



# MESTI



## COUNCIL FOR SCIENTIFIC & INDUSTRIAL RESEARCH (CSIR – Ghana)

Accelerating National Development  
through Science, Technology and Innovation

**PRESENTED BY DR ABDULAI B. SALIFU**  
***DIRECTOR GENERAL***

# CSIR: STI FOR NATIONAL DEVELOPMENT

## FACT

- science, technology and innovation supports success and sustainability in all aspects of national development.

## HOW

- The Council for Scientific and Industrial Research, (**CSIR – Ghana**), established to drive science, technology and innovation research as a national development tool.

## WHAT

- The Council runs and coordinates activities of 13 research institutes reflecting all productive sectors of Ghana's economy.

# **CSIR RESEARCH MANDATE**

# WHAT IS DONE

- The Council runs and coordinates activities of 13 research institutes reflecting productive sectors of the Ghanaian economy.
- Their respective mandates come together to reflect the following focal areas:
  - *Agriculture, environment, forestry and fisheries,*
  - *Health and medicine,*
  - *Industry and natural sciences,*
  - *Social sciences.*
- Provide technology for development; “ground-truth” for informed policy formulation/decision.

# CSIR INSTITUTES

- **Animal Research Institute (ARI)**
- **Building and Road Research Institute (BRR)**
- **Crops Research Institute (CRI)**
- **Food Research Institute (FRI)**
- **Forestry Research Institute of Ghana (FORIG)**
- **Institute for Scientific & Technological Information (INSTI)**
- **Institute of Industrial Research (IIR)**
- **Oil Palm Research Institute (OPRI)**
- **Plant Genetic Resources Research Institute (PGRRI)**
- **Savanna Agricultural Research Institute (SARI)**
- **Science & Tech. Policy Research Institute (STEPRI)**
- **Soil Research Institute (SRI)**
- **Water Research Institute (WRI)**

# CSIR NATION-WIDE



# RESEARCH MANDATE

- MANDATE recognized by Act 521 of 1996.
- Some 14 functions ascribed to the Council, *e.g.*:
  - Pursue **implementation of policies** on scientific research and development.
  - **Advise** the Minister on scientific and technological advances likely to be of importance to national development.
  - **Coordinate all** aspects of scientific research in the country and to ensure that the Council, the research institutes of the Council and other organizations engaged in research in Ghana, coordinate and cooperate in their research efforts.
  - ***Etc, etc, etc .....***

# IMPLEMENTATION OF MANDATE

- **Sector Ministry (MESTI) Policy on STI:**
  - The principal thrust of the National Science, Technology and Innovation Policy is to ensure that science and technology drives all sectors of the economy.
  - Sectoral policies in ***Agriculture, Health, Education, Environment, Energy, Trade, Industry, Natural Resources*** ..... shall be driven by sector-specific science and technology programs and activities.

# GUIDING PRINCIPLES

- **Relevance:** There is the need to critically examine areas and programs of relevance to the country's development.
- **Cost-effectiveness:** There must be the use of the most cost-effective means to achieve the desired results.
- **Realism:** Whereas Ghana desires to reach the frontiers of STI application and development, there is the need for realism in aspirations and efforts.
- **Synergy:** STI development and application must be holistic; there must be a multi-disciplinary and cross-sectoral approach to problem-solving for synergy; and
- **Partnerships:** There must be conscious efforts for collaboration and interaction with all local and foreign stakeholders as partners.

# FOR CSIR

**USING TRANSFORMING POWER OF  
STI FOR WEALTH CREATION**

# FOCUS OF RESEARCH

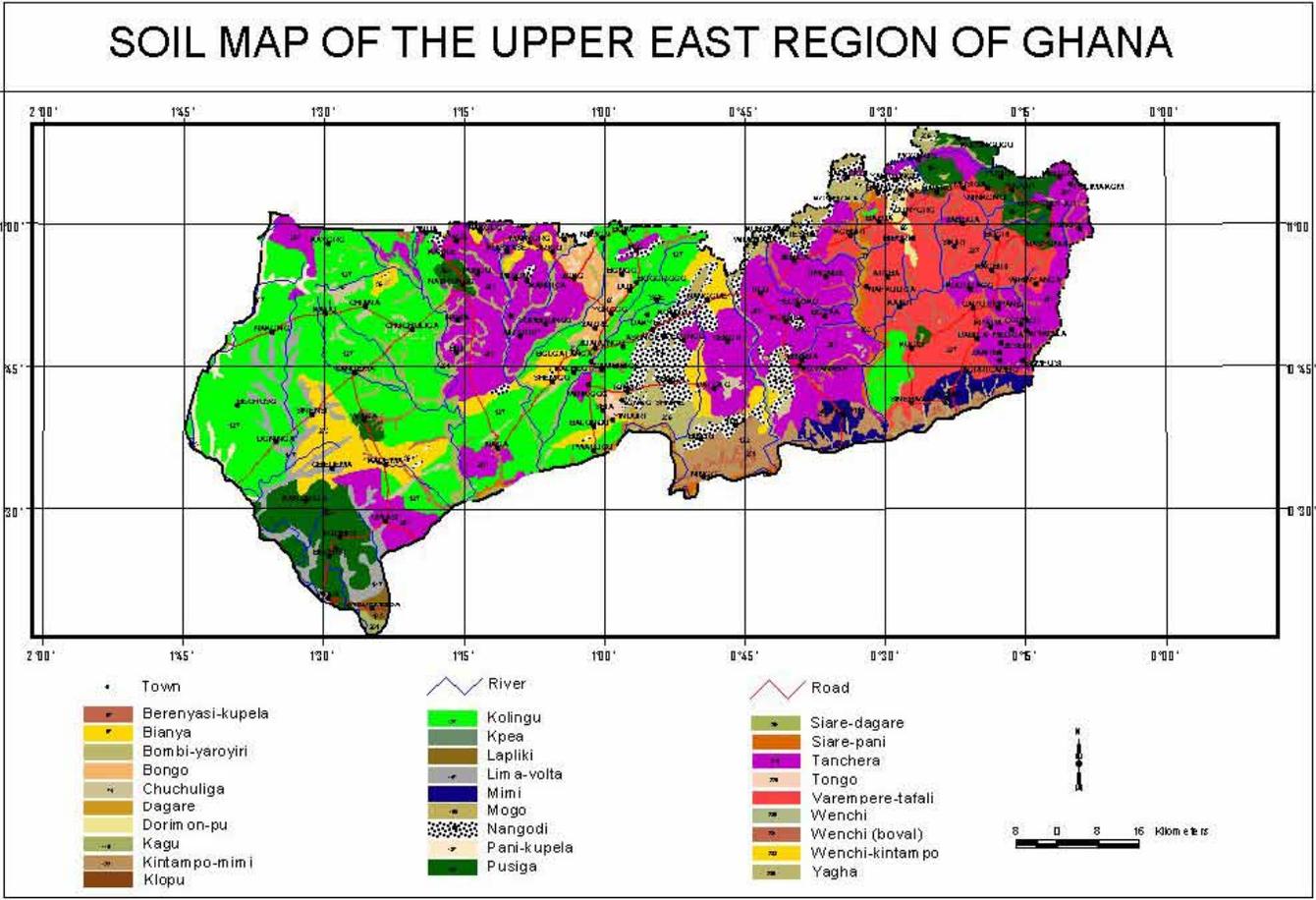
- Development and Transfer of Technologies and Provision of Services **appropriate to needs of our stakeholders.**
- Technologies identified by strong focus on our core business of scientific research and enquiry, producing outcomes that will solve national development problems.
- Commercialization of Science and Technology Research Outputs for Increased Productivity and Accelerated Growth: **CSIR-Plus**

# OPERATIONAL OPTIMUMS

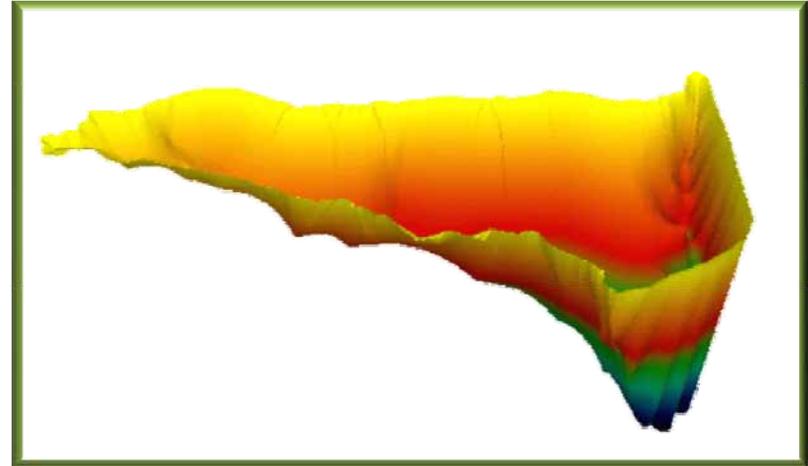
- Fully equipped functional laboratories:
  - Varying degrees of functionality
    - *State-of-art equipment.*
    - *Housing configuration.*
    - *Qualified technical staff.*
- Experimental field sites; including out-station posts:
  - Very minimal to zero land tenure issues.
- Industrial mini plants and related equipment.
- Mobility – transportation and related very key.

# SOME CSIR INTERVENTIONS

# SOIL SERIES and SUITABILITY MAPS



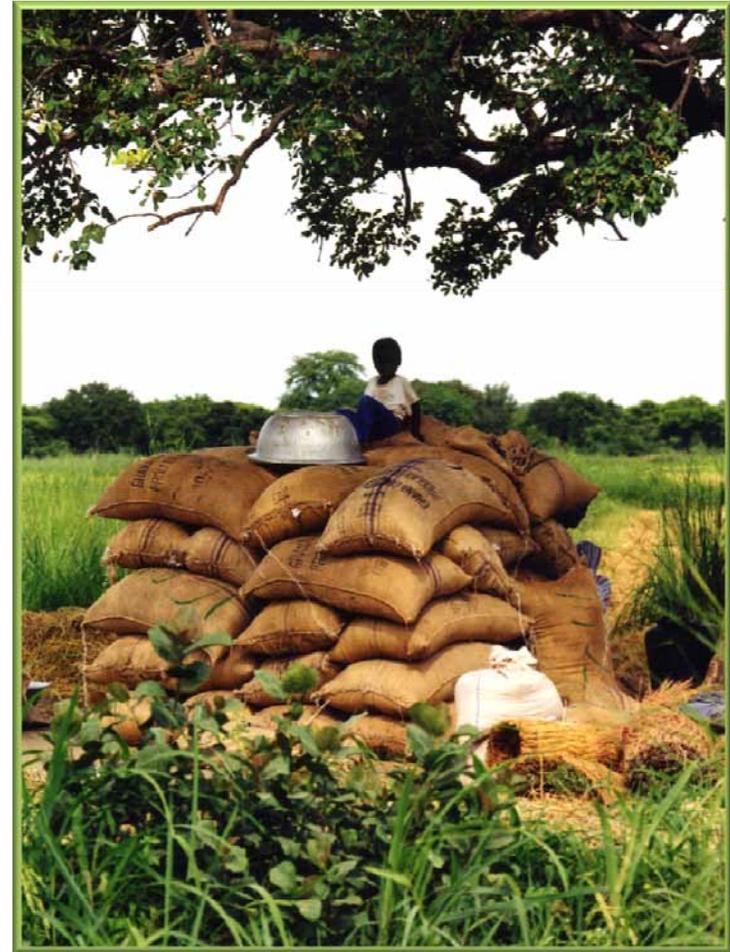
# PROVISION OF WATER



- Ground water exploration.
- Drilling of wells for communities, etc.
- Assessment of water quality.
- Construction of infiltration galleries behind dams.

# IMPROVED CROP VARIETIES

- All of the improved varieties of:
  - *Cereals*
  - *Legumes*
  - *Root and Tubers*
  - *Plantains and Banana*
- Developed by CSIR for specific agro-climate and uses, including agro-processing.





# EQUIPMENT FABRICATION



- Peanut IPM research carried out at CSIR-SARI and CRI has led to increased production in various communities.
- Collaborated with KNUST to fabricate peanut shellers to reduce shelling drudgery and reduce incidence of aflatoxin contamination.

# IRRIGATED AGRICULTURE



- Ghana abundant in water resources.
- Much wetter - >1000mm rainfall in dry north – than much of West Africa.
- Problem is economic – investment!
- Agricultural water management (AWM) solutions.

# AWM SOLUTIONS



- Take advantage of water bodies in districts:
  - *Support farmer organizations.*
  - *Out-grower schemes – e.g. ITFC mango business.*
  - *Encourage women participation.*
- Legal framework for watershed/bodies use.

# Drip Kit in the Field



- *Our system requires no reservoir*
- *Water taken directly from dam*
- *Deployed in Golinga, Navrongo, Binduri*
- *A plot of 500m<sup>2</sup> of onion generates \$3.4m OR US\$378 (COMPARE US\$250 initial cost!)*

# FERTIGATION UNDER DRIP



# PADDY WATER MANAGEMENT



- **SAWAH TECHNOLOGY:**
  - *Bunded, leveled and puddled rice field.*
  - *More than 4.0 mt/ha easily obtained by farmers.*
- **Soil and nutrient conservation achieved as well.**

# HORTICULTURAL CROPS



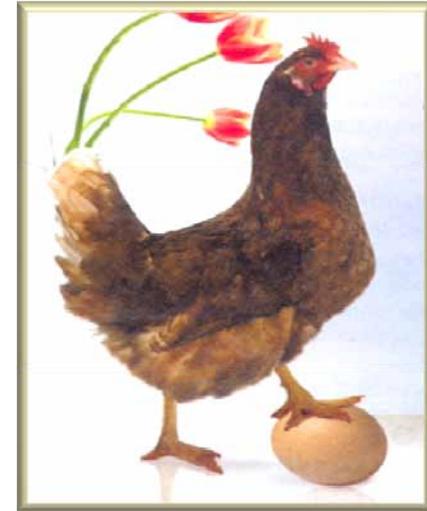
- Mango museums at **SARI, CRI** and **PGRRI**.
- CSIR-SARI Mango museum has 27 accessions.
- CSIR-PGRRI: vegetative propagation of **nutmeg**.
- PGRRI provides planting material of black pepper.

# FISHERIES AND FISH FARMING

- Production of breeds of tilapia and catfish fingerlings.
- *Formulation and production of high quality fish feed.*
- Extension of FRISMO fish smoker to women fish processors.
- *Training of fisher folk on good fishery management.*



# LIVESTOCK and POULTRY



- CSIR-ARI **ARIBRO** broiler lines; reduces production costs, matures in 7 weeks.
- Hands-on training in livestock, poultry production
- Pig feed: Grower **finisher diets** ensures faster growth; slaughter weights attained in 5 mths!
- **Dairy established for yoghurt production – incubator.**

# OIL PALM and COCONUT



- Provision of high yielding oil palm progenies and their seedlings.
- Provision of varieties of coconut; some tolerant to Cape St. Paul wilt disease.
- Technologies for integrating small ruminants in oil palm farms.

# VALUE ADDITION TECHNOLOGY



- **CSIR-Food Research Institute** has array of agro-processing/value addition technology.
- A number of commercial convenience foods in the Ghanaian and external market.

# NATURAL FOREST MANAGEMENT



- Manual of Procedures, Forest Resource Management Planning in High Forest Zone.
  - *Geared at sound fire management for protecting and rehabilitating forest resources.*
  - *Meant to provide guidelines for comprehensive strategic planning and practical steps to be taken by resource managers.*

# CLIMATE ▲ RESEARCH @ CSIR

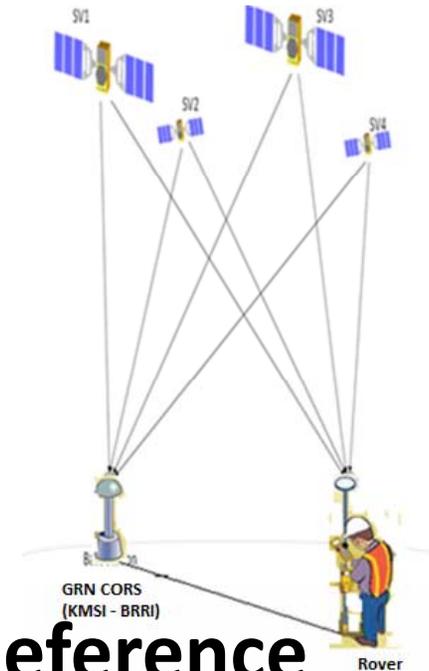
- **Fire management and post-fire restoration with local community collaboration in Ghana.**
- **Capacity building for CDM forestry in the framework of sustainable forest management (SFM) emphasizing community forests and poverty alleviation in Ghana.**
- **Potential impact of environmental fluctuations and climate change on forest plantation pests in Ghana: Improving pest management strategies through research, training and extension.**
- **Small-scale community-based reforestation CDM project in degraded Pamu Berekum Forest Reserve.**

# ROADS AND HOUSING

- CSIR-BRRI low cost technology employing **bricks** and **pozzolana** cement.
- Pozzolana-lime technology for stabilizing rural/feeder unpaved roads.
- Timber bridge construction technology

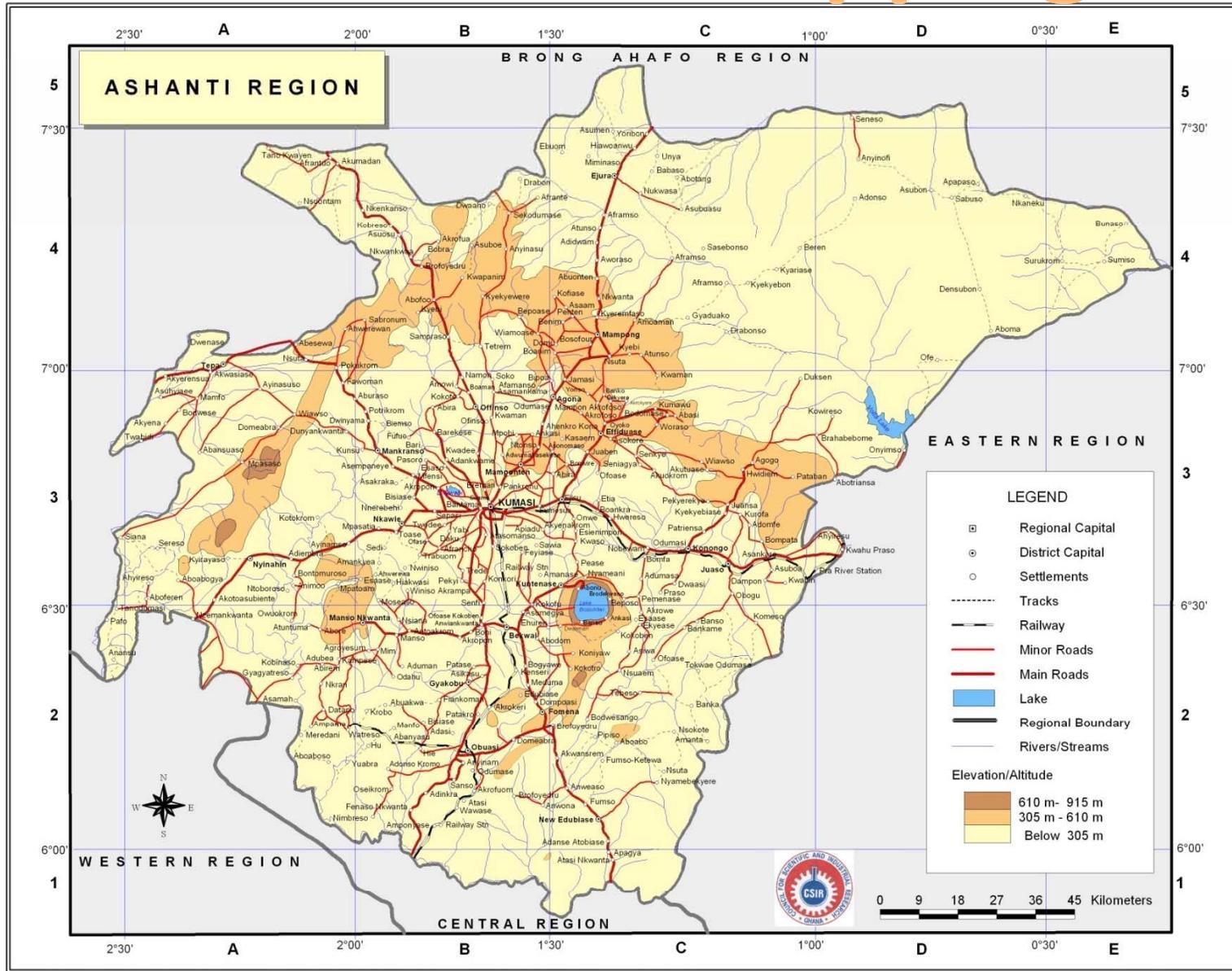


# GEOSPATIAL SETUP@BRRI



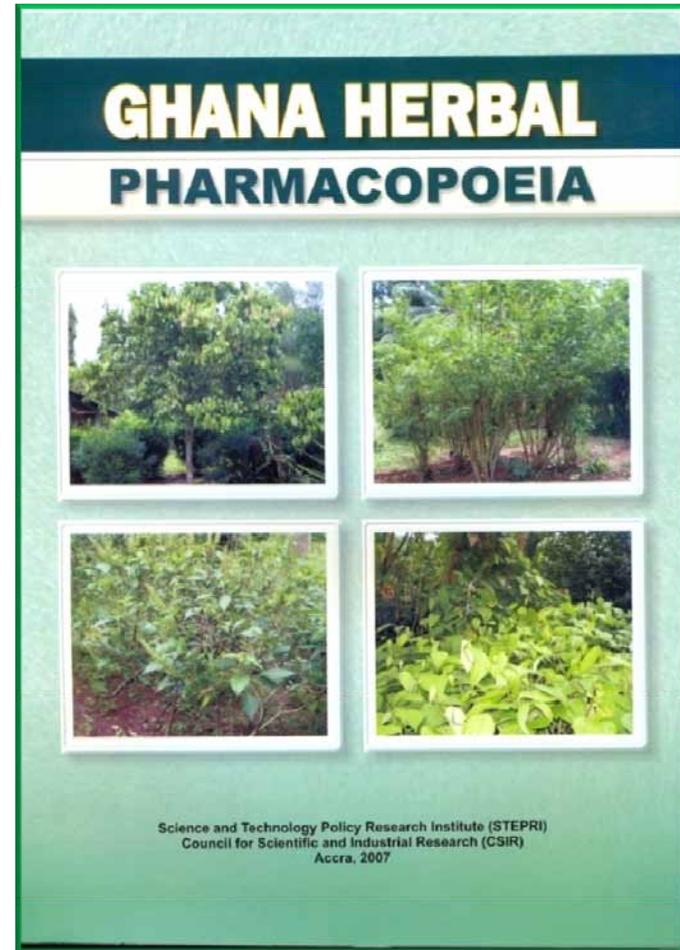
- **The National Permanent GPS Reference Station located at CSIR-BRRI.**
- **The setup at BRRI is used for Differential GPS observations.**

# Thematic Mapping



# Rationale Traditional Medicine

- “... Science without tradition can produce technicians but not cultured men; tradition without science can breed learned but not rational men”
  - Cyrus Gordon, 1968.
- **Herbal Pharmacopoeia** to integrate traditional herbal medicine.



# NEW INITIATIVES from CSIR-Ghana

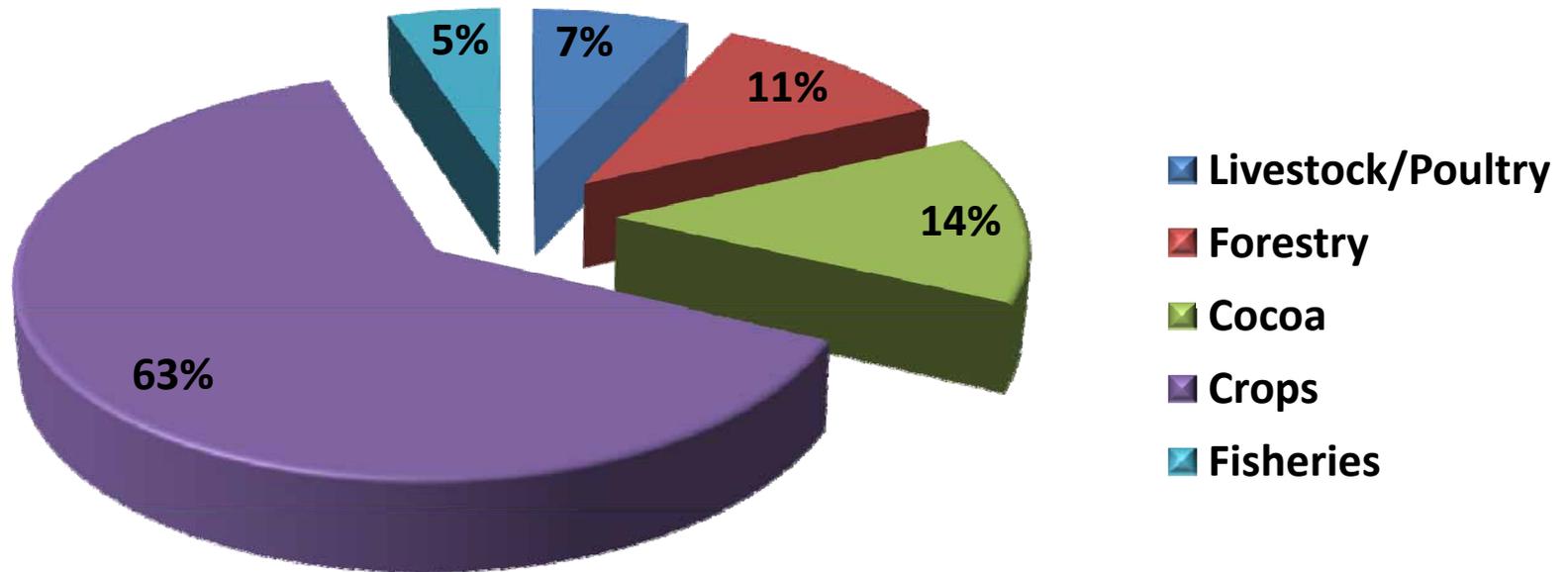
CSIR - *Plus*

gsst@csir



# RESEARCH IMPACT

## *Agricultural GDP*

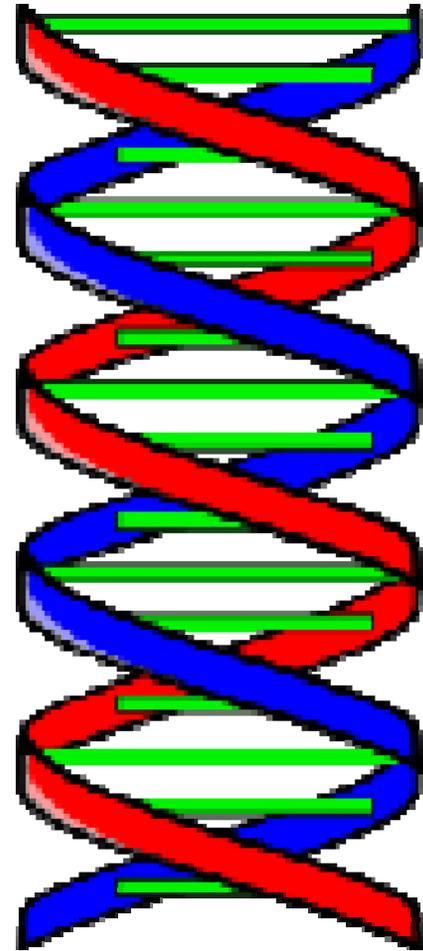


**CSIR activities impact on sectors accounting for 86%**

# NEW RESEARCH FOR DEVELOPMENT

# MODERN BIOTECHNOLOGY

- PCR-based studies to enhance:
  - *Marker Assisted Selection (MARS).*
  - *Introduce plant protection, yield and nutrient enhancing genes.*
- Cognizant of cost to farmer of biotech products.
- **Center of Excellence** at CSIR-CRI with WB funds.

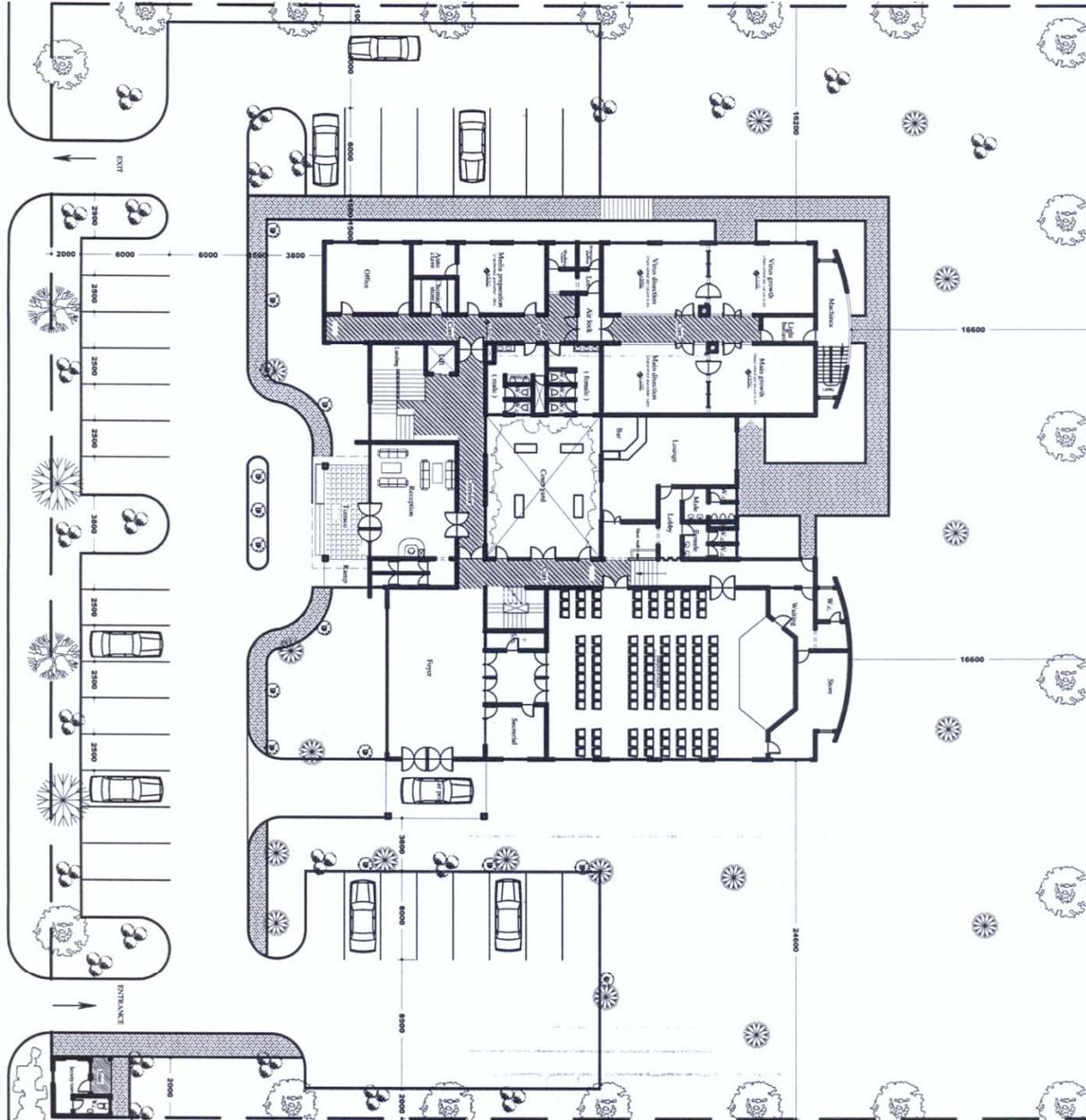


# Block Plan

N



FRONT



BACK

# BIOFUELS RESEARCH

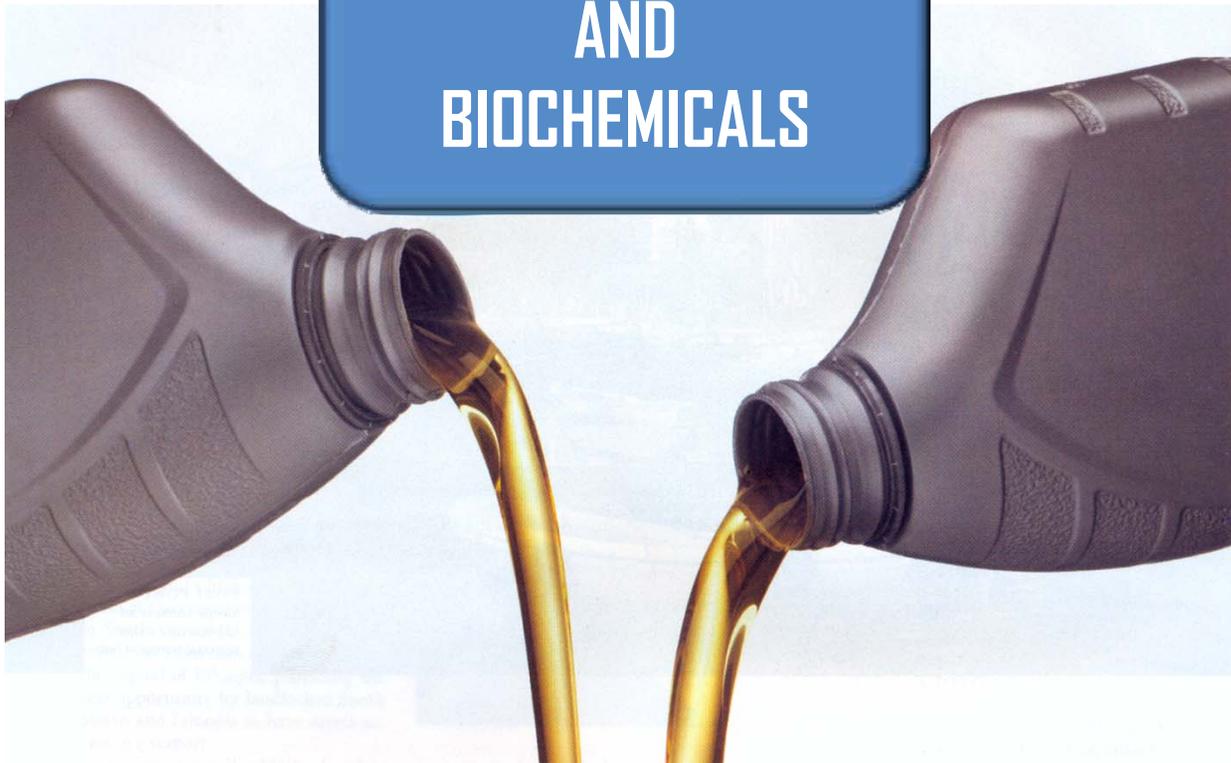
Jatropha



Maize

**Food Security 1st**

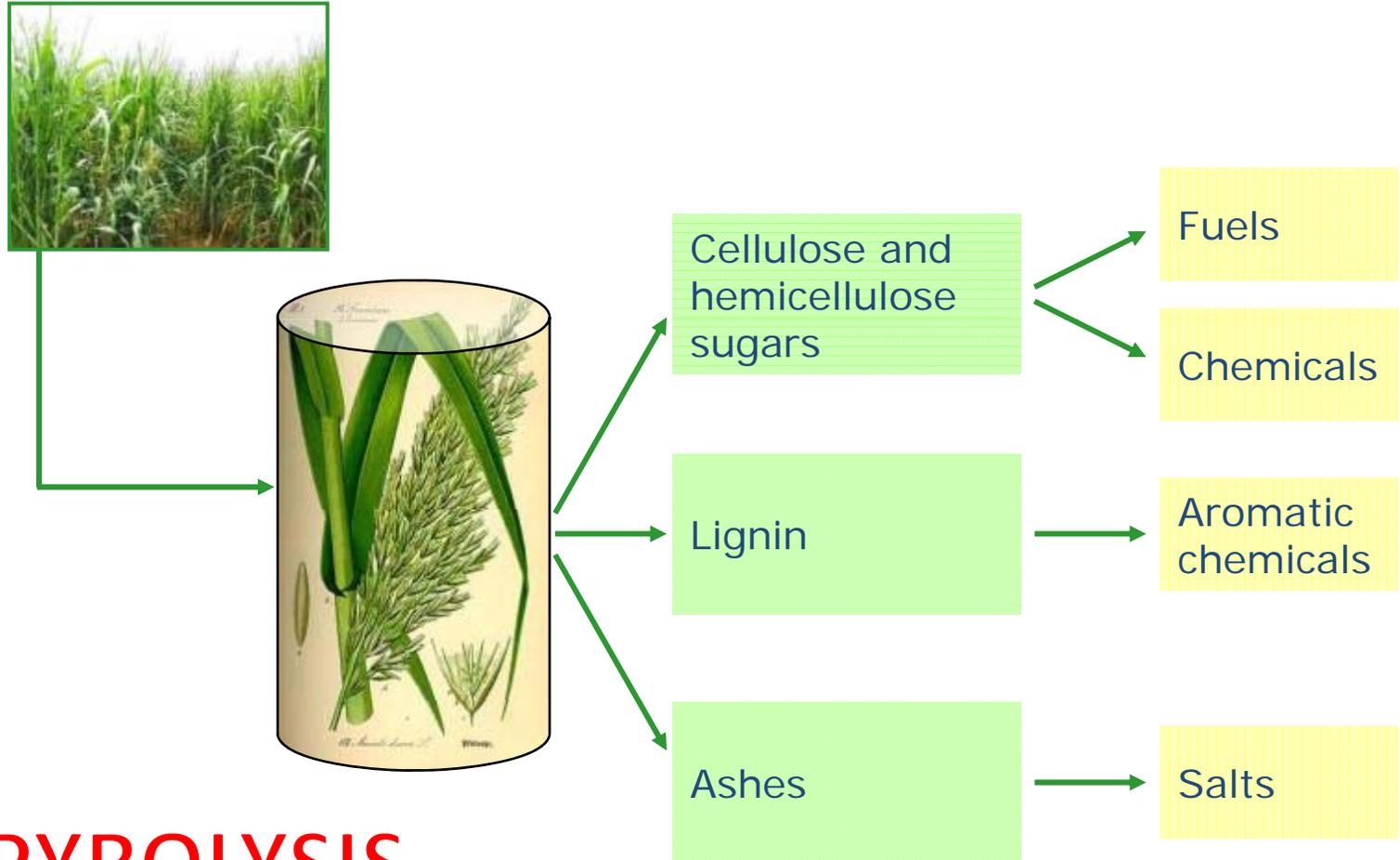
# BIOFUELS AND BIOCHEMICALS



**From Biomass**

# BIOFUELS AND BIOCHEMICALS

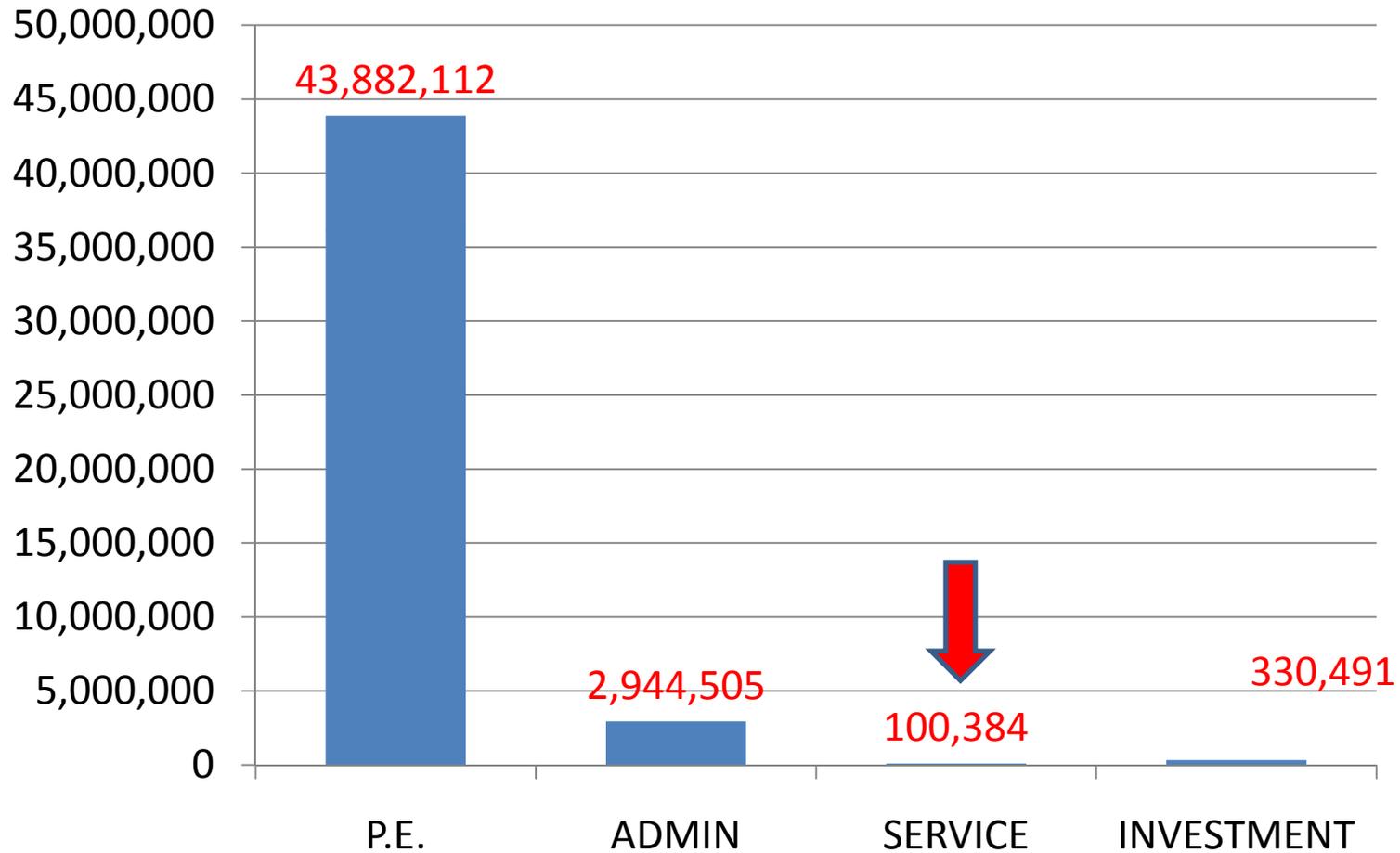
*IMMENSE OPPORTUNITIES!*



**FAST PYROLYSIS  
GASIFICATION**

# CHALLENGES FACED BY CSIR

# RESOURCE LEVEL FOR CORE BUSINESS: 2011



# 2012 REQUEST & ALLOCATION

	TOTAL	COMPENSATION	GOODS & SERVICES	ASSETS
REQUEST	98,747,499.00	54,262,625.00	16,716,528.00	26,104,500.00
ALLOCATION	49,377,366.00	44,038,140.00	3,144,889.00	530,491.00
SHORTFALLS	49,370,133.00	10,224,485.00	13,571,639.00	25,574,009.00

**1% GDP to be allocated  
for STI research**

Which one is healthy?



Burger

**OR**

Choose Now!



Apple

**THE END...**

**THANK YOU**

# THANK YOU

