REPUBLIC OF GHANA

MINISTRY OF ENVIRONMENT, SCIENCE, TECHNOLOGY & INNOVATION (MESTI)

2017 ANNUAL PROGRESS REPORT

APRIL, 2018

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LIST OF ACRONYMS

ABNE	African Biosafety Network of Expertise
ARSDF	Auto Regressive Spectral Density Function
AVN	African Very Long Baseline Interferometry Network
BNARI	Biotechnology and Nuclear Agriculture Research Institute
COTVET	Council for Technical, Vocational and Education Training
CREMA	Community Resource Management Area
CRP	Coordinated Research Project
CSIR	Council for Scientific and Industrial Research
CSIR-BBRI	Council for Scientific and Industrial Research-Building and Road Research Institute
CSIR-CRI	Council for Scientific and Industrial Research- Crops Research Institute
CSIR-FORIG	Council for Scientific and Industrial Research- Forestry Research Institute of Ghana
CSIR-FRI	Council for Scientific and Industrial Research- Food Research Institute
CSIR-IIR	Council for Scientific and Industrial Research- Institute of Industrial Research
CSIR-PGRRI	Council for Scientific and Industrial Research- Plant Genetic Resources Research Institute
CSIR-OPRI	Council for Scientific and Industrial Research- Oil Palm Research Institute
CSIR-SARI	Council for Scientific and Industrial Research- Savanna Agricultural Research Institute
CWSA	Community Water and Sanitation Agency
EI	Executive Instrument
EFPR	Environmental Fiscal Reform Policy

EPA	Environmental Protection Agency
FC	Forest Commission
FRISMO	Food Research Institute Smoke Oven
GAEC	Ghana Atomic Energy Commission
GCF	Green Climate Fund
GCNet	Ghana Community Network Services Limited
GETFund	Ghana Education Trust Fund
GHARR-1	Ghana Research Reactor
GH-(NDC)	Ghana Nationally Determined Contributions
GHS	Ghana Health Service
GIDA	Ghana Irrigation Development Authority
GIF	Gamma Irradiation Facility
GII	Greener Impact International
GIS	Geographic Information System
GNPPO	Ghana Nuclear Power Programme Organization
GoG	Government of Ghana
GRIDCo	Ghana Grid Co.Ltd
GSA	Ghana Standards Authority
GSGDA	Ghana Shared Growth and Development Agenda
GSSTI	Ghana Space Science and Technology Institute
GTUC	Ghana Telecom University College
HPC	High Performance Computing
IAEA	International Atomic Energy Agency

ICGEB	International Centre for Genetic Engineering and Biotechnology
IGF	Internally Generated Funds
IMO	International Maritime Organization
INIR	Integrated Nuclear Infrastructure Review
IPIECA	International Petroleum Industry Environmental Conservation Association
LUPMIS	Land Use Planning and Management Information System
M&E	Monitoring and Evaluation
MASTESS	Mathematics, Science and Technology Scholarship Scheme
MDA	Ministries, Departments and Agencies
MEST	Ministry of Environment, Science and Technology
MESTI	Ministry of Environment, Science, Technology and Innovation
MFIs	Micro Finance Institutions
MLNR	Ministry of Lands and Natural Resources
MMDAs	Metropolitan, Municipal and District Assemblies
MoEn	Ministry of Energy
MoFA	Ministry of Food & Agriculture
MoFAD	Ministry of Fisheries and Aquaculture Development
MoH	Ministry of Health
MOTCCA	Ministry of Tourism, Culture & Creative Arts
MoU	Memorandum of Understanding
MRV	Monitoring Reporting & Verification
NADMO	National Disaster Management Organisation
NAMA	Nationally Appropriate Mitigation Actions

NAP	National Adaptation Plans
NBP	National Biodiversity Policy
NCCP	National Climate Change Policy
NDA	National Designated Authority
NDC	Nationally Determined Contributions
NDPC	National Development Planning Commission
NDT	Non Destructive Testing
NEP	National Environment Policy
NEPAD	New Partnership for African Development
NGO	Non-Governmental Organisation
NIA	National Innovation Agency
NIST	National Investment Strategy Team
NNRI	National Nuclear Research Institute
NOSCP	National Oil Spill Contingency Plan
NRA	Nuclear Regulatory Authority
NREG	Natural Resources and Environment Governance
PACSTI	Presidential Advisory Council on Science, Technology and Innovation
PBS	Public Broadcasting Service
PEF	Private Enterprise Federations
PGEC	Post Graduate Education Course
PGRRI	Plant Genetic Resources Research Institute
PPME	Policy, Planning, Monitoring and Evaluation
PWD	Public Works Department

REDD	Reducing Emissions from Deforestation and forest Degradation
R&D	Research and Development
RSDF	Regional Spatial Development Framework
RWHS	Rain Water Harvesting System
S3A	Science Agenda for Agriculture in Africa
SADA	Savannah Accelerated Development Authority
SARI	Savannah Agricultural Research Institute
SARIMA	South African Research and Innovation Management Association
SDF	Spatial Development Framework
SDG	Sustainable Development Goal
SGC	Science Granting Council
SKA	Square Kilometre Array
SLCP	Short Lived Climate Pollutant
SLWMP	Sustainable Land and Water Management Project
SMTDP	Sector Medium Term Development Plan
SNAS	School of Nuclear and Allied Sciences
STI	Science, Technology & Innovation
SWSP	Source Waste Segregation Programme
TCU	Technology Commercialization Unit
TCPD	Town and Country Planning Department
TRC	Technical Review Committee
TTMC	Technology Transfer and Marketing Centre
UAV	Unmanned Area Vehicle

UCC	University of Cape Coast
UNDP	United Nations Development Programme
UDS	University for Development Studies
UNFCCC	United Nations Framework Convention on Climate Change
UPN	Unique Parcel Numbers
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
WRI	Water Research Institute
WRC	Water Resources Commission

1.0 INTRODUCTION

1.1 Background

The Ministry of Environment, Science, Technology and Innovation (MESTI), which forms part of government machinery, was established in 1993 as the Ministry of Environment and Science. In 2006, the Ministry was dissolved. Its portfolios on Environment and Science were added to the Ministry of Local Government and Rural Development (MLGRD) and the Ministry of Education respectively. In January 2009, the Ministry was reconstituted and named Ministry of Environment, Science and Technology (MEST), under Executive Instrument (E.I.) 7 Civil Service (Ministries) Instrument, 2009. However, in 2013, the Ministry was renamed Ministry of Environment, Science, Technology and Innovation (MESTI), under Executive Instrument (E.I.) 1 Civil Service (Ministries) Instrument, 2013. This section of the report focuses on the general overview of the sector Ministry.

The Mandate

In line with sections 11 and 13 of the Civil Service Law 1993, (PNDCL 327) and by Executive Instrument (EI. 28, 2017), The Ministry is mandated to initiate and formulate policies on Environment, Science, Technology and Innovation, as well as coordinate, monitor and evaluate the implementation of plans, programmes, and performance of the sector for national development. The Ministry is the Government's principal advisor on environmental sustainability, science and technological research and international matters that effect environment, science and technological development.

The Ministry is committed to promote sustainable environmental management and the adoption and application of science and technological innovations through the formulation of policies, monitoring and evaluation of the implementation of sector plans, programmes, and projects for national development.

1.2 Mission

The Ministry of Environment, Science, Technology, and Innovation exists to promote sustainable environmental management and the adoption and application of science and technological innovations through the formulation of policies, monitoring and evaluation of the implementation of sector plans, programmes, and projects for national development.

1.3 Vision

Sustainable development of Environment, Science, Technology and Innovation for all.

1.4 Sector Goal

The Ministry of Environment, Science, Technology and Innovation (MESTI) seeks to ensure accelerated socio-economic development of the nation through the formulation of sound policies and a regulatory framework to promote the use of appropriate environmentally friendly, scientific, and technological practices.

1.5 Policy Objectives

The following eight (8) objectives were adopted from the Ghana Shared Growth and Development Agenda (GSGDAII).

The adopted policy objectives of the Ministry are to:

1. Strengthen institutional and regulatory frameworks for sustainable natural resource management:
2. Reduce in loss of biodiversity,
3. Enhance capacity to adapt to climate change impacts,
4. Promote green economy,
5. Promote the application of Science, Technology and Innovation in all sectors of the economy,
6. Strengthen the institutional framework to promote the development of research and its application,
7. Strengthen policy formulation, development planning, and Monitoring and Evaluation (M&E processes for equitable and balanced spatial and socio- economic development and
8. Promote a sustainable, spatially integrated and orderly development of human settlements.

1.6 Core Functions

The Environment, Science, Technology and Innovation sector has eight (8) core functions. These are:-

1. Provide leadership and guidance for Environment, Science, Technology and Innovation within the broad sector of the economy through sound policy formulation and implementation,
2. Ensure the establishment of the regulatory framework and setting of standards to govern the activities of science and technology and the management of the environment for sustainable development,
3. Promote activities needed to underpin the standards and policies required for planning and implementation of sound scientific and technological development activities,
4. Ensure the coordination, supervision, monitoring and evaluation of activities of Environment, Science, Technology and Innovation while fulfilling national benefits-sharing commitments,
5. Set out the parameters required for programmes on Environment, Science, Technology and Human Settlement in consultation with the National Development Planning Commission (NDPC) in guiding the Districts Assemblies as the planning authorities at the local level,
6. Analyse and coordinate all planned programmes as well as budgets in the Environment, Science, Technology and Innovation Sector of the economy for purposes of achieving a single integrated management system,
7. Initiate, simulate and coordinate research including the continuous development and review of policies, laws, rules and regulations in the Environment, Science, Technology and Innovation Sector of the economy, and
8. Ensure effective environmental management and governance, in line with the functions of the Act 490, with the Environmental Protection Agency (EPA) as the main implementing agency and the MESTI playing an oversight, coordination and facilitating role.

1.7 LIST OF SECTOR DEPARTMENTS /AGENCIES/AUTHORITIES

i. **Sub-vented Agencies**

MESTI has six (6) Agency /Authority. They are;

- The Council for Scientific and Industrial Research (CSIR)
- Ghana Atomic Energy Commission (GAEC)
- Environmental Protection Agency (EPA)
- Nuclear Regulatory Authority (NRA)
- Land Use and Spatial Planning Authority (LUSPA)
- National Biosafety Authority (NBA)

1.7.1 Council for Scientific and Industrial Research (CSIR)

Establishment

The Council for Scientific and Industrial Research (CSIR) was established by NLC Decree 293 of 10th October 1968, amended by NLCD 329 of 1969, and re-established in its present form by CSIR Act 521 on 26th November 1996. The genesis of the Council however dates back to the erstwhile National Research Council (NRC), which was established by Government in August 1958 to organise and coordinate scientific research in Ghana. In 1963, the NRC was merged with the former Ghana Academy of Sciences, a statutory learned society. Following a review in 1966, the Academy was reconstituted into, essentially, its original component bodies, namely a national research organisation designated the CSIR and a learned society, designated the Ghana Academy of Arts and Sciences.

The distinctive features of the 1996 Act are the emphasis accorded private sector concerns, and the introduction of market principles into the Council's operations through commercialisation of research.

Mission

CSIR seeks to become the force for accelerated social and economic development of Ghana through examining, exploring and creating Science and Technology catalysts for public and private wealth creation.

Goal

The goal of CSIR is to ultimately develop capacities for contributing to industrial and agricultural productivity, food security, expand opportunities for productive employment, community renewal, environmental conservation, income generation and poverty reduction for national development.

Functions

The core functions of CSIR are among others, to:

1. Pursue the implementation of government policies on scientific research and development;
2. Advise the sector Minister on scientific and technological advances likely to be of importance to national development;
3. Encourage coordinated employment of scientific research for the management, utilization and conservation of the natural resources of Ghana in the interest of development;
4. Encourage in the national interest, scientific and industrial research of importance for development of agriculture, health, medicine, environment, technology and other service sectors and to this end to encourage close linkages with the productive sectors of the economy; and
5. Commercialise appropriate technology in partnership with the private sector and other stakeholders.

Organisation

The CSIR runs and coordinates activities of 13 research institutes reflecting productive sectors of the Ghanaian economy. Each Institute's mandate, research areas and key services provided are presented as follows:

1. The **CSIR-Animal Research Institute (CSIR-ARI)** is mandated to develop and transfer technologies related to livestock and poultry production in Ghana and to stimulate, through Research and Development, accelerated production and consumption of animal protein.

2. The **CSIR-Building and Road Research Institute (CSIR-BRRI)** is mandated to undertake research into all aspects of building and road design and construction with the view to ensuring efficiency, safety and economy. Additionally, research activities of the Institute are directed at developing construction materials from local sources to reduce construction cost and make housing affordable.

3. The **CSIR-Crops Research Institute (CSIR-CRI)** is mandated to research and develop improved varieties of food and industrial crops and their production technologies to enhance food security and poverty reduction

4. The mandate of the **CSIR-Food Research Institute (CSIR-FRI)** is to conduct applied research, through laboratory and pilot scale investigations, into problems of food processing and preservation, storage, marketing, distribution and utilisation in order to assist the local food industries to improve on and diversify their operations. The Institute also advises Government on its food policy.

5. The mandate of the **CSIR-Forestry Research Institute of Ghana (CSIR-FORIG)** is to undertake forest, forest products and related research to ensure sustainable management and utilisation of Ghana's forest resources.

6. The **CSIR-Institute of Industrial Research (CSIR-IIR)** is mandated to undertake research into process and product design and development, and to promote adaptive technology, scientific instrumentation and calibration, as well as repair of precision equipment.

7. The mandate of the **CSIR-Institute for Scientific and Technological Information (CSIR-INSTI)** is to develop a national capacity and capability for the efficient and effective delivery of real time scientific and technological information and customised knowledge on demand for the benefit of policy makers, research scientists, industrialists and others in appropriately packaged form for national development.

8. The mandate of the **CSIR-Oil Palm Research Institute (CSIR-OPRI)** is to undertake sustainable and demand-driven research on palm oil and coconut to provide scientific and technological support for the development of the entire oil palm and coconut industries.

9. The **CSIR-Plant Genetic Resources Research Institute (CSIR-PGRRI)** is mandated to collect and conserve the plant genetic resources of Ghana as well as coordinate plant genetic resource activities in the country.

10. The mandate of the **CSIR-Savanna Agricultural Research Institute (CSIR-SARI)** is to provide farmers in the Northern, Upper East and West Regions with appropriate technologies to increase their food and fibre crop production based on a sustainable production system which maintains and/or increases soil fertility.

11. The **CSIR-Science and Technology Policy Research Institute (CSIR-STEPRI)** is mandated to provide research support for national science and technology policy development, monitoring and evaluation.

12. The mandate of the **CSIR-Soil Research Institute (CSIR-SRI)** is to undertake scientific research to generate information for effective planning, utilisation and management of the soil resources of Ghana for sustainable agriculture, industry and environment.

13. The mandate of the **CSIR-Water Research Institute (CSIR-WRI)** is to undertake research into all aspects of water resources (both living and non-living) of Ghana in order to provide scientific and technical information and services needed for the sustainable development, utilisation and management of the resources for socio-economic advancement of the country.

1.7.2 Ghana Atomic Energy Commission (GAEC)

Establishment

The Ghana Atomic Energy Commission was established by an Act of Parliament, Act 204 of 1963, as the sole Agency in Ghana responsible for all matters relating to peaceful uses of atomic energy. The Act 204 was amended in 1993 by PNDC Law 308 mainly to enable it to create other institutes under the Commission. This amendment resulted in the creation of two other Institutes in addition to the National Nuclear Research Institute (NNRI) formerly Kwame Nkrumah Nuclear Research Institute (KNNRI). The two Institutes are the Radiation Protection Institute and the Biotechnology and Nuclear Agriculture Research Institute (BNARI).

The founding Act 204 of 1963 has been superseded by Act 588 of 2000 to make provision for GAEC to undertake commercialization of its research and development results.

Mission

To develop and promote the utilization of nuclear, biotechnology, and other related technologies for socio-economic development through research, training and commercialization. To advise government on policy related to peaceful applications of these technologies.

In pursuit of these GAEC will build strategic alliances and partnership with national, regional and international bodies to assist Ghana fulfil her obligations in nuclear safety, security, safeguards and environmental protection while building the necessary capacity for the introduction of nuclear power into Ghana's energy mix.

Functions

The functions of the Commission as prescribed in Act 588 of 2000 are:

1. To make proposals to the Government for Legislation in the field of nuclear radiation and radioactive waste management,
2. To advise the Government on questions relating to nuclear energy, science and technology,
3. To establish, for the purpose of research and in furtherance of its functions, Institutes of the Commission and to exercise control over the boards of management of the Institute,
4. To encourage and promote the commercialisation of research and development results through its Institutes,
5. To supervise the carrying out of all requirements designed to secure the safety and health of radiation workers and the environment,
6. To engage in research and development activities, as well as in the publication and dissemination of research findings and other useful technical information,
7. To oversee and facilitate the development of human resources in the fields of nuclear science and technology, and to promote the training of scientific, technical and non-scientific personnel of the Commission,
8. To maintain relations with the International Atomic Energy Agency and other similar international and national organisations on matters of research and development of nuclear energy and nuclear technology,
9. To collaborate with Universities and Research Institutes for the purpose of conducting research into matters connected with the peaceful uses of nuclear energy and technology.

Organisation

The research and development programmes of GAEC involve the promotion of Nuclear and Space Science technologies in various sectors of the economy. These programmes and projects are carried out by research institutes and the Graduate school of Nuclear and Allied Sciences (SNAS) to promote the commercialisation and application of scientific research in partnership with the Private Sector and other stakeholders for national development.

All the institutes are located at Kwabenya with decentralised laboratories. The research institutes under GAEC are the following:

1. ***The National Nuclear Research Institute (NNRI)*** was established to promote and strengthen Nuclear Science and technology research, and training for the socio-economic development of Ghana.
2. ***The Radiation Protection Institute (RPI)*** was established to provide an effective national regulatory framework for the protection of people, property, and environment, safety and security of radioactive materials and nuclear installations.
3. ***The Biotechnology and Nuclear Agriculture Research Institute (BNARI)*** was established to research, develop and implement activities on safe applications of biotechnology and nuclear agriculture and transfer these technologies to end-users in order to enhance agricultural productivity, health delivery and industrialization.
4. ***The Radiological and Medical Science Research Institute (RAMSRI)*** was established to carry out medical research, applying nuclear techniques to promote human health and nutrition. Some of their activities are to:
    a. Provide Research-based technical advice for Cancer Management and Treatment Studies for improving complication-free survival rates after radio-therapy.
    b. The institute is currently sourcing for funds to construct a nuclear and medical imaging centre to research into the treatment of various forms of cancer. This Centre if established will support most of the health facilities across the country and the sub-region.
5. ***The School of Nuclear and Allied Science (SNAS)*** was established to collaborate with the University of Ghana to train Nuclear Scientists to sustain skills in science in Nuclear Technology for the sub-Region. The University also collaborates with the International Atomic Energy Agency (IAEA) to run a Post Graduate Education Course (PGEC) in Radiation Protection organised for radiological professionals in the sub region.

6. ***The Ghana Space Science Technology Institute (GSSTI)*** is currently converting a 32m dish from a communication antenna to a radio telescope at Kuntunse and assessing critical indicators of radio astronomy capabilities. This project is about 80% complete. It is planning to acquire a ground receiving station to enable the country capture relevant satellite images that could be used by the aviation, meteorological, security and environmental protection agencies.
7. ***The Nuclear Power Institute*** **(NPI)** was established in 2015 to research and facilitate issues relating to Nuclear power. The institute takes over the organisation of workshops and studies that will lead to the introduction of nuclear power into the country's energy mix after 2020.

1.7.3 Environmental Protection Agency (EPA)

Establishment

The Environmental Protection Agency (EPA) of Ghana was established on 30th December 1994 through an Act of Parliament (EPA Act 1994 Act 490) to regulate environmental matters and implement environmental policy objectives of the nation. The Agency is an implementing agency, a regulatory body and catalyst for change towards sound environmental stewardship.

Mission

The Mission of the Agency is to co-manage, protect and enhance the country's environment in particular as well as seek common solutions to global environmental problems. The mission is to be achieved through integrated environmental planning and management system established on a broad based public participation, efficient implementation of appropriate programmes and technical services; giving good counsel on environmental problems as well as effective and consistent enforcement of environmental laws and regulations.

Functions

The core functions of the EPA include:

1. Coordinate the activities of bodies concerned with aspects of the environment,
2. Collaborate with national, foreign and international agencies relevant for the environmental act,
3. Issue environmental permits and notices;

4. Prescribe relevant standards and guidelines,
5. Ensure compliance with EPA act and with environmental impact assessment procedure,
6. Conduct investigations into environmental issues and advise the Minister,
7. Promote relevant studies, research, surveys and analyses,
8. Initiate and pursue education for public awareness on the environment,
9. Develop comprehensive database on the environment,
10. Conduct training programmes and publish information on the environment and
11. Impose and collect environmental protection levies.

Organisation

The EPA is currently one of the six agencies under the Ministry of Environment, Science, Technology and Innovation (MESTI). The goal of the Environmental Protection Agency (EPA) is to ensure better use of ecosystem services and natural resources, for purposes of poverty reduction and sustainable development. EPA also seeks to enhance the application of Act 490 and its regulations to reduce environmental impacts, control environmental degradation and enhance restoration of degraded resources.

EPA has adopted a functional organizational structure made up of the Governing Board at the apex, the Executive Director, three Deputy Executive Directors, 7 Divisions, 19 Departments, 11 Regional and 4 area offices. There are basically three groups of divisions within the Agency. The first group constitutes the EPA regional staff whilst the following two groups are located within the Head Office. Specialised Units responsible for the delivery of programmes which contribute directly to the implementation of EPA's statutory charter (programme-based departments); Administrative support units which provide services for the internal management of the organisation as a whole (Administrative departments).

1.7.4 Land Use and Spatial Planning Authority (LUSPA)

Establishment

Until December 2016 the Town and Country Planning Department, established in 1945, was charged with the responsibility of planning and management of growth and development of cities, towns and villages in the country. The Land Use and Spatial Planning Act, 2016, Act 925 established the Land Use and Spatial Planning Authority and an Executive Instrument

(EI180) signed in December 2016 pursuant to the Act, dissolved the Town and Country Planning Department and brought into force the Land Use and Spatial Planning Authority.

Mission

It is the Mission of the Land Use and Spatial Planning Authority: "To facilitate the planning, management and promotion of harmonious, sustainable and cost effective development of land and human settlements in Ghana in accordance with sound environmental and planning principles".

Functions

The Authority performs the following key functions, among several others:

1. Collaborate with the National Development Planning Commission (NDPC) to perform the spatial, land use and human settlements planning functions of the National Development Planning System, established under the National Development Planning Act, 1994, Act 479, and the National Development Planning (Systems) Act, 1994, Act 490;
2. Ensure the establishment of an inter-sectoral approach to decision making in spatial planning in accordance with the development objectives of government to attain a coordinated approach to development;
3. Ensure attainment of a balanced distribution of urban population and a spatially integrated hierarchy of human settlements to support the socio-economic development of the country.
4. Develop the capacities of District Assemblies and other institutions for the effective performance of their Spatial Planning functions;
5. Ensure the control of physical development in less controlled but sensitive areas such as forest reserves, nature reserves, wild life sanctuaries, green belts, coastal wetlands, water bodies, water catchment areas, mining areas, open spaces and public parks.
6. Prepare National Spatial Development Frameworks and evaluate regional and district frameworks to ensure conformity with the National Spatial Development Framework and the requirements of the Act.
7. Facilitate the creation of an institutional framework that ensures the effective operations of this Act at all levels, etc.

Organisation

With the current institutional transition, the national and regional offices of the erstwhile Town and County Planning Department operate as the Land Use and Spatial Planning Authority while the district offices operate as Physical Planning Departments of their respective Metropolitan, Municipal and District Assemblies, and reporting to the Ministry of Local Government and Rural Development. This is in consonance with the National Decentralisation Policy Framework of government, and the Local Government (Departments of District Assemblies) (Commencement Instrument), 2009 (LI 1961).

1.7.5 National Biosafety Authority (NBA)

Establishment

The Biosafety Act, 2011 (Act 831) established the National Biosafety Authority (NBA) to receive, process, respond to and make decisions on applications under the Act; to establish an administrative mechanism to ensure the appropriate handling and storage of documents and data in connection with applications and other matters covered under the Act. Again, to act as the National Focal Point responsible for liaising with any other agencies or international organizations concerned with biotechnology and biosafety and lastly to promote public awareness, participation and education concerning the activities of the Authority under the Act.

The Biotechnology Development programme ensures an adequate level of protection in the field of safe development transfer, handling and use of genetically modified organisms resulting from biotechnology that may have an adverse effect on health and the environment.

Mission

The NBA is dedicated to promoting sustainable socio-economic development through efficient and transparent regulation of Genetically Modified Organisms (GMOs).

Functions

The NBA is responsible for:

1. Receiving, processing, responding to and to make decisions on biosafety applications;
2. Establishing administrative mechanisms to ensure the appropriate handling and storing of documents and data in connection with the processing of applications and any other matters;

3. Acting as the national focal point responsible for liaising with any other agency or international organisations concerned with biotechnology and biosafety; and
4. Promoting public awareness, participation and education concerning the activities of the Authority.

Organisation

To ensure an integrated approach to the regulation of modern biotechnology and its products, the Act enjoins the Authority to operate in conjunction with other regulatory agencies such as the Food and Drugs Authority (FDA), Ghana Standards Authority (GSA), Customs Division of the Ghana Revenue Authority, the Environmental Protection Agency (EPA), Veterinary Division, the Plant Protection and Regulatory Services Division (PPRSD) and the Ministry of Local Government and Rural Development. In addition, the Authority is represented by certified Institutional Biosafety Committees (IBCs) in research and academic institutions conducting research on Genetically Modified Organisms (GMOs) in Ghana. The Act has also established a Technical Advisory Committee to support the Authority in conducting risk assessment and management of GMOs and also to provide scientific advice to the Authority on issues under the Act. Furthermore, the Authority is supported by an Appeals Tribunal which deals with concerns of aggrieved persons on issues regarding applications and other matters under the Act. The NBA is currently being headed by a Chief Executive Officer (C.E.O).

1.7.6 Nuclear Regulatory Authority (NRA)

Establishment

NRA ACT 895, 2015 established the Nuclear Regulatory Authority; to provide for the regulation and management of activities and practices for the peaceful use of nuclear material or energy, radioactive material or radiation; to provide for the protection of persons and the environment against the harmful effects of radiation hazards; to ensure the effective implementation of the country's international obligations and for related matters. The NRA was setup in 2016.

Mission

The Mission of the NRA is to ensure the protection of humans and the environment from the harmful effects of radiation.

Functions

The functions of the NRA as spelt out in the NRA Act 895 are as follows:

1. Facilitate the development of national policies on the regulation and management of activities and practices with respect to:
   i. Nuclear safety and research
   ii. Security of nuclear and radioactive materials
   iii. Radiation
   iv. Implementation of safeguards specified under the Act.
2. Regulate the introduction of radiation sources, nuclear materials, equipment or practices that expose workers, patients, the public and the environment to radiation.
3. Issue, modify, suspend or revoke authorization and determine conditions for authorization.
4. Regulate research on radiation and nuclear safety and security, and of radioactive waste matters.
5. Regulate the use of radioactive materials in the exploration, exploitation and extraction of oil and gas, and the mining and milling of radioactive ores and other ores associated with radioactive and nuclear materials.
6. Define the detailed obligations to be placed on persons who possess radiation sources and nuclear materials, including financial conditions.
7. Establish and maintain a national register of radiation sources and of persons authorized to carry out any activity or practice related to a source of radiation.
8. Collect information, documents and views from private and public organizations or persons as may be necessary and appropriate for the discharge of its functions.
9. Collaborate with agencies responsible for emergency to establish plans and procedures for coping with any radiological emergency and abnormal occurrence involving a nuclear material, radiation source or any other radioactive source.
10. Ensure that the operators provide training, information and guidance on nuclear safety, security and safeguards and radiation protection of the public.
11. Educate the public on nuclear and radiation matters.
12. Establish regional and other offices as it may consider necessary for the proper performance of its functions.

13. Facilitate the conduct of inspections by designated inspectors of the International Atomic Energy Agency to verify design information, inspections and complementary access as provided for in the safeguards agreement and the additional protocols.
14. Collect, collate and provide information to the International Atomic Energy Agency in accordance with the safeguards agreement and any additional protocols to the agreement.
15. Exchange information and co-operate with regulatory authorities of other countries and relevant international organizations on matters of nuclear safety, nuclear security and safeguards.
16. Collaborate with the Environmental Protection Agency to identify activities and practices that may require Environmental Impact Assessment and develop environmental guidelines for those activities and practices.
17. Ensure that the polluter pays principle is applied in the management of nuclear and radioactive waste in the country.
18. Review nuclear safety assessment and safety analysis reports from authorized persons; and
19. Perform other functions that may be assigned to the authority under any other enactment.

Organisation

The Director-General is responsible for the day to day administration of the affairs of the Authority and is answerable to the Board in the performance of functions under the Act. The Director-General shall perform other functions determined by the Board. The Director-General is assisted by Deputy Directors-General who is the Chief Scientific/Technical Advisor. NRA has three (3) directorates namely, Finance & Administration, Nuclear Installations and Radiological & Non-Ionizing Installations. There are also ten (10) departments under these directorates. These are Finance, General Services &Human Resource, Nuclear Safety, Nuclear Security, Nuclear Safeguards & Non Proliferations, Radiological Applications, Non-Ionizing Applications, Emergency Response and Instrumentation & ICT.

1.8 Purpose of the Monitoring & Evaluation (M&E) for 2017

MESTI in partnership with its Development Partners dedicated considerable funds to implement its development interventions as spelt out in the Sector Medium Term Development Plan (2014-2017). The Sector Medium Term Plan was prepared in accordance with the Ghana Shared Growth and Development Agenda, (2014-2017) (GSGDA II).

As a result, the 2017 Annual Progress Report seeks to track the implementation of planned activities contained in the Sector Medium Term Development Plan. The main aim of this Report is to monitor the implementation of the SMTDP and also ensure that set goals and objectives are achieved.

The M&E Report will help the Ministry

1. Assess whether the SMTDP developmental targets are being met.
2. Identify achievements, constraints and failures so that improvements can be made to the SMTDP and project designs to achieve better impact.
3. Collate information for effective coordination of environmental, science, technology and innovation interventions.
4. Provide government, development partners and the general public with information on lessons learnt.
5. Reinforce ownership of the SMTDP and build M&E capacity within the Sector.
6. Promote joint monitoring and evaluation of Sector projects and programmes and provide data and information for policy formulation and design of future projects and programmes; and
7. Provide information for evidence based decision making.

1.9 Process Involved and Difficulties Encountered

The following steps were followed in the preparation of the MESTI 2017 Annual Progress Report:

1. The Ministry obtained the NDPC format for the preparation of the Annual Progress Reports.
2. Going by the format, the PPME Directorate drew up a reporting format and template to obtain the required inputs from the Directorates and Department/Agencies/ Authority.

3. The reporting format and template were distributed to the Directorates and Department/Agencies/ Authority with deadlines for submission of inputs.
4. The PPME Directorate then compiled inputs into the first draft.
5. The Directorates and Department/Agencies/ Authority were given copies of the draft for their comments.
6. The PPME Directorate finalised the report and submitted to NDPC.

The difficulty in putting this report together had to do with the late submission of inputs from the various Directorates /Agencies/ Authority.

2.0 M&E ACTIVITIES REPORT (KEY ACHIEVEMENTS)

This section deals with the key policies, planned projects, programmes, activities and achievements of the Ministry and its Sector Institutions/Agencies. The information provided cover details of the progress made as per the planned programmes and activities during the period under review.

The information in this section of the report is presented based on the activities of the Ministry Headquarters and the Agencies/Department under the Ministry. These activities were undertaken in accordance with the vision and strategies identified in the National Environment Policy, National Climate Change Policy, the National Science, Technology and Innovation (STI) Policy, as well as the various Acts and Legislations governing the activities of the entire sector.

The Ministry has as part of its core mandate, the promulgation of all policies which have direct and indirect impact on the environment and the effective management of the country's natural resources.

2.1 Programme/Project Status 2017

The status of implementing the various programmes/projects of the Ministry are provided, based on the five (5) budget programmes of the Ministry, namely Management and Administration, Research and Development, Environmental Protection & Management, Spatial Planning & Human Settlement and Biotechnology Development.

2.1.1 Programme 1 - Management and Administration (Head Quarters)

The Management and Administration programme provides the cross-cutting services required in order that the other programmes undertaken by the sector can succeed in achieving their objectives.

As part of efforts to improve policy and legislation in the Environment, Science, Technology and Innovation sector, the Ministry undertook the following in 2017;

Ministry reviewed and revised the **National STI Policy**. The policy outlined strategies to establish the Presidential Advisory Council for STI (PACSTI) and the STI Fund. The policy was submitted to Cabinet. The Ministry also developed the framework for the development of the National STI Bill which has been submitted to the Attorney- General's Department. The framework of the bill consists of the establishment of two bodies which are the **Presidential Advisory Council for STI (PACSTI)** and **STI Fund**. The PACSTI when established will provide objective, non-partisan, uncensored and confidential advice to the President of the Republic of Ghana on matters related to Science, Technology and Innovation. This is intended to keep the President adequately informed about current advances in Science, Technology and Innovation, and their relevant applications towards national development. The establishment of the STI Fund will support and promote research through funding, human resource development and the development of the necessary research infrastructure that will facilitate the creation of knowledge and innovation in all fields of science and technology, including indigenous knowledge, and thereby contribute to the improvement of the quality of life of all the people of the Republic of Ghana.

Twenty (20) researchers from ten (10) research institutions in Ghana were trained on Research and Grants Management and STI Indicators surveys under the Science Granting Council (SGC) Initiative which is a 5-year programme by International Development Research Centre (IDRC) of Canada, Department For International Development (DFID) of UK and National Research Fund (NRF) of South Africa. Two staff members were also trained on Research and Development and Innovation Performance for increased productivity and socio-economic growth, while two (2) other staff members undertook a learning visit to the National Research Foundation (NRF), South Africa where they were able to learn how the NRF is setting its management and operations especially in the Grant Management. Additionally, three staff members participated in the Science Granting Council Initiative (SGCI) Annual Forum which provided an opportunity for all the 16 Science Granting Councils to interact with one another and with other key science, technology and innovation (STI) system actors, including policymakers, researchers, and private sector actors. It also gave the opportunity for Ghana to update on the status of establishing its Science Granting Council (which is the STI Fund). Thus trainees were provided skills and the ability to deal with scientific research and innovation activities to carry R&D and innovation surveys and on

research and grant management in terms of funding strategies, partnerships and collaboration, peer reviews, financial control and M&E of funding programmes.

The initiative aims to strengthen the ability of Science Granting Councils to: Manage research; Design and monitor research programmes based on the use of robust science, technology and innovation indicators; Support knowledge exchange with the private sector; and establish partnerships between science granting councils.

The Ministry in 2017 renovated the building hosting the telescope and launched the Ghana Radio Astronomy Observatory on August 24, 2017. The facility was launched by The President H.E. Nana Addo Dankwa Akufo -Addo. The Ministry also successfully hosted the SKA Ministerial and Senior Officials Meeting on August 22-24, 2017 which was attended by 50 participants from the 9 SKA partner countries including 7 Ministers. The outcomes of the meeting include a signed Bilateral MOU on SKA Implementation by Ministers of Partner countries, an adopted funding strategy for SKA, and an adopted communication and awareness strategy.

A number of stakeholder consultative meetings were held with the Ministry and its Agencies, academia, CSOs, Biodiversity sector MDAs and the National Focal Points to the Convention on Biological Diversity (CBD). Also, two (2) technical working sessions were held with key stakeholders to help shape the zero draft National Development Policy.

At the end of 2017, what the Ministry had was the Zero+4 Draft, which will serve as the **Draft National Biodiversity Policy** for national stakeholder validations and cabinet approval. The National Environment Policy (NEP) and National Climate Change Policy (NCCP) as well as other existing policies set the tone for the development of the National Biodiversity Policy (NBP), with the primary aim of conserving the country's biological diversity resources, particularly the unique and endangered species in Ghana.

Over 5,600 sub-projects benefiting 18,246 farmers have been supported with inputs and are currently being implemented by farmer groups in 174 communities covering 7200ha of land. The adoption of these SLM technologies by farmers will help improve their land fertility, water resources and other natural resources.

A total 879 hectares of area reforested within two forest Reserves (i.e. Kulpawn and Ambalara Forest Reserves) to improve the vegetation of these forests. In addition,

Management Plans for 8 Forest Reserves were developed and published (i.e. Kulpawn, Mawbia, Ambalara, Chiana hills, Bepong, Sissili Central, Sissili North and Pudo Hills Forest Reserves) to guide the management of the forest sustainably.

Community Resource Management Area (CREMA) management plans within the Western Wildlife Corridor for three (3) sites were completed and at various stages of implementation to guide the management of the Biological corridor for wildlife conservation and protection.

In addition, the Ministry signed the financial and Separate Agreement for Recycling and Disposal of Waste of Electrical and Electronic Equipment in an environmentally sound way project between with KFW.

See Table 2.1 for more details

2.1.2 Programme 2 – Research and Development

This programme involves the promotion of nuclear technology, scientific and industrial research. The Council for Scientific and Industrial Research (CSIR) and the Ghana Atomic Energy Commission (GAEC) harness Science and Technology expertise for sustainable agricultural production, meat and fish preservation, irrigation, good water supply, environmental management, housing, road construction, information packaging and dissemination. The programme also includes the application of space science technology.

In addition, Science and Technology is utilized to promote the peaceful use of nuclear science and technology research including health and medical research, training and development, regulation of radioactive materials and installations.

Key achievements under this programme include the following;

Council for Scientific and Industrial Research (CSIR) developed post-harvest handling model for tomato, pepper and orange. In addition, four (4) varieties of Yam were released namely: CRI-Afase Biri, CRI- Afase Soayinto, CRI-Afase Adepa, and CRI-Afase Hoodenfoo. Seven (7) maize hybrids were also released in April 2017. The CSIR also raised 120,000 seedlings of bamboo for EPA to restore degraded lands around water bodies in the Northern Regions of Ghana. Additionally, the CSIR trained ten (10) artisans in construction supervision using local building materials for construction of affordable housing units. Sixty (60) engineers and architects were also trained in the control of building deterioration and termite infestation both in Accra and Kumasi.

As part of the Ministry's efforts to control and eliminate water and soil borne diseases, microfilaria prevalence infection was reduced from 13.2% to 12.5%, Onchocerciasis infection in the highest communities reduced from 26% to 24.6%, while the lowest also reduced from 1.50% to 1.36%. Additionally, soil transmitted helminth infection studied in 10 communities also showed reduction in the prevalence of hookworm infection from 15% to 13.5%; Schistosomiasis studied in some 28 communities had an average prevalence reduction from 15 % to 13.8 %.

The Ghana Atomic Energy Commission (GAEC) targeted the irradiation of 30 tonnes of food crops using the Gamma Irradiation Facility (GIF). The main objective was to increase the shelf life of foodstuff and to support the local export industry. However, during 2017, the commission was able to irradiate 15 tonnes. This number could have been increased substantially if the source strength of the GIF was improved.

On the other hand, the Protein Bait factory which is still under construction has seen a rather slow progress of work over the year 2017. The factory which is about 90% complete as at 2017 has seen works come to a standstill due to inadequate funds being released for the project. The protein bait production plant was being constructed with the intention of improving the output of local fruit farmers in Ghana.

Source sorting of domestic waste within the GAEC Community commenced to provide raw material for the compost plant., During the year under review, a decision was taken to increase production by expanding the compost plant. Expansion works are about 70% completed. Interactions initial briefings were held with twenty (20) interested farmers in 2017. There are plans to train selected farmers on composting in batches in 2018. High nutrient level and better water holding capacity compost was developed from domestic waste. This compost has the potential to significantly increase the yield of farmers in the country. A total of 25 farmers would were trained by the end of 2017.

Additionally, in order to safeguard the welfare and well-being of staff who work directly with such substances and equipment the Commission targeted two thousand (2000) occupationally exposed workers to ensure their safety. Occupational health safety for employees and employers alike is very crucial. During the year under review the Commission was only able to monitor 147 industrial workers and 360 medical workers due to equipment failure. Individuals and organizations are now more aware of dangers associated with working with radioactive substances and equipment that produce radiation.

Hazard Assessment of Electromagnetic Radiation from Mobile phones operators and Radio Stations was done across the country in 2017. This activity had the focus of improving and protecting the public from harmful radiological hazards associated with operating base stations. Four hundred (400) RF and FM cell sites would be assessed during the year. Whiles one thousand (1000) base station safety assessments would be conducted during the year. Hazard assessment of electromagnetic radiation from mobile phones operators and radio stations done across the country yearly to safeguard the public's interest. As at October 2017, GAEC was able to assess 378 base stations before installation and 775 operational stations were monitored. The numbers reached could exceed 800 by the end of the year, as sites are still being monitored.

GAEC through the Nuclear Power Programme is championing the efforts to introduce nuclear power in the country's energy mix. The integration of nuclear power into the country's energy mix, continues to remain one of the topmost priorities for GAEC. In January 2017, the team of experts from International Atomic Energy Agency (IAEA) conducted Phase 1 of the Integrated Nuclear Infrastructure Review (INIR) Mission. The Phase 1 of the INIR Mission was a holistic IAEA coordinated international, peer review of the safety of the Nuclear Power infrastructure. The Ghana team was represented by officials of the Ghana Nuclear Power Programme Organization (GNPPO). Five (5) stakeholder meetings were held while ten (10) newsletters on nuclear power were published and disseminated. The draft HR development plan was documented with eight (8) personnel especially, Engineers and Geophysicists having been considered for appointment by the end of 2017. Grid (national and regional) networks studies were carried out whiles the Grid assessment report was submitted for review by GAEC/GNNPO/IAEA. Reconnaissance reports for two (2) suitable site for the Nuclear Power Project sites visited is 90% completed.

A scientific assessment of the environment and human health impact of e-waste was undertaken. So far, field survey and mapping of e-waste sites in Kumasi was also conducted as well as, the construction of prototype facility. The NNRI and the TTMC collaborated with Zoomlion Ghana limited with the aim of establishing E-waste management center. The first phase of the project involving ground preparation of five (5) acres land commenced in 2017.

As part of improving the general health and wellbeing of the Ghanaian public especially growing children, GAEC used isotopic techniques to assess and monitor the vitamin A status of children susceptible to infection in the Upper East region. Data collection is on-going

within the Upper East Region from identified satellite schools. The Commission also used isotope technique for obesity studies to better understand causes of obesity in children. Sampling protocols were developed and ethical review clearance obtained for the identified satellite sites for screening of 800 children.

See Table 2.2 for more details

2.1.3 Programme 3 - Environmental Protection & Management (E.P.A)

This programme aims at protecting and improving the environment in Ghana by ensuring that air, land and water are protected by everyone in today's society, so that tomorrow's generation will inherit a cleaner and healthier world. In achieving the overall aim of managing and governing the environment the underlisted were achieved:

The Ministry through the **EPA** developed one (1) Regulation on pest control and two (2) regulations for the manufacture, importation, exportation, distribution and sale of pesticides. Additionally, 193 pesticide products were recommended by the Pesticide Technical Committee for registration, whereas a total of 464 licences were issued to pesticide dealers. Eleven (11) permits were also issued to dispose of hazardous chemicals in 2017.

This programme which is carried out by the Environmental Protection Agency (EPA) aims to ensure that all activities that have significant impacts on the environment are regulated to prevent pollution of the environment.

A draft awareness creation programme was developed in 2017 for the Hazardous & Electronic Waste Control & Management Act, 2016 (Act 917) following its passage in 2016. The aim of this programme is to sensitize the general public on the new Act and also get buy-in from key stakeholders during implementation. In addition, the final Environmental Fiscal Reform Policy (EFRP) document was finalized and submitted to the Ministry of Finance in 2017. The completion of the EFRP is expected to correct price signals within the formal economy to include environmental and other costs and reform fiscal policy so that the tax system takes environmental criteria into account.

The Forest and Wood Sector Guidelines was 90% complete. On the other hand, a draft regulation on Pesticides and Industrial Chemicals was prepared and submitted for review. The Agency developed a Pesticides Inspection Manual as well as a draft guideline on the storage of chemicals in 2017. In addition, a first draft of the Coastal Zone Management Regulation was developed for Stakeholder deliberations.

Over the course of 2017, 2,961 permits for various undertakings and 18,824 chemical licenses were issued compared to 3,844 permits and 42,437 licenses respectively issued in 2016. In addition, 36 (out of the targeted 36) field verification and compliance monitoring visits were undertaken for mining companies as compared to 29 in 2016. These undertakings were monitored to ensure compliance with LI 1652. In 2017, AKOBEN Performance Rating was extended (from 68 industries in 2016) to cover new manufacturing industries. During the year, quarterly data was received from 100 industries and 50 new ones enrolled on the programme. Also, 22 mining companies participated in the AKOBEN Rating programme.

The draft Onshore and Offshore Oil and Gas Regulation was developed in 2017 for stakeholder consultation and subsequent submission to parliament in 2018. Additionally, during the year, a 4-day training exercise/workshop carried out in collaboration with the International Maritime Organization (IMO) and the International Petroleum Industry Environmental Conservation Association (IPIECA) to test the National Oil Spill Contingency Plan (NOSCP). Scoping report on Strategic Environmental Assessment (SEA) of Opening up the Voltaian and Keta Basins for Onshore Oil and Gas Exploration and Production was finalized. The Response Matrix was also validated by stakeholders and the final draft of the Pre-scoping SEA report was produced.

In 2017, the EPA set out to develop the Ghana standard for use of Oxo-biodegradable additives in production of flexible plastics as part recommendations from the monitoring visit. The Draft Ghana standard for use of Oxo-biodegradable additives in production of flexible plastics was developed during the year.

Air quality monitoring programme was continued for the 14 sites. During 2017, air quality monitoring was undertaken at 14 sites located in Residential, Commercial, and Industrial areas as well as along major road corridors indicated that PM_{10} and $PM_{2.5}$ concentrations exceeded the EPA and World Health Organisation (WHO) guideline values. Also, fifty-two (52) sector-specific industries including pharmaceuticals, paints and chemicals, alcoholic and non-alcoholic beverages, pulp and paper and cocoa processing were monitored for effluent quality. Most of the industries did not meet the EPA recommended guideline levels for COD, BOD, phosphorus and colour.

The National Source Waste Segregation Programme was extended to 40 1st and 2nd cycle institutions (12 schools in 2016) in Greater Accra. twenty (20) new schools enrolled and practiced the programme in Greater Accra .The Agency also monitored the progress of the Source Waste Segregation Programme (SWSP) in the Ministerial enclave and some selected schools. Also, the final draft state of the environment report was prepared.

The EPA collaborated with Greener Impact International (GII) to train Fifty (50) teachers on Environmental Education Methodologies. Three hundred and fifty-six (356) participants of GRA/CD Border Post Officers, pesticide dealers and MoFA Quarantine staff were trained in Pesticide Regulations, Pesticide Faking/ Counterfeiting and GCNET Chemical Clearance Procedures. Also 193 Pesticide Inspectors (made up of EPA and MOFA Officers) were appointed. 60 Commercial Pest Controllers were also trained in Pesticide regulations and safe handling.

2.1.3 Programme 3-Environmental Protection and Management (N.R.A)

Over the course of 2017, the Nuclear Regulatory Authority (NRA) reviewed regulations on Radioactive Waste management and Borehole Disposal System, Safeguards Regulations, Basic Radiation Safety Control, Transport Regulations, and Security of Radioactive Sources. Other regulatory guides reviewed include; NRA General Regulatory Requirements; NRA License Procedure for Radioactive Waste, NRA Authorization Guidelines for Industrial Radiation Applications, NRA Authorization Guidelines for Radiotherapy, NRA Authorization Guidelines for Radioactive Waste Management Facilities, NRA Authorization Guidelines for Nuclear Medicine; and NRA Authorization Guidelines for Diagnostic Radiology.

The NRA also carried out the review and assessment of submissions made in support of applications for permits and Authorizations to verify the compliance of licensee's activities with the regulatory requirements established by the NRA. In situations of non-compliance with the regulatory requirements, NRA issued enforcement notices for stipulated periods during which licensees were expected to correct the non-compliance issues.

Major regulatory activities which were carried out by the NRA include; the Core Conversion at the Ghana Research Reactor (GHARR-1) Facility. About two hundred (200) facilities were granted Authorization to use about one hundred and eighty-two (182) radiation emitting equipment and sources, whiles regulatory inspections for five hundred and forty-six (546) existing radiation emitting equipment and sources were carried out. In addition, enforcement actions were carried out at 4 facilities, as well as the assessment of three (3) base stations. As at December 2017, eighty-four (84) permits were granted for imports and exports of radioactive materials. The main purpose of undertaking these activities is to ensure the protection of humans and the environment from the harmful effects of radiation hazards.

The NRA continued to support the development of skilled employees to meet the future needs of the regulatory body through fellowships, workshops, trainings and meetings which are mostly funded by international partners as well as through internship programmes. Staff of the Authority participated in about sixty-two (62) National and International training workshops/meetings on nuclear activities to build staff capacity. One (1) seminar was also organized for media practitioners. All these are expected to ensure effective implementation of the country's international obligations.

See Table 2.3 for more details

2.1.4 Programme 4 - Spatial Planning & Human Settlement

With the objective of transforming the Town and Country Planning Department into Land Use and Spatial Planning Authority, administrative, legal and technical changes were supposed to be undertaken for the fulfilment of this goal. All the major achievements that were made in the 2017 financial year was to achieve core objectives of the Medium Term Plan 2014 – 2017 which include; facilitating on-going institutional, technological and legal reforms in support of land use planning; and strengthening the human and Institutional capacities for effective land use planning and management through science and technology.

A major milestone with regard to the legal and administrative aspects of the transformation process was the inauguration of the Land Use and Spatial Planning Board which occurred on the 11th of August, 2017. This will lead to the formation and inauguration of the 10 Regional Spatial Planning Committees. Figure 1 below provides some pictures on the day of the inauguration.

Figure 1: Swearing-in Section of the Land Use and Spatial Planning Board, 2017

Source: Land Use and Spatial Planning Authority, 2017

Another major achievement in 2017 was the completion of Spatial Development Frameworks (SDF) for Ashanti and Greater Accra Regions. As part of technical changes aimed at ensuring efficient and effective planning and management of settlements in Ghana, the Spatial Development Frameworks (SDFs) for Ashanti and Greater Accra Regions have been completed. These are significant milestones in the reformation of the spatial planning regimes as these would give guidance and impetus for the MMDAs to prepare their SDFs and structure plans and local plans.

In addition, the Land Use Planning and Management Information System (LUPMIS) was upgraded with new functionalities. With the new added plugins which come with new functionalities or add-ons, LUPMIS can now be used for property addressing. The system is able to generate Unique Parcel Numbers (UPNs) and also generate reports. It has features that are able to perform quality controls with plans that are prepared by planners or the MMDAs with the LUPMIS Quality Control functionalities**.**

Aside the upgrading of LUPMIS, a number of training programmes were organized with the financial assistance of GIZ and Ministry of Local Government and Rural Development. The training was organized in four zones and had all Regional Coordinating Councils and 60 districts participating. The list of the districts that participated and the dates for training are attached in Appendix 1. It should however be noted that the training could not have been realized as budgets that requested for funds for training in LUPMIS was not honoured by the Ministry of finance.

Figure 2: Some Participants at LUPMIS Training Workshop

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The main objectives of the LUPMIS workshops organized were; to ensure participants are familiar with the work processes of property addressing using LUPMIS; to ensure that

participants can produce outputs of the requisite standard set by LUSPA; and to ensure that participants are abreast with the new functionalities in LUPMIS.

It must be emphasized that the property addressing functionalities and the permitting plugins that are within LUPMIS can help increase revenue generation to meet government's goal of increasing revenue generation by blocking major loopholes of revenue losses in the various MMDAs. It can help determine at any point in time, the number of properties that have not paid their property rates among others. Government should therefore ensure it is the main software used for planning and revenue generation in all the MMDAs.

A significant milestone that was achieved was the organization of two zonal workshops which made inputs during the review of the business plan of LUSPA. The workshops were organized in Kumasi and Accra. At this stage what remains to be done is giving it out to consultants to fine-tune the document. Lastly, a scheme of service is needed to determine the specializations within the spatial planning professions and other administrative professionals needed for the efficient manning of the Authority.

Following the passage of the Land Use and Spatial Planning Act (Act 925 of 2016), LIs needed to be drafted and hence a number of consultation workshops were organized with the assistance of the consultants (AB & David). The consultants have since completed the drafted LIs which were submitted to the Attorney General's Department for final rewording in the expected format. After the Attorney General's completion of their part, the LIs will be deposited in parliament as expected.

2.1.5 Programme 5 - Biotechnology Development

The Biotechnology Development programme ensures an adequate level of protection in the field of safe development transfer, handling and use of genetically modified organisms resulting from biotechnology that may have an adverse effect on health and the environment. This programme is responsible for:

a) Receiving, processing, responding to and to make decisions on biosafety applications;
b) Establishing administrative mechanisms to ensure the appropriate handling and storing of documents and data in connection with the processing of applications and any other matters;
c) Acting as the national focal point responsible for liaising with any other agency or international organisations concerned with biotechnology and biosafety; and

d) Promoting public awareness, participation and education concerning the activities of the Authority.

The Ministry through the National Biosafety Authority (NBA) established appeals tribunal to address public concerns on biosafety issues. The Authority also conducted three (3) public awareness programmes on Biosafety and completed training on Biosafety emergency measures. In addition, the NBA finalized and submitted biosafety implementing regulations to the sector Minister. It is also worth mentioning that the Genetically Modified Organism (GMO) detection laboratory is about 80% complete. This will ensure an adequate level of protection in the field of safe development transfer, handling and use of GMOs resulting from biotechnology that may have an adverse effect on health and the environment.

2.2 Update on Key Performance Indicators.

The tables below show the indicator description, unit of measurement, baseline, latest status and target by which the Ministry measures the performance of the various programmes and sub-programmes.

2.2.1Update on National Performance Indicators

These set of Indicators measure the overall performance of the Environment, Science, Technology and Innovation sector. Progress on these indicators are measured and reported to NDPC and form part of the National Annual Progress Report (APR) prepared annually.

POLICY OUTCOME INDICATORS AND TARGETS

Indicator Description	Unit of Measurement	Baseline		Latest Status		Target	
		Year	Value	Year	Value	Year	Value
Reduction in climate change vulnerability: Percentage of sectors with climate change mitigation and adaptable strategy priorities integrated	No. of industries using methods to assess carbon stocks using REDD concepts, based on research	2016	14	2017	16	2018	16
	No. of sectors with climate change mitigation and adaptation strategy priorities integrated	2016	6	2017	7	2018	8
Amount of Green House Gases in the atmosphere	Metric Tonnes (MT)	2010	20MT CO_2	2017	N/A	2018	11MT CO_2
Proportion of companies compliant with EA and EMP permit conditions	The number of companies issued with EA and EMP permit as a percentage of all companies	2016	3,844	2017	4000 Provisional	2018	4,200
Research adaptation by industries	Number of research findings adopted by industry	2016	70	2017	115	2018	115
	Number of businesses /industries assisted to adopt R&D in production	2016	12	2017	17	2018	17
	Rate of adoption of improved locally-packaged technologies my MSMEs (%)	2016	35%	2017	35%	2018	35%

2.2.2 Update on Key Sector Indicators and Targets

These set of indicators are used by the Ministry and its Agencies to measure progress of broad policies, programmes/projects and activities based on the programmes and sub-programmes within the Sector Medium Term Development Plan (SMTDP) 2014-2017.

2.3 PROGRAMMES FOR THE SECTOR

2.3.1 Management & Administration Programme

Indicator Description	Unit of Measurement	Baseline		Latest Status		Target	
		Year 2016	Value	Year 2017	Value	Year 2018	Value
Land area where Sustainable Land and Water Management Practices have been adopted as a result of the SLWMP	Size of land (in Hectares)	2016	5,579.8 ha	2017	7,256.2 ha	2018	10,000
Land users adopting Sustainable Land and Water Management Practices as a result of the SLWMP.		2016	14,109	2017	18,246	2018	20,000
Direct project beneficiaries of SLWMP	No. of farmers	2016	34,213	2017	36,000	2018	45,000
	% of which are women	2016	40%	2017	40%	2018	40%
Oil and Gas environment policy developed	Level (%) of completion of policy	2016	Zero draft prepared	2017	Validation with stakeholders	2018	Approval by Cabinet
Develop legislation for Chemical Weapon Convention	Draft legislative Instrument	2016	Review of zero draft legislative instrument	2017	Stakeholder consultations	2018	Technical review of zero draft with AG's Dept and Organisation for Prohibition of Chemical Weapon (OPCW)

National Biodiversity policy developed	Level of (%) of completion of policy	2016	Zero Draft Policy developed	2017	Final Draft Policy developed	2018	Cabinet approved NBP Roll out of NBP but launch of National Biodiversity Policy (NBP)
Development of Master Plan for GH(I)NDC	Master Plan for GH(I)NDC	2016	N/A	2017	Stakeholder consultations	2018	Draft Master Plan
Programmes and project outlined to implement the National STI Policy Outlined	Number of programmes outlined in the Policy	2016	17 Programmes and 84 projects	2017	17 programmes and 84 projects	2018	At least 10 programmes and 50 projects outline in Development Plan
STI Mainstreaming Monitoring report prepared	Number of STI programmes and activities monitored	2016	20 programmes monitored	2017	20 programmes monitored	2018	30 programmes monitored
National STI Infrastructure Survey Report	Number of STI institutions surveyed	2016	42 Institutions	2017	N/A	2018	At least 50 institutions
Science and Technology Parks (STP) established	10 STPs established in Ghana	2016	N/A	2017	N/A	2018	Feasibility studies and business plans prepared for 2 sites

Incubation Centres established	10 incubation centres established	2016	N/A	2017	N/A	2018	Feasibility studies and business plans prepared for 10 sites
Number of STEM centres established	10 STEM centres established	2016	N/A	2017	N/A	2018	2 centres established
Number of foundries established	5 foundries established	2016	N/A	2017	N/A	2018	1 foundry established
Number of HPC centres established	3 HPC centres established	2016	N/A	2017		2018	2 centres established
A national database on the profile of scientists, engineers, and technologists created	Number of scientists, engineers and technologists captured in the database	2016	N/A	2017	N/A	2018	100 scientists, engineers and technologists captured in the database
No. of Ghanaian and African Diaspora STI experts established working relationship with Ghanaian institutions	200 Ghanaian and Africans in Diaspora STI experts established working relationship with Ghanaian institutions	2016	N/A	2017	N/A	2018	50 STI experts
Database of Ghanaian STI experts across the world established	4 countries of Ghanaian STI experts captured in the database	2016	N/A	2017	N/A	2018	2 countries
GRATIS centres revamped	Number of GRATIS Centres revamped	2016	10 regional centres revamped 21 Districts revamped	2017		2018	3 regional GRATIS centres and 5 district centres revamped

Technology Commercialization Unit (TCU)/ National Innovation Agency (NIA) established	1 TCU/NIA established	2016	N/A	2017	N/A	2018	1 TCU/NIA established
Databank on indigenous knowledge and skills established	Number of indigenous knowledge and skills captured in the databank	2016	N/A	2017	N/A	2018	50 indigenous knowledge and skills captured in the databank
No. or Regional, Continental and global cooperation for STI meetings attended	55 regional, Continental and global cooperation for STI meetings attended	2016	10 meetings attended	2017	15 meetings attended	2018	15 meetings attended
Number of researchers trained in Research management under SGCI	100 researchers trained in Research Management	2016	N/A	2017	20 researchers trained	2018	20 researchers trained
Researchers trained in measuring STI indicators under SCGI	100 researchers trained in STI indicators and data collection	2016	N/A	2017	20 researchers	2018	20 researchers
Number of technologies transferred to private sector under SGCI	10 technologies transferred to the private sector	2016	N/A	2017	N/A	2018	2 technologies transferred
Number of projects jointly implemented by Ghana-South Africa	20 projects jointly implemented	2016	10 projects jointly implemented	2017	N/A	2018	10 projected jointly implemented

National Space Policy prepared	Number of stakeholder consultation meetings organized National Space Policy approved by cabinet	2016	N/A	2017	N/A	2018	5 stakeholder consultation meetings held
Number of National Planetarium established at Kuntunse	1 National Planetarium established at Kuntunse	2016	N/A	2017	N/A	2018	Work initiated on the establishment of the Planetarium
Number of astronomers and engineers trained	30 astronomers and engineers trained	2016	N/A	2017	N/A	2018	10 astronomers and engineers trained
Number SKA/AVN partner countries meetings attended	8 SKA/AVN partner countries meetings attended	2016	2 meetings attended	2017	2 meetings attended	2018	2 meetings attended
Number of Satellite Ground Receiving station constructed	1 ground receiving station constructed	2016	N/A	2017	N/A	2018	Feasibility studies conducted
Space data available to institutions	Number of institutions permitted to access data	2016	N/A	2017	Draft legislative Instrument prepared	2018	Established and operationalized
Inter-ministerial coordinating committee inaugurated	Number of meetings	2016	N/A	2017		2018	2 meetings
STI Fund established and operationalized	Number of grants awarded to researchers	2016	N/A	2017	Draft Legislative Instrument prepared	2018	50 grants
Encouraging R&D by the Private Sector	Total R&D Budgets of the Private Sector	2016	N/A	2017	N/A	2018	GHC5,000,000

Venture Capital for Business Development in Technology Parks and Business Incubators	Total number of technologies supported	2016	N/A	2017	N/A	2018	10 technology parks supported

2.3.2 Research & Development Programme

Indicator Description	**Unit of Measurement**	**Baseline**		**Latest Status**		**Target**	
		Year	**Value**	**Year**	**Value**	**Year**	**Value**
High yielding rice varieties developed	Number of yielding rice varieties developed	2016	4	2017	7	2018	10
Early maturing mango varieties developed	Number of varieties developed	2016	N/A	2017	N/A	2018	3
Quality of fresh fruits stored under various freight environmental conditions evaluated	Number evaluated	2016	80	2017	100	2018	100
Increased supply of improved breeds of varieties of tilapia and catfish fingerlings for fish farmers	Percentage increase in supply	2016	80%	2017	80%	2018	80%

Technologies developed for increasing meat and egg production to sustain food and nutrition security for the population	Number of technologies developed	2016	25	2017	30	2018	30
Accidents prone (black spots) locations on road in the five cities (Accra, Kumasi, Sekondi-Takoradi and Tamale) identified ,analysed and investigated	Number of accident prone (black spots) locations	2016	150	2017	160	2018	160
Promote the use of pozzolana-lime technology in stabilizing rural types roads and extending their lifespan	Percentage increase in clients for pozzolana (technology) cement	2016	40%	2017	45%	2018	50%
Promote the construction of wooden bridges by using lesser known species	Number of lesser known wood species developed	2016	18	2017	20	2018	25

Develop technologies for soil conservation and plant water requirement, Soil and water body pollution monitoring and management, reclamation of degraded land and mine sites and climate change mitigation.	Number of technologies developed	2016	20	2017	25	2018	30
Quality of foodstuffs ensured and shelf life of food extended by irradiation.	Number of agricultural products preserved by irradiation (to be disaggregated by weight)	2016	8	2017	10	2018	20
Farmers trained in composting and organic farming.	Number of farmer/groups trained in composting	2016	10	2017	expansions works on-going	2018	100% completion of expansion on works
Baits produced for farmers to control the fruit fly menace in the country	% of Fruit fly menace among farmers reduced.	2016	30%	2017	90%	2018	100% (facility completed)
Rapid production of disease-free planting materials of food crop and ornamentals	Varieties of plant materials/Plant mutants developed using nuclear techniques and multiplied	2016	7	2017	8	2018	8

Stakeholder and public sensitization on adoption of nuclear energy organised	Level of stakeholder/ public sensitization	2016	60%	2017	75%	2018	80%
Establishment of Welding and NDT Training facility	Number of welders/NDT personnel certified	2016	N/A	2017	consultation with investors	2018	construction of training facility
Scientific assessment of the environmental and human health impact of e-waste management in Ghana	Number of researches/reports on the health impact management in Ghana	2016	1	2017	3	2018	5
Siting and feasibility studies towards introduction of nuclear energy in Ghana	Level of siting studies done	2016	N/A	2017	10%	2018	25%
Assessment of consumable water by Gross alpha-beta and Gamma activity contamination measurement	Number of samples analysed	2016	N/A	2017	N/A	2018	500
Safety assessment of base stations before installation	Number of Base Stations Assessed	2016	300	2017	378	2018	400
Post graduate Education Course (PGEC) in Radiation Protection organised	Number of radiation workers trained	2016	20	2017	20	2018	25
Training of MPhil. Students	Number of students trained	2016	33	2017	33	2018	34

Training of PhD students	Number of PhD students trained	2016	3	2017	5	2018	6
Satellite converted into radio telescope for astrological studies	Level of conservation	2016	80%	2017	90%	2018	95%
Establishment of earth observation data centre	Ground /direct receiving station procured and installed for earth observation	2016	Sourcing for fund	2017	Sourcing for fund	2018	Sourcing for fund
Developing Ghana Space Policy	Level of developing the Ghana Space Policy	2016	20% completed	2017	30% completed	2018	40% completed
Acquire and operate an Unmanned Aerial Vehicle project (UAV/ Cropcam)	Unmanned Aerial Vehicle (UAV/Cropcam)	2016	UAV acquired	2017	Staff undergoing skills development	2018	UAV training programmes in place
Astronomy Clubs established clubs in Senior High Schools in Ghana	Number of established clubs in senior high schools	2016	5	2017	10	2018	10
Use of radiation and nuclear medicine Technologies to diagnose and manage disease as well as monitor and evaluate health conditions like tuberculosis and other communicable diseases	Number of researches conducted towards diagnosing, managing and evaluating communicable disease using radiation and nuclear technologies	2016	5	2017	8	2018	10

Research conducted to improve radiotherapy and cancer treatment	Number of researches conducted towards improving cancer treatment	2016	3	2017	5	2018	5
Nuclear Technologies commercialised	Number of technologies developed	2016	19	2017	19	2018	21
Other Scientific Technologies commercialised	Number of technologies adopted	2016	10	2017	10	2018	12
S &T products and services including consultancy commercialised	Number of S &T products /services offered	2016	30	2017	32	2018	35
Nuclear products and services including consultancy and training commercialised	Number of products, services offered	2016	20	2017	25	2018	28

2.3.3. Environmental Protection and Management Programme

Indicator Description	Unit of Measurement	Baseline		Latest Status		Target	
		Year	Value	Year	Value	Year	Value
Improved compliance with sector specific EA guidelines and standards.	Percentage of sectors covered by EA: • Oil and gas exploration • agriculture	2016	 100% 70%	2017	 100% 75%	2018	 100% 80%
Undertake annual compliance monitoring	Number of Annual compliance monitoring events: • Accra • Other Regions	2016	 3 10	2017	 3 10	2018	 4 11
Monitoring of Environmental indicators - air quality	Number of monitoring locations (Accra + regions)	2016	14 sites	2017	14 sites	2018	16sites
Develop register on pesticides and industrial and consumer chemicals for proper handling and labelling	Copy of a completed Register	2016	1	2017	1	2018	1
Monitor and prevent imports of unregistered and banned chemicals	Number of monitoring reports	2016	1	2017	1	2018	1
Develop draft regulations for the control of the use of radiation sources and devices in Ghana	Number of regulations for the control of the use of radiation sources and devices developed	2016	2	2017	3	2018	6
Inspect ionizing radiation facilities to ensure compliance with regulatory requirements	Number of ionizing radiation facilities inspected	2016	100	2017	200	2018	250
Hold stakeholder workshops on draft regulations on nuclear materials and facilities, radiation emitting devices, and radioactive materials in Ghana	Number of stakeholder workshops held	2016	0	2017	0	2018	6

Hold stakeholder workshops on draft guidance documents on radioactive and nuclear waste management	Number of stakeholder workshops held	2016	0	2017	0	2018	6
Authorise ionization radiation facilities to ensure compliance with regulatory requirements	Number of ionizing radiation facilities and practices authorised	2016	300	2017	350	2018	360
Monitor and inspect base stations compliance with regulatory requirements	Number of base stations monitored	2016	-	2017	500	2018	500
Sensitise licensees on regulations on nuclear materials and facilities, radiation emitting devices, and radioactive materials in Ghana	Number of stakeholder workshops held	2016	-	2017	0	2018	6
Sensitise licensees on regulations on guidance documents on radioactive and nuclear waste management	Number of stakeholder workshops held	2016	0	2017	0	2018	6
Organise meetings/workshops for internal and external organisations to ensure implementation of Ghana's international obligations	Number of meetings/workshops with internal and external organisations held	2016	4	2017	8	2018	2

2.3.4 Spatial Planning and Human Settlements Programme

Indicator Description	Unit of Measurement	Baseline		Latest Status		Target	
		Year	Value	Year	Value	Year	Value
Requisite data sets on all spatial and human settlement development themes gathered	Percentage of data collected on all ten regions of Ghana	2016	16%	2017	18%	2018	25%
National zoning regulations and planning standards reviewed and published	Number of published guidelines on zoning regulations and planning standards distributed	2016	50	2017	100	2018	-
Manuals for spatial plan prepared	Number of spatial planning manuals distributed	2016	50	2017	100	2018	-
Develop permitting procedures reviewed and reports published	Number of manuals distributed	2016	-	2017	100	2018	150
Human settlement policy formulated and published	Number of human settlement policy guidelines distributed	2016	-	2017	-	2018	-
	Number of stakeholders sensitised on the use of the policy	2016	-	2017	-	2018	-
The land use and Spatial Planning Bill passed into law	Date of Presidential Assent to the law	2016	31st December.	2017	-	2018	-
Land Use and Spatial Authority established	Availability of scheme of service and Business Plan for the Authority	2016	-	2017	31st December.	2018	30th September
	Date of appointment of staff	2016	-	2017	-	2018	31st December
Land Use Planning and Management System (LUPMIS)upgraded and integrated into the NSDI	Full ungraded version of LUPMIS		-	2017	31st Dec.	2018	-
	Fully upgraded & integrated version of LUPMIS	2016	-	2017	-	2018	31st Dec.
Key stakeholders in spatial planning and human settlement management trained in the use of LUPMIS	Number of stakeholders trained	2016	150	2017	150	2018	200

2.3.5 Biotechnology Development Programme

Indicator Description	Unit of Measurement	Baseline		Latest Status		Target	
		Year	Value	Year	Value	Year	Value
Research institutions conducting trials according to laid down guidelines	No. of visits undertaken by M&E team	2016	2	2017	-	2018	2
Provision of guidance and support for research institutions	Reports of decisions taken to guide research institutions in conducting research	2016	2	2017	2	2018	2

2.4 Update on Disbursements from Funding Sources

The budget of the Ministry is funded by the Government of Ghana (GoG), Development Partners (DP) and Internally Generated Funds (IGF).

Table 5: Disbursements

Description	*Budget*	*Amount Received*	*Expenditure*
Compensation (GOG)	*177,765,586.00*	*154,350,825.16*	*154,350,825.16*
Use of Goods and Services	*11,200,390.00*	*4,102,576.44*	*4,102,576.44*
Capex	*6,000,000.00*	*0.00*	*0.00*
Donor /IGF	*154,186,166.00*	*176,226,728.94*	*147,257,337.19*
Total	***349,152,142.00***	***334,680,130.54***	***305,710,738.79***

*****NB: Financial Report is at December, 2017**

2.5 Challenges

This section of the report provides a summary of the major challenges encountered by the Ministry and its Sector Agencies in implementing its work plans during the period under review (2017) and the strategies for overcoming them.

Observations/Challenges Identified

The issue of **Land Encroachment** remains a major challenge for the Council for Scientific and Industrial Research (CSIR) and the Ghana Atomic Energy Commission (GAEC). The two (2) Agencies are gradually losing their land required to be protected due to the nature of the technology, as well as land required for future infrastructural expansion (i.e. laboratories, experimental fields, office accommodation etc.) to the perennial problem of encroachment. In some instances, compensations were not paid to rightful owners of the land resulting in legal suit.

On the other hand, though compensation was paid to the land owners, they have denied the claim and are asking to take their land back. The Ministry, with the acceptance of the Asantehene and chiefs who are original owners of the land of Crop, Building of Road and Forest Research Institutes of CSIR set up a committee to look into the demands of the Chiefs.

Another challenge identified was the issue of the Ministry's **inability to undertake recruitment of new staff**. With the Ministry and most of its Agencies (CSIR, GAEC, LUSPA) operating under their staffing capacities, and most of the technical staff aging and retiring, the Ministry has become challenged in terms of delivering on its mandate. The NRA and NBA, the newest Agencies, are currently operating with staff seconded from GAEC. The CEO of NBA is the only permanent staff at post.

The other challenge has to do with the **capping of Internally Generated Funds (IGF)**. Ministry of Finance (MoF) put a cap on IGF such that any IGF generated over and above the capping is immediately absorbed by MoF. This created problems for the Agencies executing their mandate and generating more revenue. Agencies such as CSIR and GAEC rely mainly on IGF to pay utility bills. The capping of the IGF meant that bills were outstanding, some critical laboratories had been closed down and losses incurred since certain projects could not be completed so the money already sunk in the project was lost. For the Agencies to pay 34% of their gross IGF to MoF and break even, it would need to increase its charges and fees, which would have spiralling repercussions.

The issue of **Inadequate Research Funding** is also a major challenge affecting the Ministry. The sustainable implementations of R&D programmes of most research institutes have been seriously hampered by the lack of funding from central government. The perennial underfunding of programmes has largely impaired the ability of research institutes to respond to challenges faced by their stakeholders and clients. This has also been translated into **Inadequate Research Infrastructure**. In terms of the infrastructural support to carry out their mandates, most CSIR and GAEC institutes do not have all the full complement of R&D infrastructure such as laboratory facilities to carry out their respective research activities. This situation has further been worsened by the growing sophistication of S&T equipment, which has impaired the capacity of most institutes to respond effectively to the changing dynamics.

Actions Taken

Officials of CSIR and GAEC, led by their respective Director-Generals with the Minister, held meetings with the Executive Secretary and officials of the Lands Commission on 11th September and 24th November 2017. The meetings discussed steps needed to be taken to obtain Good Titles to the land and secure the lands for the Agencies. Discussions and the processes are on-going with the Lands Commission.

Requests were sent to the Ministry of Finance (MoF) to give financial clearance to replace staff who had exited the Agencies. Financial clearance was given to replace twenty (20) officials for the Ghana Atomic Energy Commission and fifty (50) for Council for Scientific and Industrial Research. Although this was not the full complement of staff needed to be replaced it closed a bit of the gap.

The challenge IGF capping posed to generating further IGF was discussed by the Ministry at the Policy/Technical hearing with MoF. MESTI was asked to send a written justification to MoF on the need for capping of IGF to be halted. This was done and capping of IGF by MoF has been halted.

The establishment of the **STI Fund** will support and promote research through funding, human resource development and the development of the necessary research infrastructure that will facilitate the creation of knowledge and innovation in all fields of science and technology, including indigenous knowledge, and thereby contribute to the improvement of the quality of life of all the people of the Republic of Ghana.

THE WAY FORWARD

Recommendations

Key recommendations for the consideration in resolving the challenges encountered during the year are as follows:

- The Ministry should liaise with the Ministry of Finance for extra budgetary allocation for recruitment and replacement of staff, especially for the Council for Scientific and Industrial Research (CSIR) and Ghana Atomic Energy Commission (GAEC).
- Seek Donor support in addition to Government Funding.
- The Ministry should expedite the passage of the STI bill by cabinet which will lead to the establishment of the STI Fund.

Outlook for 2018

The Ministry of Environment, Science, Technology and Innovation (MESTI) was allocated an annual budget of **Three Hundred and Sixty-One Million, Nine Hundred and Seventy-Eight Thousand, Three Hundred and Seventy-Four Ghana Cedis (GH¢361,978,374)** for the 2018 fiscal year.

With the limited budgets in 2018, however, the Sector hopes to establish a Presidential Advisory Council on Science, Technology and Innovation (PACSTI), establish an Inter-Ministerial Coordinating Council to ensure the coordination of the application of STI in all sectors of the economy. The sector will also seek to develop a National STI Policy, finalize the STI Bill and submit to Parliament for passage, establish the STI Fund, establish Science Technology Engineering and Mathematics (STEM) Education Centres in the Regions and Districts to promote the study and practice of Science, Technology, Engineering and Mathematics throughout our educational system, establish National Foundry and Machine Tooling Centres in various parts of the country, revamp GRATIS regional and district centres to provide fabrication, production and technical support for the One-District-One factory program. MESTI will also ensure the enhancement of the management of Hazardous, Electronic and Plastic waste.

The Ministry will develop and implement the Biodiversity Policy and Oil and Gas Environment Policy to enhance Biological Diversity conservation and use of our natural resources and ensure effective compliance with environmental regulations and standards by the oil and gas industry respectively.

The Ministry will finalize Monitoring Reporting, Verification (MRV) for Climate action and also seek to mainstream Climate Change/Green Economy issues into the basic and second cycle school curriculum.

The CSIR will ensure food security and poverty reduction by developing and disseminating improved crop and animal varieties for crop and animal farmers and developing strategies to reduce field and post-harvest losses. The CSIR will also conduct baseline surveys and adoption studies of released crop varieties and support the Science Agenda for Agriculture in Africa (S3A).

CSIR will promote climate change, environmental management and green technology by developing adoptive strategies to combat the effect of climate change that foster resilient rural livelihoods for sustainable landscape restoration through climate smart agriculture.

GAEC will encourage industrial applications by completing studies on the construction of the country's and world's first radioactive waste disposal facility in Ghana to ensure public and environmental safety. In addition, GAEC will establish a National Professional Training Institute for welding and non-destructive testing to train and certify welders and Non-destructive testing (NDT) professionals.

The EPA and facilitate and co-ordinate the establishment of collection and processing centres for electronic waste as per the mandate of the Hazardous & Electronic Waste Control & Management Act, 2016 (ACT 917).The EPA will finalize and operationalize Onshore and Offshore Oil and Gas regulations as well as collaborate with key stakeholders to carry out simulation and drill exercises as part of measures aimed at operationalizing the National Oil Spill Contingency Plan (NOSCP).

The EPA will resource and retool at least two Agency regional laboratories to undertake air quality and effluent monitoring programmes and will continue to decentralize activities of the Agency's by empowering Area Offices through provision of requisite staff and resources.

The EPA will monitor undertakings nationwide to ensure compliance with Environmental Regulations LI 1652. In addition, The EPA will continue to revise and produce education

materials on key existing and emerging environmental issues for awareness raising and environmental education programmes nationwide.

The EPA will develop and operationalize Regulations on pesticides and industrial chemicals for the entire life cycle including handling of used containers and develop and operationalize (Ghana) standard for use of oxo-biodegradable additives in production of flexible plastics nationwide.

The EPA will coordinate the mainstreaming of SDGs into District Development Plans and monitor its implementation and collaborating with the Non-Formal Education Directorate to intensify hands-on awareness raising and capacity building programmes on environmental management. In addition, the EPA will develop and operationalize an E-platform for automating the Agency's operations (business processes) and partner MMDAs to manage noise pollution through enacting and enforcing Assembly By-Laws and Guidelines.

The Nuclear Regulatory Authority will draft, review and promulgate regulations and educate the public on radiation matters and set the organizational chart and the scheme of service in line with international and IAEA standards.

LUSPA will set up the Land Use Planning and Development Fund, National Human Settlement Policy, standards, guidelines and manuals to support the implementation of the Act 925 and its LI as well as revising Planning Manuals, Zoning Regulations and Planning Standards. In addition, LUSPA will commence site preparation for the construction of LUSPA office building.

The National Biosafety Authority will undertake nationwide biosafety public education, recruit and train biosafety personnel. The NBA will strengthen the operations of the Genetically Modified Organism (GMO) detective laboratory. The Authority will also review the Biosafety Act and strengthen the Biosafety administrative system.

REPORTS ON SECTOR PERFORMANCE

APPENDICES: REPORTS ON SECTOR PERFORMANCE

Table 2.1: 2017 Programme/Project Status Management and Administration (MESTI HQ)

POLICIES	POLICY OBJECTIVE(S)	EXPECTED OUTPUT(S)	BASELINE AS AT DEC. 2016	TARGETS FOR 2017	2017 ACTIVITIES UNDERTAKEN	START DATE(2017)	END DATE (2017)	COLLAB. PARTNERS & SOURCE OF FUNDING	ACTUAL RESULTS FOR 2017	CHALLENGES / REMARKS
		Report on Reconnaissance survey developed	Terms of Reference for engaging a consultant was being developed	Conduct reconnaissance survey for large multipurpose infrastructure.	Terms of reference developed and approved by the World Bank. Procurement process on-going	Feb.	Dec.	SADA,EPA,MOFA,Global Environmental Facility (GEF) through the World Bank	Terms of reference finalised and approved	
		Community watershed plans developed	Watershed plans developed in 10 districts and 118 communities	Upscale integrated watershed planning to 2 new districts and 56 new communities	Watershed planning exercise conducted in new districts and communities	Jan	May	EPA,MOFA, Global Environmental Facility (GEF) through the World Bank	Watershed plans developed in 2 new districts and in 56 new communities	
		Farmers supported to implement SLWM technologies	14109 farmers supported to implement SLWM technologies	Promote and implement 3000ha land SLWM technologies with 3500 farmers in agricultural landscape	Supported farmers to implement SLWM technologies through the subprojects and provision of farm inputs	Jan	Dec	EPA,MOFA,FSD,WD Global Environmental Facility (GEF) through the World Bank	4137 farmers supported with farm inputs 1677ha of land area implemented with SLWM	Wildfire Limited resources to support all farmers

POLICIES	POLICY OBJECTIVE(S)	EXPECTED OUTPUT(S)	BASELINE AS AT DEC. 2016	TARGETS FOR 2017	2017 ACTIVITIES UNDERTAKEN	START DATE(2017)	END DATE (2017)	COLLAB. PARTNERS & SOURCE OF FUNDING	ACTUAL RESULTS FOR 2017	CHALLENGES / REMARKS
									technologies	
			Two (2)CREMA management plans developed	Develop and implement 2 additional CREMA management plans	Additional CREMA management plans developed	Jan	Dec	EPA,MOFA,FSD,WD Global Environmental Facility (GEF) through the World Bank	4 CREMA management plans developed	
			Four (4) forest management plans developed and published	Develop and publish additional forest management plans	Additional forest management plans developed and published	Jan	Dec	EPA,MOFA,FSD,WD Global Environmental Facility (GEF) through the World Bank	Four (4) forest management plans developed and published	
		2016 project accounts audited	2015 projects audit report	Auditing of 2016 project accounts and report submitted to World Bank	External auditors engaged to audit 2016 project accounts	Jan	Dec	EPA,MOFA,FSD,WD Global Environmental Facility (GEF) through the World Bank	2016 project accounts audited and report submitted to the World Bank	

POLICIES	POLICY OBJECTIVE(S)	EXPECTED OUTPUT(S)	BASELINE AS AT DEC. 2016	TARGETS FOR 2017	2017 ACTIVITIES UNDERTAKEN	START DATE(2017)	END DATE (2017)	COLLAB. PARTNERS & SOURCE OF FUNDING	ACTUAL RESULTS FOR 2017	CHALLENGES / REMARKS
		2017 monitoring report developed	2016 monitoring report	Undertake monitoring visit to project areas	Monitoring visits undertaken to project areas	Jan	Dec	EPA,MOFA,FSD,WD Global Environmental Facility (GEF) through the World Bank	Monitoring visit undertaken	
National Environment Policy	Reduce loss of biodiversity	Revised Zero Draft NBP	Zero Draft NBP	Organise 2 MESTI Sector stakeholders consultation workshops on Zero Draft National Biodiversity Policy	One MESTI Sector meeting held to discuss the Zero Draft NBP	Jan.	March	MLNR, MoFA, MoFAD, MoEn, MoTAC, MoCTA EPA NBA CSIR Academia CSOs GoG	MESTI Sector reviewed Zero Draft NBP	One meeting was organised due to apathy from MESTI directorates and its agencies
		Improved Zero Draft NBP	Zero draft NBP	Organise stakeholder consultation with the National Focal Points of the Convention on Biological Diversity, Academia and CSOs on the Zero draft National Biodiversity Policy	One consultation meeting of NFPs and CSOs	Jan.	May.	MLNR, MoFA, MoFAD, MoEn MOTAC MoCTA EPA NBA CSIR FC Academia CSOs	One consultative meeting with the NFPs and CSOs	Limited funds

POLICIES	POLICY OBJECTIVE(S)	EXPECTED OUTPUT(S)	BASELINE AS AT DEC. 2016	TARGETS FOR 2017	2017 ACTIVITIES UNDERTAKEN	START DATE(2017)	END DATE (2017)	COLLAB. PARTNERS & SOURCE OF FUNDING	ACTUAL RESULTS FOR 2017	CHALLENGES / REMARKS
		Organise three working group meetings for each of the four technical working groups	Zero draft NBP	Develop draft National Biodiversity Policy	2 technical meetings held for the four working groups	April	Oct.	MLNR, MOFA MOFAD MoEN MoTAC MoCTA EPA NBA CSIR FC Academia CSOs GoG	Zero +4 Draft of the NBP	The Draft NBP is ready for National consultation and validation
		Ratification of Nagoya Protocol	-	Ratify the Nagoya Protocol	Submitted cabinet memo on the Nagoya Protocol Submitted the request for ratification to Parliament	April	Sept.	Cabinet, Parliament MLNR EPA CSIR NBA Academia CSOs GoG	1 Received cabinet approval on 5th June,2017 Submitted to Parliament for ratification in July,2017	Awaiting response from Parliament
National Climate Change Policy	Effective Mitigation, adaptation to impacts of climate change and equitable social develop	Climate change historical data and future projections generated for the White Volta, Black Volta and Oti River basins	No downscaled climate projections are in place	Conduct trend/historical analysis of the impact of climate variability on the White, Black and Oti River basins Generate climate change projections	Conduct trend/historical analysis of the impact of climate variability on the White, Black and Oti River basins	April.	Dec.	WRI, WRC, EPA, UDS	Trend/historical analysis of the impact of climate variability on the White, Black and Oti River basins. Generate climate change projections for the White and	

POLICIES	POLICY OBJECTIVE(S)	EXPECTED OUTPUT(S)	BASELINE AS AT DEC. 2016	TARGETS FOR 2017	2017 ACTIVITIES UNDERTAKEN	START DATE(2017)	END DATE (2017)	COLLAB. PARTNERS & SOURCE OF FUNDING	ACTUAL RESULTS FOR 2017	CHALLENGES / REMARKS
	ment			for the White and Black Volta and the Oti River basins Conduct a vulnerability analysis of communities along the White and Black Volta as well as the Oti River basins					Black Volta and the Oti River basins Vulnerability analysis of communities along the White and Black Volta as well as the Oti River basins	
		White Volta management and investment plans reviewed to take into account climate change impacts	No current plans exist for Black Volta and Oti river basins	Develop/review community/district based water management plans to include tributaries Identify/form and train water management committees in the various districts and communities	Develop Black Volta & Oti River management & investment plans Organise workshops and meetings	April.	Dec.	WRC, EPA,	Though workshops and meeting were organised for key stakeholder in the black and Oti Basins, the output of Basin level Management Plans for the Black nd Oti are not finalised yet. The PMU is awaiting the draft plans from the national consultant recruited for the exercise.	
		Climate smart water management plans designed for the Black	No current plans exist for communities within the Black Volta	Develop/review community/district based water management plans to include	These activities could not take place in 2017. They are expected to take place in 2018.	April	Dec.	WRC, EPA,	These activities could not take place in 2017. They are expected to take place in	

POLICIES	POLICY OBJECTIVE(S)	EXPECTED OUTPUT(S)	BASELINE AS AT DEC. 2016	TARGETS FOR 2017	2017 ACTIVITIES UNDERTAKEN	START DATE(2017)	END DATE (2017)	COLLAB. PARTNERS & SOURCE OF FUNDING	ACTUAL RESULTS FOR 2017	CHALLENGES / REMARKS
		Volta and Oti River basins	and Oti river basins.	tributaries Carry out an assessment of existing water management activities along the rivers					2018. The assessment of existing water resources and vulnerabilities has been conducted.	
		National, Regional, District and Community based Climate Change Adaptation Monitoring Committee established/adopted and strengthened in the three target regions	No Regional or District committee were in place.	Organise community entry and mapping exercises Organise disaster preparedness workshop for communities/stakeholders on disaster risk and disaster	Community entry and mapping exercises undertaken in 50 communities Disaster preparedness workshop for communities/stakeholders on disaster risk and disaster preparedness in the Upper West Region for	July Dec.	Aug. Dec.	WRC, EPA, NADMO, Das EPA, NADMO, DAs	As part of the preparatory activities to build trust and encourage active participation of stakeholders, the Project Management Unit (PMU) organized community entry meetings in the 50 project beneficiary communities. Disaster preparedness workshop for communities/stakeholders on disaster risk and disaster preparedness in the Upper West Region for 62 stakeholders	

POLICIES	POLICY OBJECTIVE(S)	EXPECTED OUTPUT(S)	BASELINE AS AT DEC. 2016	TARGETS FOR 2017	2017 ACTIVITIES UNDERTAKEN	START DATE(2017)	END DATE (2017)	COLLAB. PARTNERS & SOURCE OF FUNDING	ACTUAL RESULTS FOR 2017	CHALLENGES / REMARKS
				preparedness	stakeholders				selected from 3 districts (Nadowli, Sissala East, Nandom)	
		Water supply system implemented	260 boreholes	40 operational boreholes to be drilled in four (4) adaptation fund districts	40 operational boreholes drilled for four (4) adaptation fund district	Nov.	Dec.	EPA,CWSA,DA	Forty (40) boreholes have been successfully drilled in 20 communities in 4 districts (Zabzugu, Bongo, Builsa South and Nadowli). These 40 boreholes will benefit 12, 000 people as well as the utilisation of potable water for domestic and livelihood activities.	
		Small-scale irrigation systems installed in 30 communities and water user associations to manage irrigation systems established and or	116 dugouts 2 irrigation systems	Conduct community entry and repair dams Conduct repairs on dams/dug outs	Ghana Irrigation Development Authority (GIDA) conducted field visits to assess the extent of damage and repair works needed on about 30 dams/dug outs.	Nov.	Dec.	GIDA,EPA,DAs	During the reporting period, the PMU in collaboration with the Ghana Irrigation Development Authority (GIDA) conducted field visits to rehabilitate existing dams/dugouts to facilitate irrigation	

POLICIES	POLICY OBJECTIVE(S)	EXPECTED OUTPUT(S)	BASELINE AS AT DEC. 2016	TARGETS FOR 2017	2017 ACTIVITIES UNDERTAKEN	START DATE(2017)	END DATE (2017)	COLLAB. PARTNERS & SOURCE OF FUNDING	ACTUAL RESULTS FOR 2017	CHALLENGES / REMARKS
		strengthened to improve efficiency and effectiveness of water usage under conditions of climate induced water shortages.							of farm lands. The field visit was necessary to assess the extent of damage and repair works needed on about 30 dams/dug outs. It expected that 12 dams/dugout will be rehabilitated by close of 2018 to serve more than 20 communities in their livelihood activities including dry season gardening activities	
		Measures for water conservation under climate impacts implemented in 25 communities	44%	Create buffer zones with fence Plant vertiva grass and other cover crops		Oct.	Nov.	GIDA,EPA,DAs	During the reporting period, the PMU in collaboration with the Ghana Irrigation Development Authority (GIDA) conducted field visits to assess the extent of damage and repair works needed on about 30 dams/dug outs. It expected that 12 dams/dugout will be rehabilitated by	

POLICIES	POLICY OBJECTIVE(S)	EXPECTED OUTPUT(S)	BASELINE AS AT DEC. 2016	TARGETS FOR 2017	2017 ACTIVITIES UNDERTAKEN	START DATE(2017)	END DATE (2017)	COLLAB. PARTNERS & SOURCE OF FUNDING	ACTUAL RESULTS FOR 2017	CHALLENGES / REMARKS
									close of 2018 to serve more than 20 communities in their livelihood activities including dry season gardening activities.	
		Learning platforms and systems for integrating climate change-related risks into community management of water resources and livelihood activities in Northern Ghana	Not applicable	• Production and printing of lessons learnt documentation • Embark on weekly media outreach (radio/ TV) • Organise disaster preparedness workshop for communities/stakeholders on disaster risk and disaster preparedness	A local Ghanaian media firm (Input Media Solution) has been recruited by MESTI on behalf of the PMU to undertake progress video documentary, progress photobook and project newsletters for the 3rd and 4th quarters of the project's implementation	Oct.	Dec.	EPA,UNDP,WRC,WRI,MOFA	A local Ghanaian media firm (Input Media Solution) has been recruited by MESTI on behalf of the PMU to undertake progress video documentary, progress photobook and project newsletters for the 3rd and 4th quarters of the project's implementation	On-going

POLICIES	POLICY OBJECTIVE(S)	EXPECTED OUTPUT(S)	BASELINE AS AT DEC. 2016	TARGETS FOR 2017	2017 ACTIVITIES UNDERTAKEN	START DATE(2017)	END DATE (2017)	COLLAB. PARTNERS & SOURCE OF FUNDING	ACTUAL RESULTS FOR 2017	CHALLENGES / REMARKS
		Livelihoods diversification for improved adaptation to climate change in 50 communities	Not applicable	Recruitment of LNGOs	Recruitment of local NGOs to receive funding from the project to undertake livelihood activities. following livelihood activities.	Oct.	Dec.	EPA,UNDP,WRC,WRI,MOFA, MOFEP,MESTI, MOFA,DA	As part of achieving outcome 3 of the project, which is to enhance diversification of livelihoods in at least 50 communities in northern Ghana, local NGOs/CSOs have been proposed to partner with the project to support communities to undertake the following livelihood activities. Out of 148 local NGOs, 50 were subsequently approved for funding by the Adaptation Fund Project	

POLICIES	POLICY OBJECTIVE(S)	EXPECTED OUTPUT(S)	BASELINE AS AT DEC. 2016	TARGETS FOR 2017	2017 ACTIVITIES UNDERTAKEN	START DATE(2017)	END DATE (2017)	COLLAB. PARTNERS & SOURCE OF FUNDING	ACTUAL RESULTS FOR 2017	CHALLENGES / REMARKS
National Climate Change Policy	Effective Mitigation, adaptation to impacts of climate change and equitable social development	Strengthened institutional and fiduciary capacity to enable entity to access the Green Climate Fund (GCF)	Two organisations assessed as potential Direct Access Entities (DAEs) in 2016.	One DAE accreditation application submitted	Two DAE applications from Ecobank Ghana Limited and the Social Investment Bank have been submitted to the GCF	Jan.	Dec.	MoF UN Environment/ UNDP	Ghana now has two entities that could be accredited to the GCF to enable direct access to funds from the GCF. This also means that if any of them goes through Ghana would for the first time have a national/ local entity accredited to an international climate change fund.	Quick responses to queries from GCF was a challenge. The GCF also did not provide prompt feedback to initial submissions
			NDA had engaged in one GCF event and the Conference of Parties (COP 22) in 2016	Participation of NDA in, at least, one GCF or multilateral event	The NDA and MESTI were supported in their participation at COP 23 in Bonn, Germany.	Aug.	Nov.	MoF UNDP	Officials from the NDA and MESTI met the GCF Chief Executive with the Minister for MESTI at COP 23 in Bonn, Germany and were assured that Ghana and some African countries would be given priority in 2017	

POLICIES	POLICY OBJECTIVE(S)	EXPECTED OUTPUT(S)	BASELINE AS AT DEC. 2016	TARGETS FOR 2017	2017 ACTIVITIES UNDERTAKEN	START DATE(2017)	END DATE (2017)	COLLAB. PARTNERS & SOURCE OF FUNDING	ACTUAL RESULTS FOR 2017	CHALLENGES / REMARKS
National Climate Change Policy	Effective Mitigation, adaptation to impacts of climate change and equitable social development	Enhanced coordination among stakeholders and institutions of national and sub-national entities to manage and deliver climate finance	NCCSC has been re-constituted and need support in holding regular meetings	Support 2 NCCSC for its coordination meetings to enhance climate planning and budgeting process	2 meetings of the NCCSC were supported in 2017	May	Dec.	MoF UNDP	The meetings ensured that NCCSC members were able to meet and enhance their coordination role. The meetings also resulted in the re-constitution of the NCCSC Working Group on Climate Finance	
			NCCSC Working Group on Climate Finance not properly constituted	Support re-constitution of NCCSC Working Group on climate finance and their work to enhance climate finance	NCCSC Working Group on Climate Finance was re-constituted and supported in their meetings	July	Dec.	MoF UNDP	The NCCSC Working Group on Climate Finance currently has a ToR for its work. It also guided the NDA in revising the Climate Finance Tracking Tool to be rolled out in 2018 by the MoF	

POLICIES	POLICY OBJECTIVE(S)	EXPECTED OUTPUT(S)	BASELINE AS AT DEC. 2016	TARGETS FOR 2017	2017 ACTIVITIES UNDERTAKEN	START DATE(2017)	END DATE (2017)	COLLAB. PARTNERS & SOURCE OF FUNDING	ACTUAL RESULTS FOR 2017	CHALLENGES / REMARKS
			Upgrade of the existing EPA climate change data hub initiated in the last quarter of 2016	Support upgrade of the climate change data hub to include at least 2 new portals	The EPA was supported in the upgrade of the Climate Change Data hub	Jan.	Mar.	EPA UNDP	The Climate Change Data Hub has been upgraded to include two new portals on the NDCs and the GCF/ climate change pipeline	
			Ghana has no MRV system on climate finance as at the end of 2016	Develop a robust Climate Finance MRV system and template	An MRV on climate finance was supported and completed	Jan.	Mar.	MoF UNDP	The MRV framework, templates and guidance document has been developed and intended for roll out by the MoF in 2018	

POLICIES	POLICY OBJECTIVE(S)	EXPECTED OUTPUT(S)	BASELINE AS AT DEC. 2016	TARGETS FOR 2017	2017 ACTIVITIES UNDERTAKEN	START DATE(2017)	END DATE (2017)	COLLAB. PARTNERS & SOURCE OF FUNDING	ACTUAL RESULTS FOR 2017	CHALLENGES / REMARKS
			No trainings as at the end of 2016 since these systems were not in place	Provide training on the use of the Climate Finance MRV system and climate change datahub	Supported training of key stakeholder institutions on the Climate Finance MRV and Climate Change Data hub	Feb.	March	MoF UNDP	Over 20 institutions from public, private and NGO sectors have been trained and made aware of the features of these tools	
National Climate Change Policy	Effective Mitigation, adaptation to impacts of climate change and equitable social development	Development of a system for identifying, prioritizing, and developing bankable and measurable climate change programs/projects.	No GCF proposal development training done as at the end of 2016	Support one training workshop on GCF proposal development for two priority economic sectors of the Ghana's NDCs	Supported a training workshop on developing GCF proposals targeting the energy and agriculture and land use sectors	Aug.	Nov.	MoEn/ NDPC/ PEF/ MoF UNDP	A funding proposal is currently been developed by the Private Enterprises Federation for submission to the GCF as result of this workshop.	

POLICIES	POLICY OBJECTIVE(S)	EXPECTED OUTPUT(S)	BASELINE AS AT DEC. 2016	TARGETS FOR 2017	2017 ACTIVITIES UNDERTAKEN	START DATE(2017)	END DATE (2017)	COLLAB. PARTNERS & SOURCE OF FUNDING	ACTUAL RESULTS FOR 2017	CHALLENGES / REMARKS
			NDA had received support for the decision making workshops of its Technical Advisory Committee (TAC) in 2016	Support three inter-agency decision making workshops of the NDA	Three decision-making workshops of the NDA TAC was supported in 2017	May	Nov.	MoF UNDP	NDA's decision making was strengthened through it's inclusiveness	
			Ghana had not submitted any readiness proposal to the GCF on National Adaptation Plans (NAPs)	Support submission of NAPs Readiness Support to the GCF	Supported the development and submission of the NAPs readiness request from GCF	June	Oct.	EPA/ UN Environment UNDP	The EPA now has a NAPs readiness proposal submitted to the GCF. The Agency could get up to $3 million dollars in grant to fund relevant actions in the development of NAPs	

POLICIES	POLICY OBJECTIVE(S)	EXPECTED OUTPUT(S)	BASELINE AS AT DEC. 2016	TARGETS FOR 2017	2017 ACTIVITIES UNDERTAKEN	START DATE(2017)	END DATE (2017)	COLLAB. PARTNERS & SOURCE OF FUNDING	ACTUAL RESULTS FOR 2017	CHALLENGES / REMARKS
			Ghana has no guidance tool on the Nationally Determined Contributions (NDCs) for MMDAs	Develop one guidance tool on Ghana's NDCs for MMDAs	Supported the development of a guidance tool on the NDCs mainstreaming for NDPC	June	Sept.	NDPC UNDP	A guidance tool on NDCs mainstreaming at the sub-national level is developed and copies printed for distribution to all MMDAs	
			Ghana has no guidance tool on the Nationally Determined Contributions (NDCs) for MMDAs	Develop one guidance tool on Ghana's NDCs for MMDAs	Supported the development of a guidance tool on the NDCs mainstreaming for NDPC	June	Sept.	NDPC UNDP	A guidance tool on NDCs mainstreaming at the sub-national level is developed and copies printed for distribution to all MMDAs	

POLICIES	POLICY OBJECTIVE(S)	EXPECTED OUTPUT(S)	BASELINE AS AT DEC. 2016	TARGETS FOR 2017	2017 ACTIVITIES UNDERTAKEN	START DATE(2017)	END DATE (2017)	COLLAB. PARTNERS & SOURCE OF FUNDING	ACTUAL RESULTS FOR 2017	CHALLENGES / REMARKS
			Some mainstreaming on general climate change has been done at the MMDA level but nothing specifically targeted at the NDCs implementation	Support integration or mainstreaming workshops for NDC guidance tool	Supported pilot mainstreaming of the NDCs at nine districts in the 3 northern regions	July	Sept	NDPC UNDP	Feedback from the mainstreaming will be collated by NDPC to inform roll-out nationally	
National Climate Change Policy	Effective Mitigation, adaptation to impacts of climate change and equitable social development	Leveraging of private sector resources to scale up climate change solutions through market based and inclusive value chain business model	Two project ideas had been identified in 2016 that needed to be designed for submission to the GCF	Support the design and submission of two concept notes and funding proposals to the GCF	Supported the design and submission of two concept notes to the GCF	Jan	Dec.	EPA/ Energy Commission/ MoFA UN Environment	Two concept notes were submitted to the GCF namely: Accelerating Solar Access Programme and the Resilient Landscapes for Sustainable Livelihoods	This activity will be continued by UN Environment till April 2018 due to feedback comments from GCF

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			Micro Finance Institutions (MFIs) have had challenges in developing climate-related products due to challenges with re-financing	Support two MFIs to develop climate-related financial products	Provided support for 2 MFIs (Star Alliance and Ghana Cooperative Susu Collectors Association) in the development of climate-related financial products	Jan.	Dec.	Frankfurt School/ UN Environment	A report on recommendations to ensure proper leverage of private climate finance	The local MFIs had difficulty meeting the eligibility criteria of the available financing sources
Effective Mitigation, adaptation to impacts of climate change and equitable social development	Strengthened Institutional Capacities for mitigation of Short Lived Climate Pollutants (SLCP) Enhanced capacity for Low Carbon	2 financeable energy-related Nationally Appropriate Mitigation Action (NAMAs) and their governance structure developed Greenhouse Gas Inventory manual	Meeting of SLCP Taskforce Review of TOR for procurement of consultant to review the Draft SLCP mitigation action plan Paris Climate Agreement signed Paris Climate Agreement ratified	Procure Consultation to update Climate Change data hub with SLCP information Train project technical officer on the use of the LEAP IBC tool Develop a Resource mobilization strategy for the National SLCP	Developed and finalise TOR for the procurement consultant Project technical officer trained on the use of the LEAP IBC tool in York, UK Draft resource mobilization strategy developed Draft communication	Feb.	Dec.	MESTI, EPA, CSOs, Private Sector and other relevant MDAs	Second draft for GH-NDCs implementation and investment plan developed Ghana participated successfully in the second regional conference for Africa on Nationally Determined Contributions Ghana successfully	

POLICIES	POLICY OBJECTIVE(S)	EXPECTED OUTPUT(S)	BASELINE AS AT DEC. 2016	TARGETS FOR 2017	2017 ACTIVITIES UNDERTAKEN	START DATE(2017)	END DATE (2017)	COLLAB. PARTNERS & SOURCE OF FUNDING	ACTUAL RESULTS FOR 2017	CHALLENGES / REMARKS
	development	developed Greenhouse gas quality assurance and quality control plan developed Ghana's Nationally Determined Contributions developed and submitted to the UNFCCC Participated successfully in COP 21 in Paris, France	Monitoring, reporting and verification of Climate Action developed National Investment Strategy Team (NIST) for the GH_NDCs set up operational Ghana participated in COP 22 in Morocco First draft of GH-NDC implementation plan and investment framework developed NAMA investor guide promoted among business community and platform	Mitigation Action Plan Develop an SLCP mitigation communication strategy Formulate a baseline scenario for each of the mitigation actions and then select appropriate mitigation actions that are of priority for the country in its efforts to eliminate SLCP Meeting of the National Investment Strategy team (NIST) to work on the first draft of the GH_NDCs	strategy developed. Baseline scenarios formulated for mitigation actions and appropriate mitigation actions selected One meeting of National Investment Strategy Team (NIST) undertaken to work on the first draft of the GH-NDCs implementation and investment plan Three officers participated in the second regional conference for Africa on Nationally Determined Contributions Ghana participated in				participated in COP 23 and contributed appropriately to the COP process	

POLICIES	POLICY OBJECTIVE(S)	EXPECTED OUTPUT(S)	BASELINE AS AT DEC. 2016	TARGETS FOR 2017	2017 ACTIVITIES UNDERTAKEN	START DATE(2017)	END DATE (2017)	COLLAB. PARTNERS & SOURCE OF FUNDING	ACTUAL RESULTS FOR 2017	CHALLENGES / REMARKS
			for private sector established	implementation and investment plan Participate in the second regional conference for Africa on Nationally Determined Contributions Participate in COP 23 in Fiji hosted by UNFCCC in Bonn Germany	COP 23 in Fiji hosted by UNFCCC in Bonn, Germany					
Effective management of Environment for sustainable development	Enhanced coordination among stakeholders and institutuions of national and sub national entities		Zero draft on policy on Environmental Management of Oil and Gas developed	Draft document reviewed to include relevant environmental compliance issues Draft policy document reviewed to include technical issues on petroleum resource Draft policy	Organise sectoral meetings to discuss zero draft with EPA Organise review meeting with Ministry of Energy and its agencies Constitute Technical working teams to review Zero draft	12th April 21st April, Aug. Oct.	12th April 21st April, Sept. Dec.	EPA, Norwegian Government grant Ministry of Energy and Partners EPA, MoE and agencies, MoFEP,	First zero draft Second zero draft Stakeholder mapping exercise carried out	Programme implementation delayed as a result of political transition in 2017. This in a way affected submission of Audited Report for 2016 in compliance

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	for management of environmental impact of oil and gas			document reviewed to enhance effective collaboration with other sectors in terms of implementation Organise technical meetings for review of the Zero-draft policy document	policy document Organised 5 technical review meetings			MOTCCA, MoFA etc.	Fourth draft of the policy document produced for regional consultations in 2018	with programme Agreement for subsequent clearance to kick start implementation of activities for 2017. The Ministry was however able to achieve all targets for the year.
National STI Policy	Mainstream STI in all socio-economic activities	Provide funding support and management of Research and development as well as initiatives in technology development and innovation	Draft Legislative Bill Scheme has been prepared. Stakeholder consultation with Ministry of Finance organized.	Submit the National STI Bill to cabinet Review the National STI Policy	-A Technical Committee was set-up to prepare the National STI Bill Draft STI Bill prepared. A Stakeholder Consultative workshop has been organized for Ministries/Department/ Agencies to seek inputs into the draft National STI Policy and the framework of the STI	Jan.	Dec.	Ministry of Finance, CSIR, GAEC, AG's department, AGI, Ashesi University, GOG.	Draft STI Bill submitted to Attorney-General's Department for review and inputs. National STI Policy reviewed and submitted to Cabinet for approval.	

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					Bill. STI Policy have been reviewed					
		To provide infrastructure and training in Astronomical Sciences.	2 Square Kilometer Array (SKA) meetings attended.	Organize a 3-day SKA Ministerial Meeting on August 22-24, 2017. Renovate and launch the Ghana Radio Astronomy Observatory for Space Science Research and Development	A committee was set to Plan the Ministerial Meeting and Launch of the Observatory scheduled on August 22-24, 2017. A Public Works Department (PWD) was contracted to undertake the renovations of the facility. Resurfacing of the road from the main Kuntunse junction to the Observatory was undertaken by the Ministry of Roads and Highway.	Jan.	Aug.	SKA-SA, Department of Science and Technology (DST), South Africa, Ghana Space Science and Technology Institute (GSSTI) GOG	SKA Ministerial Meeting was organized on August 22-24, 2017. Ghana Radio Astronomy Observatory renovated and launched on 24 August, 2017 by the President.	

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					Ghana Radio Astronomy was launched by the President on 24 August, 2017					
		To equip researchers and with the necessary skills to manage grants and measure STI indicators.	Capacity needs assessment conducted by South African Research and Innovation Management Association, (SARIMA.)	Organize a training workshop on Research Grants and Management under SGCI Theme 1 to build the capacity of 20 Researchers.	Training workshop organized for 20 researchers in research grants and management.	Jan.	Mar.	SARIMA NEPAD, UCC, UG, KNUST, CSIR, GAEC, GSSTI, GTUC, KTU. Donor	Training workshop organized for the 20 researchers and managers.	
			Separate and financial agreements drafted for signature	• Signing of separate and financial cooperation agreements • Identification of Handing Over Center	• Signed Agreement • Acquisition of land for construction of Handing Over Center	June	Dec.	KFW, GIZ, MESTI-PPMED, EPA, MoF	• Financing and Separate Agreements negotiated and agreed for signature	Legal wording of Financing Agreement

POLICIES	POLICY OBJECTIVE(S)	EXPECTED OUTPUT(S)	BASELINE AS AT DEC. 2016	TARGETS FOR 2017	2017 ACTIVITIES UNDERTAKEN	START DATE(2017)	END DATE (2017)	COLLAB. PARTNERS & SOURCE OF FUNDING	ACTUAL RESULTS FOR 2017	CHALLENGES / REMARKS
				• Hiring of Project Consultant	• Evaluate expression of interest as well as technical and financial proposal to hire a consultant					

Table 2.2(a): 2017 Programme/Project Status Research & Development (CSIR)

PROJECTS/ PROGRAMME	POLICY OBJECTIVE(S)	EXPECTED OUTPUT(S)	BASELINE AS AT DEC. 2016	TARGETS FOR 2017	2017 ACTIVITIES UNDERTAKEN	START DATE(2017)	END DATE (2017)	COLLAB. PARTNERS & SOURCE OF FUNDING	ACTUAL RESULTS FOR 2017	CHALLENGES / REMARKS
1.Food security and poverty reduction	Apply Science and Technology and Innovation to promote agricultural development	No. of Plant Accessions collected, conserved and distributed nation.	4,352 7,112	4,382 7,117	Biotechnology:- Germplasm collection, characterization, conservation and distribution nationwide	Jan	Dec	PGRRI, CRI, SAR (GOG, IGF &DONOR)	4,352 7,112	High cost of electricity bill is hampering the efforts of the institute to perform these conservation tasks on behalf of the nation.
		No. of strategies developed to reduce post-harvest losses in cereals and legumes.	5-6%	2-4%	Develop strategies to reduce field and post- harvest losses for developed varies.			PGRRI, SARI, CRI (GOG, IGF & DONOR)	4%	
		No. of improved varieties of crops/livestock/poultry/fisheries developed	7 crop varieties	4 crop varieties	Development and dissemination of improved varieties.(Crops/ Livestock/Poultry/ Fisheries			PGRRI, SARI, CRI (GOG, IGF & DONOR)	3 crop varieties developed (Yam, 4; maize, 10 and rice, 6).	Development of varieties takes a long time.
2. Climate Change, Environmental		Technologies for Sustainable management, conservation and	One (1)	Generation of seedlings of Terminalia sp. *(Ofram)* Teak	Landscape management systems or technologies resilient to climate change vulnerabilities in time and space	Jan	Dec		One (1) technology developed to raised 120,000 seedlings of	Inadequate funding for labour and other

PROJECTS/ PROGRAMME	POLICY OBJECTIVE(S)	EXPECTED OUTPUT(S)	BASELINE AS AT DEC. 2016	TARGETS FOR 2017	2017 ACTIVITIES UNDERTAKEN	START DATE(2017)	END DATE (2017)	COLLAB. PARTNERS & SOURCE OF FUNDING	ACTUAL RESULTS FOR 2017	CHALLENGES / REMARKS
Management & Green Technology		utilization of forest resources developed	technology developed to raised 100,000 seedlings of bamboo for EPA to restore degraded lands around water bodies in the North.	and bamboo for large scale afforestation program.				CSIR-FORIG, MESTI, FC, EPA. (GOG, IGF & DONOR).	bamboo for EPA to restore degraded lands around water bodies in the North	logistics to maintain the nursery
		Capacities of stakeholders developed on the use of forest genetic resources/ adaptation to climate change strengthened	Technical services and training to selected stakeholders were provided	Provided technical services and training to selected stakeholders	Apply Innovative risk management strategies that foster resilient rural livelihoods for sustainable landscape restoration	Jan	Dec	CSIR-FORIG, MESTI, FC, EPA. (GOG, IGF & DONOR).	Provided technical services and training to selected stakeholders	

PROJECTS/ PROGRAMME	POLICY OBJECTIVE(S)	EXPECTED OUTPUT(S)	BASELINE AS AT DEC. 2016	TARGETS FOR 2017	2017 ACTIVITIES UNDERTAKEN	START DATE(2017)	END DATE (2017)	COLLAB. PARTNERS & SOURCE OF FUNDING	ACTUAL RESULTS FOR 2017	CHALLENGES / REMARKS
3. Biomedical and Public Health	Build appropriate linkages between research and production to ensure that research outputs are utilized	• Per cent (%) reduction in rate of Morbidity, Mortality and Poverty associated with NTDs.	Microfilaria infection rate of 13.2 %.	Microfilaria infection rate of 12 %.	Control and elimination of water and soil borne diseases	Jan	Dec	CSIR-WRI, GHS, GWCL	Microfilaria prevalence infection was reduced to 12.5%.	
Biomedical and Public Health	Build appropriate linkages between research and production to ensure that research outputs are utilized	Per cent (%) reduction in rate of Morbidity, Mortality and Poverty associated with NTDs.	*Onchocerciasis* infection observed was 26%. while the community infection rate was 1.50%.	*Onchocerciasis* infection rate reduced to 20 %, while communities infection reduced to 1%	Control and elimination of water and soil borne diseases	Jan	Dec	CSIR-WRI, GHS, GWCL	The highest prevalence of *Onchocerciasis* infection observed was 26% reduced to 24.6 % while the community with the lowest infection reduced from 1.50% to 1.36%.	
Biomedical and Public Health	Build appropriate linkages between research and production to ensure that research outputs are utilized	Per cent (%) reduction in rate of Morbidity, Mortality and Poverty associated with NTDs.	Lymphatic filariasis in 10 communities' prevalence rate of infection was 3%.	Lymphatic filariasis in 10 communities to reduce in microfilaria (mf) prevalence of infection from 3 % to 2 %	Control and elimination of water and soil borne diseases	Jan	Dec	CSIR-WRI, GHS, GWCL GOG, IGF & DONOR	Lymphatic filariasis in10 communities showed reduction in prevalence rate of infection to 2.5 % with the lowest prevalence rate of 0.25%.	

PROJECTS/ PROGRAMME	POLICY OBJECTIVE(S)	EXPECTED OUTPUT(S)	BASELINE AS AT DEC. 2016	TARGETS FOR 2017	2017 ACTIVITIES UNDERTAKEN	START DATE(2017)	END DATE (2017)	COLLAB. PARTNERS & SOURCE OF FUNDING	ACTUAL RESULTS FOR 2017	CHALLENGES / REMARKS
Biomedical and Public Health	Build appropriate linkages between research and production to ensure that research outputs are utilized	Per cent (%) reduction in rate of Morbidity, Mortality and Poverty associated with NTDs.	Prevalence rate of soil transmitted hookworm infection in 10 communities was 15%	Prevalence rate of soil transmitted hookworm infection in 10 communities reduced to 10%	Control and elimination of water and soil borne diseases	Jan	Dec	CSIR-WRI, GHS, GWCL GOG, IGF & DONOR	Soil transmitted helminthic infection studied in 10 communities showed reduction in the prevalence of hookworm infection to 13.5 %.	
Biomedical and Public Health	Build appropriate linkages between research and production to ensure that research outputs are utilized	Per cent (%) reduction in rate of Morbidity, Mortality and Poverty associated with NTDs.	Prevalence rate of schistosomiasis in 28 communities has an average of 15%.	Prevalence rate of schistosomias is in 28 communities reduced to 10%	Control and elimination of water and soil borne diseases	Jan	Dec	CSIR-WRI, GHS, GWCL GOG, IGF & DONOR	Schistosomiasis studied in some 28 communities had an average reduced to 13.8% with the highest prevalence of schistosomes infection of 78% and the lowest of 0.02%.	
4. Material Science and Manufacturing	Build appropriate linkages between research and production to ensure that research outputs are utilized	Number of artisans/stakeholders trained on products developed from local raw materials	Trained 10 artisans in construction supervision using local building materials for construction of affordable housing units. Trained forty (20) engineers and architects in controlling of building deterioration and	To train 100 stakeholders (30 artisans and 70 engineers) on product development from local materials and controlling building deterioration	Development of essential materials and industrial products using local raw materials	Jan	Dec	CSIR-BRRI, MIN. of Road and Highway, AESC. LTD. (GOG, IGF & DONOR)	Trained 10 artisans in construction supervision using local building materials for construction of affordable housing units. Trained sixty (60) engineers and architects in controlling of building deterioration and termite infestation both in Accra and	Training program is fee paying hence the low patronage. Lack of Sponsorship packages for training of artisans

PROJECTS/ PROGRAMME	POLICY OBJECTIVE(S)	EXPECTED OUTPUT(S)	BASELINE AS AT DEC. 2016	TARGETS FOR 2017	2017 ACTIVITIES UNDERTAKEN	START DATE(2017)	END DATE (2017)	COLLAB. PARTNERS & SOURCE OF FUNDING	ACTUAL RESULTS FOR 2017	CHALLENGES / REMARKS
			termite infestation both in Accra and Kumasi						Kumasi	
5.Energy and Petroleum	Build appropriate linkages between research and production to ensure that research outputs are utilized	No. of Solar energy systems installed	Nil	Three (3) Energy systems to be installed	Promote Renewable Energy systems for both domestic and commercial buildings	Jan	Dec	CSIR-IIR, CSIR-FRI, Energy Commission, Ministry of energy.	Electro-fitting of street lights to pave way for installation of solar street lights at CSIR-FRI to cut down cost on light bills.	The high cost of initial capital is preventing individuals from switching to Solar powered lighting systems.
6..Electronics and ICT	Build appropriate linkages between research and production to ensure that research outputs are utilized	No. of ICT Centres established. No. of training sessions organized.	Nil Nil	Two ICT centres to be established 2-3 three trainings organized.	Establishment of ICT Centre for the provision of electronics and computer engineering services.	Jan	Dec	CSIR-INSTI, MESTI. GOG, DONOR, IGF	One (1) is in the process of being established at CSIR-INSTI. Equipment procured . No training has been provided as the centre is not fully complete.	Lack of funding
7. Science and People	Build appropriate linkages between research and production to ensure that research outputs are utilized	Number of baseline surveys and adoption studies carried out	Adoption rates from the 2016 survey showed the following varieties adoption rates are as flows: Sweet potato: 59%	Two (2) baseline surveys and adoption studies to be carried out on a crop variety.	Conduct baseline surveys and adoption studies of released crop varieties	Jan	Dec	CSIR-SARI, CSIR-CRI, CSIR-PGRRI, CSIR-FRI, MOFA.	NIL	No survey was conducted in 2017 due lack of funds

PROJECTS/ PROGRAMME	POLICY OBJECTIVE(S)	EXPECTED OUTPUT(S)	BASELINE AS AT DEC. 2016	TARGETS FOR 2017	2017 ACTIVITIES UNDERTAKEN	START DATE(2017)	END DATE (2017)	COLLAB. PARTNERS & SOURCE OF FUNDING	ACTUAL RESULTS FOR 2017	CHALLENGES / REMARKS
			Cassava: 41 % Cocoyam: 21%-Yam: 6 %							
Science and People	Commercialization of research	Number and type of improved planting materials produced	Oil Palm Germinated Seeds – 100,000 Oil Palm Seedlings – 80,000	Oil palm germinate d seeds-150,000 Oil palm seedlings-120,000	Commercialization activities	Jan	Dec	CSIR-OPRI, CSIR-CRI, MOFA	Oil Palm Germinated Seeds – 120,000 Oil Palm Seedlings – 100,000	

Table 2.2(b): 2017 Programme/Project Status Research & Development (GAEC)

PROJECTS/ PROGRAMMES	OBJECTIVES	EXPECTED OUTPUT(S)	BASELINE AS AT DEC. 2016	TARGETS FOR 2017	2017 ACTIVITIES UNDERTAKEN	START DATE OF TARGET 2017	END DATE 2017	COLLAB. PARTNERS & SOURCE OF FUNDING	ACTUAL STATUS /RESULTSOF TARGET(FOR 2017)	CHALLENGES/ REMARKS
Welding and NDT training for asset integrity management in industry	To train and certify professionals to use NDT for industrial purposes	Training of 20 NDT/Welding personnel by December, 2017	Developed curricula for training	One (1) training session to be organized	-Certification of programmes and facilities ongoing -Mobilizing funds for training sessions.	Jan.	Dec.		1 NDT Appreciation course run for middle and upper management of industry	Limited funds to upgrade testing laboratory for hands-on exercises
Scientific assessment of the environment and human health impact of e-waste		Identification and mapping of locations where e-wastes are generated in Accra.	Reconnaissance mapping undertaken in Accra and Kumasi. Rainfall sampling done in Ada,	- 1 Field visit for collection of samples Complete construction works on prototype facility for e-waste processing	-Analysis of field survey results -Construction of prototype facility for e-waste processing about 80% complete	Jan.	Dec.		-Samples being analysed. - Construction of prototype facility for e-waste processing about 80% complete	Delayed Environmental Impact Assessment

			Amedzofe, Abetifi, Kumasi, Tamale and Navrongo).							
Improving crops using mutation indication and biotechnology through a farmer participatory approach		Complete nutritional analysis. Evaluation of tuber size	Mutant tuber crops successfully developed	Comprehensive evaluation of mutants to be completed	Mutant evaluation	Jan.	Dec.	CSIR/IGF	Mutant evaluation ongoing on the field	Tuber crops on the field crops takes almost one year to complete life cycle for harvesting and evaluation
Train farmers on composting by the end of the year		Farmers trained on composting	30,000 kg of organic compost produced through modified processes	Train 25 farmers	Complete expansion works on composting plant	Jan.	Dec.	COTVET	Expansion works about 70% completed	Inadequate and delayed release of funds affecting progress of work
Complete a production plant for protein bait to control fruit fly menace		Functional protein bait production plant commissioned	75% of the factory establishment completed	100% completed and commissioned for use	Expansion works undertaken	Jan.	Dec.			
Establishment of cultures of plantain,		A working Tissue culture system to	Facility shut down due to irregular power	Produce 1 million planting materials for	Selected varieties of plantain, pineapples, sweet potato, cassava grown as	Jan.	Dec.	IGF	Plantain, pineapples, sweet potato, cassava farms	Rainfed agriculture posing a threat

pineapples, sweet potatoes and cassava		produce plating materials commissioned	supply	farmers	stock.				established	
Field establishment for release of four varieties of cherry tomato varieties by end of the year 2017		System for release cherry tomato varieties successfully established	Primary research activities completed	Release of 4 varieties to farmers	Field cultivation successful	Jan.	Dec.	IGF	Tomato farm established for data collection	Lack of irrigation posing a threat
Use of Gamma Irradiation Facility for the management of postharvest losses and enhancing health care delivery		Improved postharvest management of food crops using the Gamma Irradiation	80 tote boxes of medical items 100 tote boxes of peat pellets and miscellaneous items were irradiated	Treat 30 tonnes of food crops to support export	15 tonnes of food crops irradiated	Jan.	Dec.	IGF	Additional 20 tons from herbal products irradiated.	Radioactive Source strength is low
Sensitization of stakeholders on the benefits of the GIF		Sensitization of major stakeholders in Health, Exporters of perishables		5 stakeholder meeting for major healthcare givers in Accra	Stakeholders sensitization ongoing	Jan.	Dec.	IGF	More companies demanding the use of GIF after media engagement	Limited funds affected planned outreach

										activities
Upgrade GIF		-Complete renovation of physical infrastructure and MOU signed for complete upgrade of facility. -Funds sought from both government and donors/investors.		-MOU signed on strategy for complete upgrade -Funds obtained from investor	Search for investors for upgrading is being pursued	Jan.	Dec.	IGF	Discussions with potential investors on going	Low Investor interest
Develop human resource for the implementation of Nuclear Power		Necessary knowledge and skills identified, and gaps in current capability for Nuclear power programme assessed.	A comprehensive HR requirement and plan for the nuclear power programme prepared. The document is undergoing review.	5 personnel to be trained	Personnel yet to undergo training	Jan.	Dec.	IAEA/IGF	Draft HR development plan review is ongoing	Limited staff available for training
Review of environment		Review completed,		Draft Environmental	Meetings held between various	Jan.	Dec.	EPA,IAEA/IGF	- Preliminary meeting held	Limited staff

al protection framework to include nuclear power		assignment of responsibilities to EPA and NRA clearly established, action plan to draft EPF including regulations, guides and standards to incorporate nuclear power prepared		Protection Framework submitted to EPA for final review	stakeholders				between NPI and EPA director	available
Conduct studies for national and regional grid network		First phase of grid study done and report prepared	A more detailed grid assessment studies for national and sub-regional networks and a NPP-GRID connection impact study remains to be completed	Develop draft grid assessment report	-Meetings held between GRIDCo and NPI on studies to be conducted on national and regional grid network. -Terms of reference undergoing review	Jan.	Dec.	GRIDCo, IAEA/IGF,IAEA	Draft grid assessment report submitted for review	
Identify suitable site for Nuclear Power		Complete required investigation document for all the		Reconnaissance visit reports to 2 sites completed	Desk study of 2 sites	Jan.	Dec.	GRIDCo,IAEA/IGF,IAEA	Draft grid assessment report submitted for	Lack of funds for comprehensive field study

Project		thematic areas for siting a Nuclear Power plant							review	
Using stable isotope techniques to monitor and assess vitamin A status of children susceptible to infection		Complete data collection for project in the Upper East region.		Analysis report on vitamin A status of children from the Upper East region presented to Ministry of Health	Field visit and data collection	Jan.	Dec.	MOH, IAEA/IGF	- 2nd Data collection campaign undertaken -Data analysis ongoing	Limited fund for an expanded data collection programme
Completion of Laboratories		Completion of laboratories for medical research		100% completed	Construction works undertaken	Jan.	Dec.		Laboratories are 60% completed.	Late release of funds
Research into early detection, treatment and management of cancer and other degenerative conditions.		Improve human capacity for cancer therapy		Train 5 medical doctors	Human capacity development	Jan.	Dec.	MOH, IAEA	Programme not started	Prospective investor yet to identified
Developing Ghana		Complete draft policy		Draft policy submitted for	Draft policy being constituted by	Jan.	Dec.		Draft policy 60% complete	

Space Policy				review	committee					
Commissioning of the 32m radio telescope at Kuntunse		Radio-telescope commissioned and data collection commences	About 80% completed: 1.Massive renovation of the telescope done 2.Quadlegs fabricated for the station	A functional National Radio astronomy Observatory in operation.	Completion of facility Successful commissioning of facility attended by President	Jan.	Dec.	SKA-SA	Earth Observation station commissioned at Kuntunse	
Safety Assessment of telecommunication base stations		Ensure public safety from EM radiation	Monitored 224 sites	Monitor 400 RF cell sites	Monitored a number of RF cell sites before installation (conditional compliance safety assessment)	Jan.	Dec.	Telecom companies	396 sites monitored	Limited resource
Monitoring of safety of telecommunications masts		Public safety assurance from EM radiation	803 RF sites assessed	Conduct 1000 safety assessments for base stations	Conducted a number of safety assessments on operational base stations nationwide	Jan.	Dec.	Telecom companies	782 stations assessed	Lack of sufficient number of vehicles for field exercise
Monitoring of exposures for mine / industrial workers		Ensure occupational safety for mine / industrial workers	Hazard assessment of occupational exposure done in -Chirano Mines and -Newmont	Monitor 2000 occupational exposures for mines/industrial workers	Monitored occupationally exposed workers	Jan.	Dec.		-147 industrial workers monitored -360 medical workers monitored	-Breakdown of TLD reader stalled exercise -Lack of funds to purchase new equipment

			Goldmines							
Assessment of food/dairy products and water samples for radioactive contaminati on		Ensure safety of food products and water		Assess 1000 containers of food and water samples		Jan.	Dec.		513 containers analysed	
Calibration of medical and industrial equipment		Number of surrey meters calibrated for medical and industrial application		-Calibrate 70 survey meters and -8 density gauges		Jan.	Dec.		-50 survey meters calibrated -7 density gauges calibrated	-Breakdown of -X-ray Equipment
Implementat ion of the borehole disposal concept for Disused Sealed Radioactive Sources in Ghana		Submission of safety case and associated documents to the regulatory authority		Complete and submit of safety case for regulatory review		Jan.	Dec.		-The following reports have been drafted, Site Characterizatio n, Post Closure Safety Assessment, Engineering Design Safety Case	-Financial challenges -IAEA provided assistance in the project execution.

Train MPhil and PhD students		Train MPhil and PhD students		29 MPhil and 9 PhD students trained by the end of the academic period	Admission of students	Jan.	Dec.	41 students have been given admission	Some students have deferred their programmes due to financial challenges caused by high school fees	Some students have deferred their programmes due to financial challenges caused by high school fees
Post graduate Education Course (PGEC) in Radiation Protection for radiological professionals		Train radiological professionals in Radiation Protection	Post graduate Education Course (PGEC) in Radiation Protection organized for 19 professionals in the sub-region.	23 professionals trained in Radiation Protection	Training of radiation professionals	Jan.	Dec.		23 young professionals successfully completed their training on radiation protection	Reliability of internet facility

Table 2.3(a): 2017 Programme/Project Status Environmental Protection and Management (EPA)

PROGRAMME/ PROJECT	POLICY OBJECTIVE(S)	EXPECTED OUTPUT(S)	BASELINE AS AT DEC. 2016	TARGETS FOR 2017	2017 ACTIVITIES UNDERTAKEN	START DATE(2017)	END DATE (2017)	COLLAB. PARTNERS & SOURCE OF FUNDING	ACTUAL RESULTS FOR 2017	CHALLENGES / REMARKS
Environmental Protection & Management	Strengthen institutional and regulatory frameworks for sustainable natural resource management	Develop and implement awareness creation programme for Hazardous & Electronic Waste Control & Management Act, 2016 (Act 917)	Act 917 and LI 2250 in place	Awareness creation programme developed for Hazardous & Electronic Waste Control & Management Act, 2016 (Act 917)	Formed a tasked team to develop the draft awareness creation programme.	June,	Dec.	IGF	Draft awareness creation programme developed for Hazardous & Electronic Waste Control & Management Act, 2016 (Act 917)	To be finalised in 2018
Environmental Protection & Management	Strengthen institutional and regulatory frameworks for sustainable natural resource	Environmental Fiscal Reform Policy document developed	First draft policy was prepared and subjected to a stakeholder review	Final Environmental Fiscal Reform Policy document prepared	Undertook cross sectoral meetings to finalise the document	Feb.	Nov.	IGF	-Draft fiscal reform policy document finalized and submitted to the Ministry of Finance	

PROGRAMME/ PROJECT	POLICY OBJECTIVE(S)	EXPECTED OUTPUT(S)	BASELINE AS AT DEC. 2016	TARGETS FOR 2017	2017 ACTIVITIES UNDERTAKEN	START DATE(2017)	END DATE (2017)	COLLAB. PARTNERS & SOURCE OF FUNDING	ACTUAL RESULTS FOR 2017	CHALLENGES / REMARKS
	management									
Environmental Protection & Management	Strengthen institutional and regulatory frameworks for sustainable natural resource management	Develop and implement gender policy for EPA	Nil	A Gender Policy for EPA developed	Formed task team to develop draft policy for the review of management	Mar.	Sept.	IGF	-Draft gender policy document for EPA developed	
Environmental Protection & Management	Strengthen institutional and regulatory frameworks for sustainabl	Forest and Wood sector guideline developed	80% complete	100% completion of the development of the forest and wood sector guideline	Undertook a number of cross sectoral meeting to finalise the guidelines	Feb.	Nov.	IGF	Forest and Wood sector guidelines 90% revised	

PROGRAMME/ PROJECT	POLICY OBJECTIVE(S)	EXPECTED OUTPUT(S)	BASELINE AS AT DEC. 2016	TARGETS FOR 2017	2017 ACTIVITIES UNDERTAKEN	START DATE(2017)	END DATE (2017)	COLLAB. PARTNERS & SOURCE OF FUNDING	ACTUAL RESULTS FOR 2017	CHALLENGES / REMARKS
	e natural resource management									
Environmental Protection & Management	Strengthen institutional and regulatory frameworks for sustainable natural resource management	Regulations on pesticides and industrial chemicals developed	Development of the Regulations on pesticides and industrial chemicals were initiated and ongoing	The final draft will be prepared in 2017	The task team continued the process of the development of the draft regulations on pesticides and industrial chemicals.	Mar.	Oct.	IGF	-The development was initiated and is on-going -Draft regulation on Industrial Chemicals was prepared and submitted for review -Development of the Pesticides Inspection manual is in progress	
Environmental Protection & Management	Strengthen institutional and regulatory frameworks for sustainable natural	guideline on the storage of chemicals developed and operationalised	Nil	Guidelines on storage of chemicals developed	Formed task team that developed the draft guideline on storage of chemicals	Mar	July	IGF	A draft guideline on the storage of chemicals has been completed and under review	

PROGRAMME/ PROJECT	POLICY OBJECTIVE(S)	EXPECTED OUTPUT(S)	BASELINE AS AT DEC. 2016	TARGETS FOR 2017	2017 ACTIVITIES UNDERTAKEN	START DATE(2017)	END DATE (2017)	COLLAB. PARTNERS & SOURCE OF FUNDING	ACTUAL RESULTS FOR 2017	CHALLENGES / REMARKS
	resource management									
Environmental Protection & Management	Strengthen institutional and regulatory frameworks for sustainable natural resource management	Coastal Zone Management Regulation developed	Concept note for the development of the Coastal Zone Management Regulation was prepared in 2016	First draft developed	Undertook a number of cross sectoral meetings to develop the draft coastal zone regulation	Feb.	Nov.	IGF	A first draft of the Coastal Zone Management Regulation was produced for Stakeholder deliberations	
Environmental Protection & Management	Strengthen institutional and regulatory frameworks for sustainabl	Environmental permits for projects & chemical licenses issued	In 2016, 3,844 environmental permits were issued for projects whiles 42,437 chemical	3,900 permits will be issued and 43,000 chemical licenses to be issued.	Reviewed permits applications and issued permits to various projects whose applications meeting the requirements of LI 1652	Jan.	Dec.	IGF	-2961 permits for various undertakings & 18374 chemical licenses issued -443 license granted for new pesticides -7 permits were issued for the transboundary movement of waste as required under the Basel	

PROGRAMME/ PROJECT	POLICY OBJECTIVE(S)	EXPECTED OUTPUT(S)	BASELINE AS AT DEC. 2016	TARGETS FOR 2017	2017 ACTIVITIES UNDERTAKEN	START DATE(2017)	END DATE (2017)	COLLAB. PARTNERS & SOURCE OF FUNDING	ACTUAL RESULTS FOR 2017	CHALLENGES / REMARKS
	e natural resource management		licenses were issued for chemical management						Convention notification procedures	
Environmental Protection & Management	Strengthen institutional and regulatory frameworks for sustainable natural resource management	Undertakings monitored to ensure compliance with LI 1652	Undertakings were monitored to ensure compliance with LI 1652. 5,068 facilities were visited to ensure compliance in 2016 out of which 501 were compliant with permitting condition.	Undertake compliance monitoring in the Greater Accra, Western Region and Ashanti	Visit fuel service stations,LPGs ,Hospitals, hotels and other projects whose activities impacts on the environment to inspect their operations	Feb.	Mar.	IGF	-1248 undertakings monitored of which 344 were compliant & 785 were non-compliant -An audit team of Norwegian experts and EPA officials visited the ENI drilling rig, Maersk Voyager, drilling some wells at Cape Three Point (CTP) field and observed that the Environmental permit conditions were being complied with - 5 enforcement notices for violation of provisions under the Environmental Assessment Regulations, 1999, (LI 1652) and the Environmental Protection Agency Act, 1994 (Act 490) were issued. - Compliance monitoring undertaken to 794 manufacturing industries. - 8 field visits were undertaken to various industries to verify the	

PROGRAMME/ PROJECT	POLICY OBJECTIVE(S)	EXPECTED OUTPUT(S)	BASELINE AS AT DEC. 2016	TARGETS FOR 2017	2017 ACTIVITIES UNDERTAKEN	START DATE(2017)	END DATE (2017)	COLLAB. PARTNERS & SOURCE OF FUNDING	ACTUAL RESULTS FOR 2017	CHALLENGES / REMARKS
									information provided in the EMP. -Compliance monitoring to 52 aquaculture and 2 plantation farms	
Environmental Protection & Management	Strengthen institutional and regulatory frameworks for sustainable natural resource management	Onshore and offshore Oil and Gas Regulation developed and operationalized	Development of Onshore and offshore Oil and Gas Regulation was initiated	Onshore and offshore Oil and Gas regulations developed	Held a number of cross sectoral meetings to review existing guidelines and developed draft regulations for stakeholders review.	Feb.	Nov.	Norwegian Government	Draft Onshore and offshore Oil and Gas Regulation developed	
Environmental Protection & Management	Strengthen institutional and regulatory frameworks for sustainabl	21 mining companies to be monitored by the Akoben programme and	-22 companies covered by Akoben -29 verification visits conducted to	22 companies to be covered by Akoben 35 verification visits conducted to mining companies.	Develop work plans for field audits. Monitored 22 mining companies under the Akoben programmme. The Agency also visited a number of mining	Feb.	Nov.	IGF	-22 mining companies participated in the Akoben Rating programme -36 field verification and compliance monitoring visits were undertaken	

PROGRAMME/ PROJECT	POLICY OBJECTIVE(S)	EXPECTED OUTPUT(S)	BASELINE AS AT DEC. 2016	TARGETS FOR 2017	2017 ACTIVITIES UNDERTAKEN	START DATE(2017)	END DATE (2017)	COLLAB. PARTNERS & SOURCE OF FUNDING	ACTUAL RESULTS FOR 2017	CHALLENGES / REMARKS
	e natural resource management	verification visits conducted for mining companies	mining companies.		companies to ensure compliance with LI 1652					
Environmental Protection & Management	Strengthen institutional and regulatory frameworks for sustainable natural resource management	National Oil Spill Contingency Plan (NOSCP) Operationalized	NOSCP MoU was signed by some stakeholders in 2016	1 simulation exercise undertaken	Undertook a training workshop on the NOSCP	Feb.	Nov.	Norwegian Government	A 4-day training exercise/workshop carried out in collaboration with the International Maritime Organisation (IMO) and the International Petroleum Industry Environmental Conservation Association (IPIECA) to test the NOSCP	
Environmental Protection & Management	Strengthen institutional and regulatory frameworks for sustainabl	Scoping report on SEA of Opening up the Voltaian and Keta Basins for	first draft report of SEA process was developed	scoping report on SEA of Opening up the Voltaian and Keta Basins for Onshore Oil and Gas Exploration and Production will	Undertook a number of cross-sectoral meetings to finalise draft pre-scoping SEA report	Mar	Oct.	Norwegian Government	-Key Issues Integration and Response Matrix validated by stakeholders -Final draft Pre-scoping SEA report produced	

PROGRAMME/ PROJECT	POLICY OBJECTIVE(S)	EXPECTED OUTPUT(S)	BASELINE AS AT DEC. 2016	TARGETS FOR 2017	2017 ACTIVITIES UNDERTAKEN	START DATE(2017)	END DATE (2017)	COLLAB. PARTNERS & SOURCE OF FUNDING	ACTUAL RESULTS FOR 2017	CHALLENGES / REMARKS
	e natural resource management	Onshore Oil and Gas Exploration and Production finalized		be finalized						
Environmental Protection & Management	Strengthen institutional and regulatory frameworks for sustainable natural resource management	Ghana standard for use of oxo-biodegradable additives in production of flexible plastics developed	Monitored 25 factories in Accra and Tema to ascertain companies using Bio-oxodegradable additives in the manufacture of flexible plastics	Develop the Ghana standard for use of oxo-biodegradable additives	Developed a monitoring Plan. Embarked on compliance monitoring visit. Undertook a number of cross-sectoral meeting to develop draft standard	Mar.	Aug	IGF	Twenty (20) companies have been visited so far with ten (10) issued with invoices to pay administrative charges for non-compliance. Draft Ghana standard for use of oxo-biodegradable additives in production of flexible plastics developed	
Environmental Protection & Management	Strengthen institutional and regulatory frameworks for	Akoben Performance Rating extended to cover new manufacturin	site audits were conducted for 68 industries	Akoben Performance Rating to be extended to cover 45 new manufacturing industries	Reviewed quarterly returns received and gave feedback to industries Reviewed Annual environmental report of	Feb.	Aug.	IGF	Quarterly data received from 88 industries and 50 new ones enrolled	

PROGRAMME/ PROJECT	POLICY OBJECTIVE(S)	EXPECTED OUTPUT(S)	BASELINE AS AT DEC. 2016	TARGETS FOR 2017	2017 ACTIVITIES UNDERTAKEN	START DATE(2017)	END DATE (2017)	COLLAB. PARTNERS & SOURCE OF FUNDING	ACTUAL RESULTS FOR 2017	CHALLENGES / REMARKS
	sustainable natural resource management	g industries			industries					
Environmental Protection & Management	Strengthen institutional and regulatory frameworks for sustainable natural resource management	Air quality monitoring to be conducted to ascertain the level of pollutants in the air	Air quality monitoring conducted for 14 sites to ascertain the level of pollutants in the air	air quality monitoring programme to be continued for the 14 sites	Developed work plan for monitoring Undertook monitoring of air quality in selected areas. Prepared a monitoring report with recommendations.	Feb.	Aug.	IGF	Air quality monitoring at 14 sites located in Residential, Commercial, and Industrial areas as well as along major road corridors indicates $PM_{10}$and $PM_{2.5}$ concentrations exceeded the EPA and WHO guideline values.	
Environmental Protection & Management	Strengthen institutional and regulatory frameworks for sustainabl	Industries monitored for effluent quality	81 Industries were monitored for effluent quality	the Agency intends to monitor 90 industries for effluent quality	Developed work plan for monitoring Undertook monitoring of effluent quality in industries. Prepared a monitoring report with	Feb.	Sept.	IGF	-52 sector-specific industries including pharmaceuticals, paints and chemicals, alcoholic and non-alcoholic beverages, pulp and paper and cocoa processing were	

PROGRAMME/ PROJECT	POLICY OBJECTIVE(S)	EXPECTED OUTPUT(S)	BASELINE AS AT DEC. 2016	TARGETS FOR 2017	2017 ACTIVITIES UNDERTAKEN	START DATE(2017)	END DATE (2017)	COLLAB. PARTNERS & SOURCE OF FUNDING	ACTUAL RESULTS FOR 2017	CHALLENGES / REMARKS
	e natural resource management				recommendations.				monitored during the quarter under review. Most of the industries did not meet the EPA recommended guideline levels for COD, BOD, phosphorus and colour.	
Environmental Protection & Management	Strengthen institutional and regulatory frameworks for sustainable natural resource management	National Source Waste Segregation Programme extended to 40 1st and 2nd cycle institutions in Greater Accra	National Source Waste Segregation Programme extended to 12 schools	to be extended to 40 1st and 2nd cycle institutions in Greater Accra	Visited twenty school on and had discussions with the heads on their schools participation in the SWSP. Distributed bins to 13 selected schools	Mar.	June	IGF	-20 schools enrolled and practicing programme in Greater Accra - Monitored the progress of the Source Waste Segregation Programme (SWSP) in the Ministerial enclave and some selected schools.	
Environmental Protection & Management	Reduce loss of biodiversity	At least 5000 seedlings of various species of seedlings planted in	485 seedlings were planted in some selected schools in the country	continue to plant various species of seedlings in selected sites across the country under the Greening Ghana	-Draw a programme for planting the seedlings -Organised selected staff from the head office and regional office to undertake planting	May.	Aug.	IGF	4000 seedlings planted across various locations in the country.	

PROGRAMME/ PROJECT	POLICY OBJECTIVE(S)	EXPECTED OUTPUT(S)	BASELINE AS AT DEC. 2016	TARGETS FOR 2017	2017 ACTIVITIES UNDERTAKEN	START DATE(2017)	END DATE (2017)	COLLAB. PARTNERS & SOURCE OF FUNDING	ACTUAL RESULTS FOR 2017	CHALLENGES / REMARKS
		selected sites across the country		Programme	activities -Selected locations planting seedlings -Undertook actual planting of 4000 seedlings					
Environmental Protection & Management	Strengthen institutional and regulatory frameworks for sustainable natural resource management	State of the Environment Report prepared	first draft of the State of the Environmental Report was prepared and was subjected to a stakeholder review	Final draft to the State of the Environment Report prepared.	Organised a number of cross-sectoral meetings to review and finalise draft report.	Feb.	Aug.	IGF	Final draft state of the environment report prepared	
Environmental Protection & Management	Strengthen institutional and regulatory frameworks for sustainabl	Training conducted on environmental issues	82 officers were trained on environmental issues	200 officers and 400 stakeholders to be trained on environmental issues.	-Developed programme for training by selecting target. -Implement the training programme	Jan	Dec.	IGF	-112 Officers trained on environmental Assessment Administration -569 stakeholders were trained in chemical management -The Agency collaborated with Greener Impact International (GII) to train fifty (50) teachers on	

PROGRAMME/ PROJECT	POLICY OBJECTIVE(S)	EXPECTED OUTPUT(S)	BASELINE AS AT DEC. 2016	TARGETS FOR 2017	2017 ACTIVITIES UNDERTAKEN	START DATE(2017)	END DATE (2017)	COLLAB. PARTNERS & SOURCE OF FUNDING	ACTUAL RESULTS FOR 2017	CHALLENGES / REMARKS
	e natural resource management								environmental education methodologies management - 150 MoFA staff and farmers were trained on pesticide regulation and safe/judicious use of pesticides. - 356 participants of GRA/CD Border Post Officers, Pesticide dealers and MoFA Quarantine staff were trained in Pesticide Regulations, Pesticide Faking/ Counterfeiting and GCNET Chemical Clearance Procedures. -60 Commercial Pest Controllers were trained in Pesticide regulations and safe handling.	

Table 2.3(b): 2017 Programme/Project Status Environmental Protection and Management (NRA)

PROGRAMME	POLICY OBJECTIVE(S)	EXPECTED OUTPUT(S)	BASELINE AS AT DEC. 2016	TARGETS FOR 2017	2017 ACTIVITIES UNDERTAKEN	START DATE(2017)	END DATE (2017)	COLLAB. PARTNERS & SOURCE OF FUNDING	ACTUAL RESULTS FOR 2017	CHALLENGES / REMARKS
ENVIRONMENTAL PROTECTION AND MANGEMENT	Ensure adequate control of radiation exposure to humans and environment during their use in various sectors of the Ghanaian economy	Developed and reviewed: • Radioactive Waste Management • Basic • Radiation Protection • Nuclear Security and Safeguards • Licensing of Nuclear Power Plants • Transport of Radioactive and Nuclear Materials	• Radioactive Waste Management and Borehole Disposal System • Regulations; Safeguards, Siting and Licensing Regulations; • Basic Radiation Safety Control; and the Transport Regulations.	• Draft and subject drafted Regulations to Stakeholders for review and submit same to Parliament • Coordination with the Attorney General's Department and the Parliament of Ghana to get all the draft regulations passed.	Drafting of the following Regulations: • Safeguards Information Management and Nuclear Security Regulations, • Radiological and Nuclear Emergency Preparedness and Response Regulations, • Enforcement Regulations, • Nuclear Security Regulations on Radioactive Materials,	Jan	Dec	GOG IAEA	Drafted the following Regulations: • Safeguards Information Management and Nuclear Security Regulations, • Radiological and Nuclear Emergency Preparedness and Response Regulations, • Enforcement Regulations, • Nuclear Security Regulations on Radioactive Materials,	Lack of Board to endorse drafted regulations for them to be sent to Parliament for promulgation Staffing: The Authority has inadequate staff for both regulatory and administrative functions. There are currently 56 established and 10 temporary

PROGRAMME	POLICY OBJECTIVE(S)	EXPECTED OUTPUT(S)	BASELINE AS AT DEC. 2016	TARGETS FOR 2017	2017 ACTIVITIES UNDERTAKEN	START DATE(2017)	END DATE (2017)	COLLAB. PARTNERS & SOURCE OF FUNDING	ACTUAL RESULTS FOR 2017	CHALLENGES / REMARKS
					• Nuclear Security Regulations on Nuclear Installations, Nuclear Security • Regulation on Information Security, • Non-Ionising Radiation Regulations				• Nuclear Security Regulations on Nuclear Installations, Nuclear Security • Regulation on Information Security, Submitted the following drafted regulations for review: • Radioactive Waste Management and Borehole Disposal System • Regulations; Safeguards, Siting and Licensing Regulations; • Basic Radiation Safety Control; and the	staff and an additional 70 will be required in 2018 to enable the Authority execute its functions more effectively. Office and laboratory space: The Authority has inadequate office accommodation and requires a laboratory for food test and Certification. Equipment: The Authority currently has

PROGRAMME	POLICY OBJECTIVE(S)	EXPECTED OUTPUT(S)	BASELINE AS AT DEC. 2016	TARGETS FOR 2017	2017 ACTIVITIES UNDERTAKEN	START DATE(2017)	END DATE (2017)	COLLAB. PARTNERS & SOURCE OF FUNDING	ACTUAL RESULTS FOR 2017	CHALLENGES / REMARKS
									Transport Regulations.	only TWO sets of equipment for its regulatory activities with none as a backup. Two additional sets of equipment for monitoring and inspection of both ionizing and non-ionising facilities will be required. Vehicles: The Authority has only two vehicles for its country wide regulatory activities. Staff Capacity
		Drafted regulations, for basic non-ionizing radiation protection Draft guidance document for basic non-ionizing radiation protection, developed reviewed and validated		Regulations, for basic non-ionizing radiation protection, drafted	Drafting of regulations, for basic non-ionizing radiation protection,	Jan 2017	Dec 2017	GOG	Draft regulations, for basic non-ionizing radiation protection,	

PROGRAMME	POLICY OBJECTIVE(S)	EXPECTED OUTPUT(S)	BASELINE AS AT DEC. 2016	TARGETS FOR 2017	2017 ACTIVITIES UNDERTAKEN	START DATE(2017)	END DATE (2017)	COLLAB. PARTNERS & SOURCE OF FUNDING	ACTUAL RESULTS FOR 2017	CHALLENGES / REMARKS
		Draft Requirement,, Guidelines and Code of Practice for Operating a Nuclear and Radioactive Waste Management Facilities	Guidelines for Radiotherapy • NRA Authorisation Guidelines for Radioactive Waste Management Facilities • NRA Authorisation Guidelines for Nuclear Medicine NRA Authorisation Guidelines for Diagnostic Radiology	Requirements, Guidelines and Code of Practice for Operating a Nuclear and Radioactive Waste Management Facilities developed	Development of Requirements, Guidelines and Code of Practice for Operating a Nuclear and Radioactive Waste Management Facilities	Jan.	Dec.	GOG IAEA	Guidelines for Radiotherapy • NRA Authorisation Guidelines for Radioactive Waste Management Facilities • NRA Authorisation Guidelines for Nuclear Medicine NRA Authorisation Guidelines for Diagnostic Radiology	Building: To meet our mandate
		Ionizing radiation facilities inspected Enforcement	• Inspection and authorisation of about 250 ionizing	200 ionizing radiation facilities inspected 20 enforcement actions carried out		Jan	Dec	GOG	The major regulatory activities which were carried out at the NRA are:	

PROGRAMME	POLICY OBJECTIVE(S)	EXPECTED OUTPUT(S)	BASELINE AS AT DEC. 2016	TARGETS FOR 2017	2017 ACTIVITIES UNDERTAKEN	START DATE(2017)	END DATE (2017)	COLLAB. PARTNERS & SOURCE OF FUNDING	ACTUAL RESULTS FOR 2017	CHALLENGES / REMARKS
		actions carried out	radiation facilities, review and assessment of applications from prospective and existing operators; carry out enforcement actions in facilities, development of inspection guidelines for consistency of regulatory activities and report writing.		1.Oversight of the core conversion of GHARR-1 2.Nationwide monitoring and inspection of facilities using ionising radiation sources and devices 3.Authorisation of facilities using ionising radiation sources and devices 4.Enforcement of Non-Compliance issues 5.Reviewing of applications and				1. Oversight of Core Conversion of the GHARR-1 facility 2. About 214 facilities were granted Authorization to use radiation emitting equipment and sources. 3. Regulatory inspections for 230 existing radiation emitting equipment and sources. 4. Enforcement actions carried out at 4 facilities 5. 116 permits were granted for	

PROGRAMME	POLICY OBJECTIVE(S)	EXPECTED OUTPUT(S)	BASELINE AS AT DEC. 2016	TARGETS FOR 2017	2017 ACTIVITIES UNDERTAKEN	START DATE(2017)	END DATE (2017)	COLLAB. PARTNERS & SOURCE OF FUNDING	ACTUAL RESULTS FOR 2017	CHALLENGES / REMARKS
					issuing of permits				imports and exports of radioactive materials. 6. Three (3) base stations were assessed.	Inadequate staff
			• Collaboration with National Security Secretariat and the relevant agencies responsible for emergency to develop a national strategy for the prompt recovery of orphan sources.		Organisation of training for front line officers and stakeholders to create an awareness and guidance on the security of nuclear and other radioactive materials and associated facilities.	Jan 2017	Dec 2017	GOG	One training session organised for front line officers	

PROGRAMME	POLICY OBJECTIVE(S)	EXPECTED OUTPUT(S)	BASELINE AS AT DEC. 2016	TARGETS FOR 2017	2017 ACTIVITIES UNDERTAKEN	START DATE(2017)	END DATE (2017)	COLLAB. PARTNERS & SOURCE OF FUNDING	ACTUAL RESULTS FOR 2017	CHALLENGES / REMARKS
			-	-Installation of human resource management and accounting software tool for the Authority and the provision of dedicated training for staff in the inspection of accelerators and radiotherapy facilities	Implementation of the human resource management and accounting software tool for the Authority and the provision of dedicated training for staff in the inspection of accelerators and radiotherapy facilities.	Jan	Dec	GOG	Implementation about 75% complete	
						Jan	Dec.	GOG		

PROGRAMME	POLICY OBJECTIVE(S)	EXPECTED OUTPUT(S)	BASELINE AS AT DEC. 2016	TARGETS FOR 2017	2017 ACTIVITIES UNDERTAKEN	START DATE(2017)	END DATE (2017)	COLLAB. PARTNERS & SOURCE OF FUNDING	ACTUAL RESULTS FOR 2017	CHALLENGES / REMARKS
		• Recruitment and orientation of 65 professional staff carried out • 17 management staff, 20 technical staff and 7 drivers trained both locally and abroad			- -				- -	Clearance to recruit not obtained Lack of funds
		• Surveyor engaged to demarcate land for office complex • Architectur				Jan.	Dec.	GOG	Site Plan obtained for a five-acre land Design not	Lack of funds

PROGRAMME	POLICY OBJECTIVE(S)	EXPECTED OUTPUT(S)	BASELINE AS AT DEC. 2016	TARGETS FOR 2017	2017 ACTIVITIES UNDERTAKEN	START DATE(2017)	END DATE (2017)	COLLAB. PARTNERS & SOURCE OF FUNDING	ACTUAL RESULTS FOR 2017	CHALLENGES / REMARKS
		al design for office complex secured							obtained	
		• 8 cross country vehicles and 6 saloon cars purchased • Laboratory equipment purchased							No Vehicle purchased 2 sets of equipment were acquired, 1 was bought and another was donated by the IAEA	Lack of funds
		General public and users of radiation sources educated							One Public Education held	Lack of funds Inadequate staff

PROGRAMME	POLICY OBJECTIVE(S)	EXPECTED OUTPUT(S)	BASELINE AS AT DEC. 2016	TARGETS FOR 2017	2017 ACTIVITIES UNDERTAKEN	START DATE(2017)	END DATE (2017)	COLLAB. PARTNERS & SOURCE OF FUNDING	ACTUAL RESULTS FOR 2017	CHALLENGES / REMARKS
		• Website maintained • Local seminars, workshops and meetings organized							Website being maintained Eight meetings organised	

Table 2.4: 2017 Programme/Project Status Spatial Planning and Human Settlement (LUSPA)

PROJECTS/PROGRAMMES	POLICY OBJECTIVE(S)	EXPECTED OUTPUT(S)	BASELINE AS AT DEC. 2016	TARGETS FOR 2017	2017 ACTIVITIES UNDERTAKEN	START DATE(2017)	END DATE (2017)	COLLAB. PARTNERS & SOURCE OF FUNDING	ACTUAL RESULTS FOR 2017	CHALLENGES / REMARKS
GIS and IT capacity Development Programme	Promote a sustainable, spatially integrated and orderly development of human settlements	35% nation-wide coverage of procured orthophotos	18% orthophotos nation-wide coverage	Achieve 35% nation-wide orthophotos coverage	Requests made to Lands Commission	-	-	Survey Division, Lands Commission	0%	Orthophotos were not provided by Lands Commission
Institutional, technical and Legal reforms programme for Land Use Planning	Promote a sustainable, spatially integrated and orderly development of human settlements	100 spatial planning manuals distributed to MMDAs	100 spatial planning manuals distributed	Distribute 100 copies of spatial planning manuals	100 spatial planning manuals printed and distributed	March	May		100 copies distributed	Target fully Achieved
Research Development support programme for urban and regional development planning		Completed human settlement policy	Human settlement study available	Human settlement policy to be completed	None	-		NDPC	0% target achieved	Target not achieved (unavailability of funds to undertake project)
Institutional, technical and Legal reforms programme for	Promote a sustainable,	Board of	Officials nominated for the	To have a functional Board for	LUSPA Board Inaugurated	N/A	11th of Aug.	MESTI	Board of LUSPA	100% Target achieved

PROJECTS/PROGRAMMES	POLICY OBJECTIVE(S)	EXPECTED OUTPUT(S)	BASELINE AS AT DEC. 2016	TARGETS FOR 2017	2017 ACTIVITIES UNDERTAKEN	START DATE(2017)	END DATE (2017)	COLLAB. PARTNERS & SOURCE OF FUNDING	ACTUAL RESULTS FOR 2017	CHALLENGES / REMARKS
Land Use Planning	spatially integrated and orderly development of human settlements	LUSPA fully formulated and operational	formation of the Board	LUSPA					inaugurated	
Institutional, technical and Legal reforms programme for Land Use Planning	Promote a sustainable, spatially integrated and orderly development of human settlements	Business Plan for LUSPA completed	Draft business plan 80% complete	Scheme of service and business plan to be completed	Workshop organized for the revision of LUSPA's Business Plan	20th , March	21st , March	Land Administration Project officials	90% completed	90% Draft business plan complete
GIS and IT capacity Development Programme		Deploy the full upgraded version of LUPMIS to all MMDAs	Basic versions of LUPMIS available in all MMDAs	Full upgraded version of LUPMIS deployed into all 216 MMDAs	Full upgraded version of LUPMIS deployed to 17 MMDAs completed	12th , June	28th , July	Ministry of Local Government	23% of target achieved (60 MMDAs have fully upgraded	23% of target achieved due to low funding

PROJECTS/PROGRAMMES	POLICY OBJECTIVE(S)	EXPECTED OUTPUT(S)	BASELINE AS AT DEC. 2016	TARGETS FOR 2017	2017 ACTIVITIES UNDERTAKEN	START DATE(2017)	END DATE (2017)	COLLAB. PARTNERS & SOURCE OF FUNDING	ACTUAL RESULTS FOR 2017	CHALLENGES / REMARKS
									version of LUPMIS	
Institutional, technical and Legal reforms programme for Land Use Planning	Promote a sustainable, spatially integrated and orderly development of human settlements	Complete RSDF for Ashanti Region	Ashanti Region Spatial Development Framework was 60% complete	Complete the ARSDF by June, 2017	Supervision and review of works undertaken by Consultants	Jan.	June	Regional Coordinating Council of Ashanti Region	RSDF Report for Ashanti Region completed	
Institutional, technical and Legal reforms programme for Land Use Planning	Promote a sustainable, spatially integrated and orderly development of human settlements	Complete RSDF for Greater Accra Region	Greater Accra Region's Spatial Development Framework 45% complete	Complete the ARSDF by August, 2017	Supervision and review of works undertaken by Consultants	Jan.	Aug.	Regional Coordinating Council of Greater Accra Region	RSDF Report for Greater Accra Region Completed	100% Target achieved
Institutional, technical and Legal reforms programme for Land Use Planning	Promote a sustainable, spatially integrated and orderly	Complete the Legal Instruments for the Land Use and Spatial	Draft Legal Instruments available with the Attorney General's Department	Legal Instruments completed and operational	Follow ups with the Consulting Firm and Attorney General's Department	-	-	Attorney General's Department, Parliament	Draft Legal Instruments available with the Attorney	70% complete

PROJECTS/PROGRAMMES	POLICY OBJECTIVE(S)	EXPECTED OUTPUT(S)	BASELINE AS AT DEC. 2016	TARGETS FOR 2017	2017 ACTIVITIES UNDERTAKEN	START DATE(2017)	END DATE (2017)	COLLAB. PARTNERS & SOURCE OF FUNDING	ACTUAL RESULTS FOR 2017	CHALLENGES / REMARKS
	development of human settlements	Planning Act							General	

Table 2.5: 2017 Programme/Project Status Biotechnology Development (NBA)

PROGS/ PROJECTS	OBJECTIVE(S)	EXPECTED OUTPUT(S)	BASELINE AS AT DEC. 2016	TARGETS FOR 2017	2017 ACTIVITIES UNDERTAKEN	START DATE (2017)	END DATE (2017)	COLLAB. PARTNERS & SOURCE OF FUNDING	ACTUAL RESULTS FOR 2017	CHALLENGES / REMARKS
	Strengthen institutional and regulatory frameworks for sustainable natural resource management	Guidelines on biosafety available	50%	Guidelines to be completed and operationalized	Development of guidelines	May	Oct.	ABNE PBS ICGEB GoG	Guidelines available	None
		NBA website regularly updated	20%	Websites to be updated quarterly	Website operational	Jan.	Dec.	NBA, Mark Adu Consult	Website regularly updated and functional	Poor Internet connectivity
		Appeals Tribunal established	100%	Two trainings to be conducted	Appeals Tribunal operational	Mar.	Dec.	GoG ABNE PBS ICGEB	List of members available	None
		Memorandum of Understanding with Regulatory Agencies	45%	90%	Sign remaining MoUs	Feb.	Dec.	Regulatory Agencies	Six of the MoUs signed with Regulatory Agencies	Getting the Agencies to sign
		Establishment of GMO Detection Laboratory	25%	100%	All equipment moved to site (Ghana Standards Authority)	June	Dec.	UNEP GSA CSIR	Equipment and laboratory space available	Lack of funds
		Communication Plan	50%	100%	Draft communication plan revised	Sep.	Dec	UNEP ABNE PBS	Communication plan completed	Availability of expertise

PROGS/ PROJECTS	OBJECTIVE(S)	EXPECTED OUTPUT(S)	BASELINE AS AT DEC. 2016	TARGETS FOR 2017	2017 ACTIVITIES UNDERTAKEN	START DATE (2017)	END DATE (2017)	COLLAB. PARTNERS & SOURCE OF FUNDING	ACTUAL RESULTS FOR 2017	CHALLENGES / REMARKS
								ICGEB		
		Biosafety Regulations	75%	100%	Draft Regulations submitted to Attorney General's Office	Sep.	Dec.	UNEP ABNE PBS ICGEB	Regulations passed	Bureaucracy
		Training on Biosafety Emergency response	25%	50%	One day training workshop held.	May	Dec.	UNEP ABNE PBS ICGEB	Regulatory agencies trained	Lack of expertise in biosafety emergency response
		Training on Biosafety environmental risk assessment	25%	50%	Three training programs held	Feb.	Dec.	ICGEB, UNEP	Regulatory agencies trained	Lack of expertise in biosafety emergency response
		Training of Appeals Tribunal Members	0%	25%	One day training workshop held	Nov.	Dec.	PBS	Appeals tribunal members trained	Limited expertise in Biosafety legal issues
		Training for Board Members	0%	30%	Two days training workshop held	27th Dec	29th Dec.	None	Board members trained	Lack of funds