COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH-GHANA

CSIR NEWS

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IN THIS BULLETIN

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

The Journey so far

I am indeed very grateful to witness the return of the highly informative CSIR Newsletter, which affords us the opportunity to share our progress with our cherished stakeholders. Ideally, I should be telling you about the CSIR over the past six months (January – June, 2021) in this first edition of the revived bi-annual newsletter. However, I am compelled in view of the length of time that the newsletter has been dormant, to go a couple of years back to bring everyone up to speed on how CSIR has been faring.

Over the past 5 years, we have recorded an increase in number of researchers with PhDs or studying for their PhDs from 29% to 68%; increase in rates of scientific publications from 0.5 to 0.8 papers per scientist, and over 100% increase in publications in reputable international journals. We have also made considerable gains on the financial front. Internally generated funds from commercialization and marketing of research bi -products currently hovers around 6% of our recurrent budget. However, increased donor inflows for projects and consultancies executed by our scientists brought in an equivalent of 25% of our recurrent budget. This means over the course of the past five years we have generated, on average, a total of 31% of our annual recurrent budget, with the government providing the remaining 69%. To consolidate the gains made so far, CSIR has developed a new Strategic Plan, which will guide our R&D delivery over the next five years (2021–2025). The strategic plan is anchored on four key thrusts namely, i) Private sector-driven R&D and innovation, ii) Re-branding and visibility improvement, iii) Financial

resource mobilisation and management, and iv) Systems and staff performance improvement.
In 2018, we launched our 60th Anniversary celebrations with a suite of activities and events that stretched all through to the end of 2019. Highlights of the celebrations included Inter-institutional games and sports; Quiz competition for selected high schools in Accra, which was won by the Achimota school; and an Awards nights to recognise the work of Ghana's pioneer scientists, including past and present CSIR Council chairmen, past directors and principal officers of CSIR, researchers as well as stakeholders who have supported scientific development in Ghana.

An Anniversary magazine titled 'CSIR…60 years of Research for Sustainable development' was also published to give an account of CSIR's research accomplishments and offer a sense of how far the Council has come in its quest to contribute to the socio-economic development of Ghana. The celebrations were crowned with an inter – denominational Thanksgiving Service.
In 2020, we released eleven (11) improved crop varieties in line with our agenda to support and promote food security in the country. These include two (2) varieties of groundnut [SARINUT 1 and SARINUT 2], two (2) varieties of Soyabean [CRI-Anigye and CRI-Toodana], and seven (7) varieties of Sweet Potato. CSIR has continued to offer technical support to farmers throughout the country in-partnership with the Directorate of Agricultural Extension Services (DAES) of the Ministry of Food and Agriculture (MOFA), and with the support of the Canadian government-funded Modernising Agriculture in Ghana (MAG) programme, In addition, CSIR has been collaborating with MOFA to implement extension services through the Research-Farmer-Extension Linkage Committees (RELCs) platform. Under this programme, CSIR and MOFA have engaged and assisted thousands of Ghanaian farmers with improved crop varieties, quality seeds/seedlings, and provided training on Good Agronomic Practices (GAP).

Within the past year, CSIR has also been involved in disseminating technologies and innovations, including the development of solar-powered remotely controlled irrigation system by the CSIR-Institute of Industrial Research (CSIR-IIR); development of a Digital Agriculture Innovation Hub (DAIH) by CSIR-Institute of Scientific and Technological Information (CSIR-INSTI); and conversion of Ghana's analog soil maps to digitized formats by CSIR-Soil Research Institute (CSIR-SRI). By collaborating with Ghana Television (GTV), the nation's broadcaster, we have produced and aired over 81 news stories on our R&D activities and outputs for the benefit of Ghanaians.

Our successes notwithstanding, we have had to surmount numerous challenges and problems in order to keep going. The key challenges being faced by CSIR include: limitation of funds for research; high staff turnover; and illegal encroachment of our lands.As the engine of growth and development, we implore all Ghanaians from all walks of like to support the protection and security of CSIR lands whether in Accra, Kumasi, Tamale, or elsewhere, for present and future generations.

Over the past couple of years, CSIR has received tremendous support and policy direction from the Hon. Ministers of Environment, Science, Technology and Innovation (MESTI). Prof. Kwabena Frimpong Boateng spearheaded among other things a Foundry for CSIR-IIR, High Performance Computing Centre (HPC) and Ghana Innovation and Research Commercialisation (GIRC) Centre, which are based at CSIR-INSTI. Since February, 2021 MESTI has had a new Minister in the person of Hon. Dr. Kwaku Afriyie. Within a few months of tenure at MESTI, Dr. Afriyie has called for a structural change in CSIR, which focuses on an overhaul of the CSIR Commercialisation System; prioritization of innovation and operational research; and the enhancement of the visibility of CSIR.

On this note, on behalf of the management and staff of CSIR, I wish to thank the chairman of the CSIR Governing Council Prof. Robert Kinsford-Adaboh, Council members as well as Board Members of all the thirteen CSIR Institutes.

My sincerest gratitude goes to the Deputy Director-General for his enormous support and personal commitment to ensuring that this Newsletter was published. My heartfelt appreciation also go to past and present CSIR Corporate Directors and Directors of our 13 Research Institutes, and staff for their continued dedication to the vision of CSIR.

God richly bless you all. Long Live CSIR, Long Live Ghana

Prof. Victor Kwame Agyeman, PhD, ESQ, FGIF
Director-General

News

Come Out Of Your Shells And Let Ghanaians know Your Contribution To National Development – Minister Urges CSIR Scientists

CSIR Corporate Affairs Division

- The The Minister for Ministry of Environment, Science, Technology and Innovation (MESTI) commended the Directors and staff of the Kumasi-based institutes for promoting the national research and development agenda
- CSIR has been urged to submit proposals to review aspects of policies that will allow them to sell their research works to enhance their financial status.
- If science is not packaged well to allow more people to study it, people will continue to stay away from the subject due to opinions that, it is difficult.

As part of his vision to deepen the interest of science in Ghanaians, Dr. Kwaku Afriyie, Minister of Environment Science Technology and Innovation at a familiarization visit at the Council for Scientific and Industrial Research (CSIR) said that, he would ensure science became popular among Ghanaians before his tenure ends

Dr. Kwaku Afriyie (MP)
Minister of Environment,Science,
Technology and Innovation

The MESTI Minister added that, mostly the technicality of science and the perception that science is difficult turned people away from pursuing the subject but said that, before he leaves office, he would whip up the interest to encourage many people to study and accommodate the subject.

“Ghanaians should be speaking science every day and that is what we have set ourselves to do”, Dr. Afriyie noted when he visited the

northern sector-based research institutes of the Council (CSIR- Savanna Agriculture Research Institute, CSIR-Crops Research Institute, CSIR-Building and Roads Research Institute, CSIR-Forestry Research Institute of Ghana, and CSIR-Soil Research Institute).

He observed that, there had been a gap between the Ghanaian society and research institutions which he added would be a thing of the past in his time because of his intention 'to abolish that situation and put CSIR on the Ghana scientific industrial map".

The Minister commended the Directors and staff of the Kumasi-based institutes for promoting the national research and development agenda.

He said that, government was committed to placing CSIR in a good position to enable the development of appropriate technologies for sustainable food and industrial crops production to enhance livelihoods.

Government calls on CSIR to Support Its affordable housing Project

CSIR Corporate Affairs Division

- "With huge deposits of clay across various parts of the country, we should be able to take advantage and encourage the production of burnt bricks and pozzolana cement in large volumes – Minister for Works and Housing.

- "The cost of using bricks in building is durable and has low maintenance cost as compared to the cost of maintaining a cement building which needs painting every two years" - Director, CSIR -BRRI

The Minister for Works and Housing, Hon. Francis Asenso-Boakye on Monday April 26, 2021 had an engagement with the Building and Roads Research Institute (BRRI) of the Council for Scientific and Industrial Research (CSIR) as part of government's efforts to promote locally manufactured building materials for affordable housing projects at both district and national levels.In a related interview on Citi News, the Minister indicated that his Ministry intends to make the use of local building materials an integral part of government's affordable housing project. For that reason, he has engaged with the Ministries of Education and Health to adopt the use of these materials in their school projects and CHPS compound projects respectively.

"We intend to encourage their use and to create effective demand for them. Once we are able to achieve that, a lot of people will come into the production, and we will be able to produce for the mass quantities. That is the only way we can make them affordable. As of now, they are not necessarily cheap compared to the blocks. In this age where the cost of cement keeps increasing, we have no option than to resort to these local building materials"

For Dr. Asenso- Gyambibl, the director for CSIR -BRRI, the cost of using bricks in building is durable and has low maintenance cost as compared with the cost of maintaining a cement

The Minister, in a meeting with Dr. Asenso-Gyambibi (arrowed) and other stakeholders

building which needs "painting for every two years".

In a follow up interview with the editor of the CSIR newsletter, Ms. Benedicta Nkrumah-Boateng, the Director for CSIR-BRRI ,Dr. Asenso Gyambiby disclosed that the Institute is planning to train more artisans in brick laying to promote government's move on using local materials in building and also ensure that there is some level of standardization across the industry. He further disclosed that, government had met heads of some educational institutions and the Ghana Real Estate Developers Association (GREDA) to consider the usage of bricks in building. The aim of this project by government is to absolutely make housing affordable for the people of Ghana by making use of all available options targeted at ensuring a diminution of prices of building materials in the country.

The mandate of CSIR-BRRI is to undertake research into all aspects of building and road planning, design, construction and maintenance with the goal of developing local construction materials for increased utilization in construction.

R & D News

Awakening The Sleeping Giant-King Of Crops: Yams

Author: Prof. Emmanuel Otoo
CSIR - Crops Research Institute

Yam (Dioscoreaspp) is an important food crop in Ghana and West Africa as a whole. The West African sub-region aptly referred to as the yam belt accounts for 97% of world yam. There are over 600 species of yam within the family, Dioscoreaceae, of which nine are medicinal plants and eight edible species. Table 1 shows the scientific and common names of edible yam species:

Table 1. List of edible yam species in Ghana

Scientific Name	Common Name
Dioscorearotundata	White yam
D. alata	Water Yam
D. bulbiferia	AerialYam air-potato yam
D. cayenensis	Yellow Guniea Yam
D. esculenta	Lesser Yam
D. praehensilis	Kokoasebayere
D. trifida	Cush cush Yam
D. dumentorum	Bitter or trifoliate yam

In Ghana, D.rotundata, D .cayenensis, D. alata , D . dumentorum, D . praehensilis, and D. bulbifera are the species of importance in that order.

Among the numerous nutritional benefits of yams are:

Yams are rich in nutrients such as vitamins, minerals and fiber. It is rich in Vitamins C and B5. Rich in calories and carbohydrates. It is also rich in Manganese, Magnesium, Potassium, Thiamine, Copper and Folate. These elements are essential for supporting bone health, growth, metabolism, and heart function. Copper for instance, is vital for red blood cell production and iron absorption,

and vitamin C is a strong antioxidant that can boost your immune system. It also contains a unique compound called diosgenin, which has been found to promote neuron growth and enhance brain function. Yams contain zero fats.

Yams may ease menopausal symptoms. Blood levels of estrone and estradiol, two estrogen hormones, typically decrease during menopause. Yam improves the estrogen levels in human body and this may ease menopause symptoms.

Yams may have cancer-fighting properties. Extracts from Chinese yam, specifically the peel, inhibits liver tumor growth and offers antioxidant properties.

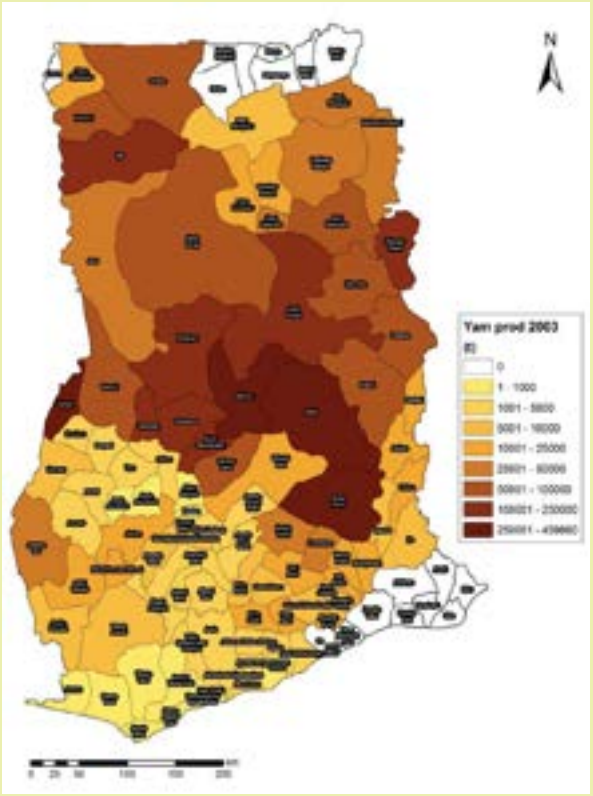
Yams may reduce inflammation. The rich antioxidant content of yams helps reduce inflammation related to various diseases.

May improve blood sugar control. Several animal studies have found that yams improve blood sugar control. The effects are thought to be due to their rich resistant starch and dietary fiber contents.

Yams are important in weight loss, antimicrobial effect and control of cholesterol. Due to the nutrient density of yams, eating them is associated with a number of health benefits, including weight loss, antimicrobial effects, and improved digestive health and cholesterol levels.

Ghana is the world's second largest yam producer and 3rd largest yam exporter, behind China and Mexico. Ghana however accounts for over 94 percent of total yam exports in West Africa (FAO). About 48 million tonnes are produced annually in this sub- region on 4 million hectares of land with the five major yam producing countries (Bénin, Côte d'Ivoire, Ghana, Nigeria, and Togo) accounting for 93% of world production.

Yam is an important staple food for many Ghanaians, accounting for 11 percent of total consumption in 2007. It also contributes 16 percent to the country's Agricultural Gross Domestic Product (GDP). In Ghana, 26.2% of the population depends on yam for food income and food security (IITA 2012). The crop is grown in almost all areas of the country and predominantly in the Forest-Savannah Transition, Guinea Savannah and Coastal Savannah areas in the order of importance (Fig. 1)



Source: CSIR-Crops Research Institute

In the production regions, yam does not only serve as an important cash crop but also a food crop for smallholder farmers and their families. Its importance in medicine cannot be over-emphasized. Yam has thus aptly being described as the "King of Crops". It is celebrated wherever it is grown from West Africa (the Yam belt) to the Caribbeans. It is an indispensable part of the socio-cultural heritage of areas where yam is grown. It has both income and price elasticity. It has low glycemic index suggesting that itis appropriate for condition such as diabetes. Nutritionally, yam has a higher nutritional value than the other root and tuber crops. Cooked yam has about 2% protein: equal to potato's but twice cassava's. In terms of energy production, yam

gives more energy than cassava, sweet potato, rice and maize.The yam export trade therefore rakes in significant foreign earnings (Fig. 2) and is exported to diverse destinations (Fig. 3).

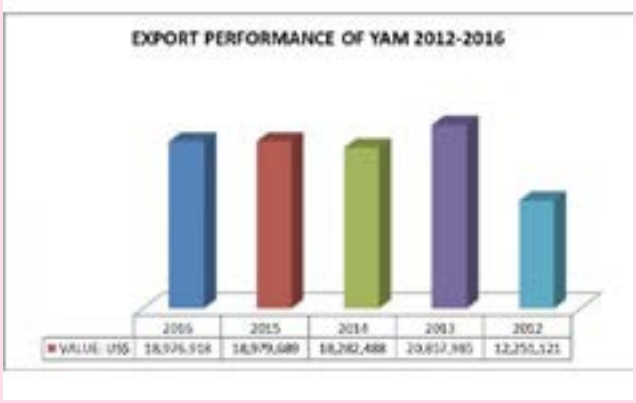


Fig. 2 Yam export performance of Ghana, 2012-2016
Source: Ghana Export Promotion Council, 2017

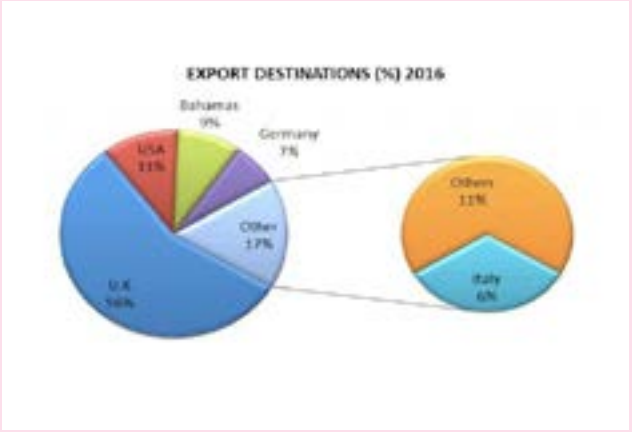


Fig. 3. Yam export destinations
Source: FAOSTAT, 2017

The industry has however suffered from institutional neglect from time immemorial. Among the numerous challenges accounting for the comatose of the yam industry in the past were limited research efforts (attributable to poor research infrastructure in terms of personnel and equipment), little or no funding for research and technical challenges such as poor synchronization of male and female flowering, low multiplication ratio for seed production resulting in unavailability of sufficient quantities of high quality seeds. The export trade has no research support and factors such as misrepresentation of varieties, low storability of exportable varieties, non-uniformity of tubers, low multiplication ratio as well as high labour cost in its production are militating against the yam trade.

The past 20 years can be aptly described as the golden age for yam research and development. It has witnessed unprecedented research and development efforts from a consortium of experts from international and local, governmental and non-governmental institutions. With strong financial support from sub-regional Governments through projects such as International Fund for Agriculture Development (IFAD)-sponsored IFAD/WECARD Yam Project (2000-2005) in Cote d'Ivoire, Ghana, Togo, Benin and Nigeria,Root and Tuber Improvement Programmein Ghana (RTIP-1997 – 2005) and Root and Tuber Improvement and Marketing Programme in Ghana (RTIMP-2007-2014),Root and Tuber Expansion Programme (RTEP-1999-2009) in Nigeria the World Bank sponsored West Africa Agricultural Productivity Programmes across the sub-region (WAAPP I and II-2007-2017), and donor-sponsorship through Bill and Merlinda Gates Foundation through subsidiary programmes such as Yam Improvement for Income and Food Security in West Africa (YIIFSWA I and II), Enhancing Yam Breeding for increased Productivity and Improved Quality in West Africa (AfricaYam-2014-2020) and The DANIDA Root and Tuber Value Chain Project in Ghana (2013-2017).Almost all these projects were executed with the International Institute for Tropical Agriculture (IITA) as a key partner in the project development and technical backstopping of the national Agricultural Research Systems, and in Ghana, CSIR is the key implementing partner and Ministries of Food and Agriculture and Trade as inseparable partners.

Significant successes have being achieved over the period. Capacity has been built in terms of human and infrastructure needed for research. Seven (7) improved yam varieties comprising 3 *D. rotundata*(2005) and 4 *D. alata*(2016) have

been released in Ghana by CSIR-Crops Research Institute. The multiplication ratio of yams has been improved from 1:4-6 to 1-1000 through technologies such as yam vine multiplication, hydroponics and aeroponics among others. The average on-farm yam yields of 10t/ha have been raised 20t/ha. The problem of non-synchronization of male and female flowers hindering hybridization has been eliminated through measures such as sink manipulation to induce flowering and staggering of planting.

Yam could be enjoyed in many ways including

- "Ampesi". (Cut yams into pieces boil and eat) eaten with stew, soup or pepper
- "Fufu "(Cut yams into pieces boil and knead/pound) eaten with soup
- Yam fries. Cut yams into wedges, add seasonings, and bake or fry them.
- Purée. Boil the tubers until soft, place in a blender, purée, and season them.
- Yam chips. Thinly slice peeled yams and bake or fry them.

Mashed yams. Peel, boil, and mash your yams, then add milk and seasonings.

Baked yams. Bake cubed yams until tender.

Cheesy yam gratin. Thinly slice peeled yams and bake them with cheese and seasonings.

Yam hash. Peel, dice, season, and then cook your yams in a pan.

Add into baked goods. Use yam purée to add moisture to breads and muffins.

The sleeping giant is awakened to take its rightful place in our national development.

Appellation For the King of Crops-Yam

In terms of food:
You are the hunger-killer
With respect to health: The savior of the barren woman
Tonic to the boastful husband who enjoys multiple births
Food for the diabetic
Athletes and those who do manual labour depend on you
All crops bow down to you
Cassava says "I wish I were you"
So do plantain,sweetpotato and cocoyam
Maize even fear you
The marriage ceremony cannot occur without you
Cocoa is nervous for it knows that if you take your choicest garment it will be no match for you in terms of foreign exchange earnings
King of Crops Arise and end hunger in our land
May it not be said that you were here when hunger and disease was destroying our lands
Arise and let the nation rise in glory.
Arise King of Crops Arise and let your enemies be scattered.

Modernizing Agriculture In Ghana (MAG) - A Success story

Author: Mahama Samuel; PhD, Scientific Information Officer, CSIR-Head Office, Accra-Ghana

The importance of viable seed with improved characteristics such as high yielding, drought tolerant and disease resistant for the enhancement food security cannot be overemphasized. In order to sustain an increasing trend in crop yields, it important to ensure that access to viable and improved certified seeds by farmer is unfettered irrespective of their locations. It on this basis that the CSIR with the support of the MAG project initiated the community seed production system.

The community seed production initiative is facilitating easy access to certified seeds by farmers in the hinterlands. It has been designed to be an income generation venture using a value chain approach in the seed supply chain with the youth constituting the core of the membership, thereby sustaining the interest of the youth in agriculture. Established groups are to be supported and backstopped by CSIR researchers from CSIR - Savannah Research Institute (SARI) and CSIR - Crop Research Institute (CRI) to produce certified seeds.

So far seven of such groups have been established in in the Ashanti, Northern and Upper West, regions to strengthen the supply chain of certified seeds for maize and soybeans to farmers in the hinterlands and other remote areas where access to certified seeds has been a huge challenge.

Atwima-Yabi maize-based community seed production group at Atwima- Kwanwoma in Ashanti region

Tingbataba Community seed production group at Nyankpala displaying their harvested produce at the end of the farming season

The crops being used to promote this initiative are improved maize and soybeans varieties released by the CSIR which are high yielding, drought tolerant, early maturing and in the case of the maize, striga/streak tolerant. The potential yield of the maize is about 5,3mt/ha while on the farmers or under harsh climatic conditions can generate between 2-3mt/ha.

At the moment over 210 farmers have been involved in the initiative with an average of 30 farmers per group out of which the youth constitute the majority and females make up to

about 35% of the membership. It is envisaged that by the close of 2022 about 15 sustained groups would have been established and made to function through a value chain system using agri-business approach where more actors would be added to the existing ones. Plans are afoot to introduce value addition actors (branding and packaging), convergence points and sales outlets.

A more sustainable approach would be to mainstream their activities into those of the conventional certified seed producers by regularizing their operations through the provision of certification from the Plant Protection and Regulatory Services Directorate (PPRSD) under Ministry of Food and Agriculture (MoFA). This will generate confidence in the products and give them a competitive edge in the wider space of the seed production industry. To this end, PPRSD has already engaged some of these groups and built their capacities in processes leading to the acquisition of certification. They have also set up timetables for inspecting established seed fields in the 2021 cropping season prior to certification.

Furthermore the development of the value chain segment of the community seed supply chain has begun with a business development workshop organised for over 200 members of already the established groups in Northern Ghana in March, 2021 to enhance the entrepreneurship abilities of stakeholders. This will allow them to expand their livelihood potentials from just being producers to other business opportunities within the seed industry as envisaged. The workshop also accorded stakeholders the opportunity to understand the necessity for the certification and branding of their produce. More follow-up workshops have been scheduled for the year (2021) to consolidate what has been achieved so far and facilitate the achievement of the overall objective of providing a viable option of sustainable livelihoods in the seed production industry for enhanced seed supply chain across the country.

This initiative was started since 2018 with established groups already being operational and serving their communities. Some beneficiary farmers have expressed their satisfaction with the seeds they obtained from the groups and that their only disappointment is the inadequate supply because what they had was just sufficient for an acre or two. They indicated that even with small quantities they had, the yields were very good compared to what they normally use.

The impact on the lives of key beneficiaries can be seen in the case of Mr Hudu Dramini (Tel: 0242029293) who is a member of a beneficiary group in the Sissala West district in the Upper West region.

A 3 Bedroom house being put up by Mr. Hudu Dramani of the Sibelle community seed production group in the Sissala West district.

Pushing the boundaries of science and Innovation

CSIR-Soil Research Institute Develops A Web-Based Soil Interactive Platform

Ghana's agriculture is characterized by low crop yields due to poor soil management and inappropriate land use systems leading to soil degradation. Furthermore, fertilizer use in Ghana is low; approximately 20 kg per hectare (GSS, 2020). Thus, a scientifically based assessment of the nutrient status of the various croplands is needed in trying to address the low fertilizer use and inappropriate soil management practices. A web-based soil information system has been developed by CSIR-Soil Research Institute (CSIR -SARI) to form the basis of soil fertility improvement protocols. This forms part of the overall digital agriculture innovation hub (DAIH) by the CSIR which should be a component of the Modernization of Agriculture agenda by the government to provide a solid and important foundation to the economy.

The CSIR-SRI has transformed all analogue soil information in Ghana into digitized format for easier retrieval and storage and has developed an Interactive Web-Based Soil Interactive Application Platform (https://www.csirsoilinfo.org/). This is a sustainable decision support system to modernize soil resources management for increased agricultural productivity, reduced poverty and ensure food and nutrition security. This will also facilitate the production of agricultural raw materials for industry and commodities for export.

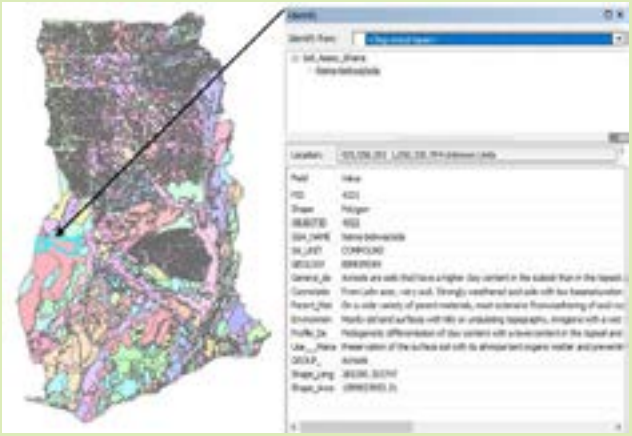


Figure 1: Screenshot of the web-based soil Interactive platform (https://www.csirsoilinfo.org/)

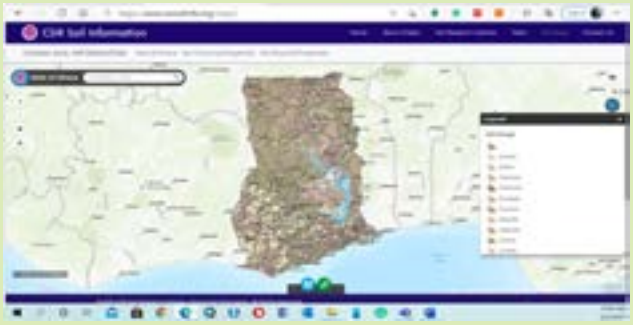


Figure 2: Soil Information of Sunyani, Nsoatre territory

The web-based soil interactive platform has several benefits which are available to the end user at the click of a button. These include:

(i) digitized soil maps of specific locations, soil characteristics and appropriate nutrient/ mineral requirement for key crops in each agro-ecological zone of Ghana.

(ii) soil management recommendations, strategies, and limitations, etc. are brought to the doorstep of farmers (small, medium and large scale), frontline field staff of MoFA, departments of Agriculture in all District/ Municipal/ Metropolitan

Assemblies across the country and other stakeholders through the internet.

(iii) site-specific fertilizer recommendations for candidate crops are advocated for as against the use of blanket fertilizer application.

(iv) the type of fertilizer blending plants and the raw materials that are required for the blending could be decided based on the digital nutrient status maps.

(v) the digital soil maps are living documents which can be updated at any time when new data is acquired.

The current and potential beneficiaries of the platform include:

a) The Ministry of Food and Agriculture (MoFA)

b) Government's agricultural development initiatives like:
   i) Planting for Food and Jobs (PFJ),
   ii) Planting for Export and Rural Development (PERD),
   iii) Rearing for Food and Jobs (RFJ),
   iv) One District, One Factory (1D,1F)

c) Smallholder, Medium and Large-scale farmers

d) Fertilizer manufacturing companies

e) International and local NGOs with focus in Agriculture

f) Estate developers, the mining and construction industries as well as other key players.

Contact:
The Scientific Secretary, Mr. Padlass Edeafour is available on 0244972337 or padlassedeafour@yahoo.com if you require more information. Please log on to https://www.csirsoilinfo.org/ to access the site. We trust that you will find it useful and a good source of information.

Impacting lives through Science & Technology

Mrs. Vida Korkor Lamptey
Senior Research Scientist
CSIR - Animal Research Institute

Mrs. Vida Korkor Lamptey is a Senior Research Scientist at the Animal Research Institute of the Council for Scientific and Industrial Research (CSIR-ARI), located at Katamanso off the Dodowa road. She holds a Master of Science degree in Animal Breeding and Genetics from the Wageningen University in the Netherlands and a Bachelor of Science (Hons) degree from the Kwame Nkrumah University of Science and Technology. Mrs. Lamptey is currently finishing a doctoral degree programme in Animal Breeding at the University of Cape Coast, Ghana, on the topic *"Genetic Diversity and Phenotypic Characterization of Rabbit In Selected Areas In Ghana"*

After her BSc. degree in 2001, she taught Chemistry, Integrated Science and Animal Husbandry at Baidoo Bonsoe Senior High School in Agona Nkwanta in the Western region. She later took up an appointment as an Assistant Research Scientist at CSIR-ARI in 2004. Her initial assignments involved experimental design, data collection, processing and analyses of field data. In addition, she supervised the technical staff involved in on-going projects at the Poultry Section of the Non-Ruminant Division of the Institute then, now Farmed Animal Technology Division. In 2010, Mrs. Lamptey was upgraded to a full Research Scientist position after the completion of her master's degree. Between 2010 and 2018, she was involved in the research and development of non-ruminant technologies, especially in the area of locally adapted commercial broiler breed popularly called ARIBRO (Animal Research Institute Broilers). Through hard work and exemplary work performance, she was promoted to the position of Senior Research Scientist in July 2018.

Mrs Lamptey is a beneficiary of two projects sponsored by the Republic of Korea, in support of the development of the poultry industry in Ghana. First, she received a $45,000.00 KAFACI (Korea-Africa Food and Agriculture Cooperation Initiative) grant to establish a Small Scale Layer Complex Model at CSIR-ARI during 2017 – 2019. The main goal of the project was to build the capacity of small-scale poultry farmers through their retention of project earnings, to introduce them to new and better ways of feeding and to build their capacity in modern layer production practices. She has trained over 50 farmers in modern layer production practices (including the effective use of sea water and limbux as disinfectants), record keeping, use of day light, among others etc.). Nearly all the beneficiary farmers are currently well established in the poultry business.

The second project is sponsored through the Korea Programme for International Agriculture (KOPIA). This $90,000.00 project seeks to establish quality source of day-old-chicks by developing improved exotic locally adapted broilers and breeders for local farmers, with the goal of helping curtail the importation of day-old-chicks to Ghana. The project also seeks to establish a brooding center and a feed mill to support farmers in the catchment area.

Mrs. Lamptey has authored nine refereed journal papers and number of technical reports and conference papers. She is married to Pastor David Lamptey and their union is blessed with three wonderful children, Gideon, Zoe and Koveshet Lamptey.

Going the extra mile

Mrs. Genevieve Nyameke-Mano Yankey
Director of Administration, CSIR - Ghana

Mrs. Genevieve Nyameke-Mano Yankey is the Director of Administration (DoA), CSIR, Secretary to the CSIR Governing Council and the also Director of the CSIR Head Office. She assumed Office on 1st August, 2019.

She was nominated and selected for the best administration staff award for implementing her 'Go Green' vision which has had a significant impact on the finances of the Head Office. Mrs . Yankey has also instituted comprehensive health screening programmes at the head office and monthly clean-up exercises to ensure a clean and healthy working environment since she assumed office on 1st August, 2019.

Go Green initiatives at Head Office.
'Go Green' initiatives protect the natural resources for the next generation and protects human health through environmental management and implementation of green ways of life. Through the implementation of her 'Go green energy' initiative at the Head Office, Mrs. Yankey has succeeded in cutting down the huge monthly electricity bill at the head office by almost 60%. Prior to the installation of a solar energy system, monthly electricity consumption for Head Office was pegged at GHC 8,000. Air conditioners could only be switched on from 12 noon to 4:30 pm to cut down on electricity bills. However, with the installation of solar panels there has been a drastic reduction in the monthly bill from GHC 8,000 to GHC 3,206.70 even with air conditioners working at full capacity all day.

Another remarkable initiative is the use of Waste Management Technologies adopted from the Institute of Industrial Research (IIR) to process waste generated at the Head Office. Currently, bins for recycling plastic are in use, to allow the separation of waste at source of generation. It is her hope that all 13 Institutes will also deploy and promote technologies developed by other institutes.

Mrs. Genevieve Nyameke-Mano Yankey holds a B.A in History and Classical Civilization from the University of Ghana and a Masters' degree in Public Administration (MPA) from the University of Ghana Business School.

She is an accomplished Administrator, a Chartered Professional Administrator (ChPA),a full member of the Chartered Institute of Administrators and Management Consultants and also a Member of the Institute of Human Resources Management Practitioners (IHRMP).

Milestones & Appointments

Prof. Mohammed Moro Buri

PROF. MOHAMMED MORO BURI retired from CSIR - SRI as a Chief Research Scientist in 2021 having served as Director of the CSIR – Soil Research Institute (CSIR-SRI) from 2018 – 2021. During his tenure as Director of CSIR-SRI, Prof Buri worked extensively with smallholder farmers, extension agents and Agro-Input Dealers in the development and dissemination of rice eco-technology (SAWAH)) in Ghana. The sawah eco-technology increases yield up to 5 t/hm^2 through bunding and the use of inlet and outlet connecting irrigation and drainage, which enhances effective water control and management, improves the efficiency of fertilizer, increases the use of wetlands, improves soil organic matter accumulation, suppresses weed growth, and enhances immune mechanism of rice through nutrient supply. He also contributed immensely to the running of the Soil Health and Environmental Resources Management Programme of the CSIR College of Science and Technology (CCST).

Prof. Buri is an accomplished Soil Fertility expert with special focus on sulphur nutrition in rice. Dr. Edward Yeboah, a Principal Research Scientist is in an acting capacity pending the appointment of a substantive director for the Institute.

Dr. Yeboah PhD in Soil Science, MPhil Soil Science and BSc. Agriculture from the University of Ghana, Legon. Edward is the immediate past Deputy Director and was first employed in CSIR-Soil Research Institute as Assistant Research Officer on 13th October 1998.

Prof. (Mrs) Mary Obodai

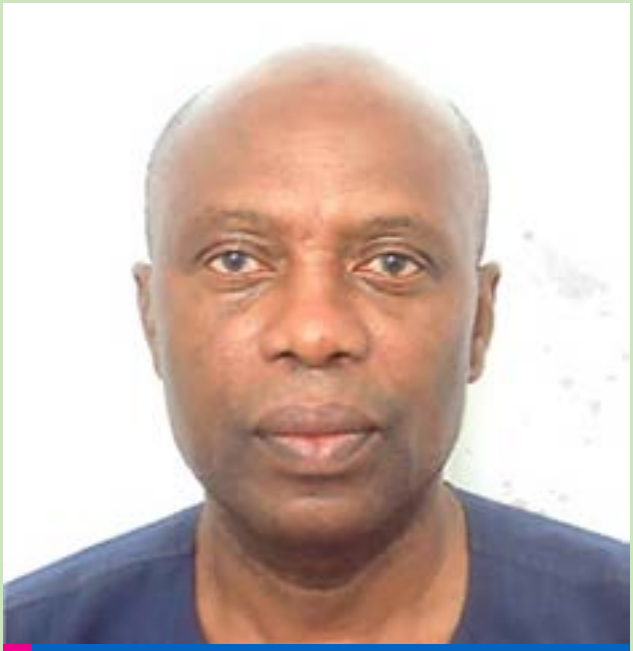
PROF. (MRS). MARY OBODAI, a Chief Research Scientist, is the immediate past Director of the Food Research Institute. She joined CSIR in November 1992 and served as Director of CSIR – Food Research Institute from 1st August 2016 – 27th November 2020. Prof. Obodai's area of expertise is Food Microbiology (Microbiota of African fermented foods) /Mushroom Biotechnology.

During her tenure the following new species of mushrooms were recorded for the first time in Ghana:

1. *Pleurotus sajor-caju*
2. *Pleurotus. albidus*
3. *Favolus brasiliensis*
4. *Ganoderma mbrekobenum* sp. nov.

A 1000 capacity spawn production unit and a 40,000-compost bag incubation centre were also built for mushroom production during her tenure.

Prof. Charles Tortoe , a Chief Research Scientist is in an acting capacity pending the appointment of a substantive director for the Institute



Dr. Stephen K. Nutsugah

DR. STEPHEN KWASI NUTSUGAH is a Chief Research Scientist and the immediate past director of the CSIR – Savanna Agricultural Research Institute. Dr. Nutsugah joined CSIR on 1st February 1994. and was appointed Director of CSIR- SARI in October 2008 and retired on 5th May 2020. His area of expertise is plant pathology

During his tenure as Director, 64 improved crop varieties were developed as follows: maize 15; rice 11; groundnut 2; cowpea 15; millet 5; soybean 4; frafra potato 5; sweet potato 7; other intangibles 8)
Dr. Samuel J. Saaka Buah, a principal research scientist has been holding the fort since May 2020.

Dr. Lawrence Misa Aboagye

DR. LAWRENCE MISA ABOAGYE, a Chief Research Scientist, retired as Director of CSIR – Plant Genetic Resources Research Institute on 30th June 2021

His area of expertise is Plant Physiology/Breeding Dr. Aboagye was very instrumental in the collection, characterization and preparation of many of Ghana's wild crop and plant varieties for conservation and future usage. During his tenure the Institute in collaboration with the International Network for Edible Aroids (INEA) introduced, multiplied and distributed germplasm of Taro (locally known as *brobe* or *kooko* , a neglected 'orphan' crop on the verge of extinction to farmers in Ghana;

Yam genetic resources getting extinct in farmers' fields identified, collected accessions under conservation multiplied and re-introduced to farmers. He was the Lead scientist in a project for up-grading of facilities at CSIR-PGRRI and the establishment of a complimentary gene bank at CSIR-SARI with support from the Crop Trust.

Dr. Daniel Ashie Kotey, a senior research scientist is in an acting capacity pending the appointment of a substantive director for the Institute. Daniel holds a PhD in Entomology: University of Fort Hare, Alice, Eastern Cape Province, South Africa., M. Phil in Entomology: University of Ghana, Legon and B.Sc Biology, University of Cape Coast, Cape Coast, Ghana.

Did you know?

1. Oleic acid is one type of omega-9 fatty acid and most associated with olive oil, but you can find it in other places too, such as our new groundnut varieties SARINUT 1 and SARINUT 2. Oleic acid offers various health benefits including improvements to cholesterol levels, blood pressure and inflammation, along with decreased heart disease risk and has the potential to improve both mood and cognition. Source: CSIR-SARI

2. An aeroponic system is the growing of plants without the need of a soil medium. The roots of the plant are systematically sprayed with water solution containing the required nutrients for the growth of the plant. CSIR-SARI's Yam Aeroponic System can generate a total of 588,000 cuttings each cutting cycle for yam propagation. Source: CSIR-SARI.

3. Kuafo Market Place is a digital platform where buyers and sellers of agriculture inputs and produce can engage. Colourful images of the seller's produce are displayed which enhances the visibility of the items being sold. Interested sellers who want to display their goods have to login and register. Source: CSIR-INSTI (csirgh.com)

4. Agriculture Research Management Repository hosts an ongoing plethora of research and resource materials developed by all the 13 Institutes of CSIR. They include Annual Reports, Conference/Journal Papers, Edited Research/Technical Reports etc. Repositories are important tools for preserving an organization's legacy; they facilitate digital preservation and scholarly communication. Source: CSIR-INSTI (csirgh.com)

5. CSIR Ghana Technologies Portal displays 4 subject areas and an interactive map of Ghana. The subject areas are Thematic and Soil Maps of Ghana, Agricultural Technologies, Agro Input & Seed Stores and Experts Reports and Newsletters. A click on any of these subject areas displays a list of companies or associations, their contacts and GPS locations as well as the services they provide. - fertilizers, agro-chemicals, tools and equipment. Source: CSIR-INSTI (csirgh.com)

6. CSIR-Soil Research Institute with support from Modernizing Agriculture in Ghana (MAG) have converted all the analogue maps of the soil formations in Ghana to digital formats. Soil information is critical to the transformation of agriculture. It also has multi-functional usage as it can be used by Real Estate Developers, Horticulturists, and Survey and Lands Department. Source: https://www.csirsoilinfo.org/

7. Are you aware you can watch quality content on research and development by visiting www.critvgh.com and on YouTube @Crops Research Institute? Watch the project with Dr. Osei-Adu to get to know the wonderful technologies being developed by CSIR scientists. You can also watch Women of Science hosted by Sylvia Archer to learn more about how women are breaking boundaries in the field of science. CRI-TV, Beyond the Research.

8. CSIR-Plant Genetic Resources Research Institute (CSIR-PGRRI) is the host institution of the National Gene bank. A Gene Banks is a type of biorepository for the preservation of genetic material. For plants, this is done by in-vitro storage, freezing cuttings from the plant, or stocking of the seeds. Source: Wikipedia.

THE EDITORIAL TEAM

Editorial Committee

The CSIR Newsletter Editorial Team, from left: Mr. David Akowuah, Member, Mrs. Rita Tsiquaye, Member/Secretary, Mr. Edward Decker, Member, Ms. Benedicta Nkrumah-Boateng, Editor, Dr. Stephen Bekoe, Member

Photo Credit: Daniel Oduro-Mensah (NSP), Corporate Affairs Division, CSIR.

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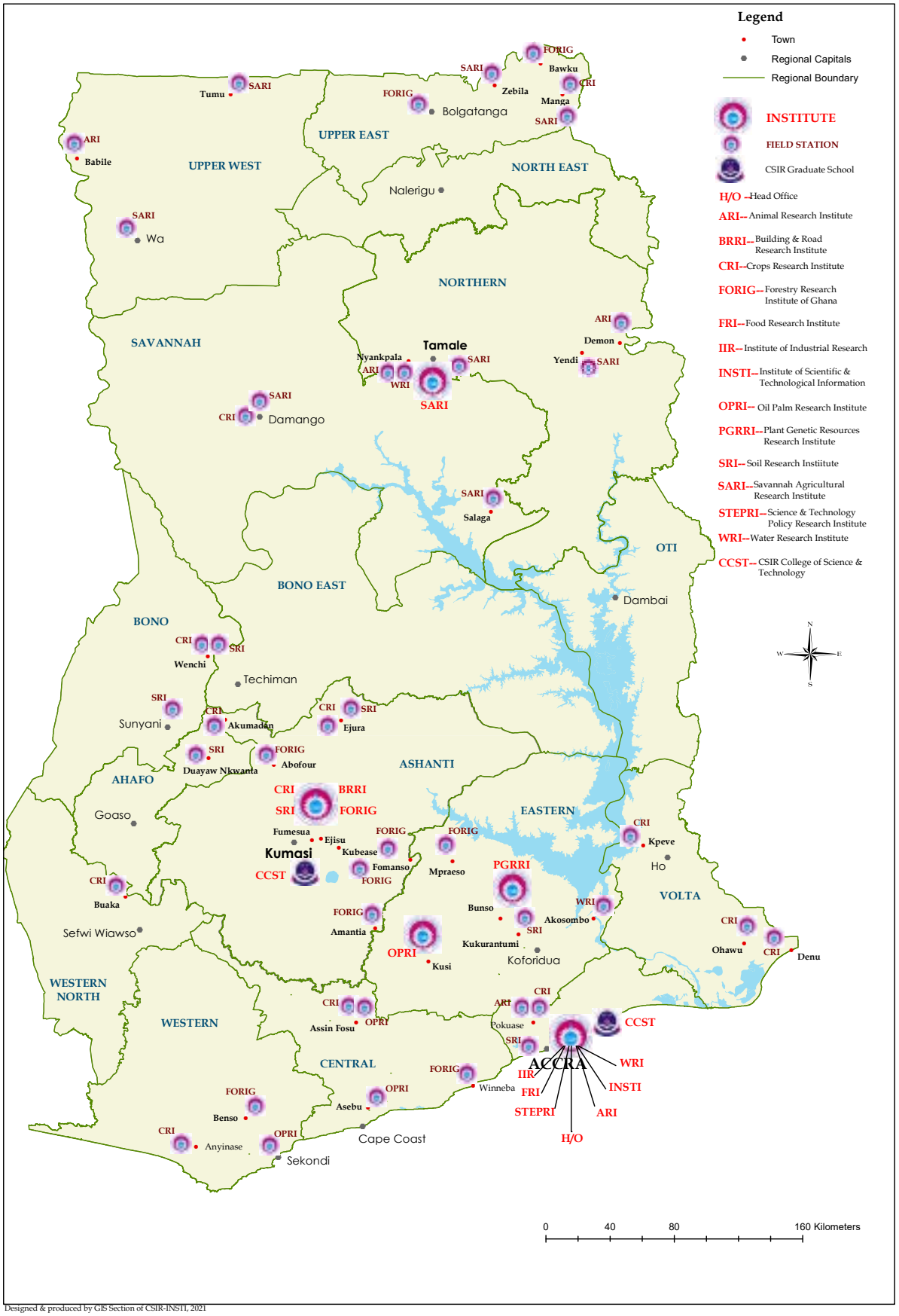
Deputy Director-General
CSIR-Ghana

Dr. Seth Awuku Manteaw
Director
CSIR-INSTI

Mr. Donald Gwira
MAG/CSIR Communications
Advisor

OUR FOOTPRINTS

INSTITUTES & FIELD STATIONS OF CSIR - GHANA



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