COMSATS COORDINATING COUNCIL MEETING

PROFILE ON

COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH INSTITUTES – GHANA
CSIR-Ghana

TRIESTE, ITALY
MAY, 2010
CSIR - Ghana

- Established in 1957
- 13 Research Institutes in agriculture, fishery, forestry, industry, environment and health
- 600 research scientists
- Total staff strength of 3000
- Under the Ministry of Environment, Science & Technology
CSIR - Ghana

- CSIR - FORESTRY RESEARCH IN GHANA (FORIG)
- CSIR - SOIL RESEARCH INSTITUTE (SRI)
- CSIR - BUILDING AND ROAD RESEARCH INSTITUTE (BRRI)
Brief on Forestry Research Institute of Ghana (FORIG)
CSIR- FORIG

- **Forest & Wildlife Management and Governance**
  - Studies on Illegal logging and chainsaw milling operations.
  - Landscape Restoration.

- **Forest, Livelihood and Sustainable Development**
  - Strengthening of capacities of public sector agencies and local communities involved in natural resources management
  - Diversification and maximization of rural income from natural resources

- **Wood Industry Development and Trade**
  - International Trade in Forest Resources
  - Promotion of lesser used species, small diameter logs and wood residue utilisation to enhance sustainable resource utilisation.
Forest Products and Marketing
- Establishment and functioning of viable small to medium-scale village enterprises
- Standardisation, Quality Control and grading for products

Ecosystem Services and Climate Change
- Carbon Sequestration and Clean Development Mechanism (CDM)
- Payment for environmental services

Biodiversity and Land-use
- Rehabilitation and restoration of mined sites and degraded cocoa landscapes
- Local Community involvement in protection of biodiversity
Wood residue Utilisation
Rehabilitation of Degraded forest and mined sites
Development of Best Nursery practices

Production of high quality seedlings for plantation development
Promotion of Non-Timber Forest Products (NTFP’s)

Cultivation of mushroom ‘Domo’ (V. volvacea) using agricultural waste developed

Vegetative cultivation of Bamboo and rattan

Taxonomical and anatomical identification key for bamboo and rattan
Extractives from forest tree species

- Extracts from Prekese Fruit
- A confectionary company has been using Prekese extract as a flavouring for their sweets

Uses
- Spread
- Condiment for cooking
- Flavour in food industry

- Acacia Gum
- Ghana Cocoa Board has been buying Acacia gum for industrial use.
Development of Products from LUS

Promoting Lesser Used Species in Ghana for the following products:

- Furniture and Joinery
- Construction

Services include:

- Strength testing
- Study of strength properties for various lesser used species.

Round Table produced from coconut tree
Cultivation of Pines and Other “Problem” Species

- Mycorrhizal-grown *Pinus caribaea* with improved physical properties developed

- Odum clones tolerant or resistant to the pest *Phytolyma lata* developed

- Mass production of superior genotypes of wawa (*Triplochiton scleroxylon*) by stem cuttings developed
CSIR- Soil Research Institute
To generate scientific information for planning, development and management of the soil resources of Ghana for increased and sustainable agriculture, industry as well as ensuring safe and sound environment.
CSIR-SRI: Objectives

- Develop knowledge for efficient management of the soil resources of Ghana

- Strengthen the institute’s delivery capacity for increased agriculture production

- Establish and strengthen linkages with local and international institutions
CSIR-SRI - RESEARCH PROGRAMMES AND SERVICES

- Land Evaluation
- Soil Fertility Management
- Environmental Management
- Laboratory Analytical Services
- Technology Transfer/Consultancy Services
Development of Thematic Maps
Achievements of the Programme

- Soil resources mapped out, described and evaluated.

- Soil suitability assessment done in some areas & management recommendations made for the production of food, cash and non-traditional export crops. e.g. pineapple, cashew, banana, cassava, oil palm, maize & rice.

- Identified benchmark soils in all agro-ecologies for easy technology adoption
Digital maps of suitable areas for maize, cassava, citrus and oil palm, etc., are available.

Also in digital format is a database of 369 soil units, which facilitates information reference, retrieval and updating of data on these soils.
Fertilizer Programme

- Developed the new maize fertilizer (16-16-19 +MgO +S(SO3)+B) which can increase maize yield to about 10 tons/ha

- Effective soil, water and nutrient management (SAWAH Technology) for lowland rice production

- Rice yields increased from 1 to 5 tonnes/ha

- Adopted by Ministry of Agriculture for increased rice production in Ghana
SAWAH Technology - teaching farmers how to transplant rice
SAWAH Technology - Improved Rice Fields
Environmental Management

Objective

- Develop capacity to engage in emerging research areas related to sustainable soil management and climate change as a major factor affecting soil productivity and food security.

- Regeneration of natural resources, degradation, pollution, effect of mining and industrial activities on soil health.
Regeneration of Degraded Lands
CSIR-Building & Road Research Institute

30-Jul-10
MISSION STATEMENT

• To profitably provide research and development products, processes and services to the building and road sectors and for the socio-economic development of Ghana.
To undertake research into all aspects of building and road planning, design, construction and maintenance with a view to assisting the construction industry to be more efficient, safe and economical

To develop local construction materials for increased utilization in construction
RESEARCH ACTIVITIES - BUILDING

- Evaluation and development of cementitious materials
- Production of composite cement from Industrial Wastes
- Mechanical activation of clay pozzolana
- Termite controlling activities of some local plants
- Improving the survival of earth buildings against floods: A case study of the Sandema floods in 2007
- Evaluation of clay for development of burnt bricks and tiles for housing
- Fast track cost-saving techniques for housing construction
- Use of bamboo for housing
- Studies on Ghanaian mineral admixtures for masonry mortars
BURNT BRICKS FOR HOUSING
• Development and Production of clay Pozzolana for housing construction
  
  • It can replace up to 40% of cement for construction
  • Reduces the price of cement by at least 18%
  • Improves the resistance of cement against sulphates attack
  • Production being increased from 200 to 300 bags/day

• More than 4000 tonnes have been sold to the building industry

30-Jul-10
CSIR-BRRI

- CSIR-BRRI in partnership with a private investor and support from government establishing pozzolana plant which will produce 4,000 bags of clay pozzolana per day.

- Production will start in August 2010 and this will save the country about $20 million dollars per annum in clinker importation
Composite cement research

Materials:

- Portland cement
- Steel slag (SS) is an industrial waste resulting from the steel-refining process in a conversion furnace.
- Limestone (CaCO₃ – CaO)
- Clam shells (CaO)
- Clay pozzolana (SiO₂)
- Bauxite waste (Al₂O₃ & SiO₂)
Mix design of samples

- Binary - 5% sample content (5%L95% cement)
- Ternary – 5%x5%y samples content (5%L5%P90% cement)
- Quarternary - 5%x5%y5%z samples content
- To be used for Housing construction
spectra of hydrated OPC and blended cements at 28 days
Studies in pedestrian safety in cities and rural population along major highways
Studies in skid resistance of major roads in Ghana
New Areas of Research which need collaboration

- Bitumen and Asphalt analysis and development

- Composite Portland Cement
  - Steel slag and limestone
  - Clam shells and slag
  - Pozzolana and slag

- Improvement of marginal materials for road construction

- Skidding resistance of asphaltic surfaces
  - Mitigate/eliminate car crashes
Thank you