THE REPUBLIC OF GHANA

MINISTRY OF ENVIRONMENT, SCIENCE & TECHNOLOGY

2024 STATISTICAL REPORT

Prepared By :

Research, Statistics and Information Management (RSIM) Directorate

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ABBREVIATIONS

BNARI – Biotechnology and Nuclear Agriculture Research Institute

BRRI – Building and Road Research Institute

CSIR – Council for Scientific and Industrial Research

EPA – Environmental Protection Agency

EO – Earth Observation

GAEC – Ghana Atomic Energy Commission

GHG – Greenhouse Gas

GSSTI – Ghana Space Science and Technology Institute

GSS – Ghana Statistical Service

IAEA – International Atomic Energy Agency

IGF – Internally Generated Funds

IPR – Intellectual Property Rights

KPI – Key Performance Indicator

MDA – Ministry, Department or Agency

MMDA – Metropolitan, Municipal and District Assembly

MLNR – Ministry of Lands and Natural Resources

MoFA – Ministry of Food and Agriculture

MEST – Ministry of Environment, Science and Technology

NBA – National Biosafety Authority

NDT/UT – Non-Destructive Testing / Ultrasonic Testing

NNRI – National Nuclear Research Institute

NPI – Nuclear Power Institute

NRA – Nuclear Regulatory Authority

PM2.5 – Particulate Matter with diameter ≤ 2.5 micrometres

PM10 – Particulate Matter with diameter ≤ 10 micrometres

RAMSRI – Radiological and Medical Sciences Research Institute

RF – Radio Frequency

RPI – Radiation Protection Institute

RSIM – Research, Statistics and Information Management

SDGs – Sustainable Development Goals

SNAS – School of Nuclear and Allied Sciences

STI – Science, Technology and Innovation

VLBI – Very Long Baseline Interferometry

PREFACE

The 2024 Statistical Report has been prepared to capture data from the various Agencies under the Ministry of Environment, Science and Technology. The purpose of this Statistical Report is to provide accurate and reliable administrative data submitted by the Departments, making it readily available and accessible to stakeholders for informed decision-making. It also serves as a platform to evaluate the credibility and usefulness of such information. Additionally, the report aims to improve data collection, analysis, and interpretation of projects and programs undertaken by the Ministry, thereby strengthening the Statistical Unit of the RSIM Directorate.

In preparing the 2024 Statistical Report, the Research, Statistics, and Information Management (RSIM) Directorate formed a Working Group with focal persons from within the Ministry and sector agencies, who submitted indicators for review and approval.

This report provides general information about the various Agencies under the Ministry, covering their respective functions and activities during the year under review. The data and other information presented in this Statistical Report were obtained from the Environmental Protection Agency, the E-Waste Fund Secretariat, the Council for Scientific and Industrial Research, the Ghana Atomic Energy Commission, the Nuclear Regulatory Authority, and the National Biosafety Authority.

ACKNOWLEDGEMENT

The **Ministry of Environment, Science and Technology** wishes to express its profound gratitude to the dedicated focal persons from the Sector Agencies and the **Ghana Statistical Service** for their invaluable contributions, professionalism, and unwavering commitment to the preparation of the **2024 Statistical Report**. Their timely submissions, technical inputs, and active participation throughout the data collation, review, and validation processes were instrumental in ensuring the quality and credibility of this Report.

The Ministry further appreciates the strong cooperation and collaboration demonstrated by all Agencies within the Sector, whose collective efforts ensured the successful development, review, and validation of the Statistical Report. This spirit of teamwork and shared responsibility significantly enhanced data consistency, accuracy, and alignment with national statistical standards.

We also acknowledge the continuous leadership and strategic guidance of the **Chief Director**, whose oversight and commitment were critical in steering the process and ensuring that the 2024 Statistical Report was completed in a timely and effective manner.

Special appreciation is extended to the Management and Staff of the Ministry of Environment, Science and Technology for their sustained direction and institutional support throughout the process. In particular, the Ministry recognizes the exceptional dedication, zeal, and technical expertise of the **RSIM Team**, led by the **Director, RSIM**, whose immense contribution and coordination efforts were central to the successful preparation of this Report.

It is envisaged that the **2024 Statistical Report** will serve as a valuable resource for policymakers, sector agencies, development partners, researchers, and other stakeholders, and will significantly enhance evidence-based decision-making, planning, and policy formulation within the Ministry and across the Sector.

EXECUTIVE SUMMARY

The **2024 Statistical Report** of the **Ministry of Environment, Science and Technology (MEST)** presents a comprehensive account of the performance and administrative statistics of the Ministry and its Sector Agencies during the 2024 reporting period. Prepared by the **Research, Statistics and Information Management (RSIM) Directorate**, the Report serves as an evidence-based resource to support policy formulation, strategic planning, performance monitoring, and informed decision-making across the Environment, Science and Technology Sector. It also reinforces the Ministry's commitment to transparency, accountability, and strengthening Ghana's National Statistical System.

The Report covers six (6) Sector Agencies under the Ministry, namely the **Council for Scientific and Industrial Research (CSIR)**, **Environmental Protection Agency (EPA)**, **Ghana Atomic Energy Commission (GAEC)**, **National Biosafety Authority (NBA)**, **Nuclear Regulatory Authority (NRA)**, and the **Electrical and Electronic Waste Management Fund (E-Waste Fund)**. It provides an overview of their mandates, programmes, institutional performance, and key statistical indicators that demonstrate their contributions to environmental sustainability, scientific research, technological advancement, public health, agricultural development, nuclear safety, environmental regulation, and national socio-economic development.

The primary objective of the Report is to collate, analyse, and disseminate reliable administrative data generated by the Ministry and its Agencies. Specifically, it seeks to strengthen evidence-based policymaking, enhance institutional accountability, monitor sector performance, improve data quality and coordination, and support resource allocation and strategic planning. To achieve these objectives, data were collected through a structured process involving stakeholder consultations, indicator validation, data collation by designated focal persons, statistical analysis using Microsoft Excel and Datawrapper, report preparation, and validation by a multi-agency Working Group.

The findings highlight significant achievements across the Sector. The Council for Scientific and Industrial Research (CSIR) continued to advance agricultural productivity and technological innovation by conserving over **5,700 plant genetic accessions**, developing improved crop varieties and technologies, publishing **209 research papers**, registering intellectual property, promoting climate-smart innovations, and reaching more than **378,000 beneficiaries** through technology adoption and capacity-building programmes.

The Environmental Protection Agency (EPA) strengthened environmental governance through the processing of environmental permits and chemical licences, nationwide compliance monitoring, industrial pollution control, environmental education, climate change interventions, and ambient air quality monitoring. During the year, the Agency monitored more than **12,800 facilities**, educated over **52,000 students**, sensitized communities nationwide, expanded environmental compliance activities, and supported climate action across Metropolitan, Municipal and District Assemblies.

The Ghana Atomic Energy Commission (GAEC) recorded substantial achievements in scientific research, nuclear technology, healthcare, agriculture, environmental monitoring, and human resource development. The Commission produced **126 refereed journal articles**, trained over **700**

professionals, provided specialised scientific and technical services, supported cancer diagnosis and treatment, advanced biotechnology applications, strengthened radiation safety, and contributed to national development through the launch of Ghana's National Space Policy.

The National Biosafety Authority (NBA) maintained full regulatory oversight by processing **100 percent** of applications received, undertaking monitoring activities, conducting public awareness programmes, and strengthening stakeholder capacity through targeted training initiatives. Similarly, the Nuclear Regulatory Authority (NRA) enhanced national radiation safety through the authorization of radioactive sources, issuance of permits, enforcement of regulatory requirements, expansion of the national register, and continued monitoring of users of radiation sources.

Beyond presenting institutional achievements, the Report identifies data quality and reporting challenges that require continuous improvement. These include strengthening coordination among Sector Agencies, enhancing data completeness and timeliness, improving standardization of indicators, expanding digital data management systems, and building institutional capacity for statistical reporting and analysis. Addressing these challenges will improve the quality, consistency, and usefulness of future statistical reports and support more effective monitoring of sector performance.

Overall, the **2024 Statistical Report** demonstrates the critical role of data in promoting evidence-based governance within the Ministry of Environment, Science and Technology. It provides policymakers, development partners, researchers, private sector actors, and the general public with credible information on the performance of the Sector and highlights the substantial contributions of the Ministry and its Agencies towards environmental protection, scientific research, technological development, innovation, public health, nuclear safety, climate resilience, and the achievement of Ghana's national development priorities and the Sustainable Development Goals. The Report further establishes a benchmark for monitoring future sector performance and strengthening accountability across the Ministry and its Agencies.

1 INTRODUCTION

In these modern times, access to reliable and accurate data/information forms an essential part of a growing economy which leads to improved governance and socio-economic advancement. This is mainly due to the high penetration and adoption of various technologies within different sectors of the economy. Data is expected to be readily available, which is of high quality, reliable, accurate and accessible. Reliable and accurate data play a crucial role in effective policy decision-making by providing a strong foundation of evidence and fostering confidence among stakeholders. When decisions are based on trustworthy information, they are more likely to yield better outcomes and results, benefiting all those who rely on the policies for guidance and implementation.

Data is a vital component in the operation and administration of organizations and projects. It serves as a foundation for identifying needs, setting clear goals and objectives, and effectively monitoring the progress of government initiatives, programs, and projects. By leveraging accurate and timely information, organizations can make informed decisions and ensure the successful implementation and evaluation of their efforts. Inaccurate or lack of data/information could have real-life implications for business institutions, especially government institutions. This is because they may not be able to give an up-to-date or accurate account of programmes and projects to stakeholders and the public; hence, the significance and accessibility of timely and accurate data/information cannot therefore be overemphasized.

Access to accurate and reliable data in public policy decision-making is acknowledged by both local and international communities as it helps to create a more transparent, accountable and responsible Government/Institutions. The availability and accessibility of reliable and accurate data generated by Government Institutions to all stakeholders and the public are vital for evidence-based planning for socio-economic development.

The Ministry of Environment, Science and Technology has developed and published the Annual Statistical Report 2024, which showcases reliable and accurate data on the projects, programs, and activities of its agencies.

2 BACKGROUND

The Ministry of Environment, Science and Technology and its Agencies in line with Sections 11 and 13 of the Civil Service Law 1993, (PNDCL 327) and by Executive Instrument (EI. 1, 2025), 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 affect environment, science, and technological development.

The Ministry of Environment, Science, Technology, and Innovation has oversight responsibility over six (6) Agencies namely;

a) Environmental Protection Authority
b) Electrical And Electronic Waste Management Fund
c) Council for Scientific and Industrial Research
d) Ghana Atomic Energy Commission
e) National Biosafety Authority
f) Nuclear Regulatory Authority

2.1 Council for Scientific and Industrial Research (CSIR)

The Council for Scientific and Industrial Research (CSIR) has its origin from the National Research Council which was established in 1958. In its current form, the CSIR has been established by the Council for Scientific and Industrial Research (CSIR) Act of 1996 (Act 521). The Council is mandated to coordinate scientific and industrial research activities of its institutes in support of the national economy, especially in food and agriculture (for ensuring food security), industry (especially intermediate technologies for small and medium enterprises) and frontier technologies such as biotechnology and non-sciences. Currently, CSIR oversees the activities of Thirteen (13) institutes. They are:

a. Animal Research Institute
b. Building and Road Research Institute
c. Crops Research Institute
d. Food Research Institute
e. Forestry Research Institute of Ghana
f. Institute of Industrial Research
g. Institute of Scientific and Technological Information
h. Oil Palm Research Institute
i. Plant Genetic Resources Research Institute
j. Soil Research Institute
k. Science and Technology Policy Research Institute (STEPRI)
l. Water Research Institute and
m. Savannah Agriculture Research Institute (SARI)

2.1.1 Animal Research Institute

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.

Research programmes being undertaken by the Institute include:

n. Economic feed and management packages for both smallholder and commercial animal agriculture.
o. Utilization of agricultural and industrial by-products for high quality feed.
p. Grasscutter breeding and production programmes.
q. Enhancing crop-livestock integration in the national farming system.
r. Efficient use and improvement of national rangelands for animal grazing.
s. Development of effective disease control and management strategies.
t. Integration of plant medicine into the orthodox animal health care system.
u. Identification of socio-cultural and economic factors limiting animal production and technology transfer.
v. Development of local dairy industry.
w. Poultry Breeding Programme.

2.1.2 Building and Road Research Institute

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.

The focus of research and development programmes of the CSIR-BRRI is on

a. Construction Cost Data Analysis and Documentation.
b. Development of National Accident Database.
c. Accident Prediction Models for Signalized Intersections on Urban Roads in Ghana.
d. Development of local mixtures in cement for housing construction.
e. Timber and Anti-Termite Treatment.
f. Environmental Impact Studies of Erosion-Susceptible Settlement, Earthquake and Landslide in Ghana.
g. Evaluation of Readily Available Marginal Materials in Road Construction.
h. Integrated Geophysical Methods and Geographical Information Systems or Improving Boreholes Siting and Mapping of Construction Materials in Ashanti Region.
i. Improving Reliability of Road Construction Cost in Ghana, the Issue of Record Keeping.
j. Bamboo for Housing and Storage Structures in Farming Communities.
k. Stabilization of Marginal Materials for Road Construction and Housing Development.
l. Land-fill Studies/Solid Waste Disposal.

2.1.3 Crops Research Institute (CRI)

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

The crops include:

a. Legumes (cowpea, soybean, groundnut, and Bambara groundnut).
b. Cereals (maize, rice).
c. Roots and Tubers (yam, cocoyam, cassava, taro and sweet potato).
d. Vegetables (pepper, garden eggs, tomato, anion, leafy vegetables).
e. Tropical fruits (citrus, mango, avocado, pineapple, cashew, pawpaw).
f. Industrial crops (rubber, sugar cane).
g. Current research and development programmes cover.
h. Maize Improvement (developing varieties with quality protein, high nitrogen use efficiency, drought, striga and stem borer resistance.
i. Rice Improvement (developing varieties for high yields and tolerance for biotic and abiotic stresses, developing technologies for efficient water management.
j. Legume Improvement (breeding for early and medium-maturing varieties of cowpea, soybean and groundnut and Bambara groundnut with promiscuous nodulation, seed longevity, and shattering resistance, as well as rosette resistance in groundnut.
k. Horticulture (developing vegetable and Musa spp of good quality, with resistance to pests and diseases, developing agronomic recommendations for vegetable production, production of healthy planting materials for farmers)
l. Resource and Crop Management (developing cropping systems for optimum use of resources for high and sustainable productivity).
m. Crop Protection (developing integrated pest and disease management strategies including biological control of pests in addition to phytosanitary functions.
n. Biotechnology (using tissue culture for germplasm conservation and mass production of healthy planting materials, using molecular technologies to characterise crop genetic materials, using genetic markers to tag genes of desired traits and to develop genetic markers to measure genetic diversity between crop genotypes.
o. Postharvest Research (developing suitable techniques for the production and storage of seeds as well as production of breeder seed to support the national seed industry.

2.1.4 Food Research Institute (FRI)

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 utilization in order to assist the local food industries to improve on and diversify their operations. The Institute also advises Government on its food policy.

The research programmes of the Institute cover

a. Development of Biochemical and Molecular Market for Determining Quality Assurance in the Primary Processing of Cocoa in West Africa.
b. Small and Medium Enterprises (SMEs) Project on "Development of the Small and Medium Scale Enterprise Sector Producing Cassava Based Products to Meet Emerging Urban Demand in West Africa."
c. Sustainable up-take of Cassava as an Industrial Commodity.
d. Industrial Development of Sorghum Malt and its Utilization in Food Industries.
e. Dissemination of Improved Rice Post-production and Marketing Technologies through coalition Arrangement to Enhance Rural Livelihoods in Northern Ghana.
f. Studies on High Quality Bambara Flour Technologies.
g. Project on Poverty Alleviation and Enhanced Food Availability in West Africa Through Improved Yam Technologies.
h. Mushroom Production Project.

2.1.5 Forestry Research Institute of Ghana, Fumesua, Kumasi (CSIR-FORIG)

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 utilization of Ghana's forest resources. CSIR-FORIG's research and development activities are conducted under three core research units and six divisions namely;

a. Forest and Wildlife Unit (Forest and Wildlife Management and Governance Division; Forest, Livelihoods and Sustainable Development Division).
b. Forest Products and Trade Unit (Wood Industry Development and Trade Division; Forest Products and Marketing Division).
c. Environmental Land-Use and Biodiversity Unit (Ecosystem Services and Climate Change Division; Biodiversity and Land-Use Division).

2.1.6 Institute of Industrial Research (CSIR-IIR)

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.

Research and development activities of the Institute cover such areas as:

a. Renewable Energy Interventions in Rural Communities.
b. Recycling of Waste-Water.
c. Development of Machinery for Integrated Agro-processing.
d. Development of Refractory Bricks for Hospital Incinerators.
e. Development of Teaching Software on Science for Schools.
f. Local Production of Scientific Laboratory Glassware.
g. Promotion of Bio-sanitation Toilets in Institution and Rural Communities.
h. Feasibility Studies/Business Plan on Industrial Ventures.

2.1.7 Institute for Scientific and Technological Information

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

The Institute has core competencies in the:

a. Development of an efficient system for the bibliographic control of existing and current Indigenous science and technology literature through the national network system.
b. Creation of databases and referral services.
c. Improvement and development of systems for the marketing of available scientific and technological information and maintenance of a national microfiche collection.
d. Human resource development in modern library and information science and technology.
e. Provision in cartographic form of a comprehensive and scientifically organized inventory of the inventory of the total national resource base as needed for development planning at the national and local levels as well as for education and research.
f. Publication and dissemination of the results of national research and development activities, which are crucial for the socio-economic development of Ghana.
g. Provision of central publishing and printing services to the national science and technology system in Ghana.

2.1.8 Oil Palm Research Institute (OPRI)

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.

Research focus of the CSIR-OPRI covers such areas as:

a. Development, maintenance and evaluation of oil palm genetic resources for breeding and seed production.
b. Selection and improvement of Oil Palm for high yield and tolerance to drought, diseases and pests.
c. Development of sustainable weed management strategies for oil palm.
d. Oil palm intercropped with food crops: development of fertilizer management strategies.
e. Development of an integrated control programme for the oil palm leaf miner and other pests.
f. Etiology and control of Blast and dry bud rot diseases of oil palm in Ghana.
g. Studies into Fusarium Wilt of oil palm.
h. Cape Saint Paul Wilt Disease (CSPWD) epidemiology and vector studies.
i. Development and evaluation of coconut progenies for high yield and tolerance to CSPWD.
j. Development of suitable permanent cropping systems for coconut.

k. Soil fertility maintenance under coconut.
l. Control of the Oryctes beetle, the most important pest of coconut.

2.1.9 Plant Genetic Resources Research Institute

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.

The core competence of the Institute is in:

a. Plant Genetic Resource Management.
b. Plantation Crops Establishment and Development.
c. Ecotourism and Arboretum Development.
d. Plant Genetic Resources Policy Development.
e. Seed Conservation and Utilization.
f. Vegetative Propagation of Horticultural Crops.

Research and development activities cover areas such as:

a. Collection, characterization, Agro-morphological and molecular evaluation and conservation of plant genetic resources.
b. Research into appropriate vegetative propagation of some tree crops including citrus, mango, nutmeg, avocado, to increase the supply of planting materials to farmers and other interested individuals.
c. On-station characterization, evaluation and conservation of underutilized plant species of economic importance.
d. Establishment and maintenance of field Gene Bank.
e. Conservation of orthodox seeds under very low-temperature regimes.
f. In-vitro conservation of recalcitrant plants.

2.1.10 Savanna Agricultural Research Institute (SARI)

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

Some of the research and development activities of the Institute focus on:

a. Development of improved cotton varieties.
b. Purification of seed stock of commercial cotton varieties.
c. On-farm evaluation of promising cotton lines.
d. Rice improvement (participatory varietal selection of promising rice lines with farmer; on-farm testing of promising varieties; breeder and foundation seed production; promotion of community seed production at the rural level).

e. Maize improvement (multi-locational evaluation of open-pollinated varieties for release; development of low nitrogen tolerant inbred lines for hybrid maize seed production; conversion of normal maize to quality protein maize; development of drought and striga tolerant inbred lines for varietal development; identification of genomic regions with maize traits using molecular/genetic markers).
f. Cassava improvement (identification of potential cassava varieties for multi-locational testing; undertaking cassava genotype testing with farmer participation).
g. Yam, Sweet Potato, Frafra Potato improvement (on-farm trials of identified yam, sweet potato and Frafra potato clones; integration of leguminous crops as rotation and intercrop for enhanced soil fertility in yam production; evaluation of cover crops for weed control).
h. Vegetable improvement (on-station and on-farm evaluation and selection of tomato, chili pepper, sweet pepper, okra and onion genotypes under rain-fed and irrigation; multi-location testing of various vegetable genotypes in selected Agro-ecological zones in northern Ghana).
i. Sorghum improvement (sorghum germplasm collection, characterisation and evaluation; development of open panicle Kapaala; sorghum hybridization; production of breeder and foundation seeds)
j. Legume improvement (development of high-yielding, extra-early, medium and late maturing cowpea, groundnut and soybean varieties; selection for grain type in cowpea; screening of cowpea genotypes for resistance to pests and diseases; development of groundnut genotypes resistant to Cercospora leaf spot).

2.1.11 Science and Technology Policy Research Institute (STEPRI)

The CSIR-Science and Technology Policy Research Institute is mandated to provide research support for national science and technology policy development, monitoring and evaluation. The Institute's core competence covers:

a. Technology evaluation, transfer and diffusion
b. Facilitation of commercialization of technological innovations
c. Science and technology acculturation and popularization
d. Policy studies on science and technology human resource development and management
e. Science and technology policy studies, monitoring and assessment; innovation studies with emphasis on new technologies, ICT and biotechnology.

2.1.12 Soil Research Institute

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

Research and development programmes undertaken by the Institute include:

a. Land Suitability Evaluation Programme.
b. Soil Inventorisation and Classification Studies.

c. Land Evaluation Studies for Agricultural Development.
d. Soil Fertility Management and Improvement Programme.
e. Organic Agriculture Studies.
f. Fertilizer Experimentation Studies for Arable and Tree Crops.
g. Environmental Management Programme.
h. Land Degradation and Climate Change Studies.
i. Erosion Control and Soil-Water Management Studies.
j. Provision of Laboratory Analytical Services for Soil, Plant and Water Samples.
k. Research Commercialization Programme.

2.1.13 Water Research Institute

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 to provide scientific and technical information and services needed for the sustainable development, utilization and management of the resources for socio-economic advancement of the country. Research and development programmes and activities cover:

a. Surface Water (delineation of hydrological basins of Ghana; water resources assessment of river basins; technology for modern rainwater harvesting for households and small communities; design of urban drainage and flood control systems; integrated assessment of sediment transport in the river basins of Ghana).
b. Ground Water (preliminary geophysical investigation for the sitting of boreholes-using 2D Resistivity Method; Exploitation of ground water resources to meet domestic supply; assessment of ground water resources and evaluation of recharge to the aquifer systems of Ghana; development of database for ground water resources).
c. Environmental Chemistry (water quality assessment in Ghana-monitoring of drinking water quality in relation to public health; domestic and industrial waste water studies; guidelines prepared for the treatment of septic and public toilet sludge using anaerobic and facultative pond systems in tropical climates; techniques developed for sewage treatment and small scale plant for the treatment of industrial effluent).
d. Environmental Biology and Health (control of obnoxious aquatic weeds in water bodies; monitoring of irrigation water for growing of vegetables; control of malaria and onchocerciasis in coastal and forest zones in Ghana using biological control agents; monitoring of pesticide contamination in farming areas of Ghana; monitoring of microbial pollution in lagoons and immediate inshore coastal environments).
e. Fishery (breeding and selection of tilapia for faster growth and mass production of fingerlings for fish farmers; fish feed formulation using local ingredients; introduction and promotion of cage and pen fish farming; documentation and distribution of freshwater fish species of Ghana; promotion of integrated aquaculture and agriculture).

2.2 Ghana Atomic Energy Commission (GAEC)

The Ghana Atomic Energy Commission was established by an Act of Parliament, Act 204 of 1963 but currently functions under Ghana Atomic Energy Commission Act, 2000 (Act 588). The Commission is mandated to: Advise Government on the peaceful uses of nuclear energy for development and promote the commercialization of research and development results. Currently, GAEC has Seven (7) Institutes, namely:

a. National Nuclear Research Institute (NNRI)
b. Biotechnology and Nuclear Agriculture Research Institute (BNARI)
c. Radiation Protection Institute (RPI)
d. Radiological and Medical Sciences Research Institute (RAMSRI)
e. Ghana Space Science Technology Institute (GSSTI)
f. School of Nuclear and Allied Sciences (SNAS) and
g. Nuclear Power Institute (NPI)

All the Institutes are located at Kwabenya with decentralized laboratories. The Research Institutes under GAEC are the following:

2.2.1 The National Nuclear Research Institute (NNRI)

It was established to promote and strengthen Nuclear Science and technology research, and training for the socio-economic development of Ghana.

The vision of the National Nuclear Research Institute is to become an Institution of excellence in the application and peaceful utilization of Nuclear Science and Technology for the welfare, safety and security of Ghana.

In accordance with its established act and provisions, the mission of the Institute is to promote and strengthen Nuclear Science and Technology Research, training and development for the Socio-Economic Development of Ghana.

The NNRI has the following Centres:

a. Accelerator Research Centre (ARC).
b. Engineering Services Centre (ESC).
c. Environmental Resources Research Centre (ERRC).
d. National Data Centre (NDC).
e. Nuclear and Analytical Chemistry Research Centre (NACRC).
f. Nuclear Applications Centre (NAC).
g. Nuclear Reactor Research Centre (NRRC).
h. Water Resources Research Centre (WRRC).

Some of the research and commercial activities carried out in Centres under the Institute include:

a. The National Data Centre (NDC) receives and uses data to provide technical advice and support on matters pertaining to the verification of the Comprehensive Nuclear Test Ban

Treaty (CTBT). The Centre also advises national authorities on issues relating to earthquake disasters and its management.

b. The use of Non-Destructive Evaluation (NDE) techniques is to check the integrity of LPG Storage Vessels, mineral processing tanks, distillation columns and other industrial process plants. The Institute also organizes NDT training for professionals.
c. Collaboration with Water Resources Commission to use isotopic techniques in assessing recharge areas, sources of water and pollution in the three (3) Northern Regions and the Central Region. This may be intensified to cover other parts of the country.

2.2.2 The Radiation Protection Institute (RPI)

It 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.

The RPI's mission is to provide an effective national scientific and technical framework for the protection of people, property and the environment, against any adverse effect of ionizing and non-ionizing radiation, and the safety and security of radioactive materials and nuclear installations.

The RPI has the following Centres:

a. Radiation Protection Training and Consultancy Centre (RPTCC)
b. Nuclear Safety and Security Centre (NSSC)
c. Radioactive Waste Management Centre (RWMC)
d. Health Physics and Instrumentation Centre (HPIC)
e. Environmental Radiation Protection Centre (ERPC)

Some of their activities include:

a. Regulatory Inspection through the issuance of import/export permits, new installations, and for cross boarder movements of radiation sources and radioactive materials. Development of regulatory guidelines for the control of radiation sources and irradiating devices has been part of their duties.
b. Personnel monitoring by ensuring safe working conditions in the nuclear and related industries. E.g. medical x-ray diagnosis and mining Industries.
c. Conducting Safety assessment of Base Stations before installation and monitoring of Radio frequencies for FM Stations and Mobile Phone companies.
d. Calibration of radiation detection equipment and nuclear density gauges used in medical and industrial facilities.
e. Radiological Safety Assessment, Consultancy, & Environmental Impact Assessment.
f. Management of radioactive waste.
g. Development and Implementation of the borehole disposal concept for Disused Sealed Radioactive Sources (DSRS) in Ghana.
h. Training and Public Education in Radiation Safety, Radiation Protection & Nuclear Security.

The National Radioactive Waste Management Centre Transports nuclear waste for registration, processing and storage and provides technical services to organizations on management of disused radioactive sources. The presence of any radioactive materials because of drilling Oil and Gas in the Western Region will be researched into by this institute.

2.2.3 Biotechnology and Nuclear Agriculture Research Institute (BNARI)

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 to enhance agricultural productivity, health delivery and industrialization.

BNARI exists to carry out research and development activities on safe applications of biotechnology and nuclear science and the transfer of these technologies to end-users in order to enhance agricultural productivity, health delivery and industrialization.

BNARI is currently made up of Seven (7) Scientific Research Centres namely:

a. Nuclear Agriculture Research Centre (NARC).
b. Radiation, Entomology and Pest Management Centre (REPMC).
c. Radiation Technology Centre (RTC).
d. Soil and Environmental Sciences Research Centre (SESRC).
e. Socioeconomic and Commercialisation Centre (SECC).
f. Plant Disease Research Centre (PDRC).
g. BNARI also has a Socioeconomic and Commercialisation Centre (SECC).

Some of BNARI's activities include:

a. Irradiation of food products to reduce postharvest losses and increase the shelf-life of agricultural produce. Sensitizations workshops are being held for identified stakeholders to patronize this technology capable of addressing post-harvest loses in agriculture and further enhance their packaging for export.
b. Development of Integrated Pest Management (IPM) strategies for pests and vectors of agricultural, medical and veterinary importance by using the Sterile Insect Technique (SIT) for the control of insect pests. Production of protein bait to curb the fruit fly menace is a major on-going project at the institute.
c. Rapid production of disease-free planting materials of food crops and ornamentals. Over the years, BNARI multiplied some disease-free planting materials (pineapple, plantain, potato etc.) for farmers.
d. Provision of veterinary services.

2.2.4 The Radiological and Medical Science Research Institute (RAMSRI)

It was established to carry out medical research, applying nuclear techniques to promote human health and nutrition.

The mission of RAMSRI is to contribute to Public Health delivery through the Medical Application of Nuclear and Isotopic Techniques and Radiation related devices for the reduction of cancer incidence in Ghana and Africa and to advance research performance in Radiation Medicine, Cancer Treatment, Medical Imaging, Diagnostic Molecular Biology and Nutrition for improved Healthcare delivery.

RAMSRI has the following Centres:

a. Applied Radiation Biology Centre (ARBC)
b. Cellular and Clinical Research Centre (CCRC)
c. Nutrition Research Centre (NRC)
d. Medical Radiation Physics Centre (MRPC)
e. Radio-pharmacy and Nuclear Medicine Centre (RNMC)

Some of RAMSRI's activities are to:

a. Provide Research-based technical advice for Cancer Management and Treatment Studies for improving complication-free survival rates after radiotherapy.
b. The institute is currently sourcing funds to construct a nuclear and medical imaging center 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.
c. Research projects to monitor and evaluate health conditions like tuberculosis and other communicable and non-communicable diseases using molecular technologies.
d. Use stable isotope techniques to monitor and assess vitamin A status of children susceptible to infection as well as for obesity studies.
e. Conducting and supervising the applications of ionizing radiation for the diagnosis and treatment of cancer in Ghana, with a focus on Radiotherapy and Nuclear Medicine Techniques.

2.2.5 The School of Nuclear and Allied Science (SNAS)

It 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 organized for radiological professionals in the sub region.

The school exists for preservation, maintenance and enhancement of nuclear knowledge in Ghana and Africa through the provision of high-quality teaching, research, entrepreneurship training, service and development of postgraduate programmes in the nuclear sciences and technology.

Departments

a. Department of Medical Physics
b. Department of Nuclear Agriculture and Radiation Processing
c. Department of Nuclear Engineering
d. Department of Nuclear Sciences and Applications
e. Department of Nuclear Safety and Security

2.2.6 The Ghana Space Science Technology Institute (GSSTI)

The Ghana Space Science and Technology Institute (GSSTI) was first established as a Centre under the School of Nuclear and Allied Sciences (SNAS) in January 2011 and launched in May 2012. It was later upgraded to an Institute in August 2013, to exploit space science and technology for socio-economic development of the country. The Institute is a state institution mandated to coordinate all space science and related technologies programmes and activities in Ghana. GSSTI is re-packaging the existing national capacities, competences, experiences and expertise in space science and related fields to find possible space technology solutions to the problems of Ghana. It has a unique research group and technical persons working assiduously to exploit space science and technology for socio-economic development in Ghana.

The centers under the institute are:

a. Radio Astronomy and Astrophysics Centre (RAAC)
b. Remote Sensing and Climate Centre (RSCC)
c. Satellite Communication and Engineering Centre (SCEC)

2.2.7 The Nuclear Power Institute (NPI)

It was established in 2015 to promote the delivery of safe, clean, efficient and reliable nuclear energy in the country and to develop the human resource capacity for sustainable nuclear power management and operational capacity. The institute has taken over the organization of workshops and studies that will lead to the introduction of nuclear power into the country's energy mix after 2020.

NPI's mission is to promote the delivery of safe, clean, efficient and reliable nuclear energy in the country and to develop the human resource capacity for sustainable nuclear power management and operational capacity.

Centers under the Institute are:

a. Nuclear Power Management Centre (NPMC).
b. Localization and Stakeholder Support Centre (LSSC).
c. Nuclear Safety Assessment Centre (NSAC).
d. Nuclear Energy Planning Centre (NEPC).
e. Configuration Management Centre (CMC).
f. Siting and Environmental Centre (SEC).
g. Public Relations and Information Centre (PRIC).

2.3 Environmental Protection Agency (EPA)

The Environmental Protection Agency (EPA) was established by the Environmental Protection Act, 1994 (Act 490) to oversee, coordinate and regulate all environmental issues. The EPA is mandated to advise the government on all environmental matters, develop regulations for managing the national and built environment, including chemical control and management and environmental impact assessments, and charge fees to be paid into the Environmental Fund. Additionally, the EPA operates three (3) Divisions, eleven (11) Departments, eighteen (18) Regional and twelve (12) area offices.

The core functions of the EPA include:

a. Coordinate the activities of bodies concerned with aspects of the environment.
b. Collaborate with national, foreign, and international agencies relevant to the Environmental act.
c. Issue environmental permits and notices.
d. Prescribe relevant standards and guidelines.
e. Ensure compliance with the EPA act and with environmental impact assessment procedure.
f. Conduct investigations into environmental issues and advise the Minister.
g. Promote relevant studies, research, surveys, and analyses.
h. Initiate and pursue education for public awareness of the environment.
i. Develop a comprehensive database on the environment.
j. Conduct training programmes and publish information on the environment; and
k. Impose and collect environmental protection levies.

2.4 Electrical and Electronic Waste Management Fund (E-waste Fund)

The Electrical and Electronic Waste Management Fund (E-waste Fund) was established by an Act of Parliament, the Hazardous and Electronic Waste Control and Management Act, 2016 to provide finance for the sustainable management of Electrical and Electronic waste and to reduce its adverse impact on human Health and the environment.

The set up of the E-waste Fund office began in October 2019 upon the appointment of the Fund Administrator by the president of the Republic of Ghana. Since its operationalization in 2019, the Fund has been active in building institutional capacity and human resources, developing partnerships to support the effective implementation of its mandate, concluding financial negotiations with all relevant institutions, developing relevant working documents to support its operations, and establishing protocols to guarantee that all parties adhere to the payment of eco levies.

EEWF is mandated to Promote Efficient E-Waste Management in an Environmentally Sound manner through Sustainable Financing whilst Creating Business Opportunities for the People in the Community.

2.5 National Biosafety Authority (NBA)

The Biosafety Act, 2011 (Act 831) established the National Biosafety Authority (NBA) to perform the following functions: receive, process, respond to, and make decisions on applications under the Act; establish an administrative mechanism for handling and storing documents and data related to applications and other matters under the Act; act as the National Focal Point for liaising with other agencies or international organizations concerned with biotechnology and biosafety; and promote public awareness, participation and education regarding the Authority's activities under the Act.

2.6 Nuclear Regulatory Authority (NRA)

Established by Act 895, 2015 to provide for the regulation and management of activities and practices for the peaceful use of nuclear and radioactive materials and protect the environment against the harmful effects of radiation hazards. The NRA is currently governed by a 7-member Board. The NRA regulates the use of ionizing and non-ionizing radiation by putting in place all the necessary regulations and guidance to help users of radiation and members of the public meet the regulatory requirements and to enforce these regulations. The object of these controls is to ensure that in the use of ionizing and non-ionizing radiation, humans (workers, the general public and patients) and the environment are protected from the harmful effects of undue exposure to radiations.

The essence of these activities is to assist in showcasing performance, institutional planning and realignment, efficient resource management and implementation hence the successful collation and dissemination of data related to these activities are necessary.

These processes deployed in the collation and dissemination of data related to projects and programmes undertaken by the various Departments and Agencies are spearheaded by the Research, Statistics and Information Management (RSIM) Directorate of the Ministry. The RSIM Directorate compiles the administrative data into a comprehensive Statistical Report for circulation to all stakeholders for their information and use as needed.

Some of the indicators collected by MEST from its agencies include:

Council for Scientific and Industrial Research (CSIR)

Programme Areas & KPIs:

- Germplasm Management
    - Number of plant accessions collected, characterized, conserved, and distributed
- Crop & Technology Development
    - Number of improved crop varieties developed and disseminated
    - Number of improved technologies/innovations developed and disseminated

- Innovation & Adoption
    - Adoption rate of disseminated technologies/varieties/improved livestock, poultry, and fish breeds
    - Number of people adopting technologies/varieties
- Research & Knowledge Outputs
    - Number of publications arising from adaptive research
    - Number of CSIR technologies patented or copyrighted
- ICT & Digital Innovation
    - Number of software solutions/apps developed
    - Number of people accessing CSIR products
- Health & Social Impact
    - Percentage reduction in prevalence of neglected tropical diseases
- Capacity Building
    - Number of people trained in value addition, processing, and fish farming technologies
- Private Sector Engagement
    - Percentage increase in private sector investment in R&D

Environmental Protection Agency (EPA)

Regulatory & Environmental KPIs:

- Environmental Permitting (L.I. 1652)
    - Number of applications received and permits issued by sector
- Chemical Control (Act 490)
    - Number of chemical licenses issued by category
- Compliance Monitoring
    - Number of entities monitored for compliance
    - Number of chemical undertakings monitored
- Pollution Control
    - Number of industries monitored for effluent quality (compliant/non-compliant)
- Air Quality Monitoring

    - Number of PM_{10} and $PM_{2.5}$ monitoring sites
    - Levels of PM_{10} and $PM_{2.5}$ recorded
- Climate Change
    - Number of MDAs and MMDAs capacity built for climate action
    - Level of greenhouse gas emissions
    - Percentage of sectors with mitigation and adaptation strategies
- Environmental Education
    - Number of schools/pupils educated
    - Number of communities and people sensitized

Ghana Atomic Energy Commission (GAEC)

Institution-wide KPIs:

- Total staff strength
- Number of refereed journal articles
- Number of books/book chapters
- Number of technical reports
- Number of conference papers
- Number of trainees across institutes
- Student enrollment and graduation numbers (MPhil & PhD)

Service & Technical KPIs (by institutes):

- Number of base stations assessed and monitored
- Number of workers monitored for radiation exposure
- Number of samples analyzed for radiation contamination
- Number of farmers trained on soil, water, and nutrient management
- Number of training programmes organized
- Number of clients served and satisfaction levels
- Number of research collaborations
- Publications produced

National Biosafety Authority (NBA)

Regulatory KPIs:

- Number of decisions made on GMO applications
- Number of decisions made on non-GMO applications
- Percentage of applications processed
- Average processing time
- Number of monitoring and inspection visits
- Number of public education programmes conducted
- Number of training programmes conducted
- Number of persons reached through awareness programmes

Nuclear Regulatory Authority (NRA)

Radiation Safety & Regulatory KPIs:

- Number of radioactive sources and devices authorised
- Number of permits issued
- Number of enforcement notices issued
- Number of users applying regulations and guidance documents
- Number of new equipment/sources added to the national register

3 OBJECTIVES

The primary objective of the Statistical Report is to **collate, analyze, and disseminate comprehensive, sector-wide administrative data** generated by the **Ministry of Environment, Science and Technology** and its Agencies, in order to provide **accurate, reliable, and timely statistics** to support informed decision-making by policymakers, sector institutions, development partners, researchers, and the general public.

Specifically, the Statistical Report seeks to:

- **Provide an evidence base for policy formulation and review** by presenting credible data that supports planning, monitoring, and evaluation of programmes and interventions across the Environment, Science, Technology, and Innovation sectors.
- **Enhance transparency and accountability** within the Sector by making administrative data accessible to stakeholders and the public, thereby strengthening confidence in government reporting systems.
- **Support performance monitoring and institutional learning** by tracking key performance indicators and outputs of Agencies, identifying trends, achievements, and emerging gaps that require policy or operational attention.
- **Showcase the achievements and contributions of the Sector Ministry and its Agencies** toward national development priorities, including environmental sustainability, scientific research, technological advancement, innovation, and public safety.
- **Improve the quality and consistency of sectoral data** by promoting standardized indicators, strengthened coordination among Agencies, and adherence to national statistical standards.
- **Inform resource allocation and strategic planning** by providing decision-makers with reliable data to guide prioritization, budgeting, and programme design.

Overall, the Statistical Report serves as a **strategic knowledge product** that supports evidence-driven governance, strengthens the national statistical system, and reinforces the Ministry's commitment to data-informed policymaking and sustainable socio-economic development.

4 METHODOLOGY

The development of the 2024 Statistical Report was carried out through five (5) main processes, namely:

1. Organizing an inception meeting to review the indicators with focal persons from the agencies and the RSIM team to ensure that the Key Performance Indicators for data collection accurately reflect the activities undertaken by the agencies.

2. Collecting and collating data from the focal persons.

3. Analyzing and interpreting the data using the Microsoft Excel and Datawrapper as a data analysis tool.

4. Writing the 2024 Statistical Report.

5. Working Group validation of the 2024 Statistical Report.

The report also summarizes and presents data and statistics generated by the Ministry and its sector agencies for the period 2024.

5 PRESENTATION OF DATA

5.1 COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH

The CSIR is the foremost national Science and Technology institution in Ghana and mandated to carry out scientific and technological research for national development.

The mandate of the CSIR involves generating and applying innovative technologies, and efficiently and effectively exploiting S&T for socio-economic development in critical areas of agriculture, industry, environment, some aspects of public health and social sciences, and improving the scientific culture of civil society in Ghana; with the goal of promoting accelerated national development. Its vision is to use the transforming power of Science & Technology for wealth creation.

CSIR's research programmes cover a wide range of activities in the following areas: Industry, Agriculture, Agro-processing, Fisheries, Forestry, Water Resources, Human Settlement Infrastructure, Environment, Health, Natural and Social Sciences. The CSIR primarily engages in applied and developmental research to evolve technology/innovations that promote productivity and development. These technologies/innovations are largely demand driven, ensuring they are responsive to both industrial and local demands. Successful development and deployment of improved technologies leads to publication in high impact journals and subsequent transfers to beneficiaries for adoption. To ensure full benefit of developed innovations in terms of returns on investment, innovations with novelty are secured through IPR registration for the necessary attributes when used anywhere on the globe. Other areas of operation include the development of improved varieties of crops, collection, characterization and conservation of germplasms of key/priority crops, and ICT/digital applications development for online access to improved technologies and capacity building of farmers and other key stakeholders in agriculture. In addition, the CSIR nurture and train people in various value addition/processing and aquaculture/fish farming innovations as a way of job creation.

In line with the scope of operations of the CSIR, the critical KPIs adopted in measuring achievement of deliverables, intended outcomes and impacts are outline in the matrix below.

Programme Area	**KPI**	**Achievement Status**
Germplasm collection, characterization and conservation of crops	Number of Plant Accessions collected characterised, conserved and distributed	• 5, 774: Collected and conserved • 3, 744: Distributed
Development and transfer of improved crop varieties	Number of improved crop varieties developed and disseminated	3 (maize, rice, soybean and tomato)

Development and transfer of improved technologies/Innovation	Number of improved technologies/innovations developed and disseminated	56
Enhancement in Forest Sustainability Management through collaborative interventions with EPA/Forestry Commission	No. of interventions implemented	Six (6) • Technology to determine the impact of lighting on forest trees • Crown tree index to determine the extent of forest disturbance to inform appropriate interventions • Technology that quantifies greenhouse emission • High efficient and envirionmrntally friently cook stoves • Hybrid Waste-to- Energy
Cost effective building innovations	No. of innovations developed	Four (4) • Timber technology in bridge construction • Terminate resistant innovation in building • Bamboo for housing technology • Fast-track cost-saving construction techniques.
Adoption of disseminated technologies/varieties/improved breeds of livestock/ poultry/fishes	Adoption rate of disseminated technologies/varieties/improved breeds of livestock/ poultry/fishes	• 65% Crop variety • 55%: Live Birds • 55%: Brood stock of Nile tilapia • 45% Improved locally-packaged technologies by MSMEs
	Number of people adopting technologies/varieties	Over 378,000 beneficiaries
Biomedical interventions leading to reduction in prevalence rates of neglected tropical diseases (Micro Filaria, Onchocerciasis, Lymphatic	Percentage reduction in the prevalence of neglected tropical diseases	Onchocerciasis: 9% Schistomiasis :10%

Filariasis, Schistomiasis, and Helmith Infections)		
Development and deployment of ICT software solutions/apps	No. of software solution/app developed	Two • CSIR-Farm accademy • Research/Techology protal
PPP arrangements for the development of demand driven technologies	Percentage increase in private sector investment in R & D	5%
IPR registration of developed technologies/innovations	Number of CSIR technologies patented/copyrighted	25 (varietal registration) 6 (copyright)
Publication of research and its findings in high impact journals	Number publications arising out adaptive resarch leading to improved technologies	209
Transfer of value addition/processing and fish farming technologies/innovation through training and incubation	Number of people trained in value addition/processing and fish farming technologies	257

5.2 ENVIRONMENTAL PROTECTION AUTHORITY

1. Number of applications received and permits issued by sectors to ensure compliance with L.I. 1652.

Environmental Assessment applications received and permits issued per sector in 2024

Sector	**Applications received**	**Applications permitted**
Agriculture and Natural Resource	359	298
Health	2,717	2,490
Energy	2,374	2,093
Hospitality	2,980	2,810
Manufacturing	1,790	1,284
Mining; Large Scale Small Scale (Gold and Diamond) Small Scale (Sand, Gravel and Kaolin) Medium Scale Exploration Quarry	 5 224 12 7 33 20	 13 137 11 15 51 30
Petroleum upstream support services	31	31
Others	190	172

(Waste Oil Recycling)		
General Construction	6,208	5,998
Total	**16,950**	**15,433**

2. Number of Chemical licences issued by categories to ensure compliance with Act 1124.

Type of Application	**Applications Received**	**Number of Certificate, Permits and Licenses, Issued**
Pesticide Products Registration	974	890
Pesticide License Applications (Dealers)	422	445
ICUMS Clearance Permit	48,582	48,582
Industrial Chemicals Permits	129	117
Permits to dispose of Hazardous Chemicals and waste	18	20
Permit for Transboundary movement of Hazardous Wastes	28	38
TOTAL	**50,153**	**50,092**

3. Number of entities monitored by regions to ensure compliance with permitting conditions and standards.

	EPA Regions	**No. of Facilities Monitored**	**Compliant**	**Non-Compliant**
1.	Greater Accra East	563	215	348
2.	Greater Accra West	846	155	691
3.	Bono East	630	194	436
4.	Northern	463	211	252
5.	Bono	1,567	793	774
6.	Eastern	854	509	345
7.	Ahafo	276	185	91
8.	Central	840	453	387
9.	Savannah	360	272	88
10.	Volta	665	558	107
11.	Ashanti	2,402	1,560	842
12.	Tarkwa	1,067	710	357
13.	Upper East	103	37	66
14.	Upper West	559	480	79
15.	Western North	390	215	175
16.	Western	482	295	187
17.	Oti	515	328	187

18.	North-East	304	99	205
Total		12,886	7,269	5,617

4. Number of schools/pupils educated on environmental issues.

Region	**Total number of schools**	**Total number of Participants**
Greater Accra East	25	3,668
Greater Accra West	23	236
Bono	19	365
Eastern	28	8,593
Bono East	11	1,430
Savannah	22	922
Ashanti	29	4,343
Western North	21	4,167
Northern	65	13,020
Western	12	2,252
Upper West	13	2,716
Upper East	14	1,672
North East	6	793
Tarkwa	21	1,729
Central	30	5,225
Volta	18	218
Oti	10	322
Ahafo	18	1,120
	385	**52,791**

5. Number of communities/people sensitized on environmental issues.

Regions	**Number of Communities**	**Number of Participants**
Ashanti	11	472
Western	9	148
Western North	14	425
Bono	7	102
Bono East	12	138
Eastern	11	158
Northeast	14	385
Northern	13	285
Upper East	5	79
Upper West	16	219
Oti	2	49
Volta	7	124
Ahafo	6	128
Savanna	9	105
Greater Accra	5	208

Central	3	78
Total	**144**	**3,103**

6. Number of industries monitored for effluent quality (compliant/non-compliant)

Type of Industry	Number of Companies	Number Sampled	Compliant	Non-Compliant
Pharmaceutical	18	18	6	12
Paint and Chemical	22	18	8	10
Alcoholic and non-alcoholic	36	29	10	19
Food processing	35	31	10	21
Cocoa Processing	6	6	3	3
General Industries	21	18	7	11
Secondary and Plastic	7	7	2	5
Power	2	2	2	0
Dairy	2	2	0	2
Crude oil refinery	4	4	0	4
Textile manufacturing industry	4	4	1	3
Fruit Processing	4	4	2	2
Pulp and Paper processing	2	2	1	1
Waste Oil Recycle	1	1	1	0
Fats and Oils Processing	3	3	1	2
Total	**167**	**149**	**54**	**95**

7. Number of sites monitored for PM_{10} and $PM_{2.5}$ (air quality) - 28 sites

8. Levels of PM_{10} and $PM_{2.5}$ at sites monitored.

Sites	PM_{10}	$PM_{2.5}$
Kaneshie First Light		283.1µg/m^3
Tetteh Quarshie		258.4µg/m^3
Mallam Market		287.6µg/m^3
Graphic Road		259.5 µg/m^3
Adabraka		38.1 µg/m^3
LA		272.1µg/m^3
Achimota		291.7µg/m^3

Tantra Hill		221.5µg/m^3
Adabraka, St Joseph Basic School	125.4µg/m^3	38.2µg/m^3
University of Ghana, Legon	97.7µg/m^3	29.4µg/m^3
Charlton Clinic Jamestown	76.8 µg/m^3	27.5µg/m^3
Dansoman	131.4µg/m^3	33.9µg/m^3
EPA Ghana	32.3µg/m^3	20.7 µg/m^3
Osu Presby Prep School	37.9µg/m^3	24.3 µg/m^3
Odwana Market	47.6µg/m^3	34.5µg/m^3
Nungua SHS	34.3 µg/m^3	25.7µg/m^3
Chisco Transport Terminal	41.9µg/m^3	30.5 µgm^{-3}
Tema Metropolitan Assembly	71.3µg/m^3	30.5µg/m^3
Tema Freezone	68.3µg/m^3	24.6µg/m^3
Guinness Ghana Limited, Kaase	107.4 µg/m^3	46.1µg/m^3
Adum Methodist Roundabout	42.0 µg/m^3	26.0µg/m^3
Asokwa New Road	71.8µg/m^3	29.9µg/m^3
Effia Pacific	64.9 µg/m^3	20.2µg/m^3
Takoradi Market Circle	64.7µg/m^3	25.8µg/m^3
Sekondi RCC Roundabout	35.9 µg/m^3	28.3µg/m^3
Lamashegu Police Station Roundabout	53.4 µg/m^3	25.0 µg/m^3
Tamale Industrial Area	52.6µg/m^3	22.7µg/m^3
Jakarayili	25.8 µg/m^3	17.3 µg/m^3

9. Number of MDAs and MMDAs capacity built for effective climate action - 43 MMDAs

10. Level of Greenhouse gas emissions - 55.5MT

11. Percentage of Sectors with climate change mitigation and adaptation strategies - 68%

Ambient Noise Level Monitoring Results for Accra (Sep - Nov 2024)

Monitoring Location	Zone				Ghana Standard (GS 1222:2018) for Daytime
		September	October	November	
Cantonments (The Executive Apartment Area)	Residential	56.5	56.9	54.2	55
Nima (Post Office area)		59.3	60	59.1	55
University of Ghana Medical Centre	Educational, Health and Shops	54	53.8	55.1	55
37 Military Hospital Basic School		57.1	56.9	60.1	55
Korle-Bu Poly Clinic		56.8	56.6	58.9	55
East Legon (La-Bawaleshie area)	Mixed -use	57.9	58.6	59.1	60
Junction Mall (Area)		64.8	61.2	59	60
ECG Makola Area	Commercial	77.4	78.1	76.3	75
Wire Weaving Area	Light Industrial	68.3	66.5	65.4	70

5.3 GHANA ATOMIC ENERGY COMMISSION

In 2024, the Ghana Atomic Energy Commission (GAEC) operated with a total staff strength of 769 across its institutes, underscoring its position as one of Ghana's largest applied science institutions. The Commission generated 126 refereed journal articles, 3 books or book chapters, 35 technical reports, and 19 conference papers, contributing evidence to national policymaking in areas such as health, environment, agriculture, climate resilience, and space governance. Capacity-building activities reached 701 trainees, including 115 in radiation and RF safety, 109 in biotechnology and agriculture, 177 in medical physics and molecular biology, 250 in earth observation and space science, and 50+ in industrial non-destructive testing. Service delivery outputs included monitoring 1,535 occupationally exposed workers, inspection of 1,060 RF base stations, calibration of 139 radiation devices, testing of 717 food samples, analysis of 1,500 XRF samples and 442 reactor-based samples, distribution of 10,000 plantain plantlets, provision of 546 veterinary clinical services, and cancer outreach and screening reaching over 2,000 beneficiaries. GAEC also supported national governance through the launch of the National Space Policy in 2024. In human capital development, the Graduate School of Nuclear and Allied Sciences recorded

sustained MPhil output over time, with 6 MPhil graduates and 1 PhD graduate in 2024, contributing specialised expertise to Ghana's science, technology, and innovation ecosystem.

1. Research, Innovation & Publications

KPI	Data
Refereed journal articles	126
Published books / book chapters	3
Technical reports	35
Conference papers	19

2. National Impact of Publications

Impact Area	SDG Link
Medical imaging safety	SDG 3
Cancer diagnostics	SDG 3
Pollution monitoring	SDG 3, 11, 12
Water resource management	SDG 6
Crop yield optimization	SDG 2
Illegal mining detection	SDG 15
Climate resilience	SDG 13
National space governance	SDG 9, 17

3. Training & Capacity Building

KPI	Data
Total trainees across GAEC	701
Radiation safety, RF compliance trainees (RPI)	115
Biotechnology, tissue culture, BSF trainees (BNARI)	109
Medical physics & molecular biology trainees (RAMSRI)	177
EO, digital earth & astronomy trainees (GSSTI)	250
NDT/UT, nuclear instrumentation trainees (NNRI)	50

4. SERVICES, COMMERCIALISATION & IGF

4.1 Radiation Protection Institute (RPI)

KPI	Data
Occupational Exposure of Workers monitored	1,535
RF base stations monitored	1,060

Radiation device calibrations	139
Food samples tested	717
Water/soil/NORM analyses	56
Conditional compliance audits	62
Radioactive source management	6 temporary + 2 permanent cases

4.2 National Nuclear Research Institute (NNRI)

KPI	Data
XRF analyses	1,500
NAA samples analyzed using the nuclear research reactor	442
Air quality monitoring	20 missions
LPG tanks tested	90
NDT/UT industrial clients	6

4.3 Biotechnology & Nuclear Agriculture (BNARI)

KPI	Data
Plantain plantlets distributed	10,000
Veterinary clinical services	546

4.4 Radiological & Medical Sciences Institute (RAMSRI)

KPI	Data
Acceptance tests of imaging machines	6 hospitals
Cancer outreach beneficiaries	2,000
Breast cancer screenings	1,500
Molecular biology trainees	177

4.5 Space Science & Earth Observation (GSSTI)

KPI	Value
National Space Policy	Launched (2024)
Flood, mining, agriculture mapping	Multiple missions
Digital Earth Africa trainees	250
VLBI astronomy sessions	Multiple

5. Outreach, Visibility & Policy Impact

KPI	Value
Cancer awareness outreach (RAMSRI)	2,000
Space Week participants (GSSTI)	500
Breast cancer screenings	1,500

Policy impact contribution	National Space Policy launched
Engagements with EPA, WRC, telecoms	Multiple

6. Graduate School of Nuclear and Allied Sciences

MPhil Graduates by Year

Year	Male	Female	Total
2008	29	7	36
2009	33	8	41
2010	36	7	43
2011	41	14	55
2012	38	15	53
2013	48	12	60
2014	28	11	39
2015	53	8	61
2016	37	12	49
2017	37	6	43
2018	28	11	39
2019	25	11	36
2020	10	4	14
2021	26	11	37
2022 (1st Batch)	20	9	29
2022 (2nd Batch)	15	7	22
2023	18	12	30
2024	6	0	6
2025 (February)	16	3	19

KPI	Data
Total PhD graduates (2024)	1
Male graduates	1
Female graduates	0

KPI	Data
Total Graduates (MPhil + PhD)	**7**
MPhil	**6**
PhD share	**1**

5.4 NATIONAL BIOSAFETY AUTHORITY

In the reporting period, the National Biosafety Authority recorded a 100 percent processing rate for all applications, with an average processing time of 180 days, indicating full regulatory coverage within the assessment cycle. A total of 26 regulatory decisions were made on genetically modified organism (GMO) use, while no decisions were recorded for non-GMO applications. Regulatory oversight activities included 4 monitoring visits to ensure compliance with biosafety requirements. In addition, the Authority conducted 8 public education programmes, reaching 303 individuals, alongside 6 capacity-building training sessions, reflecting sustained efforts in public awareness, stakeholder engagement, and institutional strengthening in national biosafety governance.

Indicator	Data
Percentage of applications processed	100%
Average processing time	180 days
Number of decisions made on GMO use	26
Number of decisions made on non-GMO use	0
Number of monitoring visits	4
Number of public education programmes conducted	8
Number of persons reached	303
Number of trainings conducted	6

5.5 NUCLEAR REGULATORY AUTHORITY

During the reporting period, regulatory compliance and oversight activities recorded measurable outputs across key outcome indicators. A total of 359 radioactive sources and devices were authorised, reflecting continued regulatory control over the safe use of radiation sources. In addition, 442 permits were issued for activities related to the import, export, transport, storage, and use of radioactive materials, indicating high demand for regulatory authorisation services. To address non-compliance, 7 enforcement notices were issued, supporting corrective actions and adherence to regulatory requirements. Furthermore, 365 users of radiation applied the approved regulations and guidance documents, demonstrating sustained compliance within the regulated community. The national register of radiation sources and authorised persons was strengthened with the addition of 83 new equipment and sources, ensuring the register remains current and supports effective regulatory monitoring and planning.

Outcome Indicator	Unit of Measurement	Data
Compliance by users of radiation sources and devices to regulatory requirements	Number of radioactive sources and devices authorised	359
Compliance by users of radiation sources and devices to regulatory requirements	Number of permits issued	442
Non-compliance issues resolved	Number of enforcement notices issued	7
Users of radiation complying with provisions of regulations and guidance documents	Number of users applying regulations and guidance documents	365
Up-to-date national register of radiation sources and authorised persons	Number of new equipment/sources added to the register	83

6 GAP ANALYSIS

The 2024 Statistical Report indicates strong progress in sector-wide data generation and reporting; however, **data completeness and coverage gaps persist**, particularly at sub-agency and institute levels. While aggregated institutional data are available, limited disaggregation constrains detailed performance assessment and masks variations in outputs across institutes, regions, and operational units.

There are also **inconsistencies in indicator definitions, measurement approaches, and reporting formats** across Agencies. Similar indicators are reported differently, and the emphasis remains largely on output-level data, with fewer outcome- and impact-oriented indicators. This limits cross-agency comparability and the ability to track long-term sectoral outcomes.

Although regulatory Agencies report high volumes of permits, inspections, and monitoring activities, **enforcement and compliance outcomes are insufficiently documented**. Data on permit revocations, sanctions, corrective actions, or follow-up on non-compliance are limited, reducing transparency and weakening assessment of regulatory effectiveness.

The analysis further reveals **constraints in data quality assurance, validation, and traceability**. Data collection relies heavily on focal persons, with limited standardized documentation of data sources, methodologies, aggregation rules, and data lineage. This affects audit readiness, consistency, and stakeholder confidence in the statistics produced.

Finally, **capacity and resource limitations**, including human skills, digital systems, and analytical tools, affect the depth and timeliness of reporting. In addition, the linkage between statistical findings and policy actions is not always explicit, reducing the strategic use of data for planning, prioritization, and evidence-based decision-making across the Sector

7 CONCLUSION

The 2024 Statistical Report provides a comprehensive and consolidated account of administrative data generated by the Ministry of Environment, Science and Technology and its Agencies during the year under review. The data presented highlight the Ministry's continued role in coordinating policy formulation, regulatory oversight, scientific research, innovation, environmental protection, biosafety, and nuclear regulation in support of national development. Overall, the performance indicators demonstrate sustained institutional activity across key mandate areas, including regulatory compliance, research output, service delivery, capacity building, and public engagement.

The report further underscores the importance of reliable administrative data in evidence-based planning, monitoring, and evaluation. While notable achievements were recorded, the analysis also reveals gaps related to resource constraints, infrastructure, and human capacity, which require strategic attention. Strengthening data collection systems, enhancing inter-agency coordination, and improving resourcing will be critical to improving performance outcomes in subsequent years. The Ministry remains committed to strengthening its statistical systems and leveraging data to inform policy decisions, enhance accountability, and support sustainable socio-economic development.

8 GLOSSARY

Administrative Data: Data collected primarily for administrative and operational purposes by government institutions rather than for statistical surveys.

Agency: A statutory body under the Ministry of Environment, Science and Technology mandated to implement specific sectoral functions.

Biosafety: Measures and regulatory systems put in place to ensure the safe handling, transfer, and use of genetically modified organisms and related technologies.

Compliance: Adherence by regulated entities to laws, regulations, standards, and conditions set by regulatory authorities.

Enforcement Notice: A formal directive issued to address non-compliance with regulatory requirements and to compel corrective action.

Key Performance Indicator (KPI): A measurable value used to assess the performance and effectiveness of programmes, projects, or institutions.

Monitoring Visit: An inspection or assessment conducted to verify compliance with regulatory requirements and operational standards.

Non-Financial Performance: Performance outcomes measured using outputs and indicators other than financial expenditure.

Permit: An official authorization granted by a regulatory authority to allow a specific regulated activity.

Radiation Source: Any radioactive material or device capable of emitting ionizing or non-ionizing radiation.

Regulatory Oversight: The supervision and enforcement activities undertaken by authorities to ensure compliance with laws and standards.

RSIM Directorate: The Research, Statistics and Information Management Directorate responsible for coordinating data collection, analysis, and reporting within the Ministry.

Statistical Report: An official publication that compiles, analyzes, and presents data to support decision-making, planning, and accountability.

Sustainable Development Goals (SDGs): A set of global development goals adopted by the United Nations to promote sustainable economic, social, and environmental development.

MINISTRY OF ENVIRONMENT, SCIENCE AND TECHNOLOGYSTATISTICAL REPORT

WORKING GROUP

No.	Name	Designation	Institution
1.	Suweibatu Adam (ESQ)	Chief Director	MEST
2.	Rev. Dr. Cephas Adjei Mensah	Director, RSIM	MEST
3.	Wilfred Edem Dennis	Principal Research Officer	MEST
4.	Prince James Quarcoo	Principal IT/IM Officer	MEST
5.	Prince Charles Ababio Aggrey	Senior Research Officer	MEST
6.	Redeemer R.K. Ganoo	Senior Planning Officer	MEST
7.	Felix Mote	Principal Programmes Officer	EPA
8.	Dr. Joseph B. Tandoh	Director	GAEC (GSSTI)
9.	Dr. Samuel Mahama	Head, Corporate Strategic Planning, Monitoring and Evaluation / MIS	CSIR
10.	Kwesi Anderson	Senior Biosafety Officer	NBA
11.	Mary Amenuku	Accountant	NRA
12.	Omar Seidu	Head of Social Statistics & Coordinator of Data for SDGs	GSS
13.	Ernest Nyarku	Regional Statistician	GSS

A soft copy of the 2024 Statistical Report can be downloaded from the Ministry of Environment, Science and Technology

website: www.mesti.gov.gh