



**COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH**

# **REVIEWING PROGRESS, AND PRESENTING NATIONAL PRIORITIES AND CASE STUDIES ON WORKING IN PARTNERSHIPS WITH CABI**

## **REPORT FROM GHANA**

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**TUESDAY, 26<sup>TH</sup> FEBRUARY, 2019**



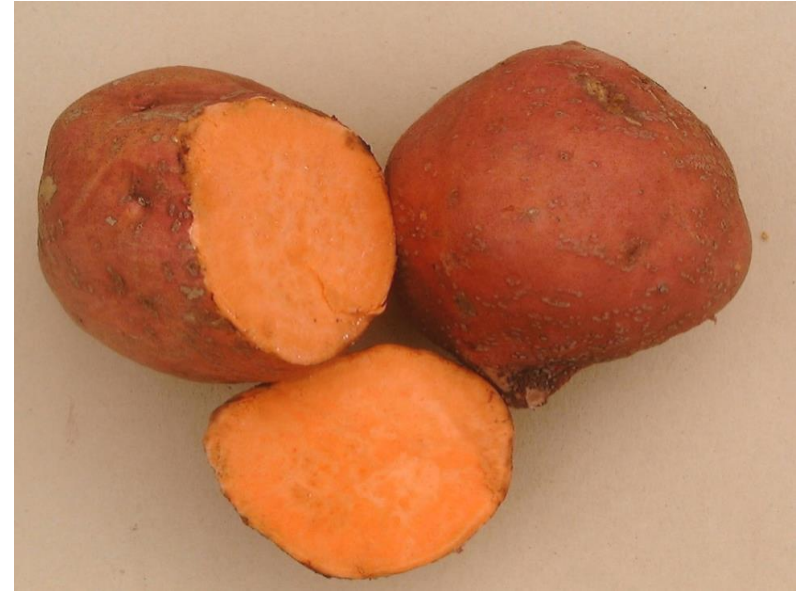
# PRESENTATION OUTLINE

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- ❑ NATIONAL AGRIC PROGRAMME
- ❑ CSIR PRIORITIES
- ❑ CURRENT CABI-GHANA COLLABORATIVE PROGRAMMES
- ❑ PROPOSED AREAS FOR JOINT CABI-CSIR IMPLEMENTATION
- ❑ WAY FORWARD

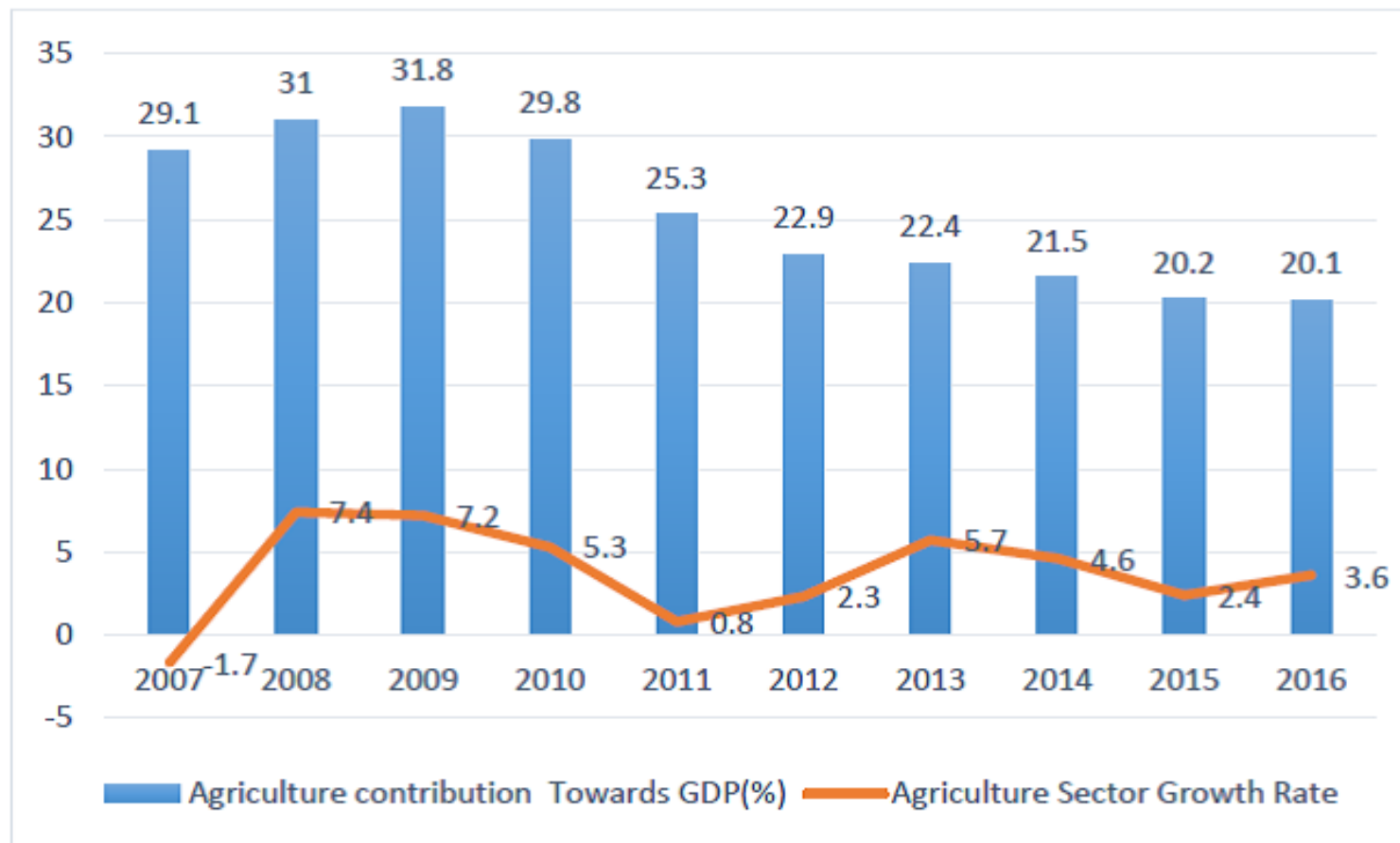


# NATIONAL AGRICULTURAL CHALLENGES, PROGRAMMES AND ACHIEVEMENTS



# AGRICULTURAL SECTORS' CONTRIBUTION TO GDP

Figure 1.1: Agricultural Sector's Contribution to GDP and Its Annual Growth Rate



# AGRICULTURAL IMPORTS AND MARKET GAPS

- ▣ Some major annual Agricultural Imports
  - US\$1 billion for rice imports (US\$0.6b formal and US\$0.4b informal)
  - US\$400m used for sugar import
  - US\$200m expended on poultry import
  - US\$110m used on vegetables import (supply gap of 201,511 MT)
- ▣ Market Gaps
  - Groundnuts - Market gap of 177,355 MT worth \$320m
  - The overall logistics market gap is valued at \$157m
  - Market gap of 23,550 tractors worth a market of over \$ 800 m

**Sources:** IMANI c.f. FinGAP Project & MADE Project

# Government Initiatives on Agriculture to Address Challenges

- ❑ Planting for Food and Jobs, aimed at transforming Agriculture
- ❑ Rearing for Food and Jobs
- ❑ Planting for Exports
- ❑ One district, One factory – aimed at establishing at least 216 agro processing factories across the nation.
- ❑ One Village, One dam policy – A policy aimed at making available water for Communities, including for livestock



# FIVE PILLARS UNDER THE PFJ AND BUDGET FOR 2017

PFJ has five (5) key pillars

1. provision of improved seeds
2. Supply of fertilizers
3. Provision of dedicated extension services
4. Marketing
5. E-agriculture and monitoring.

PILLARS	ESTIMATED COST	
	(GHS)	(USD)
Seed	74,785,875	18,696,469
Fertilizer	238,762,500	59,690,625
Extension Services	32,000,000	8,000,000
Marketing	200,000,000	50,000,000
E-agriculture	15,000,000	3,750,000
Total	560,548,375	140,137,094

# MAJOR ACHIEVEMENTS UNDER PLANTING FOR FOOD AND JOBS

- ❑ First year bedeviled by Fall Army Worm
  - CABI's impact was felt
- ❑ Second year was a success
  - a total of 296,000 MT of fertilizer were distributed to farmers in 2017 to fertilize 357,000 hectares
  - 3,200 Extension Officers were employed
- ❑ Total crop value of GH¢1.2 billion was produced.
- ❑ Production of additional 485,000 MT of maize; 179,000 MT of rice; and 45,200 MT of vegetables.
- ❑ 745,000 additional jobs created, mainly in the rural economy, were created in 2017.



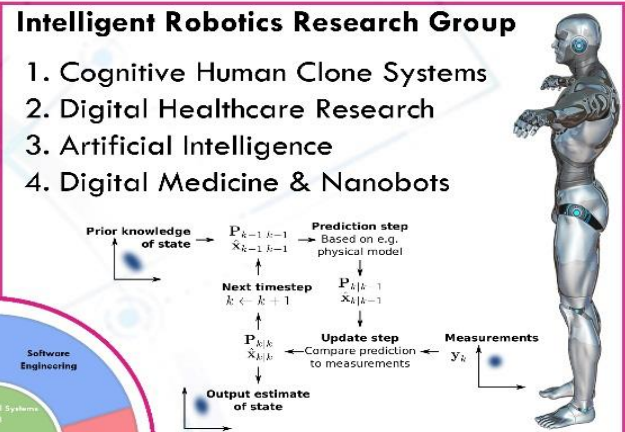
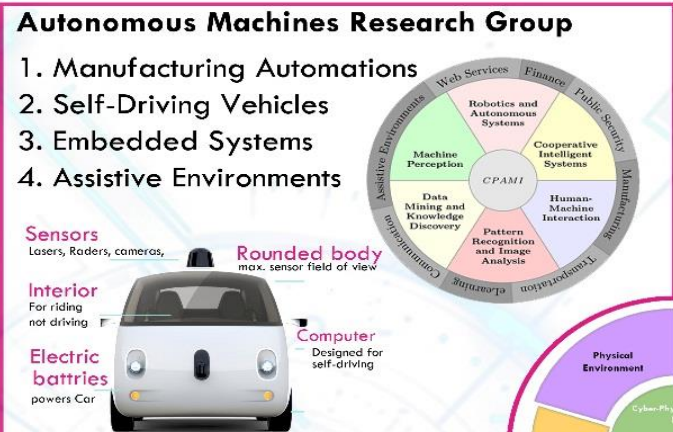
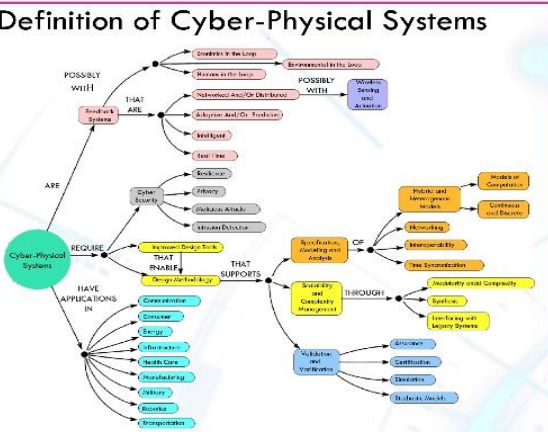
# CSIR PRIORITIES TO SUPPORT GOVERNMENT'S INITIATIVES





# Council for Scientific and Industrial Research - Institute for Scientific and Technological Information

## Cyber-Physical Systems (CPS) Research Agenda



### CSIR-INSTI CPS Laboratory - Overview

The term "cyber-physical systems" emerged around 2006, when it was coined by Helen Gill at the National Science Foundation in the United States. While we are all familiar with the term "cyberspace," and may be tempted to associate it with CPS, the roots of the term CPS are older and deeper. The CPS Laboratory operates under the ICT4D Section of the Electronics Division of CSIR-INSTI. The Laboratory is engaged in core research activities that utilizes science, math and Software applied to practical problems in diverse fields. The Lab focuses on researching into the next generation Cyber-Physical Systems for Manufacturing, Military, Domestic, Health and Agricultural operations. This poster details the Core Research Areas of the CPS Laboratory carved purposefully to drive national development commensurating the CSIR's mandate.



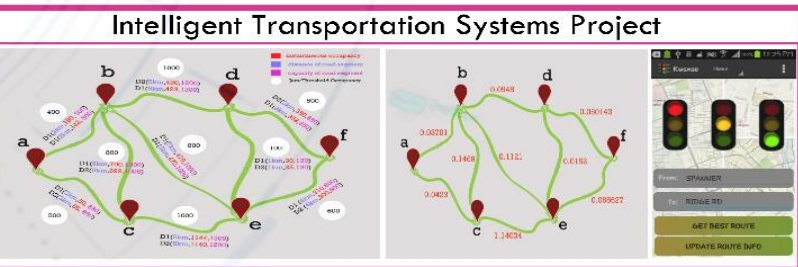
### Smart Factories (Industry 4.0)

1. Cost-effective and Eco-friendly Manufacturing automations for SMEs
2. Digital Twin Technologies for fault Tolerance and fault avoidance in manufacturing



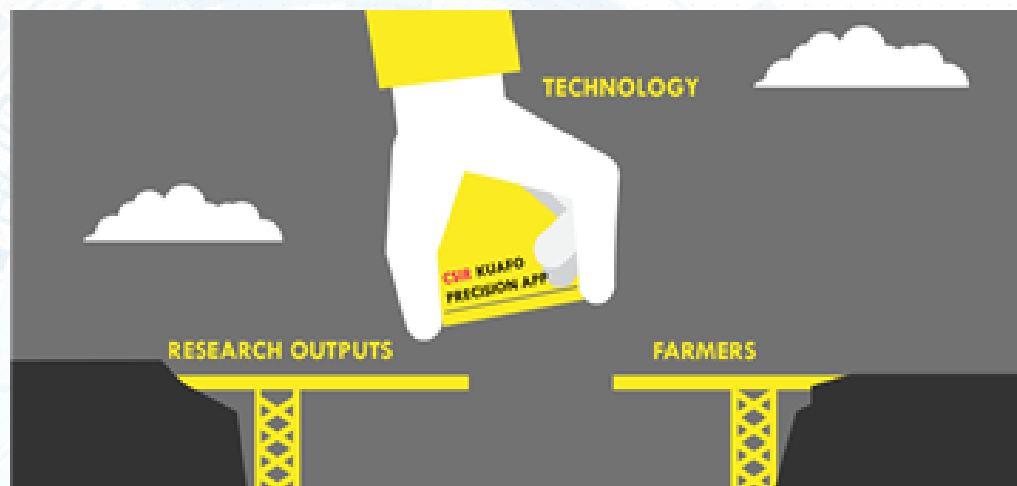
### Smart & Alternative Energy Research

1. Smart Mobility
2. Smart Energy
3. Smart City
4. Green Energy
5. Pump-Hydro
6. Smart Grids



# CSIR APPLICATIONS

## KEY CONCEPT & POTENTIAL PRODUCT CSIR KUAFO PRECISION APP



We identify research institutions as technology suppliers.

We survey and matched farmer information needs to agronomic data and knowledge in available and published Research outputs

We convert relevant data and knowledge into software tools that benefits farmer's, gather farm data for further research by Scientists and feature several climate smart training modules and farm practices

- **CSIR KUAFO PRECISION APP** is a reliable and easy to use integrated mobile based platform with front ends to aid local farmers in accessing and estimating various quantitative and qualitative measurements essential to optimized input application and yield with least or no harmful effect on the environment.



# CSIR APPLICATIONS – (SNV SUPPORT)

## IMPACT : CSIR KUAFO PRECISION APP



### KUAFO PRECISION APP

PROFIED RESEARCH OUTPUTS: 165



### Potential Social Impact

- Promotes Environmentally Safe Agri. Practices
- Job Creation (Small Scale Agro business Plans)
- Improved Research activities, Impact and Score

### Market Size and App User Groups

17.298 Million  
Ghanaians in  
the Agric Sector



Over 1,500  
Scientists  
and Researchers

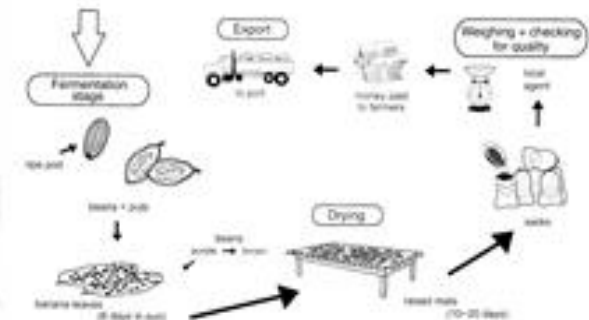


# CSIR APPLICATIONS

### Conceived Project

## **Affordable Cyber-Physical Systems towards an Industry 4.0-based Postharvest Quality Control in Small/Medium Scale Cocoa Bean Processing.**

- As far back as the 1960s, there was an effort to process cocoa before export. One of the major national goals being exporting at least 50% of cocoa as processed.
- Currently less than 30% of the country's cocoa beans grown are locally processed.
- In 2002 CPC's position as one of the world's best chocolate producers. The CPC factories process only the choicest premium Ghana cocoa beans without any blending.
- The CPC used to be the only medium scale manufacturer of chocolate products on the Ghanaian market, until Niche Cocoa also launched its locally manufactured chocolate products in February 2017.



In Ghana, up to 800,000 small scale farmers work along the cocoa bean supply chain each owning an average of 1.6 – 1.8 ha with an average yield of 400-500 kg per hectare (World Bank IFC, 2015).

The aim of this research work is to propose and design a Cyber-Physical System as an efficient step towards a consistent and sustainable supply of high quality cocoa beans to the global market.



# ONGOING CABI-GHANA COLLABORATIVE PROGRAMMES



# CURRENT CABI-GHANA COLLABORATIVE PROGRAMMES - 1

## ❑ Insects as Feed in West Africa

- Funded by SDC, Swiss National Science Foundation
- Continued trials on egg laying by adult black soldier fly
- Protocol for evaluating different methods for drying fly larvae drafted.

## ❑ Plantwise

- Stakeholder Meetings and Backstopping Visits

## ❑ Strengthening the horticulture sector in Ghana

- Work towards the lifting of EU ban on vegetable imports from Ghana
- Facilitated construction/upgrading of two (2) of packing facilities for Ghana Assoc. of Veg. Exp. (GAVEX)

# CURRENT CABI-GHANA COLLABORATIVE PROGRAMMES - 2

- ▣ **CSIR-CABI-EPA collaboration on Invasive species**
  - Working with Ghana's EPA, PPRSD and NGOs to develop a National Invasive Species Strategy and Action Plan
- ▣ **PRISE**
  - Assessment of pest alert dissemination and early changes in farmer crop losses due to pest alert release
- ▣ **Fall Army Worm**
  - ▣ Development and dissemination of Fall armyworm training poster for vegetable production.
  - ▣ Facilitated training of vegetable producers and their exporters in the management of four main quarantine pests using developed posters.



**PROPOSED AREAS  
FOR FURTHER  
COLLABORATION  
BETWEEN CSIR  
AND CABI**



# PRIORITY AREAS

- ❑ Quality Seed Production System (Breeder, Foundation and Certified Seed)
- ❑ Smart Agriculture Systems Development
  - Integrated Mobile-based platform to aid farmers in decision making e.g. input application, yield and pest control
  - Extension systems to disseminate agricultural technologies to farmers
- ❑ Extension Support – Researcher Extension Farmer Linkage Committee (RELC)
- ❑ Market and Export Development
  - Along the lines of CABI's Work on **“Improving lives through better trade”**
  - E-Market

# CONCLUSION

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ON BEHALF OF CSIR AND THE GOVERNMENT OF GHANA, I WOULD LIKE TO EXPRESS OUR APPRECIATION TO CABI FOR THE CONTINUED AND INCREASING SUPPORT FOR THE TRANSFORMATION OF THE AGRICULTURAL SECTOR IN THE COUNTRY.



# THANK YOU

