies focusing on changing people's/drivers behaviour, technological solutions, improving regulatory and institutional systems, and planning and infrastructure provision.

The concept of sustainable transport must be promoted which must aim at:

- preserving the natural environment by minimizing emissions of pollutants, reducing and managing transport waste and by careful land use planning to address the impact of transport infrastructure
- reducing environmental impacts and contribute to economic prosperity and development by maximizing transport efficiency
- enhancing social well-being by providing access and mobility to urban and rural populations
- maintaining high standards of safety and security and
- avoiding environmental nuisance.

5.4 Industry

Currently, the industry sector is the least contributor to Gross Domestic Product (GDP). For the attainment of economic transformation envisaged under government's medium-term agenda, the sector is expected to play a pivotal role, growing at an average annual rate of 14.5 per cent over the period of 2010-2013. Government must support the main drivers of the industry sector which include the construction sub-sector, oil, energy and water sub-sectors.

5.5 Biodiversity Conservation

Government is to establish a Steering Committee to mainstream sector biodiversity issues into sector programmes:

- To facilitate the development of relevant sector biodiversity policies. This will control and reduce the rapid rate of biodiversity loss in the country.
- To conserve the diversity of landscapes, ecosystems, habitats, biological communities, populations, species and genes throughout the country;
- To use biological resources sustainably and minimize adverse impacts on biological diversity;

- To ensure that benefits derived from the use and development of the country's genetic resources serve individual communities and national interests;
- To create and implement conditions and incentives that support the conservation and sustainable use of biodiversity at the national and international levels;
- To encourage involvement of local communities inside and outside protected areas in the planning and management of such areas;
- To ensure that the conservation of biological diversity outside protected areas is integrated with strategic national land use plans, district and local level plans and strategies;
- To include in protected areas a wide range of ecosystems and habitats as possible and where appropriate, to link them by safe corridors of suitable habitats to neighbouring countries for purposes of wildlife migration;
- To ensure that economic and pricing policies and instruments support biodiversity conservation.

5.6 Forest and Wildlife

The forestry and wildlife sector is

- To ensure that forestry development strategies integrate the development, management and conservation of forest resources with those of land and water resources, energy resources, wildlife resources, ecosystems and genetic resources as well as with crop and livestock production;
- To protect nature and habitat, landscape, flora and fauna from the threat of degradation and depletion;
- To increase the acceptance and practice of the principle of "sustainable forest management" which is only achieved when the volume of wood harvested in a given period is about equal to the net growth generated by the forest;
- To pursue crop production and animal husbandry policies and programmes that will reduce pressure on fragile forest and woodland ecosystems;
- To find substitutes for construction and fuel wood and popularize the use of lesser-known wood species in order to reduce pressure on forests;
- To control the occurrence of annual wildfires;

5.7 Marine and Coastal Zone Management

Polices and strategies for the management of the marine and coastal zones are:

- To ensure that the management, development and use of the coastal zone is integrated and environmentally sustainable;
- To ensure that the protection of the coastal wetlands is observed, community ownership and benefit sharing should be taken into account in line with the principles of the Ramsar Convention;
- To maintain the "wise use" and "appropriate technology" concepts in the use of marine and coastal zone resources;
- To adhere to residential and industrial land use regulations in order to protect coastal ecosystems;
- To ensure strict compliance with regulations governing ballast water discharge into the marine environment.

5.8 Water

- The sustainable use and management of water is crucial in environmental management. In this regard, water policies and strategies should:
- vigorously pursue measures in place to resolve conflicts between the different uses of water and ensure that these are reduced further to the minimum;
- make efforts to protect the various watersheds and pay special attention to buffer zone protection;
- employ environmentally sound methods of disposing waste water;
- reduce land-based pollutants flowing into the sea;
- ensure that the quantity, quality and reliability of water required to maintain ecological balance is maintained;
- support the river basin approach to water resources development and adopt the Integrated Water Resources Management (IWRM) concept;
- actively support the international waters programme especially activities of the Volta Basin Authority;
- control the introduction of exotic alien species into freshwater ecosystems and subject such acts to detailed ecological studies and environmental impact assessment;
- give particular attention to the role of women as the "managers" of water resources;
- take measures to ensure groundwater protection;
- subject all major water resources conservation and development projects to environmental impact assessment procedures;
- take measures to ensure effective coordination among water sector institutions.

5.9 Sanitation

Government endorses that environmental sanitation be designated as an *essential service*. Consequently, the government will enhance the capacity of front-line actors in the environmental sanitation sector, especially environmental health staff and the private sector will be given urgent attention so that know-how on new emerging technologies including bio-reactor landfills, waste-to-energy schemes, hydro-clav etc. improves. Priority will also be put on application of methods that contribute to reducing emission of green-house gases.

5.10 Energy

In order to ensure the attainment of environmental policy goals, energy policy would be required:

- To adopt an inter-sectoral approach to energy planning and development which integrates energy development with energy conservation, environmental protection and sustainable utilization of renewable energy resources
- To reduce the pressure on forests for wood-fuels and encourage the use of renewable energy resources in order to reduce the use of fossil energy.
- To ensure that rigorous feasibility studies are undertaken for hydro-electricity facilities and other significant generating facilities all of which must be subjected to environmental impact assessment.
- To find efficient use of the nation's gas resources

5.11 Minerals

The government has established a legal and macroeconomic environment that would attract investments in new exploration and encourage further investments and expansion of existing mines. The country is committed to mainstreaming Sustainable Consumption and Production (SCP) issues in key sectoral policies, plans and programmes of Ministries, Departments and Agencies (MDAs) as well as in the activities of the private sector mining operations to enhance poverty reduction. The concept of sustainability in consumption and production practices implies that the operations have built-in safeguards that ensure adequate protection of the environment, equity in the socio-economic distribution of benefits as well as fair returns to the state by way of adequate revenue generation to meet its responsibility to the people.

5.12 Petroleum

The emerging petroleum sector poses serious challenges to environmental management. In view of this, Petroleum policy is expected:

- To ensure efficient use of the country's hydro carbon resources in line with sustainable environmental practices
- To promote the sound management of the petroleum resources of the country.
- To initiate, formulate and review policies and strategies for the development of the petroleum sub-sector.
- To ensure optimal operations of the petroleum resource consistent with sound technical, economic and environmental practices in the international petroleum industry.

5.13 Human Settlements

There is strong link between environmental management and efficient human settlement planning and management. It is therefore important that policies on human settlement promote mechanisms and strategies:

- To plan and manage the growth of urban settlements
- To introduce modern management systems at the national, regional and district capitals.
- To facilitate the provision of adequate infrastructural facilities in human settlements
- To integrate rural-urban migration, land ownership rights and environmental health issues into national development planning processes .
- To reduce the housing stock shortage and other environmental degradation concerns associated with human settlement
- To recognize the importance of behavioral change and bring this about through education and public awareness o environmental sanitation problems in order to bring about improved urban environmental conditions as well as the sustainable use and maintenance of sanitation facilities.
- To create more job opportunities for urban dwellers.

5.14 Waste Management

The efficient management of waste is critical for environmental management in Ghana. Waste management policies, strategies and practices are required:

- To reduce and manage waste generated in urban areas as a result of residential and economic activity;

- To regulate and monitor waste production, enforce waste control measures and consolidate waste management under metropolitan, municipal and district assemblies;
- To set targets to minimize waste generation at the different levels;
- To promote a hierarchy of waste management practices, namely reduction of waste, reuse, recycling and safe disposal as the last resort;
- To provide special training and control the generation and disposal of toxic waste and hazardous materials;
- To promote the adoption of waste-to-energy practices;
- To educate the general public on littering;
- To control the importation of aged materials that easily converts to hazardous waste;
- To provide incentives to adopt affordable and appropriate technologies in waste management;
- To promote and nurture sound partnerships between and among government, communities and the private sector in the development of an integrated sanitation delivery system and to foster the supplementary role of NGOs in the urban areas;
- To introduce effective policies and incentives to encourage waste producers to adopt cleaner production processes and minimize waste generation.

5.15 Pollution Prevention and Control

Government will ensure that the existing sanitation laws are properly enforced by relevant authorities and offenders will face the appropriate penalties. Old recycling plants will be rehabilitated and where possible, a new one will be set up in every district. Existing regulations on noise pollution will be updated as and when appropriate for strict enforcement.

6.0 CROSS-SECTORAL ENVIRONMENTAL POLICIES

The following cross-sectoral issues are considered in the context of the environmental policy:

6.1 Population and the Environment

- To integrate population planning and resource management issues into environmental management to achieve sustainable consumption and production.
- To inculcate environmental management principles, both traditional and modern, among school children so that they will grow to appreciate the environment as a life supporting system.
- To include issues of poverty, health and education into the national development planning process since these are interlinked with those of population growth, availability and access to resources and environmental sustainability.
- To empower women in order to facilitate their participation in population and environmental decision making.

6.2 Community Participation and the Environment

- To provide facilities and avenues for the entire population to participate in environmental management.
- To familiarize the majority of the national population with all phases of environmental and resource development and management: – project conception planning, implementation, monitoring and evaluation.
- To develop and disseminate effective methods of popular participation in the planning and implementation of environmental and resource use projects and programmes.
- To develop the necessary legislation, training and provide financial support to grassroots communities to ensure their participation in resource and environmental management.

6.3 Social and Gender Issues

- To ensure that environmental awareness and public education programmes include both men and women across the social divide.
- To ensure that impact assessments cover all policies, programmes and projects in order to maximize equity for economic, ethnic, social, cultural, gender and age groups, especially the socially disadvantaged.
- To facilitate the participation of women across all sections of society in training, public awareness campaigns, formal and non-formal education and decision-making processes in environmental management.
- To mainstream gender issues into national development processes

6.4 Environmental Economics

- To ensure the use of environmental cost and benefit analyses in national development planning processes including programme and project preparation.
- To develop an accurate information base and standardized methodologies to facilitate calculation of environmental costs and benefits.
- To introduce environmental accounting at the tertiary level of the educational system.

- To develop the capacity of government agencies to monitor contracts, leases, concessions and performance bonds used for sustainable resource management and environmental protection.

6.5 Environmental Education, Training and Awareness

- To promote the teaching of environmental education on a multi-disciplinary basis and integrate it into the schools curricula.
- To increase the awareness of the population and their concern for environmental issues.
- To develop the knowledge, skills, values and commitment required to achieve sustainable development.
- To target the public, particularly those involved in public and private sector activities that have significant environmental impacts, for environmental education and awareness programmes.
- To ensure that all sections of the populations understand the functioning of the environment and the problems thereof, and contribute to the improvement of the environment.
- To increase the role of the media in fostering environmental awareness and education.
- To encourage religious leaders, traditional leaders and opinion leaders to foster environmental education and awareness.

6.6 Environmental Information System

- To develop an appropriate information management system to support the principle that the right to live in a clean and healthy environment carries with it the right to be informed about environmental issues.
- To make available environmental information to all interested people where appropriate.
- To base information generation on identified user needs, to make it demand-driven.
- To ensure that all environmental data collection, analysis and dissemination are coordinated and standardized but not centralized.
- To provide clear legislation and guidelines on environmental data generation indicating where restrictions are due.
- To develop a GIS database to help form a basis of an early warning system of environmental deterioration.

6.7 Environmental Research and Innovation

- To develop strategic environmental research which aims at identifying the social, economic and technical factors which influence resource and environmental management.
- To support research on appropriate technologies and innovation for environmental management.
- To combine existing traditional systems of research and learning with a new system which incorporates both modern and traditional components.

- To allocate adequate resources the respective Institutes of the Council for Scientific and Industrial Research (CSIR), tertiary institutions and analogues institutions to perform their roles in environmental research

6.8 Environmental Assessment (EA)

- To strengthen the existing EIA System to ensure balanced integration of social, socio-economic, political and cultural considerations in addition to the physical and biological impacts in project planning and implementation.
- To ensure that public and private sector development projects consider environmental impacts and incorporate them into the design process.
- To recognize and widen the scope of public consultation as an integral part of the EIA process.
- To take independent review and public comments into consideration before granting approval to proponents.
- To ensure that environmental impact statements (EIS) include mitigation and environmental management plans and contingency plans.
- To enforce existing EIA laws and regulations.
- To subject all sector policies, plans and programmes to Strategic Environmental Assessment (SEA)
- To strengthen the capacity of the Environmental Protection Agency to administer the EA processes and develop national capacity to conduct Environmental Assessments of policies, plans, programmes and projects.

6.9 Pollution Prevention and Control

- To prevent, reduce and control pollution of any part of the environment resulting from any form of human activity especially toxic and other hazardous substances.
- To set targets to minimize waste generation and pollution at source.
- To regulate and monitor waste production, enforce waste control measures, and coordinate administration of integrated pollution control and waste management under a decentralized system.
- To improve existing information systems on chemical hazards and toxic discharges and monitor the transport of hazardous materials.
- To ensure the protection and proactive management of human health-related problems in the environment.
- To adopt the “polluter pays principle” while endorsing the “precautionary principle.”
- To establish clear linkages between the control of pollution and policies of other sectors including water resources, agriculture, human settlements, health and disaster prevention and preparedness.
- To ensure that pollution control is commensurate with the potency, longevity and potential to increase or reproduce the pollutant.
- To ensure compliance with guidelines for the location and management of sanitary landfill sites.
- To review and develop guidelines for waste disposal, public and industrial waste disposal systems

- To formulate and implement a countrywide strategy and guidelines on the management of wastes from medical, agricultural and other sectors that may use potentially hazardous materials.
- To establish a system for monitoring compliance with land, air and water pollution control standards and regulations, the handling and storage of hazardous materials, mining operations, public and industrial hygiene, waste disposal and water quality.
- To update the register of toxic, hazardous and radio-active substances and to make the information available where appropriate.
- To foster better nationwide knowledge and understanding of the dangerous effects of chemicals through the provision of information in a form understandable by all users.

6.10 Disaster Risk Management

- Government will adopt measures to reduce vulnerability to climate variability and change and promote community participation in environmental governance and natural resource management as well as mitigate the impact of natural and man-made disasters.

6.11 Science Technology and Innovation

- The National Science, Technology and Innovation Policy aims among others to stimulate innovation in the economy, in the society and in environmental management.

- This policy recognizes Science Technology and innovation as central to the management of natural resources, and in the resulting environmental consequences, the application of Technology and Innovation as pivotal to the quality and type of a product in ensuring minimal environmental degradation and emissions.

- This policy therefore seeks to promote the use of environmentally sound technologies and innovation that protect the environment, ensure less pollution and promote resource efficiency and use in a more sustainable and environmentally sound manner.

- The overall principle is the application of technology and innovation to provide solutions to solving environmental problems in most cases.

6.12 Communication

- Communication will play an important role in supporting the goals and objectives of the policy by facilitating the exchange of information, encouraging collaboration, raising awareness and increasing understanding of the role and work of the EPA and MEST, among other stakeholders.

- A Communication strategy would be developed to facilitate communication of information about and resulting from activities of the Agency and the Ministry, e.g. media programs, extension, meetings etc in an appropriate and timely manner.

- It is important that the communication of information resulting from the implementation of the policy does not pose a risk to individuals and staff of the agency

and the Ministry due to the potential sensitivity of some data and information. The strategy would be designed to minimize these risks by providing guidance to EPA and MEST on how information is communicated.

7.0 POLICY IMPLEMENTATION ARRANGEMENTS

7.1 Institutional Framework

This policy will give political and grassroots support to the sustainable use of Ghana's natural, human-made and cultural resources and the management of the general environment to ensure improved standard of living for every Ghanaian.

It will also ensure that the Ministry of Environment, Science and Technology (MEST) and EPA and other coordination and management institutions (e.g. the NDPC) from the national down to the local levels perform their mandates as defined by the enabling Laws. Successful environmental management will then be assured through the maximum use of existing institutional structures. In effect, the levels of implementation will include communities, districts, and regions to the national level. The sectors will cover state institutions, non-state actors, traditional leaders and local unions.

The policy determines institutional arrangements for the formulation of strategies, legislation, regulation, monitoring and enforcement for conservation and natural resource development using the following criteria:

- conformity with the provisions of the Constitution, with particular reference to the decentralization policy
- harmonization of sectoral interests
- Integration of environmental management with development planning beginning at the national level.

The Ministry of Environment, Science and Technology has the overall responsibility for coordinating the activities of other Ministries in the implementation of the policy. An implementation framework is presented in Appendix I.

7.2 Legislative Framework

The legal framework should encourage the participation of all Ghanaians in the management of the country's resources. It should ensure that all aspects of the legal system are in agreement with the supreme law of the country and the prevailing political, socio-cultural and economic policies, and to harmonize these with the principles of sustainable development.

The framework should create conditions for formulating, reviewing and enforcing and updating sectoral regulations for the restoration, protection, management and sustainable use of all resources in the country. The review process should take on board emerging issues in environmental management.

Finally, the environmental policy provides a broad framework for both punitive and incentive measures.

7.3 National Environmental Action Plan (NEAP)

In order to ensure that the national policy is successfully translated into action, the Environmental Protection Agency (EPA), in consultation with Ministry of Environment,

Science and Technology (MEST) and the National Development Planning Commission (NDPC) and other relevant institutions, will take cognizance of the of the Ghana National Action Plan for Environment Initiative and develop programmes and projects for implementation.

The National Environmental Action Plan detailing strategies and action plans, and setting targets and time frames for the Medium Term.

In the process the following criteria will influence the choice of activities:

- those actions which will ensure healthy working and living environments
- actions to protect the environment for present and future generations
- activities to assist in achieving growth to meet basic human needs
- programmes to achieve integrated and holistic environmental management

7.4 Financing Arrangements

A major factor required to ensure success of policy implementation is the timely availability of adequate funding required for programme and project implementation. Due to the cross-sectoral nature of the environment, financing arrangements for the sector have implications for all individuals, households, communities, District Assemblies, Ministries, Government of Ghana and Development Partners, i.e. all stakeholders.

7.4.1 Objective

To ensure the availability of funding in adequate amounts and at the appropriate time to manage, rehabilitate and restore the environment in its totality throughout the territory of Ghana.

7.4.2 Measures

- Maintain and restructure the National Environment Fund established under the EPA Act 1994, Act 490.
- Provide the business community with incentives to enable them contribute to the National Environment Fund
- Ensure that each MDA generates enough funds internally to finance environmental projects within its jurisdiction.
- Solicit funding from development Partners and other international organization for specific project support.

7.4.3 The Environment Fund of Ghana

With increasing economic recession worldwide and development partners' specific conditionalities on funding generally, the over reliance on traditional approaches to fund set-up and management is losing currency. Innovative ways of generating and setting up country owned sustainable fund/trust to boost gains in environmental management - in the wake of increasing desertification, loss of biodiversity and ecosystems, pollution and the effects of climate change - is becoming relevant in national development debates and discourses.

7.5 Compliance and Enforcement

Government will support awareness creation and sensitization of stakeholders on environmental issues. It will also facilitate the development of an effective policy framework for collaboration with appropriate agencies to ensure environmental compliance and enforcement of the laws and regulations.

7.6 International Cooperation

Government will promote international cooperation in environmental issues and enhance the country's involvement in global environmental programmes and agenda.

7.7 Monitoring, Evaluation and Policy Review

Individual programme and project monitoring is the responsibility of the appropriate Ministries. However, evaluation of the overall impacts of the implementation of this Policy on the country's resources should be consistent with the institutional arrangements specified above i.e. the MEST through the Policy Planning Monitoring and Evaluation Directorate (PPMED) carries the overall responsibility for monitoring, evaluation and review of this Policy. Specific aspects of monitoring can be delegated to other institutions, e.g. EPA.

8.0 CONCLUSION

The Ghanaian economy and society in general are characterized by inequitable distribution of resources and wealth. A minority enjoys high living standards with relatively good housing, infrastructure and services, all of which are congregated in the urban centres. On the other hand the basic needs of the majority are not adequately met.

This range from high to low income lifestyles and circumstances creates particular problems for the management and protection of the environment and the promotion of sustainable development. In this situation, the environmental policy must face the challenges of addressing both the basic needs and survival strategies of the poor and the impacts of the relatively endowed in the society.

This is the context within which the environmental policy must function, and against which government will measure the success or failure of policy implementation.

APPENDIX I: NATIONAL ENVIRONMENTAL POLICY MATRIX

POLICY FOCUS	ISSUES	POLICY OBJECTIVE	STRATEGIES	LEAD INSTITUTION	IMPLEMENTING AND COLLABORATING AGENCIES
INSTITUTIONAL AND LEGAL FRAMEWORK	• Weak institutional capacity for environmental management • Weak compliance and enforcement of environmental law • Ineffective institutional coordination • Conflicting mandate for environmental management • Weak capacity (human and financial) for negotiations and implementing International Conventions, Protocols and Agreements • Inadequate environmental laws and legislations for emerging environmental issues	Improve effectiveness of Institutional and Legal Framework	• Ensuring the deployment of resources to build capacities and develop skills • Revision of existing legislation and introduction of new laws to deal with emerging environmental challenges; • Establishment of appropriate mechanisms and structures for institutional coordination • Development of subsidiary policies for the National Environmental	MEST/EPA	MEST,EPA, Attorney General's Dept, NDPC, Ministry of Information, Ghana Maritime Authority, Town and Country Planning Department, Ministry of Local Government and Rural Development, MMDA's Forestry Commission, Ministry of Energy, Energy commission, Ghana Standards Authority, NGO's, CSO's, Parliament, MDA's, LC, MC, Local Govt, Min. of Foreign Affairs, EPA, Parliament, Maritime Authority

POLICY FOCUS	ISSUES	POLICY OBJECTIVE	STRATEGIES	LEAD INSTITUTION	IMPLEMENTING AND COLLABORATING AGENCIES
			Policy; • Ensure the development of a comprehensive and coordinated national system for environmental monitoring and compliance enforcement • Ensure self regulation through promotion of compliance • Strengthening the capacity of relevant institutions for monitoring and evaluation • Ensure the integration and coordination of all environmental management functions within	MEST/EPA MEST/EPA, NDPC MEST/EPA	

POLICY FOCUS	ISSUES	POLICY OBJECTIVE	STRATEGIES	LEAD INSTITUTION	IMPLEMENTING AND COLLABORATING AGENCIES
			MDAs; • Ensure coordination and negotiation of relevant international environmental agreements, • Establishment of Dispute Resolution Mechanisms for local and international disputes; • Internalization of international environment al agreements		
SUSTAINABLE RESOURCE USE AND MANAGEMENT	• Over exploitation of natural resources (land, water, etc) • Pollution • Rapid population growth, migration and urbanization	Promote Sustainable Resource Use and Impact Management	• Ensure equitable access to natural and cultural Resources. • Promotion of life cycle approach in the management		EPA, MEST, FC, MC, MOFA, WRC, MoE, TCPD

POLICY FOCUS	ISSUES	POLICY OBJECTIVE	STRATEGIES	LEAD INSTITUTION	IMPLEMENTING AND COLLABORATING AGENCIES
	• Unsustainable consumption and production practices		of the natural and cultural resources • Mainstreaming environmental considerations/issues into National development processes. • Promotion of sustainable consumption and production practices • Ensure balanced spatial development • Development and enforcement of proper land use planning and management at all levels • Promotion of sustainable land management practices		

POLICY FOCUS	ISSUES	POLICY OBJECTIVE	STRATEGIES	LEAD INSTITUTION	IMPLEMENTING AND COLLABORATING AGENCIES
ENVIRONMENTAL MAINSTREAMING	• Low level of environmental mainstreaming into national, regional and district development policy planning processes • Weak integration of environmental considerations in the implementation of national, regional and district plans and programmes. • The absence of environmental managers at the district and community levels	Develop Holistic and Integrated Planning	• Ensure the mainstreaming of environmental issues into development planning processes (application of SEA in policies, plans and programmes) • Ensure that all spatial and economic development planning processes are subject to strategic environmental assessment. • Establishment of EPA offices in the districts	MEST, MLGRD EPA NDPC LGSS	MMDAs MDAs

POLICY FOCUS	ISSUES	POLICY OBJECTIVE	STRATEGIES	LEAD INSTITUTION	IMPLEMENTING AND COLLABORATING AGENCIES
PARTICIPATION AND COORDINATION	• Inadequate Institutional structures and mechanisms for participation in environmental governance at all levels • Fragmented, conflicting and unclear mandates for environmental management	Enhance Participation and Coordination in Environmental Governance	• Establishment of multi-sectoral advisory structures (e.g. Inter-Ministerial Committee) at all levels of environmental governance; • Development of effective public participation mechanisms • Allocation of resources, to build institutional capacity at all levels for effective environmental management; • ensuring that national communication strategies address		EPA, MEST, NCCE,MMDAs, MC, FC, MLNR, NGOs, CSOs, MoFA, GES, GHS MoE ,MoH, LC, GNFS, Wildlife Division, Ghana Maritime Authority, CoM, MoFEP, MLGRD, NDPC, CSIR, Town & Country Planning, AG's Department, TAs, Academia, Print & Electronic Media, Other relevant institutions

POLICY FOCUS	ISSUES	POLICY OBJECTIVE	STRATEGIES	LEAD INSTITUTION	IMPLEMENTING AND COLLABORATING AGENCIES
			public participation needs; • Promotion of public private partnership for sound environmental governance. • Promotion of the participation of CSOs in environmental management • Development of benefit sharing mechanisms for environmental programmes		
ENVIRONMENTAL EDUCATION, TRAINING, AWARENESS AND COMMUNICATION	• Low level of awareness on environmental issues • Poor attitudes towards environmental issues • Inadequate funding for environmental awareness creation and training	Promote Environmental Awareness creation and Empowerment	• Mainstreaming sustainable environmental management concepts into school curricula • Revision of		EPA, MEST, NCCE,MMDAs, MC, FC, MLNR, MLGRD, NGOs, CSOs, MoFA, GES, GHS MoE ,MoH, LC, GNFS, Wildlife Division,

POLICY FOCUS	ISSUES	POLICY OBJECTIVE	STRATEGIES	LEAD INSTITUTION	IMPLEMENTING AND COLLABORATING AGENCIES
			national environmental education, training and communication strategies. • Ensuring the allocation of adequate funding for environmental awareness creation and training. • Promotion of traditional indigenous knowledge systems to achieve overall sustainable development.		Ghana Maritime Authority, CoM, MoFEP, NDPC, CSIR Town & Country Planning, AG's Department, TAs, Academia, Print & Electronic Media, Other relevant institutions.
ENVIRONMENTAL INFORMATION MANAGEMENT	• Ineffective management of environmental information	Increase access and use of environmental information for	• Provision of resources to relevant public		MEST, EPA, FC, NDPC, GSS, ISD, CSIR, MLGRD, MoFA, Universities

POLICY FOCUS	ISSUES	POLICY OBJECTIVE	STRATEGIES	LEAD INSTITUTION	IMPLEMENTING AND COLLABORATING AGENCIES
	• Lack of an integrated and coherent environmental information management system Inconsistency in the definition of environmental indicators.	decision making	institutions and support private sector institutions to develop and sustain mechanisms to increase access to environmental information. • Development and improvement of existing environmental information management systems to supply reliable data and information. • Development of appropriate environmental indicators to facilitate informed decision making.		and Research Centres, NGOs

POLICY FOCUS	ISSUES	POLICY OBJECTIVE	STRATEGIES	LEAD INSTITUTION	IMPLEMENTING AND COLLABORATING AGENCIES
INTERNATIONAL COOPERATION	• Inadequate institutional framework for negotiations and implementation of international environmental agreements. • Lack of political will in implementing some international environmental agreements. •	Enhance International Cooperation	• Establishment of an institutional framework for the negotiation and implementation of international environmental agreements. • Establishment of effective cooperation mechanisms on internationally shared environmental concerns, with particular reference to the ECOWAS Region • Internalization international environmental agreements, protocol and conventions.		MEST, Min. of Foreign Affairs, EPA, Law Enforcement Agencies, Min. of Justice & Attorney General's Dept.

APPENDIX II: NATIONWIDE CONSULTATION REPORTS

CONSULTATIVE MEETING WITH STAKEHOLDERS AT TAMALE
19TH JANUARY, 2010

Participants

Names	Departments
Hon. Moses Mambingbe (Dep. Regional Minister)	Regional Administration
Bawa Karim (Dep. Chief, Nadmo)	NADMO
Azumah Kenneth (Community Devpt Officer)	DCD
Musulah Yvonne (ADPO)	RPCU
Naasiba Ahmed	NPC
Ahmed Tyani	MOFA
Acko Bawa	GNFS
Jacob L. Ndego	Dept of Women
Simon Laryea Okang	Lands Commission
Abu Iddrisu	EPA (N/R)
Nsiav Bemoah	Forestry Commission

COMMENTS ON EXISTING POLICY DOCUMENT

All except one (EPA Regional officer) participant indicated having knowledge of the existence of the policy document. They recommend that the new document should be widely distributed and even translated into local languages.

Current document lacks focus. It must have a clearly defined direction. Also it must include milestones. The objectives of the current one are outmoded because of the emergence of new environmental issues, e.g. conflict resolution, public participation; communication strategy/ dissemination plans needs to be spelt out.

Coordination among various stakeholders is poorly indicated in the existing document, as made available to them for the purposes of the consultation. Efforts should be made to harness internal resources for preparation and implementation of the new policy instead of relying largely on foreign donor assistance.

International relations should be part of the policy document to avoid, for example, confrontation with foreign herdsmen from Togo and Burkina Faso. This should also help curb activities such as charcoal preparation. Participants also indicated existence of 'Operation Hot' which creates browsing corridors where cattle herdsmen will be concentrated. This concept of 'hotspots' could be extended to the Northern part of the country.

There is need for training for stakeholders on the national environmental policy to facilitate awareness creation.

SUGGESTIONS FOR IMPROVEMENT ON THE NEW POLICY

An economic analysis of environmental degradation throughout the country must be undertaken for inclusion in the new policy.

National Environmental fund must be set-up to replace (or subsidize) current donor funds.

Institutions for enforcement of the regulations must be defined. Also the use of local knowledge systems and the whole process must be from the ground up. Furthermore, the existing penalties for environmental abuse, especially bush burning are not punitive enough.

Financing the policy implementation. Constraints on mobility of institutions in charge of implementation at the regional and district levels should be addressed.

National awareness creation programs using Radio, TV and internet to sensitize the entire citizenry on environmental challenges.

Training for the judiciary and other law enforcement agencies to administer sanctions for environmental abuse.

Traditional authorities are currently poorly involved in policy implementation. They must be involved from the formulation stage through implementation stage. They must be empowered through the policy to take action at the local level.

Monitoring components of the policy must be clearly indicated.

There is the need to bridge the gap between research, monitoring and management of the process.

Components of budgets of all land-based projects should be channeled into the environmental fund. In addition, fines at the ports, levies on road users and percentage of the District Assembly common funds and PPP should be considered.

Coordination/Consultation: This should be done at the grass roots through the District Assembly channels or systems; women's groups and other advocacy groups. TV debates, FM stations. Creates a forum for donor agencies during the policy formulation process, e.g. GTZ, CIDA. Mobile service providers and the entire membership pf the parliament (Speaker, MPs etc).

There is need for a follow-up visit for further consultation during the process.

The Role of women in water and sanitation issues

The role of women in water issues must be clearly identified in the policy and linked to training and awareness creation.

There is the need to make training available to women to enable them play key roles in water management. Knowledge and awareness creation among women on water and sanitation issues could be promoted by seminars.

Introduction of community led activities (community led environmental actions) should be considered. Also research into community led environmental systems should be enhanced. These activities should be funded by a percentage of the common fund.

CONSULTATIVE MEETING WITH STAKEHOLDERS IN KUMASI
21ST JANUARY, 2010

** Comments on Policy – Shortcomings
Falls short of current environmental challenges
Falls short of mining operations
No specific issues on Waste Management (eg. Solid/Liquid waste –
what can be done?

** Problems with implementation

Noise
Religious activities/functions, Road traffic noise (difficulty in enforcement)
Those in charge of planning are not in charge of monitoring
Enforcement is rather in the hands of the different institutions, e.g. District assembly and EPA.
Planning should not be one-time event, but must be dynamic since human activities are dynamic.

** General – Problems with coordination

Water Bodies (who manages reserves) No coordination sometimes as to who takes responsibility when problem arises (The role of water Resources Commission).

EPA (In touch with some district assemblies; no cooperation from some others; most are interested in their revenue so no concentration on the environment.;
Forestry Commission – not much coordination

Committees exist at the National, Regional and District levels but most times expertise is limited in all cases, especially at the district levels.

Lack of clarity in the Policy.

** Suggestions for new Policy

- Factor in dynamic/current issues in all existing policies

Take cognizance of what the sectors already have by way of policy
Who is responsible for what in each sector (new policy must be specific).

Noise

* Introduce into planning (land use) programmes dealing with education and awareness creation, monitoring and controlling.
* Need for Planning Inspectors/Building Inspectors
* Future development must take into consideration, other residential needs ab initio, e.g. commercial activities, transportation, waste management needs, etc.
* In light of the above, guidelines must be designed to control
* Take into consideration emerging human activities
* EPA and other similar institutions must be proactive in their handling of management issues.
* Synergy to control post planning challenges
* Use modern tools for managing noise (GIS), EIA
* Expand base for enforcement
* Noise abetment laws
* Check importations of used vehicles and other equipment.

Waste Management

* Converting Waste to Energy
* Waste Re-use (4Rs – Recycling, Re-use, Reduction)
* Disposal – (plans/standards to be set; how? where?)
* Promote community level compost infrastructure
* Compost should go with market opportunities
* Littering abetment
*Provide incentives for the adoption of new technologies in waste management

Coordination

* Define Coordination
* Define role EPA has to play with specific institutions (taking into consideration to what extent other institutions feel EPA is interfering or playing superior)

- Collaboration

* Different levels at which collaboration will take place must be stated in new Policy

- Agro Chemicals (Check the following)
  * Adulteration and faking (Chemical Control)
  * Pollution

* Designated areas for selling
* Transportation (accidents and spillage)

- International Relations
* Trans-boundary issues, safety issues, regulations

- Emerging Oil finds
* Environmental, Ecological, Social and economic problems associated with oil Finds.

** Awareness Creation
* Public Education (Negativities)
- Not been tackled well because of limitations in terms of logistics
- Getting free air-time on Radio and TV is difficult
- Sponsorship (FM Stations to solicit on behalf of EPA, but has been easy to come by so far)

* Public Education (Positives)
- Media Encounters (FM Stations invite EPA for discussions)
- School Programmes
- Community Approaches
- Local Language Usage

* The use of indigenous knowledge systems

** Women in Environment (Roles/Management)

Harvesting of firewood, fetching of water, managing domestic waste
Empowerment (for proper management of the above listed activities)
Education

** Financing the Policy
Create a Fund (from levies and taxes)
Government Coffers
Polluter Pays Principle
Mines (Royalties)
Ecological Tax (eg. Sachet water producers/Mining/Timber Contractors, etc.)
Setting up environmental courts

CONTRIBUTIONS FROM EPA STAKEHOLDERS

Preamble: Environmental Policy review should be done in tandem with NDPC policy development cycles.

Background of whole policy should capture current environment challenges which the policy intends to rectify.

New Policy should take cognizance of what are in place now i.e. policies already enacted for the various sectors.

Who is responsible for what in each sector should be spelt out clearly.

Review of energy policy and other sectoral policies must move along with review of new environmental policy.

Environmental protection should capture some aspect of conservation.

Enforcement – role of judiciary/police/other stake holders should be spelt out clearly

Chemical control: role of end users and the general public

Policy should have something on:
E-waste
oil/gas
climate change
capacity building development (principles)
* institutional
* human resources

CONTRIBUTIONS FROM EPAC STAKEHOLDERS

The fundamental aims of the environmental policy should not only be pursued through harmonization and enforcement of relevant laws, there should also be public education through any means by which it can be understood by the public adequately.

The formulation of the Environmental Action Plan should be all inclusive. It should not be sector specific.

These should also be detailed Action Plan in order to pursue and achieve the objective.

ENERGY RESOURCE
The policy statement on energy resources should encompass the impact or threat that will be posed be the upcoming oil exploration companies on the environment.

COASTAL REGION

There should be a framework or legislature or policy guide that control the activities of sand winning at the coastal region

PROTECTION OF SOIL

In tackling the principal threat of soil especially the misuse and waste as a result of space consuming activities, the Land Commission should be brought on board to specify innovative land soil protection techniques.

There should be massive public education to advocate the use of organic fertilizer by farmers.

WATER RESOURCES

The activities around in-land water bodies should also be monitored as those activities also pose threats to the existence of those water bodies, especially farming activities.

URBAN AREAS AND WASTE MANAGEMENT

The policy should also focus on timely education of the public by the appropriate MDA on safe disposal and re-use of waste.

Water Bodies

Watershed and inland water bodies can also be protected by afforestation campaigns. These must be timely and continuous.

Mining activities near water bodies should be monitored.

The water quality should also be checked regularly in order to save alarm in case there are any mis-happenings.

Chemicals

There is also the need to encourage the substitution of chemical with biological products, where possible, e.g. Farming.

Noise

As noise is a bye product of industrialization emerging industries should be placed at the country side or outside the cities.

A legislation should be made to ban the use of horns by road users at night in residential areas, unless very necessary and crucial.

Apart from the public education, there should be proper planning of our cities and towns; in this view, industries, factories, churches and schools will be appropriately located.

DEVELOPMENT OF APPROPRIATE INSTRUMENTS

As part of the social corporate responsibilities of businesses, they should be encouraged or tasked to take some eminent responsibilities in implementing this policy. Especially those whose activities affect the environment directly or indirectly.

In monitoring, there should also be information sharing of outcomes with the relevant agencies for rectification and continuous purpose.
In educating the activities about essence of this policy, international agreement and treaties should not be left out.
During environmental monitoring surprise visits also helps the responsible persons or individuals to be up to task.

NATIONAL ENVIRONMENT POLICY
CONSULTATIVE MEETING, KUMASI, 21/01/2010
REGISTRATION

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CONSULTATIVE MEETING WITH STAKEHOLDERS AT CAPE COAST
26TH MARCH, 2010

COMMENTS ON EXISTING POLICY DOCUMENT

All participants indicated having knowledge of the existence of the policy document. However, (with the exception of the Regional EPA Officer) none of the participants indicated working with its contents as a guide in their respective departments.

Current document lacks focus and has several shortcomings. Some of the shortcomings noted include:

Nothing in specifically was stated about the management of water resources. They noted in particular that issues relating to water quality, water harvesting techniques etc are of critical interest in water management but had not been touched upon in the current policy document.

Other issues of interest, which have not been amplified in the current policy, are management of pesticides and residues, e-waste management; health care (hospital) waste management. These, they believe, are emerging issues that the new policy must consider given its health and environmental implications.

Also identified as missing in the current document is farming practices and their attendant consequences—i.e. the incorporation of buffer zone protection as a national policy issue. Participants also indicated the need for government to take a critical look at Mining and its impacts on water bodies especially in the Central and Western regions. They buttressed their point by citing the case of mining in the Dunkwa-on-Offin area and its impact on the Pra River.

Participants further identified the need for stressing issues relating to environmental education more concretely in the new document since this had not been adequately considered in the current policy document. They underscored the importance of this in stemming resource depletion (especially through experiential learning), and illustrated how learning from the experiences of Burkina Faso could be of relevance to Ghana.

Legislation problems have also not escaped notice. They mentioned the need to revisit issues relating to the signing of contracts at the ministries without consultations with the AGs office as a problem area which needs to be addressed.

The issue relating to the need for a review of arrangements governing the existing national environmental fund also came to the fore. They mentioned that under the current practice, it's only the board that is authorized to spend such funds. This, they believe has some implementation problems that need to be re-examined and considered during the drafting of the new policy to enhance execution of environmental programs. Linked to

this is also the challenge of generation of extra funding. For example, should regional offices of the EPA generate funds through charges, fees; consultancies etc that could be used to augment existing sources to enable them implement projects of critical need. A concrete policy on these issues appears to be absent and should be considered.

Lastly, participants identified the importance of incorporating indigenous knowledge systems in the management of environmental systems. However, they are of the view that the current policy does not state anything explicitly on this. They expect that the new policy should give some thoughts to strengthening collaboration with traditional authorities (chiefs, community leaders etc) in our search for alternative approaches to sound environmental management.

SUGGESTIONS FOR IMPROVEMENT ON THE NEW POLICY

Participants suggested the need to empower law enforcement institutions. Also the use of local knowledge systems and the whole process must be from the ground up.
There is also the need to training for the judiciary and other law enforcement agencies to administer sanctions for environmental abuse.

Traditional authorities are currently poorly involved in policy implementation. They must be involved from the formulation stage through implementation stage. They must be empowered through the policy to take action at the local level.

Monitoring components of the policy must be clearly indicated.

There is the need to bridge the gap between research, monitoring and management of the process.

Components of budgets of all land-based projects should be channeled into the environmental fund. In addition, fines at the ports, levies on road users and percentage of the District Assembly common funds and PPP should be considered.

Coordination/Consultation: This should be done at the grass roots through the District Assembly channels or systems; women's groups and other advocacy groups. TV debates, FM stations. Creates a forum for donor agencies during the policy formulation process, eg. GTZ, CIDA. Mobile service providers and the entire membership pf the parliament (Speaker, MPs etc).

There is need for a follow-up visit for further consultation during the process.

The Role of Women in Water and Sanitation Issues

The role of women in water issues must be clearly identified in the policy and linked to training and awareness creation.

There is the need to make training available to women to enable them play key roles in water management. Knowledge and awareness creation among women on water and sanitation issues could be promoted by seminars.

Introduction of community-led activities (community led environmental actions) should be considered. Also research into community-led environmental systems should be enhanced. These activities should be funded by a percentage of the common fund.

CONSULTATIVE MEETING WITH STAKEHOLDERS AT TARKORADI 25TH MARCH, 2010

COMMENTS ON EXISTING POLICY DOCUMENT

Awareness of the existence of the policy document:

Almost all the participants (with the exception of a few) indicated having knowledge of the existence of the policy document, but said they had not seen it.

Views on the policy document:

Participants noted that the policy has a number of shortcomings. Among them are the following:

The current policy appears to have given limited focus to land use issues in urban areas. The problem impact of human activities in urban environments has been identified, particularly the challenges faced by water bodies (i.e. garbage disposal in water bodies).

Marine environment also recognized as one area that had received adequate attention in the existing policy. This they argued need to be given critical attention in the new policy. Linked to this is also the issue of data(information) on the coastal zones and the marine environment, which they believed must be given priority in this era of oil-find.

The erection of the telephone masts in communities and its associated threats was also raised as a matter of concern that needs to be given attention in the new policy.

Wetlands and the challenges confronting them—e.g. exploitation of mangroves— was also raised as an important issue that merits attention.

Waste management policies of today must include 'Hazardous wastes' (e-wastes). They noted in particular used-refrigerators, TVs etc. as major contemporary issues that need to be incorporated into the new policy. In addition the problem of plastic waste e.g. the

sachet water industry and its challenges have been identified. Participants proposed that there should be a clear policy that addresses these issues.

Environmental standards: participants identified lack of environmental standards which should support agencies in the enforcement of laws. They stressed the need for clear and unambiguous laws to be formulated. For example, the new policy should create opportunities for the formulation of requirements, regulations on development activities (projects), and environmental permitting. Also responsibilities for permitting must be clearly spelt-out, (e.g. Assemblies or EPA).

Penalties: Reviews of penalties need to be seriously considered to serve as a deterrent for violators.

SUGGESTIONS FOR IMPROVEMENT ON THE NEW POLICY

More directives should be given on the control of oil-spillage in this era of oil find. Also protection of the marine environment/ecosystem should be an issue of concern.

Challenges/Roles to be played by MDGs in the Oil and Gas Era.

Forestry Commission: They noted pressure on the resources for food especially in the Cape Three Points area as a challenge. Accordingly, there is need for resources to support awareness drive on conservation. They also recognized the need for 'Alternative Livelihood Schemes' to be established in the communities.

The Navy: Need for a Naval Task Force to protect areas close to the oil rigs.

CEPS: They indicated the absence of a specific policy on their role in the oil industry as a problem. In particular, the lack of Radiation Protection Board (RPB) in the region to check the importation and use of radioactive substances in the oil industry needs to be considered.

EPA: Baseline preparation is underway. There is therefore some data on sediments so should there be cases of pollution, they will know what action to take. Training programs are also underway for the handling of spillage. In addition to these, policies on health and safety have also been prepared, and equipments are also available for physico-chemical analysis. However, there is need for a laboratory. There is also need for an electronic data storage equipment(computers). Finally, EPA indicated having initiated SEA on the Oil and Gas industry.

Atorney-Generals Department: They noted rising cases of litigation concerning land in the wake of the Oil find. Also they noted non-compliance with regulation as a problem that needs to be addressed.

since we now now haveParticipants suggested the need to empower law enforcement institutions. Also the use of local knowledge systems and the whole process must be from the ground up.

There is also the need to training for the judiciary and other law enforcement agencies to administer sanctions for environmental abuse.

Traditional authorities are currently poorly involved in policy implementation. They must be involved from the formulation stage through implementation stage. They must be empowered through the policy to take action at the local level.

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APPENDIX III: SUMMARY OF ENVIRONMENTAL MANAGEMENT PROCEDURES IN SELECTED AFRICAN COUNTRIES

SUMMARY OF ENVIRONMENTAL MANAGEMENT PROCEDURES IN SELECTED AFRICAN COUNTRIES

Country	Title	Year of Enactment	Responsible National Authority	Areas of Coverage	Remarks
The Gambia	The Gambia: National Environment Management Act	1994	National Environment Agency (NEA) National Environmental Management Council	• General Principles • Administration • Environmental Planning • Environmental Impact Assessment, Audit and Monitoring • Environmental Standards • Environmental Management • Information, Education and Public Awareness • Offences • Judicial Proceedings	An Act for the control and management of the environment and to make provision for matters concerned therewith. This was to assure all persons living in The Gambia the fundamental right to an environment adequate for their health and well-being.
Republic of South Africa	Republic of South Africa: Environmental Management Policy	1997	Department of Environment Affairs and Tourism	• Vision • Principles • Strategic Goals and Objectives • Governance – Constitutional Setting	This is a bold policy with a broad vision founded on respect for all the relevant principles and themes of environmentalism and sustainable development. In this regard, the policy identifies a lead department for integrated

					environmental management in South Africa.
Federal Republic of Ethiopia	Federal Republic of Ethiopia: Environmental Policy	1997	Environmental Protection Authority/Ministry of Economic Development and Cooperation	• Resource Base and need for a Policy • The Policy Goal, Objectives and Guiding Principles • Sectoral Environmental Policies • Cross-Sectoral Environmental Policies • Policy Implementation	The Policy document is a succinct 28-page document which was prepared to reflect the need to improve and enhance the health and quality of life of all the citizens of Ethiopia.
Kenya	Kenya: Environmental Management and Coordination Act	1999	The National Environmental Council	• General Principles • Administration • Environmental Planning • Protection and Conservation of the Environment • Environmental Impact Assessment • Environmental Audit and Monitoring • Environmental Restoration, Conservation and Easements • Inspection, Analysis and Records • International Treaties, Conventions and	This is an Act of Parliament to provide for the establishment of an appropriate legal and institutional framework for the management of the environment in Kenya.

				Agreements • National Environmental Tribunal • Environmental Offences	

APPENDIX IV: SUMMARY OF MAJOR ENVIRONMENTAL CHALLENGES AND CURRENT MANAGEMENT INTERVENTIONS

2.1 Challenges and management activities

The current environmental challenges and management activities in Ghana have been summarized in the following matrix:

ENVIRONMENTAL CHALLENGE	CHARACTERISTICS	MANAGEMENT ACTIVITES
1. Land degradation	• Results in declining productivity • Traditional and modern agricultural practices have led to declining soil quality, deforestation, accelerated erosion, reduced crop yields, increasing desertifying conditions.	• Preparation of land use and land cover plans • Mapping and environmental information systems of Natural Resources Management Programme (NRMP) • National Soil Fertility Action Plan • National Forest Plantation Development Programme (NFPDP) 2001 • Ratification of UN Convention to Combat Desertification (UNCCD) • National Action Programme to Combat Drought and desertification (EPA, 2000) • Ghana Environmental Management Project (3 Northern Regions)
2. Deforestation	• Marked deterioration of the condition and status of forest • Forest resources mainly utilized for production of logs for export, fuel-wood extraction, charcoal production	• Forestry Commission since 1970 has been implementing comprehensive forest protection strategy to restore forest reserves • About 30 areas (121,156 ha) of

	and agriculture, the main cause of deforestation • Inadequate system for monitoring the rate and extent of deforestation • Forest destruction through mining, bush fires and other poor silvicultural management practices • Estimated annual forest cover decline of about 70,000 ha.	protected forests re-designated as Globally Significal Biodiversity Areas (GSBAs) • Forestry Commission and Private Sector engaged in cultivation of forest plantations (about 94,00 ha in 2004) • Community-protected areas (CPAs) also called "sacred groves" are available in many communities. EPA has recorded 145 CPAs in Ghana. • Forest and Wildlife Policy (1994) encourages community involvement in protecting forest resources
3. Biodiversity Loss	• Biological diversity is an indispensable component of natural resource base • Rich biodiversity in different parts of Ghana – mammals, birds and plants • Changes in the environment, drought and climate variability are proximate drivers of biodiversity loss • Economic development and urbanization have resulted in rapid loss of biological diversity • Current harvest of wildlife for meat is estimated between 225 and 385,000 tons annually	• Various domestic policies, laws and regulations related to conservation and use of biodiversity, e.g. Forestry and Wildlife policy, water resources policy • Designation of "protected areas" – Six Resource Reserves, Two wildlife Sanctuaries, Seven National Parks, Six Ramsar Sites and many community based sanctuaries • Ghana is party to many international conventions on biodiversity. - Convention on Biological Diversity (CBD) - CITES • Projects to conserve biodiversity: - Northern Savanna Biodiversity Conservation Project - National Biodiversity Strategy and Action Plan
4. Water Pollution	• Major sources include: domestic and municipal wastes, agricultural and industrial wastes and other improper land use practices • Water pollution creates major environmental health problems – spread of disease pathogens which create water-borne diseases • Marked variation in river water quality for urban and rural settlements	• Awareness creation campaigns for protection of watersheds by government agencies and NGOs • Impoundments to improve water availability for different uses • The Community Water and Sanitation Agency (CWSA) is assisting communities in the provision of water and sanitation facilities

	due to disposal of liquid and solid waste into water courses	• The African Development Bank (AFDB) has sponsored the Rural Water Supply and Sanitation Project • Provision of safe water in guinea worm endemic communities
5. Marine and Coastal Degradation	• Marine and coastal areas are under pressure due to: intensive agricultural production, industrial development, salt production, mining and quarrying and urban development • Sources of pollution are municipal and industrial effluents, agricultural runoffs • Sea erosion, e.g. Keta and Ada	• Direct investment in control structures, e.g. Keta Sea Defence Project • Gabions and boulder revetments to arrest erosion • Mangrove replanting and planting of other vegetative cover, e.g. at Winneba • Regulatory incentives – fines for illegal mining • Policy reforms in land use planning and coastal zone management • Investments in waste treatment and small scale waste collection
6. Mining and Industrial Development	• Mining has been an important industrial activity in the economy of Ghana • Small-scale mining for gold and diamond has also been important • Main environmental challenges include land devastation, soil degradation, water and air quality deterioration, noise, visual intrusion and social dislocation	• Mineral Policy and Fiscal Regime • EIA Procedures • Reclamation Bonds • Performance Disclosure Rating System • Minerals Commission • NREG Project
7. Urbanization	• Rapid population growth rate (2.2 % pa) • Regular north-south, rural-urban migration • Very high housing demand needs • Impact of over-crowding on human health, poor sanitation, absence of sewage treatment plants • Lack of planning leading to inordinate growth of cities, e.g. Accra, Kumasi, Tamale • Encroachment on reserved open spaces and waterways • Proliferation of unapproved settlements	• Policies and programmes to improve living conditions in rural areas to contain rural-urban migration • Improvement in urban transport • Affordable housing projects in the main cities • Draft Urban Policy in place • Draft Housing Policy • Cabinet approval of Environmental Sanitation Policy • Northern Region Small Towns Water and Sanitation Project

2.2 Emerging issues

These are environmental challenges which have assumed prominence since the publication of the first environmental policy

ISSUE	CHARACTERISTICS	INTERVENTIONS
1. Climate Change	• Global problem with local implications • Changes in rainfall pattern and impact on agricultural production, unprecedented floods and disasters • Increased coastal erosion due to sea level rise • Drought in Sahelian region resulting in southward migration of people and animals • Climate change and associated health problems	• Guidebook to facilitate the integration of climate change and Disaster Risk Reduction into National Development Policies and Planning prepared • Ghana is party to the UN Framework Convention on Climate Change (UNFCCC) • Studies on measures to abate climate change through forestry and Land-use using the Comprehensive Mitigation Analysis Process (COMPAP) model. • A needs assessment report prepared in fulfillment of decisions of the COP of the UNFCC • A report with the assistance of the Climate Technology Initiative (CTI) of the OECD lists a number of desired technologies based on national set of criteria: Energy Efficient Lighting, Industrial Energy Efficiency and Land fill Methane Gas Recovery
2. Natural Disasters	• Accra district and some coastal areas have previously experienced earthquakes and continue to experience minor tremors • Occasional droughts – most severe in 1982/3 with disastrous effects on livelihoods • Devastating annual floods throughout the country, especially in Greater Accra	• National Disaster Management Organization (NADMO) in place • Seismological stations installed at Weija, Shai Hills, Kukurantumi and Accra • Educational programmes to create public awareness • Integrated watershed management to combat desertification • Korle Lagoon Ecosystem Restoration project • Byelaws restricting structures in flood-plains, water ways, wetlands, etc.

		• Ghana has ascribed to the Hyogo Framework for Action (HFA) which aims to reduce substantially loss of life as well as the social economic and environmental losses resulting from disasters • NADMO spends more than 85% of its resources to address issues related to hydro-meteorological disasters
3. Urban Noise	• Motor vehicle congestion and increasing noise levels from sirens and horns • Commercial activities in markets and at lorry parks • Industrial noise: factories, mining operations, quarries • Noise at entertainment and social gatherings – e.g. parties, churches, mosques • Equipment and engine noise, e.g. generators, corn mills and block moulding machines in residential areas, itinerant musical shops, etc.	• EPA guidelines on permissible ambient noise levels for the country • Noise levels for residential, educational, commercial and places or worship • Inability of Municipal/Metropolitan Assemblies to enforce the guidelines
4. Oil and Gas Industry (Petroleum Exploration)	• Oil and Gas industry is new as a result of the Oil discovery in the Jubilee Field (Western Region) • Areas of concern include - Oil spills at sea and on land - Pollution of air, water and land - Transportation – pipelines, tankers • International relations • Coastal ecosystem destruction	• Petroleum Exploration bill before Parliament • EPA guidelines on petroleum exploration (EIA, ESIA, SEA) • "Strengthening Environmental Governance of the Oil and Gas Sector in Ghana" programme (EPA) • Act before Parliament to manage oil resources and income from oil • GNPC in place • Ghana is member of Oil for Development (OFD) programme (Norway) • Jubilee Field EIA • SEA of Petroleum Sector
5. Invasive Alien Species	• Occur in large water reservoirs – Oti arm of Volta Lake, Tano Basin • Obstruction water use: fisheries, hydropower generation, transportation	• Invasive Aquatic Weeds Management Project (EPA) • EPA Water-weed Management in West Africa • Integrated Management of the Volta River Basin
6. E-Waste	• Sources are: used equipment in the	• Ghana is signatory to the Base

	form of computers, copying machines, television sets, mobile phones and electronic equipments • Rejected in the country of origin and imported into Ghana without regard to their age and degree of usefulness • No guidelines/manuals on disposal techniques • No e-waste collection or recycling programme • Burning of e-waste to retrieve useful parts • Consequent emissions and toxins cause detrimental impacts on human health and the environment	Convention and Kyoto Protocol as well as other global treaties for the protection of environment • EPA Act 1994 (Act 490) provides the principles and mechanisms for integrating good environmental management into all developing activities. • EPA Act provides framework for waste management through the principles that refer to avoidance or minimization and remediation of pollution, including waste reduction re-use, recycling and proper waste disposal.
7. Chemicals (PCBs)	• Covers all chemicals – except pharmaceuticals • Increasing use of agro chemicals – pesticides, weedicides, fertilizers • Potential to cause considerable health and environmental problems – production to end use • Presence affects the quality of air, soil and water	• The Factories Offices and Shops Act 328 (1970) • Draft Policy on Occupational Safety and Health • Mercury Law (1989) • Prevention and Control of Pests and Diseases of Plants (Act 307) Infectious Disease Ord. Cap 78 • Licensing of all chemical dealers