

# Council for Scientific and Industrial Research (CSIR)



## **FINAL DRAFT CSIR STRATEGIC PLAN 2020-2024**

### **GOAL**

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

JULY 2019

## EXECUTIVE SUMMARY

The development of a 5-Year Strategic Plan was initiated as part of efforts to stimulate synergies amongst the CSIR Institutes, speeding 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 seven (7) 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:

### **Targeted Technology Development**

**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
- 500 staff trained in specialised areas to drive technology development

### **Corporate 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
- 130 different types of promotional materials distributed to at least 375 stakeholders
- 130 appearances in Radio/TV talk show programmes
- 260 feature articles published
- 15 public events organised
- CSIR Webometrics Ranking improved from 6368 to 500

### **IPR Policy Operationalisation for Effective Commercialisation.**

**Objective:** To ensure the patenting of all CSIR technologies and drive the uptake of at least two existing or newly developed technologies (by the private sector) per Institute per year.

**Targets:**

At least,

- 130 Existing CSIR Technologies patented
- 130 Patented technologies commercialised
- 65 New CSIR technologies patented

### **Entrepreneurial Capacity Development**

**Objective:** To develop a business mindset and drive, in the staff of CSIR to facilitate at least 10% annual incremental profits from all commercial activities.

**Targets:**

At least,

- 2250 CSIR staff trained in relevant entrepreneurial skills.

### **Financial Resource Mobilisation and Management.**

**Objective:** To generate at least 30% of annual recurrent expenditure by 2024 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,

- \$65.79 m attracted from submission of winning proposals
- GHC 101.21 m attracted into IGF with a breakdown as follows:
  - GHC42.71 m attracted through provision of consultancy services.
  - GHC 39 m attracted through technology development and transfer for industrial solutions.
  - GHC19.5 m generated from sale of research by-products
- \$20 m attracted into CSIR Endowment Fund
- GHC50 m added to STI fund.

### **Effective Sustainable Staff Sensitisation & Motivation**

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

**Targets:**

At least,

- 1500 CSIR staff benefit from more attractive incentive, loan and award schemes
- 2400 staff opinions taken into consideration in decision making
- 2,400 staff promoted at due time
- 2,400 staff benefit from professional development support.

### **Effective System Performance Management**

**Objective:** To develop and operationalise a robust and effective monitoring and evaluation system that tracks and provides timely feedback on staff performance as well as the performance of every result-oriented activity within the CSIR on a quarterly basis.

**Targets:**

At Least,

- M&E System established, with adequate staff and resources.
- 15 performance assessment reports: 5 each on CSIR systems, staff and activities.

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.

**For effective achievement of these objectives and targets there would be the need for the establishment of an effective monitoring unit to drive and track progress very diligently and dedicatedly. For effective implementation, Institutes and Coordinators of Thematic Areas would need to cascade this plan downwards by developing sub-activities that reflect their operational**

**mandates; as well as targets that reflect their individual annual contributions to the overall targets in this plan.**

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## LIST OF ABBREVIATIONS

ARI	Animal Research Institute
BRI	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
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
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.

### **Vision:**

Using the transforming power of S&T for wealth creation

### **Mission:**

To become the force for accelerated social and economic development of Ghana through examining, exploring and creating science and technology catalysts for public and private wealth creation.

### **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 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 losses.
- 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).

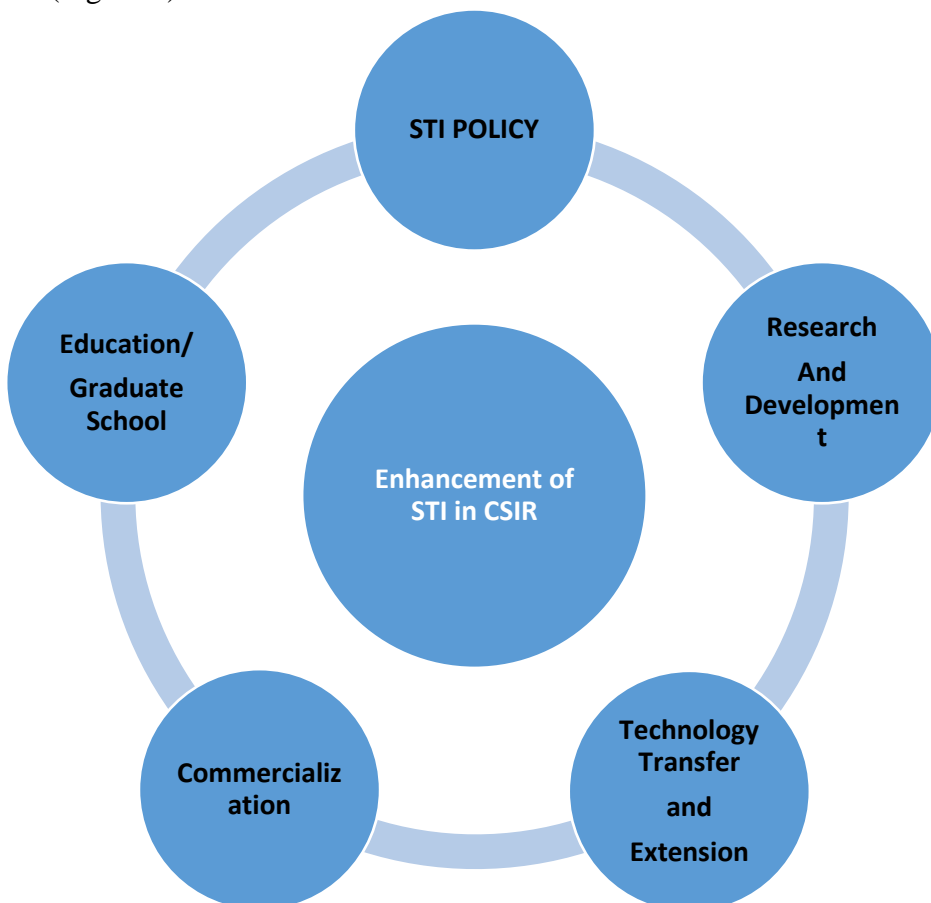


Figure 1: 5-Fold Approach to Mandate Operationalisation

### **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<sup>+</sup>)
- 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

## CHAPTER 2: SITUATIONAL ANALYSIS

### 2.1 STAKEHOLDER ANALYSIS OF THE CSIR

#### 1.3.1 Stakeholder Interests

**Table 1. Showing Stakeholders of CSIR and their respective Interests**

<i>Stakeholder</i>	<i>Interests</i>
<b>Government of Ghana</b>	<ul style="list-style-type: none"> <li>• Inputs for effective implementation and monitoring of policies and development programs</li> <li>• Inputs for formulation of policy</li> <li>• Support for Socio-economic growth</li> <li>• Employment creation and poverty reduction</li> <li>• Visible Contribution to national development</li> <li>• Sustained food security (moved from farmers)</li> <li>• Opportunities for job creation</li> </ul>
<b>Farmers</b>	<ul style="list-style-type: none"> <li>• Inputs for improved productivity,</li> <li>• Income and livelihood improvement</li> <li>• Access to training in good agronomic practices.</li> <li>• Enhanced ability to access basic needs</li> <li>• Access to improved planting materials and soil management practices.</li> <li>• Resilience and capacity to adapt to the effects of climate change.</li> </ul>
<b>Scientific Community</b>	<ul style="list-style-type: none"> <li>• Access to appropriate scientific knowledge</li> <li>• Practical training and skills acquisition in good scientific practice.</li> <li>• Access to insightful and relevant publications</li> <li>• Scientific facilities and personnel for effective partnership in research and development</li> </ul>
<b>Industry and the Private Sector</b>	<ul style="list-style-type: none"> <li>• Access to technologies for commercial application and business expansion.</li> <li>• Access to technical support services for productivity enhancement and quality assurance.</li> <li>• Opportunities for Corporate Social Responsibility through collaborative research.</li> </ul>
<b>International Organisations (non-donors)</b>	<ul style="list-style-type: none"> <li>• Strategic partnership for development</li> <li>• Support for their development agenda.</li> <li>• Attainment of the global Sustainable Development Goals.</li> </ul>
<b>Donor Organisations &amp; Agencies</b>	<ul style="list-style-type: none"> <li>• Strategic partnership for development</li> <li>• Support for their development agenda</li> <li>• Support CSIR's R&amp;D Agenda</li> </ul>
<b>NGOs</b>	<ul style="list-style-type: none"> <li>• Strategic partnership for development</li> <li>• Support the development and implementation of their programs</li> <li>• Source of readily available technologies for their activities</li> </ul>
<b>Educational Institutions</b>	<ul style="list-style-type: none"> <li>• Effective practical training in STI for their students</li> <li>• Knowledge sharing and dissemination</li> <li>• Placement of students for internship.</li> <li>• Access to scientific publications.</li> </ul>
<b>Local and International Media</b>	Marketable news
<b>Banks and Financial Institutions</b>	<ul style="list-style-type: none"> <li>• Charges on monies held in trust for the CSIR and its Institutes</li> <li>• COT Charges on staff salaries</li> <li>• Interests on loans granted.</li> <li>• Opportunities for Corporate Social Responsibility by supporting research.</li> </ul>

<b>Importers and Suppliers of Scientific equipment and supplies.</b>	<ul style="list-style-type: none"> <li>• <b>To sell their merchandise.</b></li> </ul>
<b>General Public</b>	<ul style="list-style-type: none"> <li>• Employment Opportunities</li> <li>• Poverty alleviation</li> <li>• Identifying with our achievements.</li> <li>• Access to products and services</li> </ul>
<b>CSIR Council</b>	<ul style="list-style-type: none"> <li>• CSIR delivers on its mandate</li> <li>• CSIR operates within all relevant government policies</li> <li>• CSIR operates within sound financial management practices</li> <li>• CSIR's effective contribution to the national economy</li> </ul>
<b>Institutes Management Boards</b>	<ul style="list-style-type: none"> <li>• Institutes deliver on their mandates</li> <li>• Institutes operate within all relevant government policies</li> <li>• Institutes operate within sound financial management practices</li> <li>• Institutes' effective contribution to the national economy</li> </ul>
<b>CSIR Staff</b>	<b>Financial welfare during working life and after retirement Serene working environment and job satisfaction</b>

### 2.1.2 Stakeholder Matrix

**Table 2. Analysis of Stakeholders of CSIR and their interests**

	<i>Low Interest</i>	<i>High Interest</i>
<b>High Power</b>	<b>LATENTS</b> <ul style="list-style-type: none"> <li>• <b>Local and International Media</b></li> <li>• <b>General Public</b></li> </ul>	<b>PROMOTERS</b> <ul style="list-style-type: none"> <li>• Donor Organisations and Agencies</li> <li>• Government of Ghana (MMDAs)</li> <li>• Institute Management Boards</li> <li>• CSIR Council</li> <li>• Industry and the Private Sector</li> </ul>
<b>Low Power</b>	<b>APATHETICS</b> <ul style="list-style-type: none"> <li>• Banks and Financial Institutions</li> <li>• Importers and Suppliers of Scientific equipment and supplies.</li> </ul>	<b>DEFENDERS</b> <ul style="list-style-type: none"> <li>• International Organisations (non-donors)</li> <li>• Educational Institutions</li> <li>• NGOs</li> <li>• Scientific Community</li> <li>• Farmers</li> <li>• CSIR staff</li> </ul>

## 2.2 STRENGTHS, WEAKNESSES, OPPORTUNITIES AND THREATS (SWOT) ANALYSIS OF CSIR

### 2.2.1 List of Strengths, Weaknesses, Opportunities and Threats

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

<i>Strengths</i>		<i>Opportunities</i>	
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.	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.8	CSIR Intellectual Property Right office and policy in place	P.8	Growing manufacturing sector of the economy (eg. the one district one factory initiative)
S.9	Availability of marketable technologies and success stories with the private sector.	P.9	Government still having some belief in science and technology as the engine for economic growth.
S.11	Senior scientists retained to mentor the early career researchers	P.10	The existence of Public-Private Partnership (PPP) framework
S.12	Existence of incentive and award schemes for technology transfer and commercialization activities		
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.		
<i>Weaknesses</i>		<i>Threats</i>	
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	T.5	Dwindling government investment in R&D
W.6	Weak research industry linkage; low interaction between researchers and entrepreneurs	T.6	Potentially high attrition rate (worsening staff situation due to poaching, government restrictions on employment and unattractive conditions of service)
W.7	Poor visibility of CSIR Institutes	T.7	Weak industrial sector which cannot invest much into R&D
W.8	Inadequate techno-economic evaluation of technologies developed		
W.9	Lack of institutional system to track technological needs of the private sector		
W.10	Limited piloting of the technologies developed		
W.11	Weak monitoring and evaluation systems of 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	T.9	Unfavorable government policies towards local R&D institutions
W.15	Frustrating internal bureaucratic procedures/processes leading to delays in job delivery	T.10	Inflexible government bureaucracy with respect to administration and procurement policies creating bottlenecks in bidding as well as timely delivery to clients.
W.16	Poor staff attitude to work and towards commercialisation.	T.11	Hijacking of CSIR Technologies by the private sector
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.		
W.19	Ineffective operationalisation of the IPR Policy		

## 2.2.2 SWOT Analysis Results

**Table 4. Prioritisation of Opportunities that give Highest Competitive Advantage**

<i>Opportunity</i>	<i>Action Needed</i>	<i>Identified Appropriate Strategic Thrust</i>
<b>P10</b> The existence of Public-Private Partnership (PPP) framework	<ul style="list-style-type: none"> <li>• Initiate a PPP Agenda</li> <li>• Proactive engagement with industry and private sector</li> </ul>	Corporate visibility
<b>P.2</b> High demand for technological and innovative products and services	<ul style="list-style-type: none"> <li>• Develop demand-driven technologies</li> </ul>	Targeted Technology Development
<b>P.9</b> Government's recognition of STI as the engine for economic growth	<ul style="list-style-type: none"> <li>• Increase CSIR Visibility through effective management of Government and Other Stakeholders.</li> <li>• Active and regular Media and Stakeholder engagement</li> </ul>	Corporate Visibility Improvement
<b>P.1</b> Vibrant scientific community and industrial environment that provides good networking opportunities	<ul style="list-style-type: none"> <li>• Strengthen IPR System and use it to aggressively promote uptake of Technologies and Services</li> </ul>	Operationalising IPR Policy for Effective Commercialisation
<b>P.8</b> Growing Manufacturing sector of the Economy (One District One Factory initiative)	<ul style="list-style-type: none"> <li>• Strengthen IPR System and use it to aggressively promote uptake of Technologies and Services</li> </ul>	Operationalising IPR Policy for Effective Commercialisation
<b>P.4</b> Availability of numerous Capacity building Institutions.	<ul style="list-style-type: none"> <li>• Develop Entrepreneurial Capacity for effective Commercialisation</li> </ul>	Entrepreneurial Capacity Development
<b>P.7</b> The goodwill and support of donor agencies for national development programs including R&D (e.g. DANIDA, WORLD BANK, GTZ, USAID etc.)	<ul style="list-style-type: none"> <li>• Source funding through development of winning proposals for funding by donors.</li> </ul>	Financial Resource Mobilisation and Management.

**Table 5. Prioritisation of Strengths that give Highest Competitive Advantage**

<i>Strength</i>	<i>Action Needed</i>	<i>Identified Appropriate Strategic Thrust</i>
<b>S1.</b> Highly qualified human resource and technological skills	<ul style="list-style-type: none"> <li>• Develop demand driven economically viable technologies for the industry and services sector</li> <li>• Publish scientific papers in high impact journals</li> </ul>	Targeted Technology Development
<b>S2.</b> 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	<ul style="list-style-type: none"> <li>• Develop demand driven economically viable technologies for the industry and service sector</li> <li>• Publish scientific papers in high impact journals</li> </ul>	Targeted Technology Development
<b>S12.</b> Institutionalization of incentive and award schemes for technology transfer and commercialization activities	<ul style="list-style-type: none"> <li>• Review and effectively operationalise Incentive and Award Schemes</li> </ul>	Effective Sustainable Staff Sensitisation & Motivation
<b>S8.</b> CSIR Intellectual Property Right office and policy in place	<ul style="list-style-type: none"> <li>• Operationalise the IPR Policy</li> </ul>	Operationalising IPR Policy for Effective Commercialisation
<b>S9.</b> Availability of marketable technologies and success stories with the private sector, for example in the food industry	<ul style="list-style-type: none"> <li>• Patent all marketable technologies developed</li> </ul>	Operationalising IPR Policy for Effective Commercialisation

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

<i>Weaknesses</i>	<i>Action Needed</i>	<i>Identified Appropriate Strategic Thrust</i>
<b>W.11 Weak monitoring and evaluation systems of R&amp;D</b>	<ul style="list-style-type: none"> <li>Establish a robust monitoring and evaluation system</li> </ul>	Effective System Performance Management
<b>W.7 Poor visibility of some CSIR Institutes</b>	<ul style="list-style-type: none"> <li>Increase visibility through effective stakeholder management</li> </ul>	Corporate Visibility Improvement
<b>W.16 Poor staff attitude to work and towards commercialisation</b>	<ul style="list-style-type: none"> <li>Explore causes of poor staff attitude and resolve issues</li> </ul>	Effective Sustainable Staff Sensitisation & Motivation
<b>W.14 Very Weak Financial Base</b>	<ul style="list-style-type: none"> <li>Commercialise technologies developed through:                             <ul style="list-style-type: none"> <li>effective IPR policy operationalisation</li> <li>piloting of technologies</li> </ul> </li> <li>Aggressively source for funds from donor agencies through submission of winning proposals.</li> <li>Aggressively bid for consultancy jobs.</li> </ul>	Financial Resource Mobilisation and Management.
<b>W.3 Limited institutional capacity to commercialise research outputs on a commercial scale</b>	<ul style="list-style-type: none"> <li>Enter into partnerships with industry to commercialise research outputs.</li> </ul>	Operationalising IPR Policy for Effective Commercialisation
<b>W.1 Inadequate entrepreneurial skills or business mindsets among CSIR employees</b>	<ul style="list-style-type: none"> <li>Undertake entrepreneurial skills development of staff.</li> </ul>	Entrepreneurial Capacity Development

## 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**

<i>Strategic Thrust</i>	<i>Strategic Objective</i>
<b>Targeted Technology Development</b>	<ul style="list-style-type: none"> <li>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.</li> </ul>
<b>Corporate Visibility Improvement</b>	<ul style="list-style-type: none"> <li>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.</li> </ul>
<b>IPR Policy Operationalisation for Effective Commercialisation.</b>	<ul style="list-style-type: none"> <li>To ensure the patenting of all CSIR technologies and drive the uptake of at least two existing or newly developed technologies (by the private sector) per Institute per year.</li> </ul>
<b>Entrepreneurial Capacity Development</b>	<ul style="list-style-type: none"> <li>To develop a business mindset and drive in the staff of CSIR to facilitate at least 10% annual incremental profits from all commercial activities.</li> </ul>
<b>Financial Resource Mobilisation and Management.</b>	<ul style="list-style-type: none"> <li>To generate at least 30% of annual recurrent expenditure by 2024 through: <ul style="list-style-type: none"> <li>Attraction of funding for at least one project per team of five (5) Research Scientists per year.</li> <li>Winning at least one consultancy service per year per Institute</li> <li>Attraction of at least one private sector funding per Institute for technologies that address a specific private sector need.</li> <li>The sale of research by-products</li> </ul> </li> </ul>
<b>Effective Sustainable Staff Sensitisation &amp; Motivation</b>	<ul style="list-style-type: none"> <li>To get 80% of the workforce to be passionate, results-oriented, positive- and ethically-minded enough to pursue the CSIR vision.</li> </ul>
<b>Effective System Performance Management</b>	<ul style="list-style-type: none"> <li>To develop and operationalise a robust and effective monitoring and evaluation system that tracks and interrogates staff performance as well as the performance of every result-oriented activity within the CSIR on a quarterly basis.</li> </ul>

### STRATEGIC THRUST 1: TARGETED TECHNOLOGY DEVELOPMENT

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: CORPORATE 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. Regularly 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: IPR POLICY OPERATIONALISATION FOR EFFECTIVE COMMERCIALISATION.**

The effective commercialisation of CSIR technologies would depend on how effectively the IPR policy of the Council is operationalised. Current IPR, PR and marketing functions of the Council would be audited and strengthened to effectively deliver and aggressively promote uptake of technologies & services. Similarly, existing technologies would be audited and practical steps pursued to patent/copyright all marketable technologies developed within each thematic area. 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). An institutionalised annual performance assessment of all CSIR partnerships and technologies would also be pursued to ensure that the effectiveness of the commercialisation drive is well consolidated.

## **STRATEGIC THRUST 4: ENTREPRENEURIAL CAPACITY DEVELOPMENT**

The human resource of any organisation is the most important of all the resources needed to drive the attainment of organisational goals. The fact that CSIR staff are technically competent is without question. Complementing this high level of technical competency with entrepreneurial skills would greatly leverage the performance of the Council in a holistic manner. There is the need to continually identify and address entrepreneurial capacity development needs for different categories of staff (eg. Top and middle level management, Senior Members, Senior Staff and Junior Staff). There is also the need to identify and actively engage potential sources of entrepreneurial capacity development, and assess cost and content of training vis-a-vis CSIR needs. These would be aggressively pursued and the results fed into the development and implementation of an entrepreneurial skills training programme for different categories of staff, to include areas like: identification of business opportunities, customer relationships, costing and pricing of products, services, consultancies, projects, etc.

## **STRATEGIC THRUST 5: 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. 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 6: EFFECTIVE SUSTAINABLE STAFF SENSITISATION & MOTIVATION**

This thrust also has to do with the human resource of the CSIR and as indicated for Strategic Thrust 4, it cannot be underestimated if CSIR must make progress towards achieving its goals. 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. Additionally, professional development needs of staff, and professional development opportunities would 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.

#### **STRATEGIC THRUST 7: EFFECTIVE SYSTEM PERFORMANCE MANAGEMENT**

Effective performance management is key to continual improvement in any organisation. 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. The M&E System within the CSIR would be established and capacitated with staff and resources to track performance and advise 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: Targeted Technology Development**

Strategic Goal 1: 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 two scientific papers per Institute per year in a recognised journal.							
Outputs	Actions	Time Frame (Year)					Lead Responsibility
		1	2	3	4	5	
<b>Output 1.1</b> At least 39 technical proposals approved by industry to address 39 identified industrial needs, each year.	<b>Activity 1.1.1</b> Identify annually industry needs in each of the seven thematic areas of the CSIR transformational agenda.	████████████████████					Directors/Deputy Directors of all the CSIR Institutes (ARI, BRRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)
	<b>Activity 1.1.2</b> Constitute inter-institutional multi-disciplinary research teams in each of the thematic areas to develop technical proposals for addressing needs identified.	██					
	<b>Activity 1.2.3</b> Submit technical proposals - to industry partners - for addressing the needs identified.	██	██	██	██	██	
<b>Output 1.2</b> At least 39 industry driven technologies – 3 per each Institute - developed for testing and validation, each year.	<b>Activity 1.2.1</b> 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.	██					Directors/Deputy Directors of all the CSIR Institutes (ARI, BRRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)
	<b>Activity 1.2.2</b> Re-package research results in industry-friendly formats.		████████████████████				
<b>Output 1.3</b> At least 39 industry driven technologies validated and adopted by industry, each year-3 per each Institute.	<b>Activity 1.3.1</b> Develop science parks to share knowledge from research outcomes, and promote innovations for commercial/industrial uptake		████████████████████				Directors/Deputy Directors of all the CSIR Institutes (ARI, BRRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)
	<b>Activity 1.3.2</b> Develop Business Incubation Centres that would facilitate the adoption of technologies developed.		████████████████████				

	<p><b>Activity 1.3.3</b> Test the technologies developed with the industry partners.</p>	<table border="1"> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>																									
<p><b>Output 1.4</b> At least 39 scientific papers published in internationally recognised journals, each year-3 per each Institute.</p>	<p><b>Activity 1.4.1</b> Repackage research outputs in journal formats</p> <p>Activity 1.4.2 Identify highly rated international journals for publication.</p> <p><b>Activity 1.4.3</b> Submit manuscripts for publication</p> <p><b>Activity 1.4.4</b> Submit published papers to CSIR.</p>	<table border="1"> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>																									<p>Directors/Deputy Directors of all the CSIR Institutes (ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)</p>
<p><b>Output 1.5</b> Technology development capacity strengthened in at least 5 relevant specialised areas (eg. Robotics, ICT, nanotechnology etc)</p>	<p><b>Activity 1.5.1</b> Recruit highly qualified IT and Engineering staff</p> <p><b>Activity 1.5.2</b> Acquire research equipment relevant to the specialised areas.</p> <p><b>Activity 1.5.3</b> Assign specific responsibility with performance targets and timelines to recruited staff.</p>	<table border="1"> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>																			<p>Director of Administration in partnership with Directors of IIR, BRRI, &amp; INSTI</p>						



**Table 9. Action Plan for Strategic Thrust 2: Corporate 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
<b>Output 2.1</b> <b>Guidelines for a PPP agenda developed</b>	<b>Activity 2.1.1</b> Initiate a Public-Private Sector Partnership Agenda to effectively engage with industry and other relevant government ministries on a regular basis.	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	Director of Administration in collaboration with the PRO
	<b>Activity 2.1.2</b> Strengthen PR Systems in all Institutes to drive corporate visibility						
<b>Output 2.2</b> <b>PPP arrangements established with at least 26 private sector actors–2 per each Institute– each year.</b>	<b>Activity 2.2.1</b> Conduct meetings regularly with stakeholders aligned to each thematic area.						Director of Administration in collaboration with the PRO
<b>Output 2.3</b> <b>At least one specific interest of one stakeholder - in each of the 15 identified stakeholder categories - addressed per Institute each year.</b>	<b>Activity 2.3.1</b> Implement a stakeholder management strategy that addresses the interests of the various categories of CSIR stakeholders.(See Stakeholder management plan)						Director of Administration in collaboration with the PRO  Directors/Deputy Directors of all the CSIR Institutes (ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRI, SARI, SRI, STEPRI, WRI)
	<b>Activity 2.3.2</b> Conduct open days and exhibitions each year – 4 per each thematic area.						
<b>Output 2.4</b> <b>At least 26 informative promotional materials per year - 2 per Institute - made available to all stakeholders as per the stakeholder management plan.</b>	<b>Activity 2.4.1</b> Develop and disseminate informative documentaries, brochures, flyers, newsletters, pamphlets, and other promotional materials.						Directors/Deputy Directors of all the CSIR Institutes (ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRI, SARI, SRI, STEPRI, WRI)
<b>Output 2.5</b>	<b>Activity 2.5.1</b>						Director of Administration in collaboration with the PRO/

<p><b>Participation in at least 26 TV/radio talk show programmes per year – two per each Institute; publication of at least 52 feature articles each year– four per each Institute.</b></p>	<p>Identify media houses, programmes, participating staff, etc.</p> <p><b>Activity 2.5.2</b> Increase media exposure of CSIR (feature articles, radio, TV etc.)</p>	<table border="1"> <tr><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td></tr> </table>																					<p>Directors/Deputy Directors of all the CSIR Institutes (ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRI, SARI, SRI, STEPRI, WRI)</p>															
<p><b>Output 2.6</b> <b>At least Three public events organised annually.</b></p>	<p><b>Activity 2.6.1</b> Organise Awards Night each year to reward staff, customers, partners, donors etc.</p> <p><b>Activity 2.6.2</b> Institute and operationalise Annual R&amp;D Policy lectures to educate public on R&amp;D issues.</p> <p><b>Activity 2.6.3</b> Organise one inter-institutional social activity each year.</p> <p><b>Activity 2.6.4</b> Organise in partnership with stakeholders grand events on African Scientific Renaissance Day to promote importance of science and technology in nation development.</p>	<table border="1"> <tr><td>■</td><td>■</td><td>■</td><td>■</td><td>■</td></tr> <tr><td>■</td><td>■</td><td>■</td><td>■</td><td>■</td></tr> <tr><td>■</td><td>■</td><td>■</td><td>■</td><td>■</td></tr> <tr><td>■</td><td>■</td><td>■</td><td>■</td><td>■</td></tr> </table>	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	<p>Director of Administration in collaboration with the PRO/ Directors/Deputy Directors of all the CSIR Institutes (ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRI, SARI, SRI, STEPRI, WRI)</p>															
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<p><b>Output 2.7</b> <b>Webometrics ranking of CSIR improved from 6368 to at least 500 in five years.</b></p>	<p><b>Activity 2.7.1</b> Enhance visibility by 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.</p> <p><b>Activity 2.7.2</b> Improve Website activity by increasing total number of webpages hosted in the main web domain (including all the subdomains and directories)</p> <p><b>Activity 2.7.3</b></p>	<table border="1"> <tr><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td></tr> </table>																																				<p>Deputy Director General's Office</p>

	<p>Improve Openness by increasing the number of rich files (pdf, doc, docx, ppt) published in dedicated websites.</p> <p><b>Activity 2.7.4</b>          Improve excellence by increasing the number of academic papers published in high impact international journals</p>	<table border="1"> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>																					

**Table 10. Action Plan for Strategic Thrust 3: IPR Policy Operationalisation for Effective Commercialisation.**

Objective: To ensure the patenting of all CSIR technologies and drive the uptake of at least two existing or newly developed technologies (by the private sector) per thematic area per year.							
Outputs	Actions	Time Frame (Year)					Responsibility
		1	2	3	4	5	
<b>Output 3.1</b> IPR, PR and marketing functions audited and strengthened.	<b>Activity 3.1.1</b> Audit current IPR, PR and marketing functions and strengthen them to effectively deliver and aggressively promote uptake of technologies & services.	[Gantt bar: Year 1 to Year 2]					Deputy Director General's Office /Director of Finance/Director of Audit
<b>Output 3.2</b> At least 26 existing CSIR technologies patented/copyrighted each year -2 per Institute.	<b>Activity 3.2.1</b> Audit existing technologies and patent/copyright all marketable technologies developed within each thematic area.	[Gantt bar: Year 1 to Year 2]					Deputy Director General's Office /Director of Finance/Director of Audit
	<b>Activity 3.2.2</b> Pursue practical steps to patent technologies	[Gantt bar: Year 2 to Year 5]					
<b>Output 3.3</b> At least 26 private sector actors partner CSIR to commercialise copyrighted/patented technologies per year (two per each Institute).	<b>Activity 3.3.1</b> Establish strong beneficial business relationships/partnerships with industry to commercialise research outputs.	[Gantt bar: Year 2 to Year 5]					Deputy Director General's Office /Director of Finance/Director of Audit
<b>Output 3.4</b> At least 13 newly developed technologies patented or copyrighted (one per each Institute).	<b>Activity 3.4.1</b> Continually audit the technological environment to identify technologies that can beat competition.	[Gantt bar: Year 1 to Year 5]					Deputy Director General's Office /Director of Finance/Director of Audit
	<b>Activity 3.4.2</b> Pursue practical steps to patent technologies	[Gantt bar: Year 2 to Year 5]					
<b>Output 3.5</b> Annual Performance assessment of all CSIR Partnerships and technologies effectively undertaken.	<b>Activity 3.5.1</b> Define performance assessment criteria and scoring system separately for Partnerships and Technologies	[Gantt bar: Year 1]					Deputy Director General in collaboration with M&E Team.

	<p><b>Activity 3.5.2</b> Develop performance assessment forms separately for Partnerships and Technologies</p>	-					
	<p><b>Activity 3.5.3</b> Undertake performance assessment of partnerships and technologies</p>	-	-	-	-	-	

**Table 11. Action Plan for Strategic Thrust 4: Entrepreneurial Capacity Development**

Objective: To develop a business mindset and drive in the staff of CSIR to facilitate significant annual incremental profits from all commercial activities.							
Outputs	Actions	Time Frame (Year)					Responsibility
<b>Output 4.1</b> Entrepreneurial capacity development needs identified for: Top and middle level management Senior Members Senior Staff and Junior Staff	<b>Activity 4.1.1</b> Continually identify entrepreneurial capacity development needs for different categories of staff.	1	2	3	4	5	Directors/Deputy Directors of all the CSIR Institutes (ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)
<b>Output 4.2</b> At least 3 institutions assessed and confirmed for capacity to develop entrepreneurial capacity of all categories of staff.	<b>Activity 4.2.1</b> Identify and actively engage potential sources for entrepreneurial capacity development, and assess cost and content of training vis a vis CSIR needs.						Directors/Deputy Directors of all the CSIR Institutes (ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)
<b>Output 4.3</b> At least 75% of all categories of staff trained in relevant entrepreneurial activities	<b>Activity 4.3.1</b> 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.)						Directors/Deputy Directors of all the CSIR Institutes (ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)

**Table 12. Action Plan for Strategic Thrust 5: Financial Resource Mobilisation and Management.**

<b>Objective:</b> 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.							
<b>Outputs</b>	<b>Actions</b>	<b>Time Frame (Year)</b>					<b>Responsibility</b>
		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	
<b>Output 5.1</b> At least \$65.79 million - attracted through funding of winning proposals. Institutional contributions would be as specified in Appendix 3.	<b>Activity 5.1.1</b> Set up research proposal development and fund raising teams.	█					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) /Director of Finance/Director of Audit
	<b>Activity 5.1.2</b> Develop and submit winning proposals to donors for funding.	█					
<b>Output 5.2</b> At least GHC42.71 million attracted through the provision of consultancy services. Institutional contributions would be as specified in Appendix 3.	<b>Activity 5.2.1</b> Identify and bid for relevant consultancy services.	█					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) /Director of Finance/Director of Audit
	<b>Activity 5.2.2</b> Lobby government to get at least 20% of government jobs related to STI	█					
<b>Output 5.3</b> At least GHC39 million attracted through development of technologies for solving industry problems. Institutional contributions would be as specified in Appendix 3.	<b>Activity 5.3.1</b> Develop and submit technical and financial proposals to industry for funding to address identified industrial needs.	█					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) /Director of Finance/Director of Audit
<b>Output 5.4</b> At least GHC19.5 million generated through the sale of Research By-Products. Institutional contributions would be as specified in Appendix 3.	<b>Activity 5.4.1</b> Identify most marketable research by-products and potential buyers	█					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) /Director of Finance/Director of Audit
	<b>Activity 5.4.2</b> Develop and implement a marketing plan.	█					

<p><b>Output 5.5</b>  <b>Costing and pricing structure developed for products, services, projects and consultancies.</b></p>	<p><b>Activity 5.5.1</b>  Establish a competitive system for pricing products and services as well as budgeting for projects and consultancies.</p>	<table border="1"> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td colspan="5" style="text-align: center;">████████████████████</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>						████████████████████										<p>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) /Director of Finance/Director of Audit</p>
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<p><b>Output 5.6</b>  <b>Attract at least \$20 million into a CSIR Endowment fund for R&amp;D</b></p>	<p><b>Activity 5.6.1</b>  Organise a donors’ forum to solicit funds into the endowment fund.</p>	<table border="1"> <tr> <td>██</td> <td>██</td> <td>██</td> <td>██</td> <td>██</td> </tr> <tr> <td colspan="5" style="text-align: center;">████████████████████</td> </tr> </table>	██	██	██	██	██	████████████████████					<p>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) /Director of Finance/Director of Audit</p>					
██	██	██	██	██														
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<p><b>Output 5.7</b>  <b>At least GHC50 million added to the S&amp;T fund annually by government for undertaking targeted research activities.</b></p>	<p><b>Activity 5.7.1</b>  Actively engage with government to add on and operationalise the S&amp;T Fund.</p>	<table border="1"> <tr> <td>██</td> <td>██</td> <td>██</td> <td>██</td> <td>██</td> </tr> <tr> <td colspan="5" style="text-align: center;">████████████████████</td> </tr> </table>	██	██	██	██	██	████████████████████					<p>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) /Director of Finance/Director of Audit</p>					
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████████████████████																		



**Table 13. Action plan for Strategic Thrust 6: Effective Sustainable Staff Sensitisation & Motivation**

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	
<b>Output 6.1</b> <b>At least ten causes of poor attitudes and lack of motivation identified, addressed and reviewed annually.</b>	<b>Activity 6.1.1</b> Conduct annual situational analysis (HR Climate survey) to identify causes of poor attitudes and the lack of motivation amongst CSIR Staff.	██████████					Director of Administration
	<b>Activity 6.1.2</b> Re-orient staff to vision and mission of CSIR.	██████					
	<b>Activity 6.1.3</b> Effectively engage all staff in the implementation of new strategic plan	██████					
<b>Output 6.2</b> <b>Staff Incentive, loan and award schemes made more attractive to staff and management.</b>	<b>Activity 6.2.1</b> Audit existing staff incentive, loan and Award Schemes to identify shortfalls, improve and enhance effective operationalisation.	██████					Director of Finance /Director of Audit
<b>Output 6.3</b> <b>At least 80% of staff opinions taken into consideration in every decision making process.</b>	<b>Activity 6.3.1</b> Develop and implement a system for seeking opinions on issues before decision making and ensuring effective communication and feedback at all levels.	██████					Director of Administration Directors/Deputy Directors of all the CSIR Institutes (ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)
<b>Output 6.4</b> <b>Eighty percent (80%) of staff get promoted at the due time.</b>	<b>Activity 6.4.1</b> Meet staff at the beginning of their promotion cycle and develop a programme (with annual targets) for ensuring promotion criteria are met when due.	██████████					Deputy Director General's office Directors/Deputy Directors of all the CSIR Institutes (ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)
	<b>Activity 6.4.2</b>	██████████					

	Monitor staff progress annually to ensure purposeful progress on the plan developed.	<table border="1"> <tr> <td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td colspan="5"><hr/></td> </tr> </table>						<hr/>																														
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<p><b>Output 6.5</b>  <b>Eighty percent (80%) of staff benefit from one professional development support for each promotion cycle.</b></p>	<p><b>Activity 6.5.1</b>  Identify professional development needs of staff</p> <p><b>Activity 6.5.2</b>  Identify professional development opportunities</p> <p><b>Activity 6.5.3</b>  Develop and implement training programmes for professional development of staff.</p>	<table border="1"> <tr> <td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td colspan="5"><hr/></td> </tr> <tr> <td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td colspan="5"><hr/></td> </tr> <tr> <td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td colspan="5"><hr/></td> </tr> <tr> <td></td><td></td><td></td><td></td><td></td> </tr> </table>						<hr/>										<hr/>										<hr/>										<p>Deputy Director General in collaboration with Directors of all the CSIR Institutes (ARI, BIRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)</p>
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**Table 14. Action Plan for Strategic Thrust 7: Effective System Performance Management**

Objective: To develop a robust and effective monitoring and evaluation system that tracks and interrogates staff performance as well as the performance of every result-oriented activity within the CSIR on a quarterly basis.							
Outputs	Actions	Time Frame (Year)					Responsibility
<b>Output 7.1</b> Effective M&E Unit established and capacitated with staff and resources.	<b>Activity 7.1.1</b> Establish and capacitate an effective Monitoring and Evaluation Unit within the CSIR.	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	Deputy Director General in collaboration with M&E Team.
		█	█				
<b>Output 7.2</b> Comprehensive, robust and effective M&E system for CSIR developed.	<b>Activity 7.2.1</b> Audit current reporting systems for all result-oriented activities within the CSIR and improve upon them for robustness and effectiveness.						Deputy Director General in collaboration with M&E Team.
		█	█				
<b>Output 7.3</b> Objective performance of all systems and every CSIR staff and activities effectively measured.	<b>Activity 7.3.1</b> Implement a robust monitoring and evaluation system for all result-oriented activities within the CSIR.						Deputy Director General in collaboration with M&E Team.
		█	█	█	█	█	

**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 of Administration in collaboration with Director of STEPRI

**Table 15. Action Plan for Stakeholder Management Plan**

Output	Activities	Timeframe (Year)					Targeted Stakeholders
		1	2	3	4	5	
<b>SM.1</b> <b>Strategic Objectives and CSIR Goal and Vision effectively leveraged by promoters.</b>	<b>Activity SM.1.1</b> Engage closely, consult and influence actively.	█	█	█	█	█	<ul style="list-style-type: none"> <li>• Donor Organisations and Agencies</li> <li>• Government of Ghana (MMDAs)</li> <li>• Institute Management Boards</li> <li>• CSIR Council</li> <li>• Industrialists and the Private Sector</li> </ul>
	<b>Activity SM.1.2</b> Involve in governance and decision making bodies.	█	█	█	█	█	
	<b>Activity SM. 1.3</b> Monitor interest areas closely and address them on a timely basis.	█	█	█	█	█	
<b>SM.2</b> <b>Interest levels of Latents increased to become effective promoters of the CSIR Goal and Vision</b>	<b>Activity SM.2.1</b> Identify and satisfy their interests, to make them more passionate about the CSIR Goal and Vision.	█	█	█			<ul style="list-style-type: none"> <li>• Local and International Media</li> <li>• General Public</li> </ul>
	<b>Activity SM.2.2</b> Inform, engage and consult on interest areas as specified in the stakeholder analysis.	█	█	█			
	<b>Activity SM.2.3</b> Consciously influence Latents to become Promoters	█	█	█			
<b>SM.3</b> <b>Defenders become effective goodwill ambassadors and supporters of the CSIR Goal and Vision.</b>	<b>Activity SM.3.1</b> Inform adequately and consult effectively on interest area.	█	█	█			<ul style="list-style-type: none"> <li>• International Organisations (non-donors)</li> <li>• Educational Institutions</li> <li>• NGOs</li> <li>• Scientific Community</li> <li>• Farmers</li> <li>• CSIR staff</li> </ul>
	<b>Activity SM.3.2</b> Make use of interests through involvement in low risk areas.	█	█	█			
	<b>Activity SM.3.3</b> Inspire Defenders to consciously and actively support CSIR activities.	█	█	█			
<b>SM.4</b>	<b>Activity SM.4.1</b>						

<b>Interest level of the Apathetics increased to become effective Defenders of the CSIR Goal and Vision.</b>	Monitor Regularly to identify other interest areas that can be more effectively aligned to the CSIR vision.	<table border="1"> <tr><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td></tr> </table>											<ul style="list-style-type: none"> <li>• Banks and Financial Institutions</li> <li>• Importers and Suppliers of Scientific equipment and supplies.</li> </ul>
<b>Activity SM.4.2</b> Inform via general communication, newsletter, website and mail shots.	<table border="1"> <tr><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td></tr> </table>												
<b>Activity SM.4.3</b> Consciously influence Apathetics to become Defenders.	<table border="1"> <tr><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td></tr> </table>												

## CHAPTER 5 MONITORING AND EVALUATION FRAMEWORK

### 5.1 OUTPUT INDICATORS, MEANS OF VERIFICATION AND DUE DATES.

<b>Table 16. Monitoring Framework for Strategic Thrust 1: Targeted Technology Development</b>			
<b>Outputs</b>	<b>Indicators</b>	<b>Means of Verification</b>	<b>Due Date</b>
<b>Output 1.1</b> At least 39 technical proposals approved annually by industry to address 39 identified industrial needs.	•Number of technical proposals approved by industry	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	June 30 & Dec. 31 of each year
	•Number of identified industrial needs.	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	June 30 & Dec. 31 of each year
<b>Output 1.2</b>			
<b>At least 39 industry driven technologies – 3 per each Institute per year - developed for testing and validation.</b>	•Number of industry driven technologies developed	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	June 30 & Dec. 31 of each year
<b>Output 1.3</b>			
<b>At least 39 industry driven technologies validated and adopted by industry.</b>	•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
<b>Output 1.4</b>			
<b>At least 39 scientific papers published in internationally recognised journals.</b>	•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
<b>Output 1.5</b>			
<b>Strengthening technology development capacity in relevant specialised areas (eg. Robotics, ICT, nanotechnology etc)</b>	•Number of staff trained in relevant specialised areas	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 17. Monitoring Framework for Strategic Thrust 2: Corporate Visibility Improvement

Outputs	Indicators	Means of Verification	Due Date
<i>Output 2.1</i>			
<b>Guidelines for a PPP agenda developed</b>	•Document detailing Guidelines for a PPP agenda.	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	Dec 31. 2020.
<i>Output 2.2</i>			
<b>PPP arrangements established with at least 26 private sector actors – 2 per each Institute per year</b>	•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
<i>Output 2.3</i>			
<b>At least one specific interest of 50% of identified stakeholders addressed.</b>	•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
	•Number of stakeholder interests addressed	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	June 30& Dec. 31 of each year.
<i>Output 2.4</i>			
<b>At least two informative promotional materials per year per Institute made available to all stakeholders as per the stakeholder management plan.</b>	•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)	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	June 30& Dec. 31 of each year
<i>Output 2.5</i>			
<b>Participation in at least 26 TV/radio talk show programmes a year – two per each Institute; publication of at least 52 feature articles each year – four per each Institute per year.</b>	•Number of TV/radio talk show programmes participated in.	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	June 30& Dec. 31 of each year
	•Number of feature articles published.	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	June 30& Dec. 31 of each year
<i>Output 2.6</i>			
<b>At least Three public events organised annually.</b>	•Number of public events organised annually.	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	June 30& Dec. 31 of each year
<i>Output 2.7</i>			
<b>CSIR ranking on webometrics improved from 6368 to at least 500 in five years.</b>	•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 18. Monitoring Framework For Strategic Thrust 3: IPR Policy Operationalisation for Effective Commercialisation.**

<b>Outputs</b>	<b>Indicators</b>	<b>Means of Verification</b>	<b>Due Date</b>
<i>Output 3.1</i>			
<b>IPR, PR and marketing functions audited and strengthened.</b>	•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. 2020.
<i>Output 3.2</i>			
<b>At least 26 existing CSIR technologies patented/copyrighted each year -2 per each Institute.</b>	•Number of existing 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
<i>Output 3.3</i>			
<b>At least 26 private sector actors partner CSIR to commercialise copyrighted/patented technologies per year (two per each Institute).</b>	•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
<i>Output 3.4</i>			
<b>At least 13 newly developed technologies patented or copyrighted (one per each Institute per year).</b>	•Number of newly developed technologies patented or copyrighted (one per each Institute).	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	June 30 & Dec. 31 of each year
<i>Output 3.5</i>			
<b>Annual Performance assessment of all CSIR Partnerships and technologies effectively undertaken.</b>	•Number of CSIR Partnerships effectively assessed.	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	June 30 & Dec. 31 of each year
	•Number of CSIR technologies effectively assessed.	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	June 30 & Dec. 31 of each year



<b>Table 19. Monitoring Framework For Strategic Thrust 4: Entrepreneurial Capacity Development</b>			
<b>Outputs</b>	<b>Indicators</b>	<b>Means of Verification</b>	<b>Due Date</b>
<i>Output 4.1</i>			
<b>Entrepreneurial capacity development needs identified for:</b>	Number and types of Entrepreneurial capacity development needs identified for:	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	Dec 31. 2020.
<b>Top and middle level management</b>	•Number and types of Entrepreneurial capacity development needs identified for: Top and middle level management	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	Dec 31. 2020.
<b>Senior Members</b>	•Number and types of Entrepreneurial capacity development needs identified for: Senior Members	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	Dec 31. 2020.
<b>Senior Staff and</b>	•Number and types of Entrepreneurial capacity development needs identified for: Senior Staff	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	Dec 31. 2020.
<b>Junior Staff</b>	•Number and types of Entrepreneurial capacity development needs identified for: Junior Staff	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	Dec 31. 2020.
<i>Output 4.2</i>			
<b>At least 3 institutions assessed and confirmed for capacity to develop entrepreneurial capacity of all categories of staff.</b>	•Number of institutions assessed and confirmed for capacity to develop entrepreneurial capacity of staff.	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	Dec 31. 2020.
<i>Output 4.3</i>			
<b>At least 75% of all categories of staff trained in relevant entrepreneurial activities</b>	•Number and category of staff trained in relevant entrepreneurial activities.	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	June 30 & Dec 31 of each year

**Table 20. Monitoring Framework For Strategic Thrust 5: Financial Resource Mobilisation and Management.**

<b>Outputs</b>	<b>Indicators</b>	<b>Means of Verification</b>	<b>Due Date</b>
<i>Output 5.1</i>			
<b>At least \$65.79 million - attracted through funding of winning proposals. Institutional contributions would be as specified in Appendix 3.</b>	•Amount attracted through funding of winning proposals by donor community	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	Dec 31 of each year
<i>Output 5.2</i>			
<b>At least GHC42.71 million attracted through the provision of consultancy services. Institutional contributions would be as specified in Appendix 3.</b>	•Amount attracted through the provision of consultancy services.	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	Dec 31 of each year
<i>Output 5.3</i>			
<b>At least GHC39 million attracted through development of technologies for solving industry problems. Institutional contributions would be as specified in Appendix 3.</b>	•Amount attracted through development of technologies for solving industry problems	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	Dec 31 of each year
<i>Output 5.4</i>			
<b>At least GHC19.5 million generated through the sale of Research By-Products. Institutional contributions would be as specified in Appendix 3.</b>	•Amount generated through the sale of Research By-Products.	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	Dec 31 of each year
<i>Output 5.5</i>			
<b>Costing and pricing structure developed for products, services, projects and consultancies.</b>	•Number of different Costing and pricing structure developed (one each for products, services, projects and consultancies).	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	Dec 31 of each year
<i>Output 5.6</i>			
<b>Attract at least 20million dollars into a CSIR Endowment fund for R&amp;D</b>	•Amount attracted into CSIR Endowment fund	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	Dec 31 of each year
<i>Output 5.7</i>			
<b>At least 50 Million cedis added to the S&amp;T fund annually for undertaking targeted research activities.</b>	•Amount added to the S&T fund annually	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	Dec 31 of each year



**Table 21. Monitoring Framework For Strategic Thrust 6: Effective Sustainable Staff Sensitisation & Motivation**

<b>Outputs</b>	<b>Indicators</b>	<b>Means of Verification</b>	<b>Due Date</b>
<i>Output 6.1</i>			
<b>At least ten causes of poor attitudes and lack of motivation identified, addressed and reviewed annually.</b>	•Number of causes of poor attitudes and lack of motivation identified	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	Dec 31. 2020.
	•Number of causes of poor attitudes and lack of motivation identified, addressed and reviewed annually.	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	June 30.& Dec 31 of each year
<i>Output 6.2</i>			
<b>Staff Incentive, loan and award schemes made more attractive to staff and management.</b>	•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
<i>Output 6.3</i>			
<b>At least 80% of staff opinions taken into consideration in every decision making process.</b>	•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
<i>Output 6.4</i>			
<b>80% of staff get promoted at the due time.</b>	•Number of staff promoted at the due time.	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	June 30& Dec 31 of each year
<i>Output 6.5</i>			
<b>80% of staff benefit from one professional development support for each promotion cycle.</b>	•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

**Table 22. Monitoring Framework For Strategic Thrust 7: Effective System Performance Management**

<b>Outputs</b>	<b>Indicators</b>	<b>Means of Verification</b>	<b>Due Date</b>
<i>Output 7.1</i>			
<b>Effective M&amp;E Unit established and empowered and capacitated.</b>	•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. 2020
<i>Output 7.2</i>			
<b>Comprehensive, robust and effective M&amp;E system for CSIR developed.</b>	•Copy of comprehensive, robust and effective M&E system developed for CSIR.	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	Dec 31. 2020
<i>Output 7.3</i>			
<b>Objective performance of all systems and every CSIR staff and activities effectively measured.</b>	•Annual performance assessment reports on CSIR systems, staff and activities (one for each area)	Progress Report, Activity Report, M&E Report, Indicator Tracking Report.	June 30& Dec 31 of each year

**Table 23. Monitoring Framework For Stakeholder Management Outputs**

<b>Outputs</b>	<b>Indicators</b>	<b>Means of Verification</b>	<b>Due Date</b>
<i>SM 1</i>			
<b>Strategic Objectives and CSIR Goal and Vision effectively leveraged by Promoters.</b>	• 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.
<i>SM 2.</i>			
<b>Interest levels of Latents increased to become effective promoters of the CSIR Goal and Vision</b>	• 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.
<i>SM 3</i>			
<b>Defenders become effective goodwill ambassadors and supporters of the CSIR Goal and Vision.</b>	• 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.
<i>SM 4</i>			
<b>Interest level of the Apathetics increased to become effective Defenders of the CSIR Goal and Vision.</b>	• 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 24. Targets for Strategic Thrust 1 Indicators**

<b>Strategic Thrust 1: Targeted Technology Development</b>		
<b>INDICATOR</b>	<b>TARGETS</b>	
	<b>5-Years</b>	<b>Yearly</b>
<i>Indicator 1.1</i>		
Number of technical proposals approved by industry	195	39
Number of identified industrial needs.	195	39
<i>Indicator 1.2</i>		
Number of industry driven technologies developed	195	39
<i>Indicator 1.3</i>		
Number of industry driven technologies validated and adopted by industry.	195	39
<i>Indicator 1.4</i>		
Number of scientific papers published in internationally recognised journals.	195	39
<i>Indicator 1.5</i>		
Number of staff trained in relevant specialised areas	500	100
Number of specified specialised areas covered	7	7

**Table 25. Targets for Strategic Thrust 2 Indicators**

<b>Strategic Thrust 2: Corporate Visibility Improvement</b>		
<b>INDICATOR</b>	<b>TARGET</b>	
	<b>5-Year</b>	<b>1-Year</b>
<i>Indicator 2.1</i>		
Document detailing Guidelines for a PPP agenda.	1	1
<i>Indicator 2.2</i>		
Number of private sector actors with whom PPP arrangements have been established.	130	26
<i>Indicator 2.3</i>		
Number of identified stakeholders whose interests have been addressed. (1 per category per year)	75	15
Number of stakeholder interests addressed	52	52
<i>Indicator 2.4</i>		
Number of informative promotional materials distributed to stakeholders.	130	26
Number of stakeholders receiving promotional materials. (at least 5 per each stakeholder category)	375	75
<i>Indicator 2.5</i>		
Number of TV/radio talk show programmes participated in.	130	26

Number of feature articles published.	260	52
<i>Indicator 2.6</i>		
Number of public events organised annually.	15	3
<i>Indicator 2.7</i>		
CSIR ranking on webometrics improved from 6368 to at least 500 in five years.	6000	1200

**Table 26. Targets for Strategic Thrust 3 Indicators**

<b>Strategic Thrust 3: IPR Policy Operationalisation for Effective Commercialisation.</b>		
<b>INDICATOR</b>	<b>TARGET</b>	
	<b>5-Year</b>	<b>1-Year</b>
<i>Indicator 3.1</i>		
Document re-defining staffing, responsibilities, powers and allocated resources for IPR, PR and marketing functions.	1	1
<i>Indicator 3.2</i>		
Number of existing CSIR technologies patented/copyrighted each year – (two per Institute)	130	26
<i>Indicator 3.3</i>		
Number of private sector actors partnering CSIR to commercialise copyrighted/patented technologies	130	26
<i>Indicator 3.4</i>		
Number of newly developed technologies patented or copyrighted (one per each Institute).	65	13
<i>Indicator 3.5</i>		
Number of CSIR Partnerships effectively assessed.	65	13
Number of CSIR technologies effectively assessed.	130	26

**Table 27. Targets for Strategic Thrust 4 Indicators**

<b>Strategic Thrust 4: Entrepreneurial Capacity Development</b>		
<b>INDICATOR</b>	<b>TARGET</b>	
	<b>5-Year</b>	<b>1-Year</b>
<i>Indicator 4.1</i>		
Number and types of Entrepreneurial capacity development needs identified for:		
Top and middle level management	4	4
Senior Members	4	4
Senior Staff and	4	4
Junior Staff	4	4



<b>Indicator 4.2</b>		
<b>Number of institutions assessed and confirmed for capacity to develop entrepreneurial capacity of staff.</b>	3	3
<b>Indicator 4.3</b>		
<b>Number and category of staff trained in relevant entrepreneurial activities.</b>	2250	450

**Table 28. Targets for Strategic Thrust 5 Indicators**

**Strategic Thrust 5: Financial Resource Mobilisation and Management.**

INDICATOR	TARGETS	
	5-Year	Yearly
<b>Indicator 5.1</b>		
<b>Amount attracted through funding of winning proposals by donor community</b>	\$65.79m	See Appendix 3
<b>Indicator 5.2</b>		
<b>Amount attracted through the provision of consultancy services.</b>	GHC42.71m	See Appendix 3
<b>Indicator 5.3</b>		
<b>Amount attracted through development of technologies for solving industry problems</b>	GHC39.00 m	See Appendix 3
<b>Indicator 5.4</b>		
<b>Amount generated through the sale of Research By-Products.</b>	GHC19.50 m	See Appendix 3
<b>Indicator 5.5</b>		
<b>Number of different Costing and pricing structures developed (one each for products, services, projects and consultancies).</b>	4	4
<b>Indicator 5.6</b>		
<b>Amount attracted into CSIR Endowment fund</b>	\$20m	\$4m
<b>Indicator 5.7</b>		
<b>Amount added to the S&amp;T fund</b>	GHC250 m	GHC50 m

**Table 29. Targets for Strategic Thrust 6 Indicators**

<b>Strategic Thrust 6: Effective Sustainable Staff Sensitisation &amp; Motivation</b>		
<b>INDICATORS</b>	<b>TARGETS</b>	
	<b>5-Year</b>	<b>1-Year</b>
<i>Indicator 6.1</i>		
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	2
<i>Indicator 6.2</i>		
Number of Staff benefitting from more attractive Incentive, loan and award schemes.	1500	300
<i>Indicator 6.3</i>		
Number of staff opinions taken into consideration in decision making processes.	2400	480
<i>Indicator 6.4</i>		
Number of staff promoted at the due time.	2400	480
<i>Indicator 6.5</i>		
Number of staff benefit from one professional development support for each promotion cycle.	2400	480

**Table 30. Targets for Strategic Thrust 7 Indicators**

<b>Strategic Thrust 7: Effective System Performance Management</b>		
<b>INDICATOR</b>	<b>TARGET</b>	
	<b>5-Year</b>	<b>1-Year</b>
<i>Indicator 7.1</i>		
Copy of document re-defining staffing, responsibilities, powers and allocated resources, for the established M&E Function.	1	1
<i>Indicator 7.2</i>		
Copy of comprehensive, robust and effective M&E system developed for CSIR.	1	1
<i>Indicator 7.3</i>		
Annual performance assessment reports on CSIR systems, staff and activities (one for each area)	15	3

**Table 31. Targets for Stakeholder Management Indicators**

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

## CHAPTER 6 IMPLEMENTATION

The day to day implementation of the strategic plan shall be the responsibility of the Institute Directors, and the Director of Administration, who shall be expected to submit six-monthly reports on progress made to the Unit responsible for M&E, for compilation and preparation of a report for the Directors Management Committee (DMC). The DMC shall decide and empower a Unit at the Head Office that shall be responsible for Monitoring and Evaluation of progress of the plan.

## APPENDICES

### APPENDIX 1 INDICATOR TRACKING TABLES

#### Indicator Tracking for Strategic Thrust 1: Targeted Technology Development

Indicator	Overall Target	Overall Due Date	Expected Targets for Each Specified Period									
			2020		2021		2022		2023		2024	
			Jun	Dec	Jun	Dec	Jun	Dec	Jun	Dec	Jun	Dec
•Number of technical proposals approved by industry	One Hundred and ninety-five (195) technical proposals approved by industry	31st December 2024	26	13	26	13	26	13	26	13	26	13
•Number of identified industrial needs.	One Hundred and ninety-five (195) industry needs identified	31st December 2024	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 2024	26	13	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 2024	26	13	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 2024	26	13	26	13	26	13	26	13	26	13
•Number of staff trained in relevant specialised disciplines	Five Hundred (500) staff trained in specialised disciplines.	31st December 2024		100		100		100		100		100
•Number of specified specialised disciplines covered	Seven (7) specific specialised disciplines covered	31st December 2024		7		7		7		7		7

**Indicator Tracking for Strategic Thrust 2: Corporate Visibility**

Indicator	Overall Target	Overall Due Date	Expected Targets for Each Specified Period										
			2020		2021		2022		2023		2024		
			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 2020		1									
•Number of private sector actors with whom PPP arrangements have been established.	One Hundred and thirty (130) PPP arrangements established	31st December 2024	13	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 2024		15		15		15		15		15	
•Number of stakeholder interests addressed	Fifty-two (52) stakeholder interests addressed	31st December 2020		52		52		52		52		52	
•Number of informative promotional materials distributed to stakeholders	One Hundred and thirty (130) informative promotional materials distributed to stakeholders	31st December 2024	13	13	13	13	13	13	13	13	13	13	13
•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 2024	38	37	38	37	38	37	38	37	38	37	38
•Number of TV/radio talk show programmes participated in.	One Hundred and Thirty (130) TV/radio show programmes participated in	31st December 2024	13	13	13	13	13	13	13	13	13	13	13
•Number of feature articles published.	Two hundred and Sixty (260) articles published	31st December 2024	26	26	26	26	26	26	26	26	26	26	26
•Number of public events organised annually.	Fifteen (15) public events organised annually	31st December 2024		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 2024		4800		3600		2400		1200		500	

**Indicator Tracking for Strategic Thrust 3: IPR Policy Operationalisaion for Effective Commercialisation**

Indicator	Overall Target	Overall Due Date	Expected Targets for Each Specified Period										
			2020		2021		2022		2023		2024		
			Jun	Dec	Jun	Dec	Jun	Dec	Jun	Dec	Jun	Dec	
•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 2020		1									
•Number of existing CSIR technologies patented/copyrighted each year – (two per Institute)	One Hundred and thirty (130) CSIR technologies patented/copyrighted	31st December 2024	13	13	13	13	13	13	13	13	13	13	13
•Number of private sector actors partnering CSIR to commercialise copyrighted/patented technologies	Sixty five (65) private actors partnering CSIR to commercialise copyrighted/patented	31st December 2024		13		13		13		13		13	
•Number of newly developed technologies patented or copyrighted (one per each Institute).	Sixty five (65) newly developed technologies patented/copyrighted (one per Institute)	31st December 2024		13		13		13		13		13	
•Number of CSIR Partnerships effectively assessed.	Sixty-five (65) CSIR Partnerships effectively assessed	31st December 2024		13		13		13		13		13	
•Number of CSIR technologies effectively assessed.	Sixty-five (65) CSIR technologies effectively assessed	31st December 2024		13		13		13		13		13	

### Indicator Tracking for Strategic Thrust 4: Entrepreneurial Capacity Development

Indicator	Overall Target	Overall Due Date	Expected Targets for Each Specified Period									
			2020		2021		2022		2023		2024	
			Jun	Dec	Jun	Dec	Jun	Dec	Jun	Dec	Jun	Dec
•Number and types of Entrepreneurial capacity development needs identified for: Top and middle level management	Four (4) Entrepreneurial capacity development needs identified for Top and middle level management	31st December 2020	0	4	0	0	0	0	0	0	0	0
•Number and types of Entrepreneurial capacity development needs identified for: Senior Members	Four (4) Entrepreneurial capacity development needs identified for Senior Members		0	4	0	0	0	0	0	0	0	0
•Number and types of Entrepreneurial capacity development needs identified for: Senior Staff	Four (4) Entrepreneurial capacity development needs identified for Senior Staff		0	4	0	0	0	0	0	0	0	0
•Number and types of Entrepreneurial capacity development needs identified for: Junior Staff	Four (4) Entrepreneurial capacity development needs identified for Junior Staff		0	4	0	0	0	0	0	0	0	0
•Number of institutions assessed and confirmed for capacity to develop entrepreneurial capacity of staff.	Three (3) institutions assessed and confirmed for capacity to develop entrepreneurial capacity of staff	31st December 2020	0	3	0	0	0	0	0	0	0	0
•Number and category of staff trained in relevant entrepreneurial activities.	Two thousand two hundred and fifty (2250) staff trained in relevant entrepreneurial activities	31st December 2024	225	225	225	225	225	225	225	225	225	225

### Indicator Tracking for Strategic Thrust 5: Financial Resource Mobilisation and Management

Indicator	Overall Target	Overall Due Date	Expected Targets for Each Specified Period											
			2020		2021		2022		2023		2024			
			Jun	Dec	Jun	Dec	Jun	Dec	Jun	Dec	Jun	Dec		
•Amount attracted through funding of winning proposals by donor community	Approx Sixty-five million US dollars (\$65.79m) attracted through winning proposals	31st December 2024		48.36		52.22		56.40		60.91		65.79		
•Amount attracted through the provision of consultancy services.	Approx Forty-three million cedis (GHC42.71m) attracted through consultancy services	31st December 2024		33.44		44.10		58.17		76.73		101.21		
•Amount attracted through development of technologies for solving industry problems	Approx thirty-nine million cedis (GHC39.00m) attracted through development of technologies for solving industry problems	31st December 2024												
Amount generated through the sale of Research By-Products.	Approx Nineteen million cedis (GHC19.50m) generated through the sale of Research By-Products	31st December 2024												
•Number of different Costing and pricing structure developed (one each for products, services, projects and consultancies).	Four (4) different costing and pricing structure developed (one each for products, services, products and consultancies)	31st December 2020		4		4		4		4		4		
•Amount attracted into CSIR Endowment fund	Twenty million US dollars (\$20m) attracted into CSIR Endowment fund	31st December 2024		4		4		4		4		4		
•Amount added to the S&T fund annually	Fifty million cedis (GHC50m) added to S&T fund annually by government	31st December 2024		50		50		50		50		50		



**Indicator Tracking for Strategic Thrust 6: Effective Sustainable Staff Sensitisation & Motivation**

Indicator	Overall Target	Overall Due Date	Expected Targets for Each Specified Period										
			2020		2021		2022		2023		2024		
			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 2020		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 2024		10		10		10		10			10
•Number of Staff benefitting from more attractive Incentive, loan and award schemes.	One Thousand five hundred (1500) staff benefitting from attractive Incentive loan and award schemes	31st December 2024	150	150	150	150	150	150	150	150	150	150	150
•Number of staff opinions taken into consideration in decision making processes.	Two thousand four hundred (2400) staff opinions taken into consideration in decision making processes	31st December 2024	240	240	240	240	240	240	240	240	240	240	240
•Number of staff promoted at the due time.	Two thousand four hundred (2400) staff promoted at the due time	31st December 2024	240	240	240	240	240	240	240	240	240	240	240
•Number of staff benefit from one professional development support for each promotion cycle.	Two thousand four hundred (2400) staff benefit from one professional development support	31st December 2024	240	240	240	240	240	240	240	240	240	240	240

**Indicator Tracking for Strategic Thrust 7: Effective System Performance Management**

Indicator	Overall Target	Overall Due Date	Expected Targets for Each Specified Period										
			2020		2021		2022		2023		2024		
			Jun	Dec	Jun	Dec	Jun	Dec	Jun	Dec	Jun	Dec	
•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 2020	0	1	0	0	0	0	0	0	0	0	0
•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 2020	0	1	0	0	0	0	0	0	0	0	0
•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 2024	0	3	0	3	0	3	0	3	0	3	3

## Indicator Tracking For Stakeholder Management

Indicator	Overall Target	Overall Due Date	Expected Targets for Each Specified Period									
			2020		2021		2022		2023		2024	
			Jun	Dec	Jun	Dec	Jun	Dec	Jun	Dec	Jun	Dec
• <b>Number of Promoters involved in decision making bodies of CSIR (5 per category)</b>	Twenty five (25) Promoters involved in decision making bodies of CSIR (5 per category)	31st December 2024	3	2	3	2	3	2	3	2	3	2
• <b>Number of impact activities creditable to Promoters' lobbying or funding support activities or promoting access to opportunity. (2 per category)</b>	Fifty (50) impact activities creditable to Promoters' lobbying or funding support activities or promoting access to opportunity (2 per category)	31st December 2024	5	5	5	5	5	5	5	5	5	5
• <b>Number of Latents becoming effective Promoters of the CSIR Goal and Vision (2 per category)</b>	Twenty (20) Latents becoming effective Promoters of CSIR Goal and Vision (2 per category)	31st December 2024	2	2	2	2	2	2	2	2	2	2
• <b>Number of Defenders become effective goodwill ambassadors and supporters of the CSIR Goal and Vision. (2 per category)</b>	Sixty (60) Defenders becoming effective goodwill ambassadors and supporters of the CSIR Goal and Vision (2 per category)	31st December 2024	6	6	6	6	6	6	6	6	6	6
• <b>Number of the Apathetics becoming effective Defenders of the CSIR Goal and Vision. (2 per category)</b>	Twenty (20) Apathetics becoming effective Defenders of the CSIR Goal and Vision (2 per category)	31st December 2024	2	2	2	2	2	2	2	2	2	2

**APPENDIX 2 INDICATOR TRACKING REPORTING FORMS FOR JANUARY - DECEMBER 2020**
**Reporting Form for Strategic Thrust 1: Targeted Technology Development**

Indicators	Target	Responsibility	Actual	% Achieved	Variance & Comments
•Number of technical proposals approved by industry	39	Directors/Deputy Directors of all the CSIR Institutes (ARI, BIRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)			
•Number of identified industrial needs.	39	Directors/Deputy Directors of all the CSIR Institutes (ARI, BIRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)			
•Number of industry driven technologies developed	39	Directors/Deputy Directors of all the CSIR Institutes (ARI, BIRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)			
•Number of industry driven technologies validated and adopted by industry.	39	Directors/Deputy Directors of all the CSIR Institutes (ARI, BIRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)			
•Number of scientific papers published in internationally recognised journals.	39	Directors/Deputy Directors of all the CSIR Institutes (ARI, BIRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)			
•Number of staff trained in relevant specialised disciplines	7	Director of Administration in partnership with Directors of IIR, BIRRI, & INSTI			
•Number of specified specialised disciplines covered	7	Director of Administration in partnership with Directors of IIR, BIRRI, & INSTI			

**Reporting Form for Strategic Thrust 2: Corporate Visibility Improvement**

Indicators	Target	Responsibility	Actual	% Achieved	Variance & Comments
•Document detailing Guidelines for a PPP agenda.	1	Director of Administration in collaboration with the PRO			
•Number of private sector actors with whom PPP arrangements have been established.	26	Director of Administration in collaboration with the PRO/Directors/Deputy Directors of 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 PRO / Directors/Deputy 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 / Directors/Deputy Directors of 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	26	Directors/Deputy Directors of 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	Directors/Deputy Directors of 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.	26	Director of Administration in collaboration with the PRO/ Directors/Deputy Directors of all the CSIR Institutes (ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)			
•Number of feature articles published.	52	Director of Administration in collaboration with the PRO/ Directors/Deputy Directors of 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 PRO/ Directors/Deputy Directors of all the CSIR Institutes (ARI,			

		BRRRI, 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's Office			

### Reporting Form for Strategic Thrust 3: IPR Policy Operationalisaion for Effective Commercialisation

Indicators	Target	Responsibility	Actual	% Achieved	Variance & Comments
•Document re-defining staffing, responsibilities, powers and allocated resources for IPR, PR and marketing functions.	1	Deputy Director General's Office			
•Number of existing CSIR technologies patented/copyrighted each year – (two per Institute)	26	Deputy Director General's Office, Directors/Deputy Directors of all the CSIR Institutes (ARI, BRRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)			
•Number of private sector actors partnering CSIR to commercialise copyrighted/patented technologies	13	Deputy Director General's Office; Directors/Deputy Directors of all the CSIR Institutes (ARI, BRRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)			
•Number of newly developed technologies patented or copyrighted (one per each Institute).	13	Deputy Director General's Office; Directors/Deputy Directors of all the CSIR Institutes (ARI, BRRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)			
•Number of CSIR Partnerships effectively assessed.	13	Deputy Director General in collaboration with M&E Team.			
•Number of CSIR technologies effectively assessed.	13	Deputy Director General in collaboration with M&E Team.			

### Reporting Form for Strategic Thrust 4: Entrepreneurial Capacity Development

Indicators	Target	Responsibility	Actual	% Achieved	Variance & Comments
•Number and types of Entrepreneurial capacity development needs identified for: Top and middle level management	4	Directors/Deputy Directors of all the CSIR Institutes (ARI, BRRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)			
•Number and types of Entrepreneurial capacity development needs identified for: Senior Members	4	Directors/Deputy Directors of all the CSIR Institutes (ARI, BRRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI) Directors/Deputy Directors of all the CSIR Institutes (ARI, BRRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)			
•Number and types of Entrepreneurial capacity development needs identified for: Senior Staff	4	Directors/Deputy Directors of all the CSIR Institutes (ARI, BRRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)			
•Number and types of Entrepreneurial capacity development needs identified for: Junior Staff	4	Directors/Deputy Directors of all the CSIR Institutes (ARI, BRRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)			
•Number of institutions assessed and confirmed for capacity to develop entrepreneurial capacity of staff.	3	Directors/Deputy Directors of all the CSIR Institutes (ARI, BRRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)			
•Number and category of staff trained in relevant entrepreneurial activities.	450	Directors/Deputy Directors of all the CSIR Institutes (ARI, BRRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRRI, SARI, SRI, STEPRI, WRI)			

### Reporting Form for Strategic Thrust 5: Financial Resource Mobilisation and Management

Indicators	Target	Responsibility	Actual	% Achieved	Variance & Comments
•Amount attracted through funding of winning proposals by donor community	US\$7.8m	Deputy Director General in collaboration with Directors of all the CSIR Institutes (ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRI, SARI, SRI, STEPRI, WRI)			
•Amount attracted through the provision of consultancy services.	GHC7.8m	Deputy Director General in collaboration with Directors of all the CSIR Institutes (ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRI, SARI, SRI, STEPRI, WRI)			
•Amount attracted through development of technologies for solving industry problems	GHC7.8m	Deputy Director General in collaboration with Directors of all the CSIR Institutes (ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRI, SARI, SRI, STEPRI, WRI)			
Amount generated through the sale of Research By-Products. (GHCm)	GHC3.9m	Deputy Director General in collaboration with Directors of all the CSIR Institutes (ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRI, SARI, SRI, STEPRI, WRI)			
•Number of different Costing and pricing structure developed (one each for products, services, projects and consultancies).	4	Deputy Director General in collaboration with Directors of all the CSIR Institutes (ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRI, SARI, SRI, STEPRI, WRI)			
•Amount attracted into CSIR Endowment fund	US\$4.0m	Deputy Director General in collaboration with Directors of all the CSIR Institutes (ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRI, SARI, SRI, STEPRI, WRI)			
•Amount added to the S&T fund annually	US\$10m	Deputy Director General in collaboration with Directors of all the CSIR Institutes (ARI, BRRI, CRI, FORIG, FRI, IIR, INSTI, OPRI, PGRI, SARI, SRI, STEPRI, WRI)			



### Reporting Form for Strategic Thrust 6: Effective Sustainable Staff Sensitisation & Motivation

Indicators	Target	Responsibility	Actual	% Achieved	Variance & Comments
•Number of causes of poor attitudes and lack of motivation identified	10	Director of Administration			
•Number of causes of poor attitudes and lack of motivation identified, addressed and reviewed annually.	10	Director of Administration			
•Number of Staff benefitting from more attractive Incentive, loan and award schemes.	300	Director of Finance			
•Number of staff opinions taken into consideration in decision making processes.	480	Director of Administration			
•Number of staff promoted at the due time.	480	Deputy Director General's office			
•Number of staff benefit from one professional development support for each promotion cycle.	480	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)			

### Reporting Form for Strategic Thrust 7: Effective System Performance Management

Indicators	Target	Responsibility	Actual	% Achieved	Variance & Comments
•Copy of document re-defining staffing, responsibilities, powers and allocated resources, for the established M&E Function.	1	Deputy Director General in collaboration with M&E Team.			
•Copy of comprehensive, robust and effective M&E system developed for CSIR.	1	Deputy Director General in collaboration with M&E Team.			
•Annual performance assessment reports on CSIR systems, staff and activities (one for each area)	3	Deputy Director General in collaboration with M&E Team.			

**Reporting Form For Stakeholder Management**

<b>Indicators</b>	<b>Target</b>	<b>Responsibility</b>	<b>Actual</b>	<b>% Achieved</b>	<b>Variance &amp; Comments</b>
• <b>Number of promoters involved in decision making bodies of CSIR (5 per category)</b>	5	Director General, Institute Directors, Scientific Secretaries and Public Relation Officers			
• <b>Number of impact activities creditable to Promoters' lobbying or funding support activities or promoting access to opportunity. (2 per category)</b>	10	Director General, Institute Directors, Scientific Secretaries and Public Relation Officers			
• <b>Number of Latents becoming effective Promoters of the CSIR Goal and Vision (2 per category)</b>	4	Director General, Institute Directors, Scientific Secretaries and Public Relation Officers			
• <b>Number of Defenders become effective goodwill ambassadors and supporters of the CSIR Goal and Vision. (2 per category)</b>	12	Director General, Institute Directors, Scientific Secretaries and Public Relation Officers			
• <b>Number of the Apathetics becoming effective Defenders of the CSIR Goal and Vision. (2 per category)</b>	4	Director General, Institute Directors, Scientific Secretaries and Public Relation Officers			

**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)				
	2020	2021	2022	2023	2024
ARI	0.40	0.52	0.69	0.91	1.20
BRRI	5.53	7.30	9.63	12.70	16.75
CRI	3.80	5.01	6.61	8.72	11.50
FORIG	3.50	4.61	6.08	8.02	10.58
FRI	2.70	3.56	4.69	6.19	8.16
IIR	1.26	1.66	2.19	2.89	3.82
INSTI	0.19	0.25	0.33	0.44	0.58
OPRI	3.54	4.67	6.16	8.12	10.72
PGRRI	0.34	0.45	0.60	0.79	1.04
SARI	1.95	2.57	3.39	4.47	5.90
SRI	0.19	0.25	0.33	0.44	0.58
STEPRI	0.55	0.72	0.95	1.26	1.66
WRI	9.49	12.52	16.51	21.78	28.73
<b>CSIR TOTAL</b>	<b>33.44</b>	<b>44.10</b>	<b>58.17</b>	<b>76.73</b>	<b>101.21</b>

**Targets for Donor Funds**

INSTITUTE	PROJECTED DONOR FUNDS PER SPECIFIED YEAR (million dollars)				
	2020	2021	2022	2023	2024
ARI	1.42	1.53	1.65	1.79	1.93
BRRI	1.05	1.13	1.22	1.32	1.43
CRI	9.91	10.71	11.56	12.49	13.49
FORIG	9.68	10.46	11.29	12.20	13.17
FRI	4.11	4.44	4.80	5.18	5.59
IIR	1.19	1.28	1.39	1.50	1.62
INSTI	0.83	0.89	0.97	1.04	1.13
OPRI	0.83	0.89	0.97	1.04	1.13
PGRRI	1.67	1.81	1.95	2.11	2.28
SARI	11.08	11.97	12.92	13.96	15.08
SRI	0.01	0.01	0.01	0.01	0.01
STEPRI	2.29	2.48	2.67	2.89	3.12
WRI	4.28	4.62	4.99	5.39	5.82
<b>CSIR TOTAL</b>	<b>48.36</b>	<b>52.22</b>	<b>56.40</b>	<b>60.91</b>	<b>65.79</b>