Council for Scientific and Industrial Research (CSIR)

FINAL DRAFT CSIR
STRATEGIC PLAN
2021-2025

GOAL
Promoting Accelerated Socio-Economic Development through Research and Innovation, Technology Transfer and Training in Partnership with the Private and Public Sectors.

JULY 2020

EXECUTIVE SUMMARY

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 ultimate goal of promoting accelerated national development. Its vision is to use the transforming power of Science & Technology for wealth creation. The CSIR is therefore on a mission to become the force for accelerated social and economic development of Ghana. The development of a 5-Year Strategic Plan was initiated as part of efforts to stimulate synergies amongst the CSIR Institutes, speed up the achievement of its goal in real time with the resultant effect of increasing the contribution that the CSIR makes to national development. A situational analysis of the Council was undertaken which led to the identification of four (4) strategic thrusts, with well-defined objectives, targets and a robust monitoring and evaluation framework which, when diligently pursued, would enable the Council make significant impact. A summary of these are as outlined below:

Private Sector Driven R&D and Technological Innovation.
Objective: To develop and transfer at least three industry-driven technologies (of relevance to the local economy) per Institute per year, leading to the publication of at least three scientific papers per Institute per year in reputable journals.
Targets:
At least,

- 195 industry-relevant technologies developed, validated and adopted by industry
- 195 scientific papers published
- 35 staff trained in specialised areas to drive technology development

CSIR Re-Branding and Visibility Improvement
Objective: To ensure that the CSIR is positively visible through weekly appearances in the print and electronic media; and enjoys significant goodwill from its identified stakeholders through a one contact-hour bimonthly interaction.
Targets:
At least,

- 130 PPP arrangements operationalised
- 52 stakeholder interests addressed annually
- 140 different types of promotional materials distributed to at least 375 stakeholders
- 140 appearances in Radio/TV talk show programmes
- 280 feature articles published
- 15 public events organised
- CSIR Webometrics Ranking improved from 6368 to 500

Financial Resource Mobilisation.
Objective: To generate at least 30% of annual recurrent expenditure by 2025 through: Attraction of funding for at least one project per team of five (5) Research Scientists per year; Bidding for at least one consultancy service per year per Institute; &Attraction of at least one private sector funding per Institute for technologies that address specific private sector needs.
Targets:
At least,

- $ 306.37 m attracted from submission of winning proposals
- GHC 413.60 m attracted into IGF with a breakdown as follows:
  - GHC 150.110 m attracted through provision of consultancy services.

- o GHC 165.00 m attracted through technology development and transfer for industrial solutions.
- o GHC 97.50 m generated from sale of research by-products
- $20 m attracted into CSIR Endowment Fund
- GHC250 m added to STI fund.
- 130 CSIR Technologies patented & commercialised
- 2675 CSIR staff trained in relevant entrepreneurial skills.

Staff and Systems Performance Improvement

Objective: To get 80% of the workforce to be passionate, results-oriented, positive- and ethically-minded enough to pursue the CSIR vision.

Targets:
- M&E System enhanced, with adequate staff and resources.
- 15 performance assessment reports: 5 each on CSIR systems, staff and activities.
- At least 1780 CSIR staff benefit from more attractive incentive, loan and award schemes
- At least 2850 staff opinions taken into consideration in decision making
- At least 2,850 staff promoted at due time
- At least 2,850 staff benefit from professional development support.

A stakeholder analysis unearthed the need to develop a robust stakeholder management plan for the CSIR as part of its strategic plan. The objective is to improve CSIR visibility by ensuring that all identified stakeholders have at least one specific interest addressed; and the targets are, at least:
- 25 Promoters involved in decision making bodies of CSIR
- 50 impact activities creditable to promoters' lobbying or funding support activities or promoting access to opportunity.
- 20 Latents become effective promoters.
- 60 Defenders become effective goodwill ambassadors/supporters of CSIR Goal and Vision
- 20 Apathetics become effective Defenders of CSIR Goal and Vision.

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LIST OF ABBREVIATIONS

ARI	Animal Research Institute
BRRI	Building and Road Research Institute
CCST	CSIR College of Science and Technology
COT	Cost of Transactions
COTVET	Council for Technical and Vocational Education and Training
CRI	Crops Research Institute
CSIR	Council for Scientific and Industrial Research
DANIDA	Danish International Development Agency
FORIG	Forestry Research Institute of Ghana
FRI	Food Research Institute
GTZ	German Development Agency
GHC	Ghana Cedis
IGF	Internally Generated Funds
IIR	Institute of Industrial Research
INSTI	Institute of Scientific and Technological Information
IPR	Intellectual Property Rights
ISPIC	Institute Strategic Plan Implementation Committee
M&E	Monitoring and Evaluation
NAB	National Accreditation Board
NGOs	Non-Governmental Organisations
OPRI	Oil Palm Research Institute
PGRRI	Plant Genetic Resources Research Institute
PPP	Public Private Partnership
PR	Public Relations
REDD	Reducing Emissions from Deforestation and Forest Degradation
R&D	Research and Development
SARI	Savanna Agricultural Research Institute
S&T	Science and Technology
SM	Stakeholder Management
SPAT	Strategic Plan Audit Team
SPICC	Strategic Plan Implementation and Coordinating Committee
STEPRI	Science and Technology Policy Research Institute
SRI	Soil Research Institute
STI	Science, Technology and Innovation
SWOT	Strengths, Weaknesses, Opportunities and Threats
USAID	United States Agency for International Development
USD	United States Dollars
WRI	Water Research Institute

CHAPTER 1 – INTRODUCTORY BACKGROUND INFORMATION

1.1 THE CSIR AND ITS INSTITUTES

The Council for Scientific and Industrial Research (CSIR), is the foremost public Science and Technology (S&T) Research Institution in Ghana. The CSIR generates and applies innovative technologies, and efficiently and effectively exploits S&T for socio-economic development in critical areas of agriculture, industry, environment, some aspects of public health and social sciences, and improves the scientific culture of civil society in Ghana. The activities of the CSIR and its Institutes are also guided by the United Nation's Sustainable Development Goals (SDGs) and the African Union's long term Agenda 2063.

Vision:
The leading Science, Technology and Innovation Institution (STI) for accelerated socio-economic development

Mission:
Using the transforming power of STI for wealth creation through research and the creation of innovative technologies for industrial development.

Mandate
The CSIR generates and applies innovative technologies, and efficiently and effectively exploits S&T for socio-economic development in critical areas of agriculture, industry, environment, some aspects of public health and social sciences, and improves the scientific culture of civil society in Ghana.

Establishment, Structure and Organization
The CSIR was established through an act of parliament, CSIR Act 521 of 1996. The Governing Council is made up of 21 members appointed by Government representing both the public and private sectors, and relevant government Ministries/Agencies/Departments (MDAs).

The Management of the CSIR comprises: The Director General, who is the Chief Executive, The Deputy Director-General, The Director of Administration, Director of Finance, Director of Commercialisation, Director of Audit and the Legal Officer.

The CSIR is made up of thirteen (13) semi-autonomous Research Institutes stationed nationwide with the Head Office in Accra. CSIR currently has staff strength of 3,564. The Institutes, including their locations are listed below:

- Animal Research Institute   - Accra
- Building and Road Research Institute   - Kumasi
- Crops Research Institute   - Kumasi
- Food Research Institute   - Accra
- Forestry Research Institute of Ghana   - Kumasi
- Oil Palm Research Institute   - Kusi-Kade
- Plant Genetic Resources Research Institute   - Bunso
- Savanna Agricultural Research Institute   - Tamale

- Science and Technology Policy Research Institute   - Accra
- Soil Research Institute   - Kumasi
- Institute of Scientific and Technological Information   - Accra
- Institute of Industrial Research   - Accra
- Water Research Institute   - Accra

The Mandates of each of the 13 Research Institutes within the CSIR are as follows:

a) **Animal Research Institute (ARI):** To undertake research aimed at providing solutions to problems relevant to the livestock industry in Ghana. The Institute's research focus is to help the country to become self-sufficient and achieve food security in the supply of animal protein.

b) **Building and Road Research Institute (BRRI):** To undertake research into all aspects of building and road design and construction, with a view to assisting the construction industry to be more efficient, safe and economical. BRRI is also mandated to develop construction materials from local materials.

c) **Crops Research Institute (CRI):** To research into all food and industrial crops except cocoa, coffee, cola, shea nut, oil palm, coconut and cotton which fall under different research institutes. The Institute's research is directed at developing improved varieties of crops and improved production technologies for increasing agricultural productivity so as to ensure food security and self-sufficiency as well as the production of industrial raw materials.

d) **Food Research Institute (FRI):** To undertake applied research through laboratory and pilot-scale investigation into the processing, preservation and storage, transportation and distribution of staple and non-staple plant and animal food in the country with a view to producing new foods and improving upon traditional ones. FRI's research aims to add value to agricultural produce and help reduce post-harvest loses.

e) **Forestry Research Institute of Ghana (FORIG):** To undertake user-focused research that generates scientific knowledge and appropriate technologies for the enhancement of sustainable development conservation and efficient utilization of Ghana's forest resources.

f) **Institute for Scientific and Technological Information (INSTI):** To develop national capacity for efficient and effective provision of scientific and technological information to the Ghanaian society through the publication and dissemination of research results in appropriately packaged form.

g) **Institute of Industrial Research (IIR):** To undertake research into process and product design and development, and to promote adaptive technology, scientific instrumentation and calibration and repair of precision equipment.

h) **Oil Palm Research Institute (OPRI):** To conduct research aimed at providing scientific and technological support for the development of the oil palm and coconut industries in Ghana.

i) **Plant Genetic Resources Research Institute (PGRRI):** To collect, characterize, evaluate, conserve, document, distribute and utilize the plant genetic resources of Ghana.

j) **Savanna Agricultural Research Institute (SARI):** To undertake agricultural research particularly related to food and fibre crop farming in Northern Ghana for the purpose of introducing improved technology to enhance agricultural productivity.

k) **Science and Technology Policy Research Institute (STEPRI):** To provide research support for national science and technology policy development, monitoring and evaluation.

l) **Soil Research Institute (SRI):** To undertake scientific research to generate technologies (information) for sustainable soil resources management, and to build human capacity for further knowledge development extension and sustainable agriculture as well as commercialize developed technologies.

m) **Water Research Institute (WRI):** To undertake research in all aspects of water resources (both living and non-living) of Ghana in order to provide scientific and technical information and sources needed for the sustainable development, utilization and management of the resource in support of the socio-economic development of the country.

1.2 CURRENT APPROACH TO OPERATIONALISING MANDATE

In an effort to effectively and efficiently fulfil its mandate the CSIR adopted a five-fold approach where the products/technologies/innovations/services generated from the research activities are transferred to private sector entities or marketed to the general public through commercialization (CSIR-Plus). Research Scientists assist in training, conducting research and supervising post-graduate students in the CSIR College of Science and Technology (CCST). Finally, the revenue generated from both the CSIR-Plus and the Graduate School is used to support research in emerging and national priority areas. This five-fold approach is illustrated below (Figure 1).
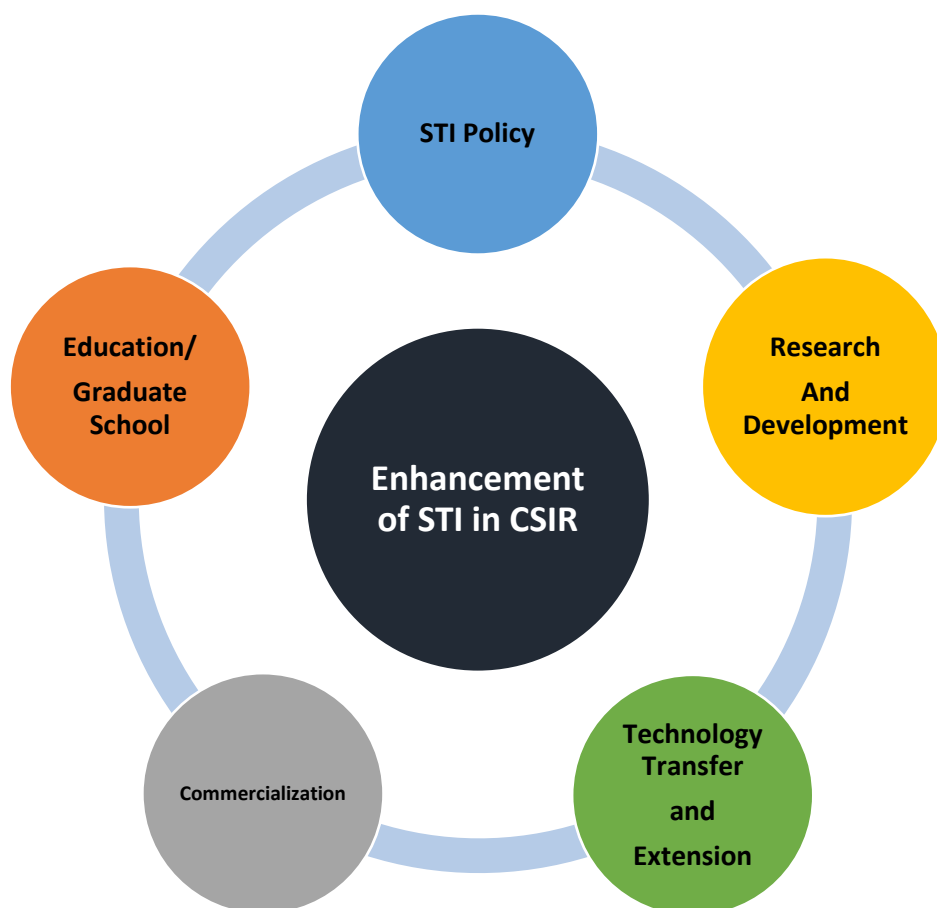
Figure 1: **5-Fold Approach to Mandate Operationalisation**

1.3 RESEARCH AND DEVELOPMENT PROGRAMMES

The Research and Development (R & D) programmes are grouped under seven thematic areas:

1.3.1 Food Security and Poverty Reduction:

Lead Institute: CRI

Collaborating Institutes: ARI, FORIG, FRI, OPRI, PGRRI, SARI, SRI, WRI.

The objective of this thematic area is to develop, disseminate and drive the adoption of R&D interventions and products that ensure the availability and access to food; and reduce poverty in rural communities. Key sub-themes under this theme are:

- Cereals and Legumes
- Roots, Tubers, Horticultural (Vegetables & Fruits) and Industrial Crops
- Forest, Trees and Plant Resources (Natural Products)
- Livestock and Poultry
- Soils, Mechanization, Agro-food processing
- Biotechnology (Genetics, Germplasm Collection and Conservation, Bio-prospecting and Bio-processing)
- Fisheries and Aqua-culture

1.3.2 Climate Change, Environmental Management and Green Technology:

Lead Institute: FORIG

Collaborating Institutes: BRRI, IIR, PGRRI, SRI, WRI**.**

The objective is to develop, disseminate and drive the adoption of R&D interventions and products that minimize the negative impact of climate change on agriculture, forestry, industry, housing, the environment and social development.
Sub-thematic areas include:

- Soil, Water and Biodiversity Conservation, Climate Change Mitigation (Including REDD$^+$)
- Climate Change Adaptation and Social Development
- Pollution and Waste Management, (Including Bio-Remediation)
- Green Technologies for Sustainable Development.

1.3.3 Materials Science and Manufacturing:

Lead Institute: BRRI

Collaborating Institutes: CRI, FRI, IIR, SARI.

The objective is to develop, disseminate and drive the adoption of R&D interventions and technologies for the production of industrial materials and products, nano-products as well as improvement in manufacturing systems to improve competitiveness in industries.
Sub-thematic areas include:

- Material Science (Wood, Metals, Integrated Materials)
- Industrial Products (Bio-Resource and Bio-Products Engineering)
- Nanotechnology and Nano Products

1.3.4 Energy and Petroleum:

Lead Institute: IIR

Collaborating Institutes: BRRI, FORIG, SRI

The objective is to develop, disseminate and drive the adoption of R&D interventions in the energy and petroleum sector to enhance the performance of SMEs and improve competitiveness of our local industries.

- Oil and Gas (including Cathodic Protection System).
- Renewable Energy including Bio-energy and Bio-gas.
- Energy and Oil by-products (Bitumen).
- Metrology and Industrial Engineering.

1.3.5 BIO-MEDICAL AND PUBLIC HEALTH:

Lead Institute: ARI

Collaborating Institutes: CRI, FORIG, OPRI, PGRRI, SARI, WRI.

The objective is to develop, disseminate and drive the adoption of R&D interventions and products that minimize health risks in humans, animals and plants.

Sub-themes include:

- Plant and Animal Health (Pathology, Virology, Entomology, Microbiology, Molecular Biology, Cell Biology).
- Genetics, Germplasm Collection and Conservation, Bio-prospecting and Bio-processing.
- Bio-Informatics, Bio-Physics and Bio-Chemistry
- Biomedical, Biosafety and Public Health Ethics.

1.3.6 Electronics and ICT:

Lead Institute: INSTI

Collaborating Institutes: BRRI, IIR, SRI.

The objective is to develop, disseminate and drive the adoption of R&D interventions and products that introduce efficiency in electronic communication systems and address electronic communication engineering problems.

- Computing and Software Systems (Electronic and Computing Engineering).
- Electrical and Electronic Systems and Design
- Information and Communication System, including Geographic and Management Information System.
- Robotics and Mathematical Sciences.

1.3.7 Science and People:

Lead Institute: STEPRI

Collaborating Institutes: FRI, PGRRI, SRI

The objective is to develop, disseminate and drive the adoption of R&D interventions and products that ensure livelihood improvements and effective demonstration of the contribution of STI to economic development.

Sub-themes include:

- Policy and Governance
- Statistical, Social and Economic Research

- Culture, Indigenous Knowledge and Community Improvement
- Technology for Livelihood and Wealth Creation
- Value Chain Promotion

1.4 COMMERCIALISATION

There is inadequate funding for research at CSIR as government funding for direct research-related activities have amounted to about 0.5% of total funds released to the Council over the years. Additionally, between 2010 and 2011 about $2.2 million was realized annually as proceeds from internally generated funds (IGF) from all the CSIR Institutes. In order to achieve the target of financing 30% of our recurrent (operational budget) through IGF, an annual amount of at least $20 million would have to be earned through commercialization.

A conscious effort will be made by management to strengthen corporate commercialisation to promote strong links between CSIR and industry.

Four (4) main commercialisation activities have been identified

- Production not related to research (Carpentry section at CSIR-FORIG) nor related to current research (*Fufu* powder of CSIR-FRI or Glass blowing of CSIR-IIR)
- By-product of research (Sale of grains from research fields and table-size production of tilapia and catfish)
- End-product of research (Mushroom sales, Breeder seeds, Fingerlings of tilapia and catfish)
- Services (Consultancy, Contract research, Guest Houses, Hiring of facilities)

Six key issues have been identified as needing focus to drive commercialization in the Council.

- Research and commercialisation complementarities
- Management of CSIR human resource
- Marketing, Branding and Image Building
- Sources of Funding
- Policy & Legislation
- Organisational Change Management

1.5   CSIR COLLEGE OF SCIENCE AND TECHNOLOGY (CCST)

The CSIR College of Science and Technology (CCST) is a registered, non-profit institution accredited by the National Accreditation Board (NAB). The college has two campuses in Accra and Kumasi. It has at its disposal state-of-the-art facilities, equipment and field research stations countrywide. An innovative educational institution, the college offers graduate programmes in agriculture and environmental sciences. It is a practical-oriented, industry-focused training facility and based on areas that the CSIR has clear competences and comparative advantage over other similar training institutions of higher learning in the country.

The vision of the CCST is to become the leading provider of quality science and technology education, research, innovation and entrepreneurship in Africa; whilst its mission is to equip stakeholders (or students) in the physical and natural sciences with appropriate skills and attitudes to enhance their contribution to sustainable development in Ghana and Africa. The College seeks to pursue the following objectives:

- To expand the platform for STI capacity and entrepreneurship at the postgraduate level for national and sub-regional development.
- To improve research-industry linkage and collaboration with institutions of higher learning within and outside Ghana
- To help focus student research on generating practical solutions to national socio-economic challenges.

In pursuit of these objectives, seven (7) academic programmes are currently offered with plans to roll out others in future. These programmes are:
- MSc Climate Change and Integrated Natural Resources Management
- MPhil Climate Change and Integrated Natural Resources Management
- MPhil Soil Health and Environmental Resources Management
- MPhil Fisheries and Aquaculture
- MPhil Agro-Processing Technology and Food Bio-Sciences
- MPhil Plant Breeding and Biotechnology
- MPhil Industrial Animal Nutrition and Feed Production

1.6 CSIR *PLUS* LIMITED

CSIR *Plus* Limited is a special purpose company set up by the Council for Scientific and Industrial Research (CSIR) to undertake profit-oriented projects. It was incorporated under the Companies Code, 1963 (Act 179) on December 31, 2009 as a private limited liability company and was issued with a Certificate to Commence business on January 4, 2010. CSIR *Plus* Limited is wholly owned by the CSIR with the primary objective (mission) of marketing and selling CSIR products, produce, services and commercialization of their research results by utilizing private sector driven efficiency and profit generating principles to deliver enhanced shareholder value. The current mandate of CSIR *Plus* as a Company is to consolidate and develop commercial interactions with external communities of interest such as industry, government and investment community. The Company's main areas of responsibility include:
- Developing and maintaining relationships between CSIR and industry.
- Identifying and protecting CSIR intellectual property.
- Negotiating and managing contract research collaboration which involves technology transfer or intellectual property transactions.
- Forming and managing start-up companies to commercialize technologies developed by CSIR.

The success of the Company is contingent on registering and owning CSIR's intellectual property. Achievements of the Company so far include the following:
- CSIR-*Plus* office has been opened and furnished and a bank account opened.
- It has identified and selected projects from five (5) CSIR Institutes (WRI, FORIG, SRI, ARI and BRRI). However, it would start with three (3) Institutes (SRI, FORIG, and WRI) when funds is available.
- It has prepared a financial cashflow statement for the projects involved
- A draft memorandum of understanding (MOU) has been prepared awaiting finalization and signing.

1.7 CSIR-TECHNOLOGY DEVELOPMENT AND TRANSFER CENTRE (CSIR-TDTC)

The CSIR-Technology Development Transfer Centre is a key pillar in the structure for commercialization and technology transfer of technologies and innovations from the CSIR Research Institutes to end-users in the private sector. The CSIR-TDTC was formally incorporated under the Companies Act, 1963 (Act 179) with liability limited by guarantee on the 17th of September, 2019 with its Board of Directors inaugurated on 21st May, 2020. The vision is to become a centre of excellence that uses the transforming power of Science, Technology and Innovation (STI) for wealth creation through effective linkages between Research and Industry; the mission being to: (a) engage the private sector in partnerships for technology development, appropriation and transfer from the CSIR to industry, (b) encourage CSIR Research Scientists to respond effectively to the technology demands from the private sector, (c) create a system or platform for intensive research-industry interaction including but not limited to organization of technology fairs, business meetings and online discussions via a dedicated website, and, (d) facilitate commercialisation of all technologies developed by the CSIR. The mission is effectively reflected in its Objects of Incorporation stated as:

1. Provide a platform for commercialisation of research outputs of CSIR institutes;
2. Promotion of interaction between researchers and entrepreneurs for technology development and adoption;
3. Any other related business.

In accordance with its mandate, the CSIR-TDTC has and continues to engage in activities leading to partnerships and possible commercialisation of technologies developed by CSIR institutes. Some institutions that the CSIR-TDTC has had successful engagement with include:

- EXIMBANK - CSIR-TDTC has prepared profiles of selected market-ready CSIR technologies for consideration.
- The Israeli Embassy Accra, Ghana - discussion on various areas of interest for collaboration are ongoing.
- The Kristo Asafo Mission of Ghana - areas of Technology Transfer and or uptake of CSIR developed technologies, internships, further education opportunities with our CSIR- College of Science and Technology (CCST).
- Kosmos Innovation Center (KIC) – CSIR-TDTC through experts from the CSIR facilitate, train, inspire and mentor young entrepreneurs and start-up businesses in Ghana through the Kosmos Energy Ghana corporate social responsibility initiative using innovation and technology to address the needs of Ghana's agricultural sector and simultaneously create viable business opportunities.

The CSIR-TDTC hopes to:

- Review the publication on marketable technologies developed by CSIR, which was published during the implementation of the CSIR-TDTC Project. This book will be used to facilitate CSIR's commercialization drive through the CSIR-TDTC.
- Conduct a thorough audit of the key technologies developed by the CSIR Institutes, Scientists and Technologists and assess them for possible upscaling and market uptake.
- Engage with the Directors of all CSIR institutes and Council concerning its activities.
- Develop training modules for SMEs, Researchers, Top and Middle-level Management.
- Follow up on the proposal sent to EXIMBANK along with other potential institutions, the private sector and the industry for uptake of CSIR technologies and collaboration.

CHAPTER 2:   SITUATIONAL ANALYSIS

2.1 STAKEHOLDER ANALYSIS OF THE CSIR

2.1.1.   Stakeholder Interests

Table 1.   Showing Stakeholders of CSIR and their respective Interests

Stakeholder	Interests
Government of Ghana	• Inputs for effective implementation and monitoring of policies and development programs • Inputs for formulation of policy • Support for Socio-economic growth • Employment creation and poverty reduction • Visible Contribution to national development • Sustained food security (moved from farmers) • Opportunities for job creation
Farmers	• Inputs for improved productivity, • Income and livelihood improvement • Access to training in good agronomic practices. • Enhanced ability to access basic needs • Access to improved planting materials and soil management practices. • Resilience and capacity to adapt to the effects of climate change.
Scientific Community	• Access to appropriate scientific knowledge • Practical training and skills acquisition in good scientific practice. • Access to insightful and relevant publications • Scientific facilities and personnel for effective partnership in research and development
Industry and the Private Sector	• Access to technologies for commercial application and business expansion. • Access to technical support services for productivity enhancement and quality assurance. • Opportunities for Corporate Social Responsibility through collaborative research.
International Organisations (non-donors)	• Strategic partnership for development • Support for their development agenda. • Attainment of the global Sustainable Development Goals.
Donor Organisations & Agencies	• Strategic partnership for development • Support for their development agenda • Support CSIR's R&D Agenda
NGOs	• Strategic partnership for development • Support the development and implementation of their programs • Source of readily available technologies for their activities
Educational Institutions	• Effective practical training in STI for their students • Knowledge sharing and dissemination • Placement of students for internship. • Access to scientific publications.
Local and International Media	Marketable news
Banks and Financial Institutions	• Charges on monies held in trust for the CSIR and its Institutes • COT Charges on staff salaries • Interests on loans granted. • Opportunities for Corporate Social Responsibility by supporting research.

Importers and Suppliers of Scientific equipment and supplies.	• **To sell their merchandise.**
General Public	• Employment Opportunities • Poverty alleviation • Identifying with our achievements. • Access to products and services
CSIR Council	• CSIR delivers on its mandate • CSIR operates within all relevant government policies • CSIR operates within sound financial management practices • CSIR's effective contribution to the national economy
Institutes Management Boards	• Institutes deliver on their mandates • Institutes operate within all relevant government policies • Institutes operate within sound financial management practices • Institutes' effective contribution to the national economy
CSIR Staff	Financial welfare during working life and after retirement Serene working environment and job satisfaction

2.1.2 Stakeholder Matrix

Table 2. Analysis of Stakeholders of CSIR and their interests

	Low Interest	*High Interest*
High Power	**LATENTS** • **Local and International Media** • **General Public**	**PROMOTERS** • Donor Organisations and Agencies • Government of Ghana (MMDAs) • Institute Management Boards • CSIR Council • Industry and the Private Sector
Low Power	**APATHETICS** • Banks and Financial Institutions • Importers and Suppliers of Scientific equipment and supplies.	**DEFENDERS** • International Organisations (non-donors) • Educational Institutions • NGOs • Scientific Community • Farmers • CSIR staff

2.2 PESTEL ANALYSIS

A PESTEL analysis is a framework or tool used to analyse and monitor the macro-environmental factors – namely political, economic, social, technological, environmental and legal factors - that may have profound impact on an organisation's performance. The factors identified to have potential for significantly impacting the performance of the CSIR are as listed below.

Political Factors
• Historically inadequate commitment of governments to S&T driven socio-economic development
• Lack of technology-friendly policies

- Lack of awareness, understanding and interest about the role and benefits of STI and research by government
- Loss of memory about the contribution and impact of STI on national development and resulting inertia
- STI not a priority area of Government
- Negative perception of STI by parliament
- Lack of belief in STI as a developmental lever
- Frequent changes in the leadership of the Ministry with oversight responsibility for CSIR
- External consideration (including donor priorities) influence policy direction
- Government seeks alternative STI solutions from external sources
- AGI not facilitating effectively the link between CSIR and private sector
- Government may have failed to determine the right posture for effective growth and development
- Weak inter-sectoral linkages
- Current policies within national strategy marginalizes STI
- Government has not accepted fully responsibility for funding research.
- Lack of ownership from sector ministry, because they are not direct beneficiaries of research.
- Unclear national research agenda.

Economic Factors
- Poor performance of the national economy
- Inability to carry out import substitution under WTO rules
- The advent of PSIs providing some hope for industrial development and therefore technological uptake.
- Donor fatigue as far as funding research is concerned

Social Factors
- Fear of science at all societal levels
- Misplaced social priorities
- The unattractiveness of science to young people
- Lack of effective career guidance for youth
- The general unattractive image of science; the notion that science has no economic value
- No incentives for science careers
- Relative to others, Ghana is far behind in developing STI for growth
- Emphasis of science education at the primary level is very poor
- No national framework guiding science acculturation in our educational institutions
- The absence of the application of science in our daily lives
- Very materialistic society with little regard for the value of science.

Technological Factors
- No clear ministerial oversight of technology.
- The vast majority of technology driving the national economy is imported.
- Scientific community believes that technology is relevant.
- Indigenous technologies are still relevant.
- Lack of mechanism for technology fore-sighting.
- High rate of change in technology.

- New directions in R&D (e.g. biotechnology).

Environmental Factors
- International commitment to UNCED (UN Conference on Environment & Development).
- Increasing concerns for environmental research.
- Continuous increase in illegal mining activities with attendant pollution of water bodies leading to increasing demands for water research.
- Changes in the climatic conditions (e.g., rainfall and temperature) creating higher demand for crop adaptation research.

Legal Factors
- No law controlling the movement of biological material within and outside the country.
- Limitations on ability to compete for some projects due to corporate nature and subvented status.
- The need to renegotiate the positioning of the ministerial responsibility for STI because of its cross-sectional nature.
- The lack of enforcement of laws makes CSIR seem irrelevant.
- The Act gives CSIR a broad scope with limited responsibility.

2.3 Strengths, Weaknesses, Opportunities and Threats (SWOT) Analysis of CSIR

A SWOT Analysis is a technique used to identify the strengths, weaknesses, opportunities and threats related to business competition or planning of an organisation. It is used to evaluate the strategic position of the organisation, specify the objectives of the business and identify the internal and external factors favourable and unfavourable to the attainment of those objectives. It helps establish the competitive advantage of the organisation.

2.3.1 List of Strengths, Weaknesses, Opportunities and Threats

Table 3.   Strengths, Weaknesses, Opportunities and threats of CSIR

Strengths		Opportunities	
S.1	Highly qualified human resource and technological skills	P.1	High demand for technological and innovative products and services
S.2	Scientific and Industrial Research undertaken in all the important sectors of the Ghanaian economy (food, agriculture, livestock, health, medicine, environment, housing, transport/roads, industry energy and other service sectors	P.2	Vibrant scientific community and industrial environment that provides good networking opportunities.
S.3	The strong operational presence in all the agro ecological zones	P.3	Ready availability of well-trained graduates
S.4	Availability of R & D infrastructure and facilities	P.4	Availability of numerous Capacity building institutions.
S.5	Existence of facilities and opportunities for agribusiness incubation	P.5	Growing Service Sector
S.6	Internationally accredited laboratories	P.6	Existence and operations of financial institution such as the banks, Venture Capital Trust Fund, COTVET funding opportunities for scaling ups, Stanford SEED project
S.7	Institutionalized commercialization of developed technologies; and the capacity to adapt and transfer technologies.		
S.8	CSIR Intellectual Property Right office and policy in place	P.7	The goodwill and support of donor agencies for national development programs including R&D (e.g. DANIDA, WORLD BANK, GTZ, USAID etc.)
S.9	Availability of marketable technologies and success stories with the private sector.	P.8	Growing manufacturing sector of the economy (eg. the one district one factory initiative)
S.11	Senior scientists retained to mentor the early career researchers	P.9	Government still having some belief in science and technology as the engine for economic growth.
S.12	Existence of incentive and award schemes for technology transfer and commercialization activities	P.10	The existence of Public-Private Partnership (PPP) framework
S.13	Strong local and International Partnerships for R&D		
S.14	Availability of internet resources and internet connectivity for R&D		
S.15	Ability to develop proposals to attract donor funding.		
Weaknesses		Threats	
W.1	Inadequate entrepreneurial skills or business mindsets among CSIR employees	T.1	Competition from foreign technologies and innovations as well as competition from Universities and NGOs
W.2	Inadequate state of the art equipment	T.2	Encroachment on CSIR lands
W.3	Limited institutional capacity to commercialise research outputs on a commercial scale	T.3	Technological advances in developed countries rendering CSIR technologies obsolete
W.4	Inadequate clarity in the commercialization concept	T.4	The unfriendly business climate in Ghana (e.g. high interest rates on loans, high cost of utilities inflation etc. as well as in bidding for jobs, adoption of technologies and sale of products and services).
W.5	High expense ratio		
W.6	Weak research industry linkage; low interaction between researchers and entrepreneurs		
W.7	Poor visibility of CSIR Institutes		

W.8	Inadequate techno-economic evaluation of technologies developed	T.5	Dwindling government investment in R&D
W.9	Lack of institutional system to track technological needs of the private sector	T.6	High attrition rate (worsening staff situation due to poaching, government restrictions on employment and unattractive conditions of service)
W.10	Limited piloting of the technologies developed		
W.11	Weak monitoring and evaluation systems of R&D	T.7	Weak industrial sector which cannot invest much into R&D
W.12	Poor working relationship amongst CSIR Institutes; and between Institutes and the Head Office.	T.8	Governments discretionary powers/interference could be at CSIR disadvantage given that CSIR is a national organization
W.14	Very Weak Financial Base		
W.15	Frustrating internal bureaucratic procedures/processes leading to delays in job delivery	T.9	Unfavorable government policies towards local R&D institutions
W.16	Poor staff attitude to work and towards commercialisation.	T.10	Inflexible government bureaucracy with respect to administration and procurement policies creating bottlenecks in bidding as well as timely delivery to clients.
W.17	Unrealistic charges/fees (overheads) on consultancies and jobs bid for.		
W.18	Poor operationalisation of the incentive and award schemes leading to de-motivation of staff.	T.11	Hijacking of CSIR Technologies by the private sector
W.19	Ineffective operationalisation of the IPR Policy		

2.3.2   SWOT Analysis Results

Table 4.   Prioritisation of Opportunities that give Highest Competitive Advantage

	Opportunity	Action Needed	Identified Appropriate Strategic Thrust
P10	The existence of Public-Private Partnership (PPP) framework	• Initiate a PPP Agenda • Proactive engagement with industry and private sector	CSIR Re-Branding and Visibility Improvement
P.2	**High demand for technological and innovative products and services**	• Develop demand-driven technologies	Private Sector Driven R&D and Technological Innovation.
P.9	**Government's recognition of STI as the engine for economic growth**	• Increase CSIR Visibility through effective management of Government and Other Stakeholders. • Active and regular Media and Stakeholder engagement	CSIR Re-Branding and Visibility Improvement
P.1	**Vibrant scientific community and industrial environment that provides good networking opportunities**	• Strengthen IPR System and use it to aggressively promote uptake of Technologies and Services	Financial Resource Mobilisation
P.8	**Growing Manufacturing sector of the Economy (One District One Factory initiative)**	• Strengthen IPR System and use it to aggressively promote uptake of Technologies and Services	Financial Resource Mobilisation
P.4	**Availability of numerous Capacity building Institutions.**	• Develop Entrepreneurial Capacity for effective Commercialisation	Financial Resource Mobilisation
P.7	**The goodwill and support of donor agencies for national development programs including R&D (e.g. DANIDA, WORLD BANK, GTZ, USAID etc.)**	• Source funding through development of winning proposals for funding by donors.	Financial Resource Mobilisation

Table 5.   Prioritisation of Strengths that give Highest Competitive Advantage

	Strength	Action Needed	Identified Appropriate Strategic Thrust
S1.	**Highly qualified human resource and technological skills**	• Develop demand driven economically viable technologies for the industry and services sector • Publish scientific papers in high impact journals	Private Sector Driven R&D and Technological Innovation.
S2.	**Scientific and Industrial Research in all the important sectors of the Ghanaian economy (food, agriculture, livestock, health, medicine, environment, housing, transport/roads, industry energy and other service sectors**	• Develop demand driven economically viable technologies for the industry and service sector • Publish scientific papers in high impact journals	Private Sector Driven R&D and Technological Innovation.
S12.	**Institutionalization of incentive and award schemes for technology transfer and commercialization activities**	• Review and effectively operationalise Incentive and Award Schemes	Staff and Systems Performance Improvement.
S8.	**CSIR Intellectual Property Right office and policy in place**	• Operationalise the IPR Policy	Financial Resource Mobilisation
S9.	**Availability of marketable technologies and success stories with the private sector, for example in the food industry**	• Patent all marketable technologies developed	Financial Resource Mobilisation

Table 6.   Prioritisation of Weaknesses which when resolved create significant Competitive Advantage

	Weaknesses	Action Needed	Identified Appropriate Strategic Thrust
W.11	Weak monitoring and evaluation systems of R&D	• Establish a robust monitoring and evaluation system	Staff and Systems Performance Improvement.
W.7	Poor visibility of some CSIR Institutes	• Increase visibility through effective stakeholder management	CSIR Re-Branding and Visibility Improvement
W.16	Poor staff attitude to work and towards commercialisation	• Explore causes of poor staff attitude and resolve issues	Staff and Systems Performance Improvement.
W.14	Very Weak Financial Base	• Commercialise technologies developed through: 　• effective IPR policy operationalisation 　• piloting of technologies • Aggressively source for funds from donor agencies through submission of winning proposals. • Aggressively bid for consultancy jobs.	Financial Resource Mobilisation
W.3	Limited institutional capacity to commercialise research outputs on a commercial scale	• Enter into partnerships with industry to commercialise research outputs.	Financial Resource Mobilisation
W.1	Inadequate entrepreneurial skills or business mindsets among CSIR employees	• Undertake entrepreneurial skills development of staff.	Financial Resource Mobilisation

CHAPTER 3: STRATEGIC THRUSTS AND OPERATIONAL STRATEGY

From the SWOT analysis undertaken the following strategic thrusts and objectives were derived as the critical areas needing attention in order to leverage the CSIR to a level that positions it to impact significantly on the socio-economic development in the next five years.

Table 7.   Summary of Strategic Thrusts and Objectives

Strategic Thrust	Strategic Objective
Private Sector Driven R&D and Technological Innovation	• To develop and transfer at least three industry-driven technologies (of relevance to the local economy) per Institute per year, leading to the publication of at least three scientific papers per Institute per year in a recognised journal.
CSIR Re-Branding and Visibility Improvement	• To ensure that the CSIR is positively visible through weekly appearances in the print and electronic media; and enjoys significant goodwill from its identified stakeholders through one contact-hour bimonthly interaction.
Financial Resource Mobilisation	• To generate at least 30% of annual recurrent expenditure by 2025 through: IPR operationalisation; entrepreneurial capacity development; attraction of donor funds for research projects; and private sector funds for consultancy services and public private partnerships.
Staff and Systems Performance Improvement	• To enhance corporate performance through staff sensitisation and motivation as well as ensuring a robust and effective monitoring and evaluation system.

STRATEGIC THRUST 1: PRIVATE SECTOR DRIVEN R&D AND TECHNOLOGICAL INNOVATION

The relevance of the CSIR is most effectively assessed by the extent to which its technologies resolve industry challenges and increase their contribution to national GDP. Technology development thus needs to be targeted to specific industry needs. The technological needs of industry will be identified in each of the seven thematic areas of the CSIR transformational agenda. Where the CSIR lacks the HR and technological capability to address these needs, highly qualified IT and Engineering staff will be recruited and research equipment relevant to the specialised areas acquired to facilitate delivery. Technical proposals for addressing the needs identified will be developed by inter-institutional multi-disciplinary research teams, and discussed with industry partners for validation. Research programmes would then be initiated based on the validated proposals and the results re-packaged in industry-friendly formats for discussion with industry partners. Science parks and Business Incubation Centers will be developed to share knowledge from research outcomes, test the technologies developed with the industry partners and promote innovations for commercial/industrial uptake. The research outputs will also be re-packaged in journal formats for publication in highly rated international journals.

STRATEGIC THRUST 2: CSIR RE-BRANDING & VISIBILITY IMPROVEMENT

A positive national and international visibility of the CSIR is critical to the image of the Council and the extent to which it attracts favourable responses to its legitimate entitlements, concerns and achievements, from its key stakeholders especially the promoters. This could be achieved through a number of initiatives. First the strengthening of PR Systems in all Institutes would be key in driving corporate visibility. Regular meetings would be conducted with stakeholders aligned to each thematic area, and a stakeholder management strategy implemented to address the interests of the various categories of CSIR stakeholders. Open days and exhibitions will be organised to showcase the achievements of the CSIR. Informative documentaries, brochures, flyers, newsletters, pamphlets, and other promotional materials would be developed and disseminated before, during and after these open days. Publication of feature articles and participation in radio, TV and other media talk shows would be undertaken to contribute significantly to increasing the media exposure of CSIR. The organisation of a CSIR Scientific Awards Night each fifth year and Awards Night every two years to reward staff, customers, partners, donors etc., as well as the institutionalisation and operationalisation of an annual R&D

Policy lectures to educate public on R&D issues would further enhance the CSIR's visibility. Other key initiatives that would be undertaken to help increase corporate visibility are:

- Organisation of inter-institutional social activities.
- Organising- in partnership with stakeholders - grand events on African Scientific Renaissance Day to promote the importance of science and technology in nation development.
- Improving the quality of the content of the Website of CSIR to increase the external links that the CSIR web domain receives from third parties, as well as improving activity, openness and excellence on the website.

STRATEGIC THRUST 3: FINANCIAL RESOURCE MOBILISATION AND MANAGEMENT.

The heartbeat of any organisation is the financial resources it has at its disposal to procure the factors of production needed to implement programmes aimed at achieving its organisational goals. Various strategies would be put in place to ensure that funds are continually mobilised to drive the agenda of the CSIR. There would be established, research proposal development and fund raising teams, that would develop and submit winning proposals to donors for funding. A programme would be put in place for identifying and bidding for relevant consultancy assignments, whilst government is aggressively lobbied to give to CSIR at least 20% of government jobs related to STI. Commercialisation of CSIR technologies would be improved by strengthening current IPR, PR and marketing functions of the Council to effectively deliver and aggressively promote uptake of technologies & services. Practical steps would be pursued to patent/copyright all marketable technologies developed within the CSIR. The establishment of strong beneficial business relationships/partnerships with industry will be pursued as a means of greatly enhancing the commercialisation of research outputs. The target would be to attract the interest of at least 14 private sector actors to partner CSIR to commercialise copyrighted/patented technologies each year (two per each thematic area). The high level of technical competency of CSIR Staff will be complemented with entrepreneurial skills in order to leverage the performance of the Council in a holistic manner. The entrepreneurial capacity development needs for different categories of staff (eg. Top and middle level management, Senior Members, Senior Staff and Junior Staff) would be continually identified and addressed. Potential sources of entrepreneurial capacity development would be identified and actively engaged and assessed for cost and content of training vis-a-vis CSIR needs. It is hoped that these entrepreneurial capacity development efforts would translate into financial benefits for the CSIR. Other avenues to be explored in mobilising funds for the CSIR would include:

- Development and submission of technical and financial proposals to industry for funding to address identified industrial needs.
- Aggressive and competitive marketing and sale of Research By-Products, not yet taken up in PPPs.
- Organisation of a donors' forum to solicit funds into a CSIR Endowment fund for R&D.
- Active engagement with government to add on and operationalise the S&T Fund.

STRATEGIC THRUST 4: STAFF AND SYSTEMS PERFORMANCE IMPROVEMENT

The human resource of any organisation is the most important of all the resources needed to drive the attainment of organisational goals. Similarly effective performance of staff and systems is key to continual improvement in any organisation; and a strong, well-resourced M&E system ensures effective tracking of the performance of the whole organisation, and the institution of timely corrective measures that enhance achievement of results. An annual situational analysis (HR Climate survey) would help identify the causes of poor attitudes and the lack of motivation amongst CSIR Staff, as identified in the SWOT analysis. A conscious effort would be made to re-orient staff to the vision and mission of CSIR and all staff effectively engaged in the implementation of the new strategic plan. All existing staff incentive, loan and award schemes would be audited to identify shortfalls, as well as improve and enhance effective operationalisation as a way of making them more attractive to staff and management. Conscious effort would be made to develop and implement a system for seeking opinions on issues before decision making and for ensuring effective communication and feedback at all levels. Promotions and professional development are very dear to the heart of all staff. Efforts would thus be made to meet staff at the beginning of their promotion cycle and develop a programme (with annual targets) for monitoring staff progress annually to ensure purposeful progress on the plan that has been developed. This is to ensure that promotion criteria are met when due, and at least 80% of staff get promoted at the due time. Professional development needs of staff, and professional development opportunities would also be identified, and fed into the development and implementation of training programmes aimed at ensuring that at least 80% of staff benefit from at least one professional development support for each promotion cycle. The M&E System within the

CSIR would be strengthened and resourced to tract performance and advice management on necessary actions to take. All current reporting systems for all result-oriented activities within the CSIR would be audited and improved upon to provide a comprehensive, robust and effective M&E system for the CSIR. The system would then be used to objectively track, measure and evaluate the performance of all systems, staff and activities of the CSIR within and beyond the context of this strategic plan.

STAKEHOLDER MANAGEMENT PLAN

As indicated in the Strategic Thrust 2, the effective management of stakeholders is one of the most important ways to increase corporate visibility. It must be noted that it is the stakeholders who would market the CSIR and the way they are managed would determine how well they market the Council. The stakeholder analysis has categorised the stakeholders into four major groups – Promoters, Latents, Defenders and Apathetics - with very specific interests and power levels that are adequately defined. Promoters would be closely engaged, consulted and influenced actively. They would be involved in governance and decision-making bodies of the Council; their interest areas would be monitored closely and addressed on a timely basis, in order to effectively leverage the strategic objectives, goal and vision of CSIR. The interests of the Latents would be critically examined and reasonably satisfied, to make them passionate enough about the CSIR Goal and Vision to promote it. They would be informed, engaged and consulted on interest areas as specified in the stakeholder analysis, whilst being consciously influenced to become promoters. Defenders would also be informed adequately and consulted effectively on interest areas. They would be involved in low risk areas, inspired to consciously and actively participate in, and support CSIR activities in the quest to making them effective goodwill ambassadors and supporters of the CSIR Goal and Vision. Apathetics would be monitored regularly to identify other interest areas that can more effectively align them to the CSIR vision. They would be mostly informed via general communication, newsletter, website and mail shots; and consciously influenced to become effective defenders of the CSIR Goal and Vision.

CHAPTER 4:   STRATEGIC ACTIONS

Table 8.   Action Plan for Strategic Thrust 1:   Private Sector Driven R&D and Technological Innovation

Objective:	To develop and transfer at least three industry-driven technologies (of relevance to the local economy) per Institute per year, leading to the publication of at least three scientific papers per Institute per year in a recognised journal.						
Outputs	**Actions**	**Time Frame (Year)**					**Lead Responsibility**
		1	**2**	**3**	**4**	**5**	
Output 1.1 **At least 39 technical proposals approved by industry to address 39 identified industrial needs, each year.**	*Activity 1.1.1* Identify annually industry needs in each of the seven thematic areas of the CSIR transformational agenda.	▬	▬	▬	▬	▬	**Deputy Director-General in collaboration with Directors of the Lead Institutes:** **ARI** – Biomedical & Public Health **BRRI** – Materials Science & Manufacturing, **CRI** – Food Security & Poverty Reduction, **FORIG** – Climate Change, Environmental Management & Green Technology, **IIR** – Energy & Petroleum, **INSTI** – Electronics & ICT, **STEPRI** – Science & People.
	Activity 1.1.2 Constitute inter-institutional multi-disciplinary research teams in each of the thematic areas to develop technical proposals for addressing needs identified.	▬	▬	▬	▬	▬	
	Activity 1.2.3 Submit technical proposals to industry partners - for addressing the needs identified.	▬	▬	▬	▬	▬	
Output 1.2 **At least 39 industry driven technologies – 3 per each Institute - developed for testing and validation, each year.**	*Activity 1.2.1* Initiate research programmes in each of the seven thematic areas of the CSIR Transformational Agenda to develop technologies to address the needs identified and approved by industry.	▬					**Deputy Director-General in collaboration with Directors of all the CSIR Institutes** (ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)
	Activity 1.2.2 Re-package research results in industry-friendly formats.		▬	▬	▬	▬	
Output 1.3 **At least 39 industry driven technologies validated and adopted by industry, each year- 3 per each Institute.**	*Activity 1.3.1* Develop science parks to share knowledge from research outcomes, and promote innovations for commercial/industrial uptake		▬	▬	▬	▬	**Deputy Director-General in collaboration with Directors of all the CSIR Institutes** (ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)
	Activity 1.3.2 Develop Business Incubation Centres that would facilitate the adoption of technologies developed.		▬	▬	▬	▬	
	Activity 1.3.3						

	Test the technologies developed with the industry partners.			▬▬▬	
Output 1.4 **At least 39 scientific papers published in internationally recognised journals, each year- 3 per each Institute.**	*Activity 1.4.1* Repackage research outputs in journal formats Activity 1.4.2 Publish papers in highly rated international journals.		▬▬▬▬▬ ▬▬▬		**Deputy Director-General in collaboration with Directors of all the CSIR Institutes** (ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)
Output 1.5 **Technology development capacity strengthened in at least 5 relevant specialised areas (eg. Robotics, ICT, nanotechnology, Biomedical and Public Health)**	*Activity 1.5.1* Recruit highly qualified IT, Engineering and Biomedical staff *Activity 1.5.2* Acquire research equipment relevant to the specialised areas. *Activity 1.5.3* Assign specific responsibility with performance targets and timelines to recruited staff.	▬▬ ▬▬▬ ▬▬▬			**Deputy Director-General in collaboration with the Director of Administration and Directors of the respective Lead Institutes** **ARI –** Biomedical & Public Health **BRRI –** Materials Science & Manufacturing, **IIR –** Energy & Petroleum, **INSTI** – Electronics & ICT,

Table 9.   Action Plan for Strategic Thrust 2:   CSIR Re-Branding and Visibility Improvement

| Objective: | To ensure that the CSIR is positively visible and enjoys significant goodwill from all its identified stakeholders through effective management of its relationship with them. | | | | | | |

Outputs	Actions	Time Frame (Year)					Responsibility
		1	**2**	**3**	**4**	**5**	
Output 2.1 **PPP arrangements established with at least 26 private sector actors – 2 per each Institute – each year.**	*Activity 2.1.1* Develop Guidelines for a Public-Private Sector Partnership Agenda and Strengthen PR Systems in all Institutes, *Activity 2.1.2* Operationalise a Public-Private Sector Partnership Agenda to effectively engage with industry and other relevant government ministries on a regular basis. *Activity 2.1.3* Conduct meetings regularly with stakeholders aligned to each thematic area	▬▬▬▬▬▬▬	▬▬▬▬▬▬▬	▬▬▬▬▬▬▬	▬▬▬▬▬▬▬	▬▬▬▬	**Director of Administration in collaboration with the Legal Officer, Director of Audit, Director of Finance, PRO and the Directors of all the CSIR Institutes** (ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)
Output 2.2 **Increased Stakeholder Engagement and Media Exposure.**	*Activity 2.2.1* Implement a stakeholder management strategy that addresses the interests of the various categories of CSIR Stakeholders. (See Stakeholder Management Plan) *Activity 2.2.2* Develop and disseminate informative documentaries, brochures, flyers, newsletters, pamphlets, and, other promotional materials. *Activity 2.2.3* Participation in Radio and TV talk shows and publication of feature articles.	▬▬▬▬▬▬	▬▬▬▬▬▬	▬▬▬▬▬▬	▬▬▬▬▬▬	▬▬	**Director of Administration in collaboration with the PRO and Directors all the CSIR Institutes** (ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)
Output 2.3 **At least three Public Events organised annually.**	*Activity 2.3.1* Organise Awards Night each year to reward staff, customers, partners, donors, etc. *Activity 2.3.2* Institute and operationalise Annual R&D Policy lectures to educate public on R&D issues.	▬▬▬▬▬	▬▬▬▬▬	▬▬▬▬▬	▬▬▬▬▬	▬	**Director of Administration in collaboration with the Director of Finance, Director of Audit, PRO and the Directors of all the CSIR Institutes**

			(ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)
	Activity 2.3.3 Organise one inter-institutional social activity each year.		
	Activity 2.3.4 Organise in partnership with stakeholders an open day and exhibition on African Renaissance Day to promote importance of science and technology in nation development.		
Output 2.4 **Webometrics ranking of CSIR improved from 6368 to at least 500 in five years.**	*Activity 2.4.1* Enhance visibility by improving content quality of the CSIR Website to increase the external links that the CSIR web domain receives from third parties. *Activity 2.4.2* Improve Website activity by increasing total number of webpages hosted in the main web domain (including all the subdomains and directories) *Activity 2.4.3* Improve Openness by increasing the number of rich files (pdf, doc, docx, ppt) published in dedicated websites *Activity 2.4.4* Improve excellence by increasing the number of academic papers published in high impact international journals.		**Deputy Director-General in collaboration with the Director of Administration, Director of Finance, Director of Audit, and the Directors of all the CSIR Institutes** (ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)

Table 10.   Action Plan for Strategic Thrust 3:   Financial Resource Mobilisation.

Objective:	To generate at least 30% of annual recurrent expenditure by 2022 through: attraction of funding for at least one project per team of 5 Research Scientists per Year; Bidding for at least one consultancy service per year per Institute; and attraction of at least one private sector funding per Institute for the development of one technology each that addresses a specific private sector need.						

Outputs	Actions	Time Frame (Year)					Responsibility
		1	**2**	**3**	**4**	**5**	
Output 3.1 **Attraction of funds through submission of winning proposals, bidding for consultancies, sale of research by-products and technology development for industry.**	*Activity 3.1.1* Develop and submit winning proposals to donors for funding.	━━━	━━━	━━━	━━━	━━━	**Deputy Director-General in collaboration with the Director of Finance, Director of Audit and Directors of all the CSIR Institutes**
	Activity 3.1.2 Identify and bid for relevant consultancy services; whilst lobbying government to get at least 20% of government jobs related to STI.	━━━	━━━	━━━	━━━	━━━	**(ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)**
	Activity 3.1.3 Develop and submit technical and financial proposals to industry for funding to address identified industrial needs.	━━━	━━━	━━━	━━━	━━━	
	Activity 3.1.4 Develop and implement a marketing plan for the most marketable research by-products.	━━━	━━━	━━━	━━━	━━━	
	Activity 3.1.5 Establish a competitive system for pricing products and services as well as budgeting for projects and consultancies.	━━━	━━━	━━━	━━━	━━━	
Output 3.2 **Funds attracted into CSIR Endowment Fund for R&D; and the STI Fund.**	*Activity 3.2.1* Organise a donors; forum to solicit funds into the Endowment Fund,	▬	▬	▬	▬	▬	**Director-General in collaboration with the Director of Administration, Director of Finance and Director of Audit**
	Activity 3.2.2 Actively engage with government to add on and operationalise the S&T Fund.	━━━	━━━	━━━	━━━	━━━	
Output 3.3	*Activity 3.3.1*						**Deputy Director-General in collaboration with Director of**

| IPR Policy operationalised for effective commercialisation. | Audit current IPR, PR and marketing functions and strengthen them to effectively deliver and aggressively promote uptake of technologies & services.

Activity 3.3.2
Establish strong beneficial business relationships/partnerships with industry to commercialise copyrighted/patented technologies.

Activity 3.3.3
Continually audit the technological environment to identify technologies that can beat competition and pursue practical steps to patent these technologies. | | **Administration, Director of Finance, Director of Audit and Directors of all the CSIR Institutes**

(ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI) |
| *Output 3.4*
At least 75% of all categories of staff trained in relevant entrepreneurial activities. | *Activity 3.4.1*
Continually identify entrepreneurial capacity development needs of different categories of staff (Management, Senior Members, Senior Staff and Junior Staff).

Activity 3.4.2
Identify and actively engage potential sources for entrepreneurial capacity development, and assess cost and content of training vis-a-vis CSIR needs.

Activity 3.4.3
Develop and implement an entrepreneurial skills training programme for different categories of staff (to include identification of business opportunities, customer relationships, costing and pricing of products, services, consultancies, projects, etc.) | | **Deputy Director-General in collaboration with Director of Administration, Director of Finance, Director of Audit and Directors of all the CSIR Institutes**

(ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI) |

Table 11.   Action plan for Strategic Thrust 4:   Staff and Systems Performance Improvement

Objective:	To develop a workforce that is passionate, results-oriented, positive- and ethically-minded enough to pursue the CSIR vision.						
Outputs	**Actions**	**Time Frame (Year)**					**Responsibility**
		1	**2**	**3**	**4**	**5**	
Output 4.1 **Improved staff motivation and performance.**	*Activity 4.1.1* Conduct annual situational analysis (HR Climate survey) to identify causes of poor attitudes and the lack of motivation amongst CSIR Staff and address them.	▬▬					**Director of Administration in collaboration with Director of Finance, Director of Audit and Directors of all the CSIR Institutes** **(ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)**
	Activity 4.1.2 Audit existing staff incentive, loan and Award Schemes to identify shortfalls, improve and enhance effective operationalisation.	▬▬					
	Activity 4.1.3 Develop and implement a system for seeking opinions on issues before decision making and ensuring effective communication and feedback at all levels.	▬▬					
	Activity 4.1.4 Meet staff at the beginning of their promotion cycle and develop and monitor a programme (with annual targets) for ensuring promotion criteria are met when due.	▬▬▬▬▬▬▬▬▬▬					
	Activity 4.1.5 Identify professional development needs of staff and develop and implement training programmes to address them.	▬▬▬▬▬▬▬▬▬▬					
Output 4.2 **Improved Systems performance management.**	*Activity 4.2.1* Audit and capacitate an effective Monitoring and Evaluation Unit within the CSIR.	▬▬					**Deputy Director-General in collaboration with Director of Administration, Director of Finance, Director of Audit and Directors of all the CSIR Institutes**

	Activity 4.2.2 Audit current reporting systems for all result-oriented activities within the CSIR and improve upon them for robustness and effectiveness.							(ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)
	Activity 4.2.3 Implement a robust monitoring and evaluation system for all result-oriented activities within the CSIR							

Stakeholder Management Plan:

Overall Objective: To improve CSIR visibility by ensuring that all identified stakeholders have at least one specific interest addressed (as per Output 2.3)

Responsibility: Director-General in collaboration with Director of Administration, Director of Finance, Director of Audit, PRO and Directors of all CSIR Institutes

Table 12.   Action Plan for Stakeholder Management Plan

Output	Activities	Timeframe (Year)					Targeted Stakeholders
		1	2	3	4	5	
SM.1 **Strategic Objectives and CSIR Goal and Vision effectively leveraged by promoters.**	***Activity SM.1.1*** Engage closely, consult and influence actively.	██	██	██	██	██	• Donor Organisations and Agencies • Government of Ghana (MMDAs) • Institute Management Boards • CSIR Council • Industrialists and the Private Sector
	Activity SM.1.2 Involve in governance and decision making bodies.	██	██	██	██	██	
	Activity SM. 1.3 Monitor interest areas closely and address them on a timely basis.	██	██	██	██	██	
SM.2 **Interest levels of Latents increased to become effective promoters of the CSIR Goal and Vision**	***Activity SM.2.1*** Identify and satisfy their interests, to make them more passionate about the CSIR Goal and Vision.	██	██	██			• Local and International Media • General Public
	Activity SM.2.2 Inform, engage and consult on interest areas as specified in the stakeholder analysis.	██	██	██			
	Activity SM.2.3 Consciously influence Latents to become Promoters	██	██	██			
SM.3 **Defenders become effective goodwill ambassadors and supporters of the CSIR Goal and Vision.**	***Activity SM.3.1*** Inform adequately and consult effectively on interest area.	██	██	██			• International Organisations (non-donors) • Educational Institutions • NGOs • Scientific Community • Farmers • CSIR staff
	Activity SM.3.2 Make use of interests through involvement in low risk areas.	██	██	██			
	Activity SM.3.3 Inspire Defenders to consciously and actively support CSIR activities.	██	██	██			
SM.4	***Activity SM.4.1***						

Interest level of the Apathetics increased to become effective Defenders of the CSIR Goal and Vision.	Monitor Regularly to identify other interest areas that can be more effectively aligned to the CSIR vision.						• Banks and Financial Institutions • Importers and Suppliers of Scientific equipment and supplies.
	Activity SM.4.2 Inform via general communication, newsletter, website and mail shots.						
	Activity SM.4.3 Consciously influence Apathetics to become Defenders.						

CHAPTER 5   MONITORING AND EVALUATION FRAMEWORK

5.1   OUTPUT INDICATORS, MEANS OF VERIFICATION AND DUE DATES.

Table 13.	Monitoring Framework for Strategic Thrust 1: Private Sector Driven R&D Driven Technological Innovation		
Outputs	**Indicators**	**Means of Verification**	**Due Date**
Output 1.1 **At least 39 technical proposals approved annually by industry to address 39 identified industrial needs.**	•Number of identified industrial needs.	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	June 30 & Dec. 31 of each year
	•Number of technical proposals approved by industry.	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	June 30 & Dec. 31 of each year
Output 1.2 **At least 39 industry driven technologies – 3 per each Institute per year - developed for testing and validation.**	•Number of industry driven technologies developed	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	June 30 & Dec. 31 of each year
Output 1.3 **At least 39 industry driven technologies validated and adopted by industry.**	•Number of industry driven technologies validated and adopted by industry.	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	June 30 & Dec. 31 of each year
Output 1.4 **At least 39 scientific papers published in internationally recognised journals.**	•Number of scientific papers published in internationally recognised journals.	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	June 30 & Dec. 31 of each year
Output 1.5 **Strengthening technology development capacity in relevant specialised areas (eg. Robotics, ICT, nanotechnology, Biomedical and Public Health)**	•Number of staff trained in relevant specialised areas (4 Scientists & 3 Technicians) for each specialized area	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	June 30 & Dec. 31 of each year
	•Number of specified specialised areas covered	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	Dec 31. 2020

Table 14.   Monitoring Framework for Strategic Thrust 2: CSIR Re-Branding and Visibility Improvement

Outputs	Indicators	Means of Verification	Due Date
Output 2.1 **PPP arrangements established with at least 26 private sector actors – 2 per each Institute – each year.**	Document detailing Guidelines for a PPP agenda.	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	Dec 31. 2021.
	Number of private sector actors with whom PPP arrangements have been established.	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	June 30 & Dec. 31 of each year
	Number of identified stakeholders whose interests have been addressed. (1 per category per year)	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	June 30 & Dec. 31 of each year
Output 2.2 **Increased Stakeholder Engagement and Media Exposure.**	Number of stakeholder interests addressed	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	June 30 & Dec. 31 of each year
	Number of informative promotional materials distributed to stakeholders.	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	June 30 & Dec. 31 of each year
	Number of stakeholders receiving promotional materials. (at least 5 per each stakeholder category) Number of TV/radio talk show programmes participated in. Number of feature articles published.	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	June 30 & Dec. 31 of each year
Output 2.3 **At least three Public Events organised annually**	Number of public events organised annually.	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	Dec. 31 of each year
Output 2.4 **Webometrics ranking of CSIR improved from 6368 to at least 500 in five years.**	CSIR ranking on webometrics improved from 6368 to at least 500 in five years.	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	June 30 & Dec. 31 of each year

Table 15.	Monitoring Framework For Strategic Thrust 3: Financial Resource Mobilisation		
Outputs	**Indicators**	**Means of Verification**	**Due Date**
Output 3.1 **Attraction of funds through submission of winning proposals, bidding for consultancies, sale of research by-products and technology development for industry.**	Amount attracted through funding of winning proposals by donor community	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	June 30 & Dec. 31 of each year
	Amount attracted through the provision of consultancy services.	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	June 30 & Dec. 31 of each year
	Amount attracted through development of technologies for solving industry problems	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	June 30 & Dec. 31 of each year
	Amount generated through the sale of Research By-Products.	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	June 30 & Dec. 31 of each year
Output 3.2 **Funds attracted into CSIR Endowment Fund for R&D; and the STI Fund.**	Amount attracted into CSIR Endowment fund	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	Dec 31 of each year
	Amount added to the S&T fund	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	Dec 31 of each year
Output 3.3 **IPR Policy operationalised for effective commercialisation.**	Document re-defining staffing, responsibilities, powers and allocated resources for IPR, PR and marketing functions	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	Dec 31 of 2021
	Number of CSIR technologies patented/copyrighted each year – (two per Institute)	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	June 30 & Dec. 31 of each year
	Number of private sector actors partnering CSIR to commercialise copyrighted/patented technologies	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	June 30 & Dec. 31 of each year
Output 3.4 **At least 75% of all categories of staff trained in relevant entrepreneurial activities.**	Number and category of staff trained in relevant entrepreneurial activities	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	Dec 31 of each year

Table 16.	Monitoring Framework For Strategic Thrust 4: Staff and Systems Performance Improvement		
Outputs	**Indicators**	**Means of Verification**	**Due Date**
Output 4.1 **Improved staff motivation and performance.**	Number of causes of poor attitudes and lack of motivation identified.	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	Dec 31 of each year
	Number of causes of poor attitudes and lack of motivation addressed and reviewed annually.	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	Dec 31 of each year
	Number of Staff benefitting from more attractive Incentive, loan and award schemes.	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	June 30 & Dec. 31 of each year
	Number of staff opinions taken into consideration in decision making processes.	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	June 30 & Dec. 31 of each year
	Number of staff promoted at the due time. Number of staff benefit from one professional development support for each promotion cycle.	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	June 30 & Dec. 31 of each year
Output 4.2 **Improved Systems performance management.**	Copy of document re-defining staffing, responsibilities, powers and allocated resources, for the established M&E Function.	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	Dec 31. 2021.
	Copy of comprehensive, robust and effective M&E system developed for CSIR.	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	Dec 31. 2021.
	Annual performance assessment reports on CSIR systems, staff and activities (one for each area)	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	Dec 31. 2021.

Table 17.	Monitoring Framework For Stakeholder Management Outputs		
Outputs	**Indicators**	**Means of Verification**	**Due Date**
SM 1			
Strategic Objectives and CSIR Goal and Vision effectively leveraged by Promoters.	• Number of Promoters involved in decision making bodies of CSIR (5 per category)	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	June 30 & Dec 31 of each year
	• Number of impact activities creditable to Promoters' lobbying or funding support activities or promoting access to opportunity. (2 per category)	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	June 30 & Dec 31 of each year.
SM 2.			
Interest levels of Latents increased to become effective promoters of the CSIR Goal and Vision	• Number of Latents becoming effective promoters of the CSIR Goal and Vision (2 per category)	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	June 30 & Dec 31 of each year.
SM 3			
Defenders become effective goodwill ambassadors and supporters of the CSIR Goal and Vision.	• Number of Defenders become effective goodwill ambassadors and supporters of the CSIR Goal and Vision. (2 per category)	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	June 30 & Dec 31 of each year.
SM 4			
Interest level of the Apathetics increased to become effective Defenders of the CSIR Goal and Vision.	• Number of the Apathetics becoming effective Defenders of the CSIR Goal and Vision. (2 per category)	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	June 30 & Dec 31 of each year.

5.2 TARGETS FOR PERFORMANCE INDICATORS

Table 18.   Targets for Strategic Thrust 1 Indicators

INDICATOR	TARGETS	
	5-Years	Yearly
Indicator 1.1		
Number of identified industrial needs.	195	39
Number of technical proposals approved by industry.	195	39
Indicator 1.2		
Number of industry driven technologies developed	195	39
Indicator 1.3		
Number of industry driven technologies validated and adopted by industry.	195	39
Indicator 1.4		
Number of scientific papers published in internationally recognised journals.	195	39
Indicator 1.5		
Number of staff trained in relevant specialised areas (4 Scientists & 3 Technicians = 7)	35	35
Number of specified specialised areas covered	5	5

Table 19.   Targets for Strategic Thrust 2 Indicators

INDICATOR	TARGET	
	5-Year	1-Year
Indicator 2.1		
Document detailing Guidelines for a PPP agenda.	1	1
Indicator 2.2		
Number of private sector actors with whom PPP arrangements have been established.	130	26
Indicator 2.3		
Number of identified stakeholders whose interests have been addressed. (1 per category per year)	75	15
Number of stakeholder interests addressed	52	52
Indicator 2.4		
Number of informative promotional materials distributed to stakeholders.	140	28
Number of stakeholders receiving promotional materials. (at least 5 per each stakeholder category)	375	75
Indicator 2.5		
Number of TV/radio talk show programmes participated in.	140	28

Number of feature articles published.	280	56
Indicator 2.6		
Number of public events organised annually.	15	3
Indicator 2.7		
CSIR ranking on webometrics improved from 6368 to at least 500 in five years.	500	4800

Table 20.   Targets for Strategic Thrust 3 Indicators

Strategic Thrust 3: Financial Resource Mobilisation		
INDICATOR	**TARGETS**	
	5-Year	**Yearly**
Indicator 3.1		
Amount attracted through funding of winning proposals by donor community	$ 306.37 m	See Appendix 3a
Indicator 3.2		
Amount attracted through the provision of consultancy services.	GHC 150.10 m	See Appendix 3b
Indicator 3.3		
Amount attracted through development of technologies for solving industry problems	GHC 165.00 m	See Appendix 3b
Indicator 3.4		
Amount generated through the sale of Research By-Products.	GHC 97.50 m	See Appendix 3b
Indicator 3.5		
Amount attracted into CSIR Endowment fund	$ 20m	$4m
Indicator 3.6		
Amount added to the S&T fund	GHC 250 m	GHC50 m
Indicator 3.7		
Document re-defining staffing, responsibilities, powers and allocated resources for IPR, PR and marketing functions	1	1
Indicator 3.8		
Number of CSIR technologies patented/copyrighted each ye ar – (two per Institute)	130	26
Indicator 3.9		
Number of private sector actors partnering CSIR to commercialise copyrighted/patented technologies	130	26
Indicator 3.10		
Number and category of staff trained in relevant entrepreneurial activities		
Top and middle level management	95	19
Senior Members	375	75
Senior Staff	900	180
Junior Staff	1305	261

Table 21.   Targets for Strategic Thrust 4 Indicators

Strategic Thrust 4: Staff and Systems Performance Improvement		
INDICATORS	**TARGETS**	
	5-Year	**1-Year**
Indicator 4.1		
Number of causes of poor attitudes and lack of motivation identified.	10	10
Number of causes of poor attitudes and lack of motivation addressed and reviewed annually.	10	10
Indicator 4.2		
Number of Staff benefitting from more attractive Incentive, loan and award schemes.	1780	356
Indicator 4.3		
Number of staff opinions taken into consideration in decision making processes.	2850	570
Indicator 4.4		
Number of staff promoted at the due time.	2850	570
Indicator 4.5		
Number of staff benefit from one professional development support for each promotion cycle.	2850	570
Indicator 4.6		
Copy of document re-defining staffing, responsibilities, powers and allocated resources, for the established M&E Function.	1	1
Indicator 4.7		
Copy of comprehensive, robust and effective M&E system developed for CSIR.	1	1
Indicator 4.8		
Annual performance assessment reports on CSIR systems, staff and activities (one for each area)	15	3

Table 22.   Targets for Stakeholder Management Indicators

INDICATOR	TARGET	
	5-Year	**1-Year**
Indicator SM.1		
Number of Promoters involved in decision making bodies of CSIR (5 per category)	125	25
Number of impact activities creditable to Promoters' lobbying or funding support activities or promoting access to opportunity. (2 per category)	50	10
Indicator SM.2		
Number of Latents becoming effective Promoters of the CSIR Goal and Vision (2 per category)	20	4
Indicator SM.3		
Number of Defenders become effective goodwill ambassadors and supporters of the CSIR Goal and Vision. (2 per category)	60	12
Indicator SM.4		
Number of the Apathetics becoming effective Defenders of the CSIR Goal and Vision. (2 per category)	20	4

CHAPTER 6   INDICATIVE BUDGET

OVERALL ANNUAL INDICATIVE BUDGET SUMMARY PER INSTITUTE

OBJECTIVE	TOTAL COST FOR SPECIFIED OUTPUT (GHS)					TOTAL COST (GHS)FOR SPECIFIED OBJECTIVE
	OUTPUT 1	OUTPUT 2	OUTPUT 3	OUTPUT 4	OUTPUT 5	
Objective 1	14,822.64	335,011.68	68,084.64	54,505.44	11,561.76	483,986.16
Objective 2	61,538.40	121,731.84	64,276.32	103,380.48	-	350,927.04
Objective 3	214,024.32	65,698.56	122,037.12	44,288.64	-	446,048.64
Objective 4	111,873.60	95,545.44	-	-	-	207,419.04
Stakeholder Management	81,161.28	48,898.08	43,241.28	48,898.08	-	222,198.72
GRAND TOTAL BUDGET						1,710,579.60

OVERALL ANNUAL INDICATIVE BUDGET SUMMARY – OVERALL

OBJECTIVE	TOTAL COST FOR SPECIFIED OUTPUT (GHS)					TOTAL COST (GHS) FOR SPECIFIED OBJECTIVE
	OUTPUT 1	OUTPUT 2	OUTPUT 3	OUTPUT 4	OUTPUT 5	
Objective 1	192,694.32	4,355,151.84	885,100.32	708,570.72	150,302.88	6,291,820.08
Objective 2	799,999.20	1,582,513.92	835,592.16	1,343,946.24	-	4,562,051.52
Objective 3	2,782,316.16	854,081.28	1,586,482.56	575,752.32	-	5,798,632.32
Objective 4	1,454,356.80	1,242,090.72	-	-	-	2,696,447.52
Stakeholder Management	1,055,096.64	635,675.04	562,136.64	635,675.04	-	2,888,583.36
GRAND TOTAL BUDGET						22,237,534.80

CHAPTER 7   IMPLEMENTATION PLAN

Management and Leadership
- A 7-Member Strategic Plan Implementation and Coordination Committee (SPICC) shall be established under Corporate CSIR to manage and drive the implementation of all aspects of the Strategic Plan across all the Institutes of the CSIR including the Head Office.
- The SPICC shall be chaired by the Deputy Director General (DDG), and comprise amongst others, the Head of M&E, The Quality Control Manager, and Four other persons to be appointed by the DG, one of whom shall serve as the Secretary to the Committee.
- The Committee shall be directly responsible to the DG.
- A 7-member Institute Strategic Plan Implementation Committees (ISPIC) shall also be established at all the 13 Institutes and the Head Office, to drive the internal implementation of Institute Strategic Plans.
- The ISPIC shall be chaired by the Deputy Directors of the various Institutes (or for the Head Office, the 2nd in command to the Director of Administration), and comprise amongst others The M&E Officer, The Scientific Secretary and Four other persons to be appointed by the Directors of the Institutes (Director of Admin for the Head Office).
- The ISPIC shall be directly responsible to the Directors of the Various Institutes, through whom they shall report to the SPICC.
- A 5-member Strategic Plan Auditing Team (SPAT) shall be established to monitor the levels of compliance by SPICC and ISPICs.
- The SPAT shall be chaired by The Director of Audit and shall comprise amongst others The Legal Officer, and three other persons to be appointed by the DG – one of whom shall serve as the Secretary to the Team.
- Both the SPICC and the ISPIC shall meet Quarterly to review progress on the implementation of the strategic plan and report appropriately. The SPICC meetings should be held one clear month before DMC Meetings to facilitate early reporting to DG and discussion of implementation progress at DMC.
- Within the first quarter of its formation, The SPICC must develop:
    - A budget for its operations for approval by the DG.
    - A timetable for the submission of its reports to the DG
    - Appropriate reporting forms for reporting from:
        - Responsible Officers to ISPIC
        - ISPICs to SPICC
        - SPICC to DG
- The reporting forms should be designed to capture information that identifies or enables deduction of:
    - Activities not undertaken
    - Variance between Targets and Actual Performance
    - Overall Performance at Output Levels, Objective Levels, and Institute Levels.
    - Causes of variances observed
    - Planned Mitigative Measures to minimize non-performance.

Implementation Process
- There shall be an official launch of the Strategic Plan and an official inauguration of the SPICC, ISPICSs and SPAT at a common function within January 2021.
- The first year of the strategic plan implementation would follow the generic workplan outlined in the Plan. Two months before the start of implementation, the SPICC and ISPICs shall tease these out and develop it into an annual workplan which shall include a monitoring plan for the first strategic year; and serve as the working document for the year.
- A Strategic Plan Inception Meeting shall be held two weeks within the first strategic year, for key stakeholders of the strategic plan – both at the Corporate and Institute levels - where the first year's annual workplan shall be presented.

- Two months to the start of each strategic year the SPICC and the ISPIC shall review progress of implementation over the previous year and develop an annual workplan (which shall include a monitoring Plan) for the next year taking into account observations made on the previous year's review and using it to appropriately modify the generic workplan in the Strategic Plans.
- A presentation of the Previous Year's performance and the Annual workplan for the next year shall be made to the key stakeholders of the strategic plan – both at the Corporate and Institutes levels – within two weeks of the start of each strategic year.
- The SPICC shall send reminders to the Directors of Institutes and copy Chairmen of ISPICs two weeks before the start of various activities, as well as two weeks before the due date for reporting on the activity.
- The ISPIC shall send reminders to Officers responsible for various activities two weeks before the start of the Activity; as well as two weeks before the due reporting date for the Activity.
- Two weeks after the due reporting date, further reminders shall be sent if reports have not been received.
- SPICC and all ISPICs must put the Chairman of SPAT in copy of all scheduled presentations, reminders, meeting notices, signed minutes of all meetings and correspondences in relation to report submissions to facilitate its auditing role.
- Based on the reports from ISPIC, and feedback from SPICC, Institute Directors shall:
  - Make a presentation to IMCs and Management Boards quarterly on the progress of implementation of the Strategic Plan
  - Provide Feedback to ISPIC on comments, suggestions and recommendations from IMC, Management Boards, and SPICC.
- Based on the reports from SPICC, the DG shall:
  - Make a presentation to DMC and Council quarterly on the progress of implementation of the Strategic Plan
  - Provide Feedback to SPICC on comments, suggestions and recommendations from DMC and Council, for onward transmission to Institutes.

Auditing of Strategic Plan Implementation System
- The SPAT shall be responsible for auditing the operations of the SPICC and ISPIC with particular reference to their level of compliance in:
  - Developing appropriate reporting forms that capture the critical information for monitoring performance
  - Organising their quarterly meetings
  - Sending reminders for Activity initiations and due dates for reporting
  - Organising Inception meetings and Yearly Presentations on Progress and Annual Workplans.
  - Timely submission of reports.
- The SPAT shall carry out its audit and report its findings to the DG within the first quarter of each strategic year.
- The report of the SPAT should cover very concisely, the targets for each of the above indicators, the level of compliance, the variance, overall percentage performance (ranking Institute ISPICs and SPICC), and recommendations for improvement.
- The SPAT shall develop an appropriate reporting form –within the first two weeks of its creation - to capture the above details and submit to the DG for approval.

APPENDICES

Indicator Tracking for Strategic Thrust 1: Private Sector Driven R&D and Technological Innovation												
Indicator	**Overall Target**	**Overall Due Date**	**Expected Targets for Each Specified Period**									
			2021		**2022**		**2023**		**2024**		**2025**	
			Jun	Dec	Jun	Dec	Jun	Dec	Jun	Dec	Jun	Dec
•**Number of identified industrial needs.**	One Hundred and ninety-five (195) technical proposals approved by industry	31st December 2025	39	-	39	-	39	-	39	-	39	-
•**Number of technical proposals approved by industry.**	One Hundred and ninety-five (195) industry needs identified	31st December 2025	26	13	26	13	26	13	26	13	26	13
•**Number of industry driven technologies developed**	One Hundred and ninety-five (195) industry technologies developed	31st December 2025	13	26	26	13	26	13	26	13	26	13
•**Number of industry driven technologies validated and adopted by industry.**	One Hundred and ninety-five (195) technologies validated and adopted by industry	31st December 2025	13	26	26	13	26	13	26	13	26	13
•**Number of scientific papers published in internationally recognised journals.**	One Hundred and ninety-five (195) scientific papers published	31st December 2025		39	26	13	26	13	26	13	26	13
•**Number of staff trained in relevant specialised areas (4 Scientists & 3 Technicians)**	Twenty (20) Scientists & fifteen (15) Technicians trained in specialised areas.	31st December 2021		35								
•**Number of specified specialised areas covered**	Seven (7) specific specialised disciplines covered	31st December 2021		5								

Indicator	Overall Target	Overall Due Date	2021		2022		2023		2024		2025	
Indicator Tracking for Strategic Thrust 2: CSIR Re-Branding and Visibility Improvement			**Expected Targets for Each Specified Period**									
			Jun	Dec	Jun	Dec	Jun	Dec	Jun	Dec	Jun	Dec
•Document detailing Guidelines for a PPP agenda.	One (1) report detailing the guidelines for the PPP agenda	31st December 2021		1								
•Number of private sector actors with whom PPP arrangements have been established.	One Hundred and thirty (130) PPP arrangements established	31st December 2025	13	13	13	13	13	13	13	13	13	13
•Number of identified stakeholders whose interests have been addressed. (1 per category per year)	Seventy-five (75) stakeholders identified with their interest addressed	31st December 2025		15		15		15		15		15
•Number of stakeholder interests addressed annually	Fifty-two (52) stakeholder interests addressed annually	31st December 2025		52		52		52		52		52
•Number of informative promotional materials distributed to stakeholders	One Hundred and Forty (140) informative promotional materials distributed to stakeholders	31st December 2025	14	14	14	14	14	14	14	14	14	14
•Number of stakeholders receiving promotional materials. (at least 5 per each stakeholder category)	Three Hundred and seventy-five (375) stakeholders given promotional materials	31st December 2025	38	37	38	37	38	37	38	37	38	37
•Number of TV/radio talk show programmes participated in.	One Hundred and Forty (140) TV/radio show programmes participated in	31st December 2025	14	14	14	14	14	14	14	14	14	14
•Number of feature articles published.	Two hundred and Eighty (280) articles published	31st December 2025	28	28	28	28	28	28	28	28	28	28
•Number of public events organised annually.	Fifteen (15) public events organised annually	31st December 2025		15		15		15		15		15
•CSIR ranking on webometrics improved from 6368 to at least 500 in five years.	Ranking on webometrics improved from 6368 to 500	31st December 2025		4800		3600		2400		1200		500

Indicator Tracking for Strategic Thrust 3: Financial Resource Mobilisation

Indicator	Overall Target	Overall Due Date	Expected Targets for Each Specified Period									
			2021		2022		2023		2024		2025	
			Jun	Dec	Jun	Dec	Jun	Dec	Jun	Dec	Jun	Dec
•Amount attracted through funding of winning proposals by donor community	Approx Three hundred and Six million US dollars ($306.37 m) attracted through winning proposals	31st December 2025		52.22		56.40		60.91		65.79		71.05
•Amount attracted through the provision of consultancy services.	Approx One hundred and Fifty million cedis (GHC 150.10 m) attracted through consultancy services	31st December 2025										
•Amount attracted through development of technologies for solving industry problems	Approx One hundred and Sixty-five (GHC 165.00m) attracted through development of technologies for solving industry problems	31st December 2025		44.10		58.17		76.73		101.21		133.49
Amount generated through the sale of Research By-Products.	Approx Ninety Seven million cedis (GHC 97.50 m) generated through the sale of Research By-Products	31st December 2025										
•Amount attracted into CSIR Endowment fund	Twenty million US dollars ($ 20m) attracted into CSIR Endowment fund	31st December 2025		$4m		$4m		$4m		$4m		$4m
•Amount added to the S&T fund annually	Fifty million cedis (GHC50m) added to S&T fund annually by government	31st December 2025		GHC50m		GHC50m		GHC50m		GHC50m		GHC50m
Document re-defining staffing, responsibilities, powers and allocated resources for IPR, PR and marketing functions	One (1) report defining staffing, responsibilities, powers and allocated resources for IPR, PR and marketing functions	31st December 2021		1								
Number of CSIR technologies patented/copyrighted	One Hundred and thirty (130) CSIR technologies patented/copyrighted	31st December 2025	13	13	13	13	13	13	13	13	13	13

each year – (two per Institute)													
•Number of private sector actors partnering CSIR to commercialise copyrighted/patented technologies	One hundred and thirty (130) private actors partnering CSIR to commercialise copyrighted/patented	31st December 2025	13	13	13	13	13	13	13	13	13	13
Number of Top and Middle level Management staff trained in relevant entrepreneurial activities	Ninety-five (95) Top and Middle level Management staff trained in relevant entrepreneurial activities	31st December 2025		19		19		19		19		19
Number of Senior Members trained in relevant entrepreneurial activities	Three Hundred and seventy-five (375) Senior Members trained in relevant entrepreneurial activities	31st December 2025		75		75		75		75		75
Number of Senior staff trained in relevant entrepreneurial activities	Nine Hundred (900) Senior staff trained in relevant entrepreneurial activities	31st December 2025		180		180		180		180		180
Number of Junior staff trained in relevant entrepreneurial activities	One thousand three hundred and five (1305) Junior staff trained in relevant entrepreneurial activities	31st December 2025		261		261		261		261		261

			Expected Targets for Each Specified Period									
Indicator Tracking for Strategic Thrust 4: Staff and Systems Performance Improvement													

			2021		2022		2023		2024		2025	
Indicator	**Overall Target**	**Overall Due Date**	Jun	Dec	Jun	Dec	Jun	Dec	Jun	Dec	Jun	Dec
•**Number of causes of poor attitudes and lack of motivation identified**	Ten (10) causes of poor attitudes and lack of motivation identified	31st December 2021		10								
•**Number of causes of poor attitudes and lack of motivation identified, addressed and reviewed annually.**	Ten (10) causes of poor attitudes and lack of motivation addressed and reviewed annually	31st December 2025		10		10		10		10		10
•**Number of Staff benefitting from more attractive Incentive, loan and award schemes.**	One Thousand seven hundred and eighty (1780) staff benefiting from attractive Incentive loan and award schemes	31st December 2025	356	356	356	356	356	356	356	356	356	356
•**Number of staff opinions taken into consideration in decision making processes.**	Two thousand eight hundred and fifty (2850) staff opinions taken into consideration in decision making processes	31st December 2025	570	570	570	570	570	570	570	570	570	570
•**Number of staff promoted at the due time.**	Two thousand eight hundred and fifty (2850) staff promoted at the due time	31st December 2025	570	570	570	570	570	570	570	570	570	570
•**Copy of document re-defining staffing, responsibilities, powers and allocated resources, for the established M&E Function.**	One (1) report re-defining staffing, responsibilities, powers and allocated resources, for the established M&E function.	31st December 2021		1								
•**Copy of comprehensive, robust and effective M&E system developed for CSIR.**	One (1) comprehensive document prepared, detailing robust and effective M&E system	31st December 2021		1								

•Annual performance assessment reports on CSIR systems, staff and activities (one for each area)	Fifteen (15) annual performance assessment reports on CSIR systems, staff and activities (one for each area)	31st December 2025		3		3		3		3		3

Indicator Tracking for Stakeholder Management

Indicator	Overall Target	Overall Due Date	Expected Targets for Each Specified Period									
			2021		2022		2023		2024		2025	
			Jun	Dec	Jun	Dec	Jun	Dec	Jun	Dec	Jun	Dec
• **Number of Promoters involved in decision making bodies of CSIR (5 per category)**	One hundred and twenty-five (125) Promoters involved in decision making bodies of CSIR (5 per category)	31st December 2025	15	10	15	10	15	10	15	10	15	10
• **Number of impact activities creditable to Promoters' lobbying or funding support activities or promoting access to opportunity. (2 per category)**	Fifty (50) impact activities creditable to Promoters' lobbying or funding support activities or promoting access to opportunity (2 per category)	31st December 2025	5	5	5	5	5	5	5	5	5	5
• **Number of Latents becoming effective Promoters of the CSIR Goal and Vision (2 per category)**	Twenty (20) Latents becoming effective Promoters of CSIR Goal and Vision (2 per category)	31st December 2025	2	2	2	2	2	2	2	2	2	2
• **Number of Defenders become effective goodwill ambassadors and supporters of the CSIR Goal and Vision. (2 per category)**	Sixty (60) Defenders becoming effective goodwill ambassadors and supporters of the CSIR Goal and Vision (2 per category)	31st December 2025	6	6	6	6	6	6	6	6	6	6
• **Number of the Apathetics becoming effective Defenders of the CSIR Goal and Vision. (2 per category)**	Twenty (20) Apathetics becoming effective Defenders of the CSIR Goal and Vision (2 per category)	31st December 2025	2	2	2	2	2	2	2	2	2	2

Reporting Form for Strategic Thrust 1: Private Sector Driven R&D and Technological Innovation

Indicators	Target	Responsibility	Actual	% Achieved	Variance & Comments
•**Number of identified industrial needs.**	39	**Deputy Director-General in collaboration with Directors of the Lead Institutes:** **ARI –** Biomedical & Public Health **BRRI –** Materials Science & Manufacturing, **CRI –** Food Security & Poverty Reduction, **FORIG –** Climate Change, Environmental Management & Green Technology, **IIR –** Energy & Petroleum, **INSTI –** Electronics & ICT, **STEPRI –** Science & People			
•**Number of technical proposals approved by industry**	39	**Deputy Director-General in collaboration with Directors of all the CSIR Institutes** (ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)			
•**Number of industry driven technologies developed**	39	**Deputy Director-General in collaboration with Directors of all the CSIR Institutes** (ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)			
•**Number of industry driven technologies validated and adopted by industry.**	39	**Deputy Director-General in collaboration with Directors of all the CSIR Institutes** (ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)			
•**Number of scientific papers published in internationally recognised journals.**	39	**Deputy Director-General in collaboration with Directors of all the CSIR Institutes** (ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)			

•**Number of staff trained in relevant specialised areas**	35	**Deputy Director-General in collaboration with the Director of Administration and Directors of the respective Lead Institutes** **ARI –** Biomedical & Public Health **BRRI –** Materials Science & Manufacturing, **IIR –** Energy & Petroleum, **INSTI –** Electronics & ICT,			
•**Number of specified specialised disciplines covered**	5	**Deputy Director-General in collaboration with the Director of Administration and Directors of the respective Lead Institutes** **ARI –** Biomedical & Public Health **BRRI –** Materials Science & Manufacturing, **IIR –** Energy & Petroleum, **INSTI –** Electronics & ICT,			

Reporting Form for Strategic Thrust 2: CSIR Re-Branding and Visibility Improvement						
Indicators	**Target**	**Responsibility**	**Actual**	**% Achieved**	**Variance & Comments**	
•Document detailing Guidelines for a PPP agenda.	1	Director of Administration in collaboration with the Legal Officer, Director of Audit, Director of Finance, PRO and the Directors of all the CSIR Institutes (ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)				
•Number of private sector actors with whom PPP arrangements have been established.	26	Director of Administration in collaboration with the PRO and Directors all the CSIR Institutes (ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)				
•Number of identified stakeholders whose interests have been addressed. (1 per category per year)	15	Director of Administration in collaboration with the Director of Finance, Director of Audit, PRO and the Directors of all the CSIR Institutes (ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)				
•Number of stakeholder interests addressed	52	Director of Administration in collaboration with the PRO and Directors all the CSIR Institutes (ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)				
•Number of informative promotional materials distributed to stakeholders	28	Director of Administration in collaboration with the PRO and Directors all the CSIR Institutes (ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)				
•Number of stakeholders receiving promotional materials. (at least 5 per each stakeholder category)	75	Director of Administration in collaboration with the PRO and Directors all the CSIR Institutes (ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)				
•Number of TV/radio talk show programmes participated in.	28	Director of Administration in collaboration with the PRO and Directors all the CSIR Institutes (ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)				

•Number of feature articles published.	56	Director of Administration in collaboration with the PRO and Directors all the CSIR Institutes (ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)			
•Number of public events organised annually.	15	Director of Administration in collaboration with the Director of Finance, Director of Audit, PRO and the Directors of all the CSIR Institutes (ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)			
•CSIR ranking on webometrics improved from 6368 to at least 500 in five years.	500	Deputy Director-General in collaboration with the Director of Administration, Director of Finance, Director of Audit, and the Directors of all the CSIR Institutes (ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)			

Reporting Form for Strategic Thrust 3: Financial Resource Mobilisation					
Indicators	**Target**	**Responsibility**	**Actual**	**% Achieved**	**Variance & Comments**
•Amount attracted through funding of winning proposals by donor community	US$ 52.22m	Deputy Director-General in collaboration with the Director of Finance, Director of Audit and Directors of all the CSIR Institutes (ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)			
•Amount attracted through the provision of consultancy services.	GHC 150.10 m	Deputy Director-General in collaboration with the Director of Finance, Director of Audit and Directors of all the CSIR Institutes (ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)			
•Amount attracted through development of technologies for solving industry problems	GHC 165.00m	Deputy Director-General in collaboration with the Director of Finance, Director of Audit and Directors of all the CSIR Institutes (ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)			
Amount generated through the sale of Research By-Products. (GHCm)	GHC97.50m	Deputy Director-General in collaboration with the Director of Finance, Director of Audit and Directors of all the CSIR Institutes (ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)			
•Amount attracted into CSIR Endowment fund	US$ 4.00m	Director-General in collaboration with the Director of Administration, Director of Finance and Director of Audit			
•Amount added to the S&T fund annually	GHC 50m	Director-General in collaboration with the Director of Administration, Director of Finance and Director of Audit			
Document re-defining staffing, responsibilities, powers and allocated resources for IPR, PR and marketing functions	1	Deputy Director-General in collaboration with the Director of Finance, Director of Audit and Directors of all the CSIR Institutes			

		(ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)			
Number of CSIR technologies patented/copyrighted each year – (two per Institute)	26	**Deputy Director-General in collaboration with the Director of Finance, Director of Audit and Directors of all the CSIR Institutes** (ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)			
•Number of private sector actors partnering CSIR to commercialise copyrighted/patented technologies	26	**Deputy Director-General in collaboration with the Director of Finance, Director of Audit and Directors of all the CSIR Institutes** (ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)			
Number of Top and Middle level Management staff trained in relevant entrepreneurial activities	19	**Deputy Director-General in collaboration with the Director of Finance, Director of Audit and Directors of all the CSIR Institutes** (ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)			
Number of Senior Members trained in relevant entrepreneurial activities	75	**Deputy Director-General in collaboration with the Director of Finance, Director of Audit and Directors of all the CSIR Institutes** (ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)			
Number of Senior staff trained in relevant entrepreneurial activities	180	**Deputy Director-General in collaboration with the Director of Finance, Director of Audit and Directors of all the CSIR Institutes** (ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)			
Number of Junior staff trained in relevant entrepreneurial activities	261	**Deputy Director-General in collaboration with the Director of Finance, Director of Audit and Directors of all the CSIR Institutes** (ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)			

Reporting Form for Strategic Thrust 4: Staff and Systems Performance Improvement					
Indicators	Target	Responsibility	Actual	% Achieved	Variance & Comments
•Number of causes of poor attitudes and lack of motivation identified	10	Director of Administration in collaboration with Director of Finance, Director of Audit and Directors of all the CSIR Institutes (ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)			
•Number of causes of poor attitudes and lack of motivation identified, addressed and reviewed annually.	10	Director of Administration in collaboration with Director of Finance, Director of Audit and Directors of all the CSIR Institutes (ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)			
•Number of Staff benefitting from more attractive Incentive, loan and award schemes.	356	Director of Administration in collaboration with Director of Finance, Director of Audit and Directors of all the CSIR Institutes (ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)			
•Number of staff opinions taken into consideration in decision making processes.	570	Director of Administration in collaboration with Director of Finance, Director of Audit and Directors of all the CSIR Institutes (ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)			
•Number of staff promoted at the due time.	570	Director of Administration in collaboration with Director of Finance, Director of Audit and Directors of all the CSIR Institutes			

		(ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)			
•Number of staff benefit from one professional development support for each promotion cycle.	570	Director of Administration in collaboration with Director of Finance, Director of Audit and Directors of all the CSIR Institutes (ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)			
Copy of document re-defining staffing, responsibilities, powers and allocated resources, for the established M&E Function.	1	Director of Administration in collaboration with Director of Finance, Director of Audit and Directors of all the CSIR Institutes (ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)			
Copy of comprehensive, robust and effective M&E system developed for CSIR.	1	Director of Administration in collaboration with Director of Finance, Director of Audit and Directors of all the CSIR Institutes (ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)			
Annual performance assessment reports on CSIR systems, staff and activities (one for each area)	3	Director of Administration in collaboration with Director of Finance, Director of Audit and Directors of all the CSIR Institutes (ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)			

Reporting Form for Stakeholder Management					
Indicators	**Target**	**Responsibility**	**Actual**	**% Achieved**	**Variance & Comments**
• **Number of promoters involved in decision making bodies of CSIR (5 per category)**	25	**Director-General in collaboration with Director of Administration, Director of Finance, Director of Audit, PRO and Directors of all CSIR Institutes.**			
• **Number of impact activities creditable to Promoters' lobbying or funding support activities or promoting access to opportunity. (2 per category)**	10	**Director-General in collaboration with Director of Administration, Director of Finance, Director of Audit, PRO and Directors of all CSIR Institutes.**			
• **Number of Latents becoming effective Promoters of the CSIR Goal and Vision (2 per category)**	4	**Director-General in collaboration with Director of Administration, Director of Finance, Director of Audit, PRO and Directors of all CSIR Institutes.**			
• **Number of Defenders become effective goodwill ambassadors and supporters of the CSIR Goal and Vision. (2 per category)**	12	**Director-General in collaboration with Director of Administration, Director of Finance, Director of Audit, PRO and Directors of all CSIR Institutes.**			
• **Number of the Apathetics becoming effective Defenders of the CSIR Goal and Vision. (2 per category)**	4	**Director-General in collaboration with Director of Administration, Director of Finance, Director of Audit, PRO and Directors of all CSIR Institutes.**			

APPENDIX 3: ANNUAL REVENUE MOBILISATION (IGF AND DONOR FUNDING) TARGETS FOR INDIVIDUAL INSTITUTES AND THE CSIR

Targets for IGF

INSTITUTE	PROJECTED IGF PER SPECIFIED YEAR (million cedis)				
	2021	**2022**	**2023**	**2024**	**2025**
ARI	0.52	0.69	0.91	1.20	1.59
BRRI	7.30	9.63	12.70	16.75	22.09
CRI	5.01	6.61	8.72	11.50	15.16
FORIG	4.61	6.08	8.02	10.58	13.96
FRI	3.56	4.69	6.19	8.16	10.77
IIR	1.66	2.19	2.89	3.82	5.04
INSTI	0.25	0.33	0.44	0.58	0.77
OPRI	4.67	6.16	8.12	10.72	14.13
PGRRI	0.45	0.60	0.79	1.04	1.37
SARI	2.57	3.39	4.47	5.90	7.78
SRI	0.25	0.33	0.44	0.58	0.77
STEPRI	0.72	0.95	1.26	1.66	2.19
WRI	12.52	16.51	21.78	28.73	37.89
CSIR TOTAL	**44.10**	**58.17**	**76.73**	**101.21**	**133.49**

Targets for Donor Funds

INSTITUTE	PROJECTED DONOR FUNDS PER SPECIFIED YEAR (million dollars)				
	2021	**2022**	**2023**	**2024**	**2025**
ARI	1.53	1.65	1.79	1.93	2.08
BRRI	1.13	1.22	1.32	1.43	1.54
CRI	10.71	11.56	12.49	13.49	14.57
FORIG	10.46	11.29	12.20	13.17	14.22
FRI	4.44	4.80	5.18	5.59	6.04
IIR	1.28	1.39	1.50	1.62	1.75
INSTI	0.89	0.97	1.04	1.13	1.22
OPRI	0.89	0.97	1.04	1.13	1.22
PGRRI	1.81	1.95	2.11	2.28	2.46
SARI	11.97	12.92	13.96	15.08	16.28
SRI	0.01	0.01	0.01	0.01	0.01
STEPRI	2.48	2.67	2.89	3.12	3.37
WRI	4.62	4.99	5.39	5.82	6.29
CSIR TOTAL	**52.22**	**56.40**	**60.91**	**65.79**	**71.05**

OBJECTIVE 1 INDICATIVE BUDGET

Outputs	Actions	ACTIVITY TOTAL BUDGET (GHS)		OUTPUT TOTAL BUDGET (GHS)	
		Per Institute	Overall	Per Institute	Overall
Output 1.1	*Activity 1.1.1: Identify annually industry needs in each of the seven thematic areas of the CSIR transformational agenda.*	2,355.12	30,616.56	*14,822.64*	*192,694.32*
At least 39 technical proposals approved by industry to address 39 identified industrial needs, each year.	*Activity 1.1.2: Constitute inter-institutional multi-disciplinary research teams in each of the thematic areas to develop technical proposals for addressing needs identified.*	12,467.52	162,077.76		
	Activity 1.1.3: Submit technical proposals to industry partners - for addressing the needs identified.	262.32	3,410.16		
Output 1.2	*Activity 1.2.1: Initiate research programmes in each of the seven thematic areas of the CSIR Transformational Agenda to develop technologies to address the needs identified and approved by industry.*	325,836.00	4,235,868.00	*335,011.68*	*4,355,151.84*
At least 39 industry driven technologies – 3 per each Institute - developed for testing and validation, each year.	*Activity 1.2.2: Re-package research results in industry-friendly formats.*	9,175.68	119,283.84		

Output 1.3	*Activity 1.3.1: Develop science parks to share knowledge from research outcomes, and promote innovations for commercial/industrial uptake*	6,117.12	79,522.56	*68,084.64*	**885,100.32**
At least 39 industry driven technologies validated and adopted by industry, each year-3 per each Institute.	*Activity 1.3.2: Develop Business Incubation Centres that would facilitate the adoption of technologies developed.*	47,102.40	612,331.20		
	Activity 1.3.3: Test the technologies developed with the industry partners.	14,865.12	193,246.56		
Output 1.4	*Activity 1.4.1: Repackage research outputs in journal formats*	49,550.40	644,155.20	*54,505.44*	**708,570.72**
At least 39 scientific papers published in internationally recognised journals, each year-3 per each Institute.	Activity 1.4.2: Publish papers in highly rated international journals.	4,955.04	64,415.52		
Output 1.5	*Activity 1.5.1: Recruit highly qualified IT, Engineering and Biomedical staff*	3,303.36	42,943.68	*11,561.76*	**150,302.88**
Technology development capacity strengthened in at least 5 relevant specialised areas (eg. Robotics, ICT, nanotechnology, Biomedical and Public Health)	*Activity 1.5.2: Acquire research equipment relevant to the specialised areas.*	6,606.72	85,887.36		
	Activity 1.5.3: Assign specific responsibility with performance targets and timelines to recruited staff.	1,651.68	21,471.84		

OBJECTIVE 2 INDICATIVE BUDGET

Outputs	Actions	ACTIVITY TOTAL BUDGET (GHS)		OUTPUT TOTAL BUDGET (GHS)	
		Per Institute	Overall	Per Institute	Overall
Output 2.1	*Activity 2.1.1: Develop Guidelines for a Public-Private Sector Partnership Agenda and Strengthen PR Systems in all Institutes,*	14,130.72	183,699.36	*61,538.40*	**799,999.20**
PPP arrangements established with at least 26 private sector actors – 2 per each Institute – each year.	*Activity 2.1.2: Operationalise a Public-Private Sector Partnership Agenda to effectively engage with industry and other relevant government ministries on a regular basis.*	36,702.72	477,135.36		
	Activity 2.1.3: Conduct meetings regularly with stakeholders aligned to each thematic area	10,704.96	139,164.48		
Output 2.2	*Activity 2.2.1: Implement a stakeholder management strategy that addresses the interests of the various categories of CSIR Stakeholders. (See Stakeholder Management Plan)*	37,681.92	489,864.96	*121,731.84*	**1,582,513.92**
Increased Stakeholder Engagement and Media Exposure.	*Activity 2.2.2: Develop and disseminate informative documentaries, brochures, flyers, newsletters, pamphlets, and, other promotional materials.*	45,878.40	596,419.20		
	Activity 2.2.3: Participation in Radio and TV talk shows and publication of feature articles.	38,171.52	496,229.76		
Output 2.3	*Activity 2.3.1: Organise Awards Night each year to reward staff, customers, partners, donors, etc.*	18,840.96	244,932.48	*64,276.32*	**835,592.16**
At least three Public Events organised annually.	*Activity 2.3.2: Institute and operationalise Annual R&D Policy lectures to educate public on R&D issues.*	18,840.96	244,932.48		

	Activity 2.3.3: Organise one inter-institutional social activity each year.	7,875.84	102,385.92		
	Activity 2.3.4: Organise in partnership with stakeholders an open day and exhibition on African Renaissance Day to promote importance of science and technology in nation development.	18,718.56	243,341.28		
Output 2.4	*Activity 2.4.1: Enhance visibility by improving content quality of the CSIR Website to increase the external links that the CSIR web domain receives from third parties.*	18,351.36	238,567.68	*103,380.48*	**1,343,946.24**
Webometrics ranking of CSIR improved from 6368 to at least 500 in five years.	*Activity 2.4.2: Improve Website activity by increasing total number of webpages hosted in the main web domain (including all the subdomains and directories)*	27,527.04	357,851.52		
	Activity 2.4.3: Improve Openness by increasing the number of rich files (pdf, doc, docx, ppt) published in dedicated websites	9,175.68	119,283.84		
	Activity 2.4.4: Improve excellence by increasing the number of academic papers published in high impact international journals.	48,326.40	628,243.20		

OBJECTIVE 3 INDICATIVE BUDGET

Outputs	Actions	ACTIVITY TOTAL BUDGET (GHS)		OUTPUT TOTAL BUDGET (GHS)	
		Per Institute	**Overall**	**Per Institute**	**Overall**
Output 3.1	*Activity 3.1.1: Develop and submit winning proposals to donors for funding.*	41,558.40	540,259.20	*214,024.32*	**2,782,316.16**
Attraction of funds through submission of winning proposals, bidding for consultancies, sale of research by-products and technology development for industry.	*Activity 3.1.2: Identify and bid for relevant consultancy services; whilst lobbying government to get at least 20% of government jobs related to STI.*	63,619.20	827,049.60		
	Activity 3.1.3: Develop and submit technical and financial proposals to industry for funding to address identified industrial needs.	56,851.20	739,065.60		
	Activity 3.1.4: Develop and implement a marketing plan for the most marketable research by-products.	27,527.04	357,851.52		
	Activity 3.1.5: Establish a competitive system for pricing products and services as well as budgeting for projects and consultancies.	24,468.48	318,090.24		
Output 3.2	*Activity 3.2.1: Organise a donors; forum to solicit funds into the Endowment Fund,*	37,437.12	486,682.56	*65,698.56*	**854,081.28**
Funds attracted into CSIR Endowment Fund for R&D; and the STI Fund.	*Activity 3.2.2: Actively engage with government to add on and operationalise the S&T Fund.*	28,261.44	367,398.72		
Output 3.3	*Activity 3.3.1: Audit current IPR, PR and marketing functions and strengthen them to effectively deliver and aggressively promote uptake of technologies & services.*	13,763.52	178,925.76	*122,037.12*	**1,586,482.56**

IPR Policy operationalised for effective commercialisation.	*Activity 3.3.2: Establish strong beneficial business relationships/partnerships with industry to commercialise copyrighted/patented technologies.*	62,395.20	811,137.60		
	Activity 3.3.3: Continually audit the technological environment to identify technologies that can beat competition and pursue practical steps to patent these technologies.	45,878.40	596,419.20		
Output 3.4	*Activity 3.4.1: Continually identify entrepreneurial capacity development needs of different categories of staff (Management, Senior Members, Senior Staff and Junior Staff).*	12,723.84	165,409.92	*44,288.64*	**575,752.32**
At least 75% of all categories of staff trained in relevant entrepreneurial activities.	*Activity 3.4.2: Identify and actively engage potential sources for entrepreneurial capacity development, and assess cost and content of training vis-a-vis CSIR needs.*	6,117.12	79,522.56		
	Activity 3.4.3: Develop and implement an entrepreneurial skills training programme for different categories of staff (to include identification of business opportunities, customer relationships, costing and pricing of products, services, consultancies, projects, etc.)	25,447.68	330,819.84		

OBJECTIVE 4 INDICATIVE BUDGET

Outputs	Actions	ACTIVITY TOTAL BUDGET (GHS)		OUTPUT TOTAL BUDGET (GHS)	
		Per Institute	Overall	Per Institute	Overall
Output 4.1	*Activity 4.1.1: Conduct annual situational analysis (HR Climate survey) to identify causes of poor attitudes and the lack of motivation amongst CSIR Staff and address them.*	7,879.68	102,435.84	*111,873.60*	**1,454,356.80**
Improved staff motivation and performance.	*Activity 4.1.2: Audit existing staff incentive, loan and Award Schemes to identify shortfalls, improve and enhance effective operationalisation.*	7,879.68	102,435.84		
	Activity 4.1.3: Develop and implement a system for seeking opinions on issues before decision making and ensuring effective communication and feedback at all levels.	52,531.20	682,905.60		
	Activity 4.1.4: Meet staff at the beginning of their promotion cycle and develop and monitor a programme (with annual targets) for ensuring promotion criteria are met when due.	24,958.56	324,461.28		
	Activity 4.1.5: Identify professional development needs of staff and develop and implement training programmes to address them.	18,624.48	242,118.24		
Output 4.2	*Activity 4.2.1: Audit and capacitate an effective Monitoring and Evaluation Unit within the CSIR.*	6,806.88	88,489.44	*95,545.44*	**1,242,090.72**

Improved Systems performance management.	*Activity 4.2.2: Audit current reporting systems for all result-oriented activities with the CSIR and improve upon them for robustness and effectiveness.*	13,613.76	176,978.88		
	Activity 4.2.3: Implement a robust monitoring and evaluation system for all result-oriented activities within the CSIR	75,124.80	976,622.40		

STAKEHOLDER MANAGEMENT INDICATIVE BUDGET

Outputs	Actions	ACTIVITY TOTAL BUDGET (GHS)		OUTPUT TOTAL BUDGET (GHS)	
		Per Institute	Overall	Per Institute	Overall
SM.1	*Activity SM.1.1: Engage closely, consult and influence actively.*	58,534.08	760,943.04	*81,161.28*	**1,055,096.64**
Strategic Objectives and CSIR Goal and Vision effectively leveraged by promoters.	*Activity SM.1.2: Involve in governance and decision making bodies.*	11,313.60	147,076.80		
	Activity SM. 1.3: Monitor interest areas closely and address them on a timely basis.	11,313.60	147,076.80		
SM.2	*Activity SM.2.1: Identify and satisfy their interests, to make them more passionate about the CSIR Goal and Vision.*	31,927.68	415,059.84	*48,898.08*	**635,675.04**
Interest levels of Latents increased to become effective promoters of the CSIR Goal and Vision	*Activity SM.2.2: Inform, engage and consult on interest areas as specified in the stakeholder analysis.*	11,313.60	147,076.80		
	Activity SM.2.3: Consciously influence Latents to become Promoters	5,656.80	73,538.40		
SM.3	*Activity SM.3.1: Inform adequately and consult effectively on interest area.*	31,927.68	415,059.84	*43,241.28*	**562,136.64**
Defenders become effective goodwill ambassadors and supporters of the CSIR Goal and Vision.	*Activity SM.3.2: Make use of interests through involvement in low risk areas.*	5,656.80	73,538.40		

	Activity SM.3.3: Inspire Defenders to consciously and actively support CSIR activities.	5,656.80	73,538.40		
SM.4	*Activity SM.4.1: Monitor Regularly to identify other interest areas that can be more effectively aligned to the CSIR vision.*	31,927.68	415,059.84	*48,898.08*	*635,675.04*
Interest level of the Apathetics increased to become effective Defenders of the CSIR Goal and Vision.	*Activity SM.4.2: Inform via general communication, newsletter, website and mail shots.*	11,313.60	147,076.80		
	Activity SM.4.3: Consciously influence Apathetics to become Defenders.	5,656.80	73,538.40		