

Crops Research Institute (CSIR-CRI) of Ghana: Organization Committed to Developing Affordable and Desired Food and Agro-Industrial Products

J.N. Asafu-Agyei

Director, Crops Research Institute, Box 3785, Kumasi, Ghana

(director@cropsresearch.org; asafuagyei@yahoo.com)



A: BACKGROUND

Ghana has a high population growth rate, widespread poverty, high levels of food insecurity and malnutrition. Research and developmental interventions are needed.

The Council for Scientific and Industrial Research (CSIR), is a statutory semi-autonomous corporation mandated to implement, coordinate and advise on scientific research and development policies in Ghana. The Crops Research Institute (CSIR-CRI) is the largest of the 13 research institutes of the CSIR.

CSIR-CRI is committed to become a centre of excellence for innovative and quality agricultural research for development. Over the years, environmentally sound technologies have been developed and disseminated.

CSIR-CRI has twelve programmes: Maize, Rice, Legumes, Roots & Tubers, Horticulture, Seed Technology, Resource and Crop Management, Crop Protection, Biochemistry/Biotechnology, Socio-Economics, Biometrics, Training and Communication. CSIR-CRI has a multi-disciplinary team of 77 scientists (26 PhD, 36 MS, and 15 BS) Current research thrust is focused on modernized agriculture for agro-industrial rural development in line with the Ghana government's development agenda

CSIR-CRI, as the foremost national scientific agricultural research and technology transfer institution, is mandated to use science to advance agriculture and industry in order to improve the incomes and livelihoods and ensure food security as envisaged.

The following themes are therefore pertinent at CSIR-CRI

- > development of improved, market-targeted, quality and specific-desired crop varieties through innovative agricultural crops research.
- > Ensure high and sustainable agricultural crops productivity and profitability through the development of impact oriented, sustainable, appropriate, saleable and cost-effective production technologies
- > Facilitate the transfer and dissemination of environmentally sound technologies responsive to private sector demands, stakeholders' requirements and the needs of agro-based industries
- > Facilitate the nations drive to modernized agriculture by making significant inputs to the essential processes of production and adding value (processing, preservation, presentation, packaging) marketing of agro-based industrial products for local and export markets.
- > Play a leading role to help ensure food security, poverty reduction, increased incomes and employment creation for rural socio economic development.
- > Commercialize or repackage technologies for income generation.

Specifically for biotech, molecular and tissue culture work, CSIR-CRI would need funding, equipment, training infrastructure, technical backstopping. The following areas are critical:

- > Molecular level characterization of all mandate crops in order to keep a core collection and authentic documentation for further crop improvement activities to establish genetic diversity of existing landraces/collections
- > Finger printing for the developed varieties before release and distribution
- > Genetic engineering to develop GMOs to develop disease resistance, weedicide tolerance, drought resistance, efficient uptake of plant nutrients and improve nutritional qualities, starch content and quality, ripening conditions shelf-life of crops.
- > Selection and in vitro cleaning of mandated crops to prevent the spread of diseases and pathogens
 - Ø In vitro rapid multiplication of crops of commercial and research interest to ensure availability
 - Ø Cryopreservation methods as well as other in vitro slow growth techniques for conservation of vegetatively propagated crops
 - Ø Screen house and field establishment of in vitro raised materials

B: CSIR-CRI IS A GOOD PARTNER

CSIR-CRI is a good partner and has a proven record and a long history of agricultural research. Example is research in another small-farmer crop, maize, in Ghana. Studies have indicated that the livelihood of the rural poor farmer has been improved due to investment in agricultural research (Dankyi et al., 1999.)

Achievements include development and release of high yielding varieties of cassava, maize, cowpea, soybean, rice, etc. widely utilized by farmers, agro-industrialist, food processors, vendors and exporters.

The highly acclaimed QPM maize variety Obatanpa produced under different names in other countries is noteworthy. CSIR-CRI is also proud to have supplied the cassava variety used for industrial starch production in the Presidential Special Initiative (PSI) is a product of CSIR-CRI, IITA collaborative work



Fig.1. Industrial processing.



Fig.2. Household / community level processing.

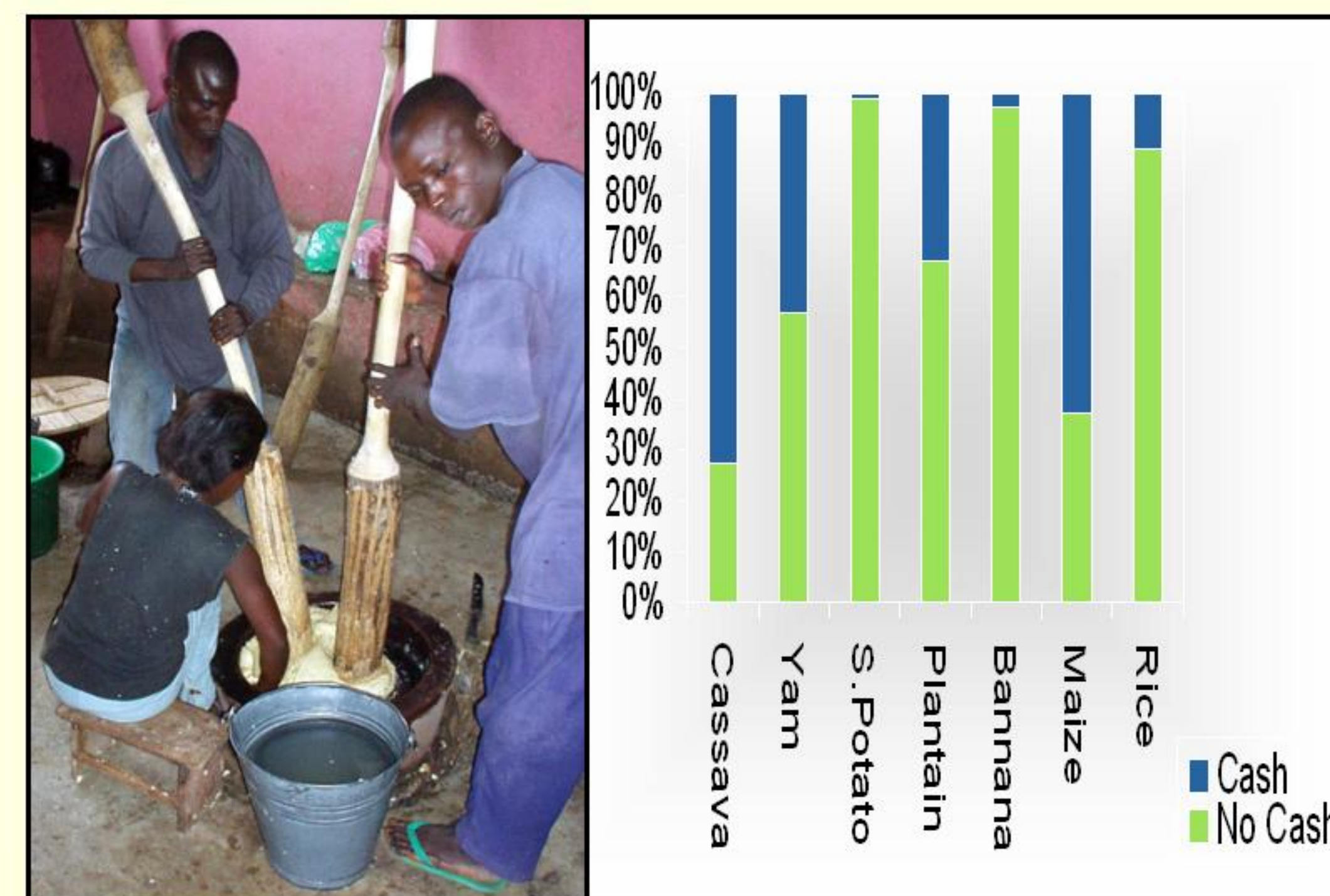


Fig. 3. Fufu preparation.

Fig.4. Cassava for income.

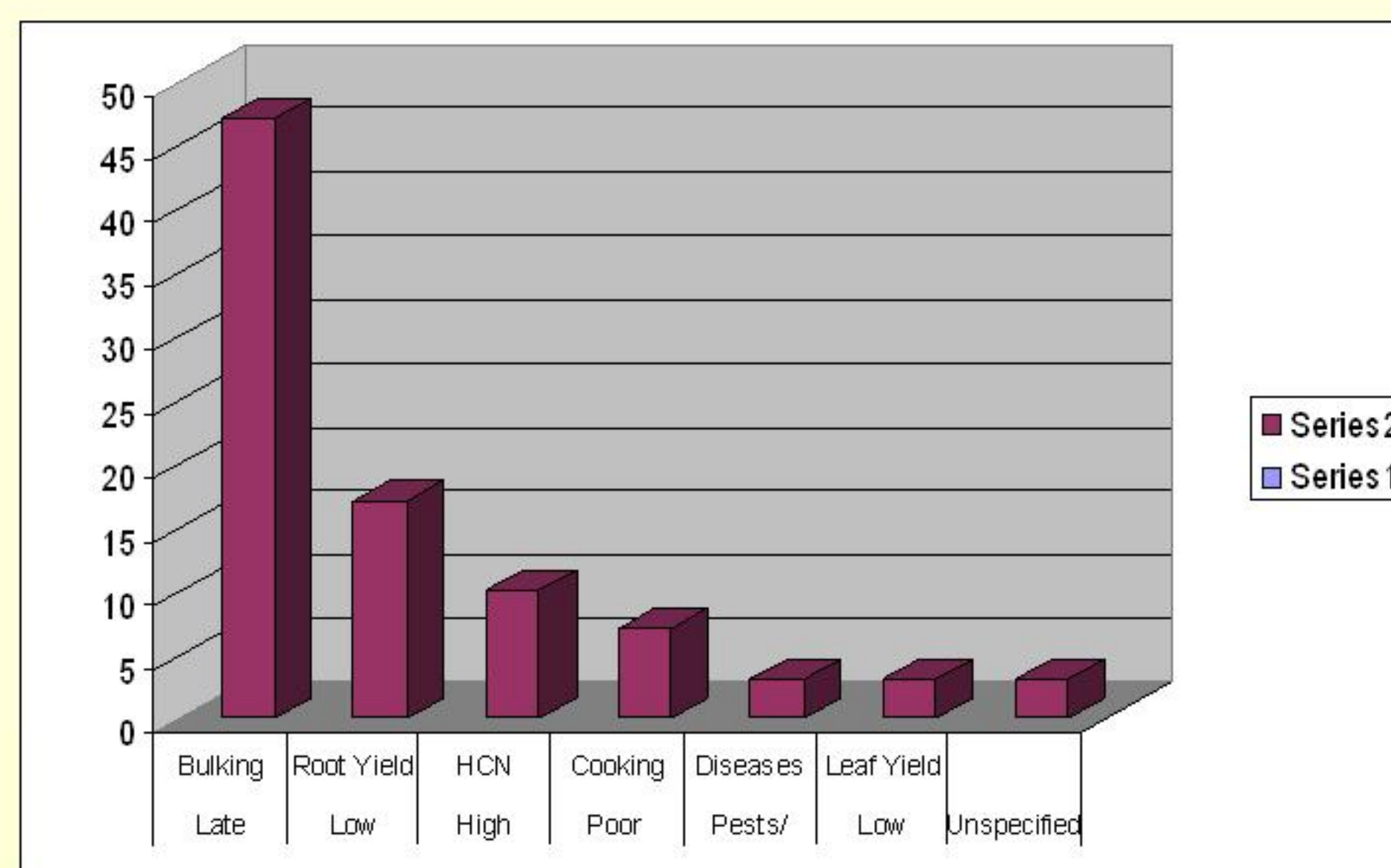


Fig. 5. Researchable Areas.



Visit us at CSIR-CRI

C: CSIR-CRI's role in adding value

Roots and tuber crops constitute 40% of AGDP. Cassava alone constitutes about 20%. It is one of the most widely cultivated and consumed foods in Ghana. It has several domestic and industrial uses.

Seventy scientists who evaluated crop types in May 2002 in Ghana confirmed cassava as the no.1 crop in Ghana. Cassava production is however constrained by low yields, poor soil fertility, drought, susceptibility to diseases such as the African Cassava Mosaic Virus (ACMV), Cassava Bacteria Blight (CBB), *Polyporus* root rot disease of cassava, as well as pests such as green mites, variegated grasshopper, etc. In addition some cassava genotypes may possess good agronomic traits but not preferred for food.

THE KEY TO IMPROVING STATUS OF SMALL FARMER:

ADD VALUE TO THE STATUS OF THE CASSAVA SMALL-FARMER BY ADDING VALUE TO CASSAVA TO MAKE IT A HIGH VALUE CROP STILL IN THE HANDS OF THE SMALL FARMER.

The Ghana government in the bid to bring development to the doorsteps of the rural communities and make them part of the mainstream economic activity targeted cassava because cassava is important in Ghana (Fig. 1-5). The starch factory cited in a rural area (Awutu-Bawjiase) in 2001 has created jobs for 10,000 small-scale cassava farmers. Farmers sell cassava to the factory to increase their incomes and improve their living standards. Yam, for example, was a small farmer crop years ago. As urban and export market access improved, farmers got good prices because of heightened demand to change status.

THE INPUT OF CSIR-CRI TO THE SMALL-FARMER CASSAVA CROP. THE PRESIDENTIAL INITIATIVE (PSI)

1. develop improved, market-targeted, quality and specific-desired cassava varieties for the starch industry
2. Produce and supply improved and healthy planting material of released varieties to the seed industry
3. Initiate maintenance breeding
4. Initiate in-vitro propagation and virus indexing.
5. Develop sustainable, appropriate and cost-effective production technologies to go with these crop varieties.
6. Organize training programs for extension, farmer and relevant agro-based groups.
7. Follow up to acquaint with progress and provide appropriate solutions to identified problems.
8. Provide advisers as secondment to the various PSI

ii. FUTURE ROLE OF CSIR-CRI IN GHANA PSI THROUGH AGRICULTURAL RESEARCH ON THE SMALL-FARMER CASSAVA CROP

CSIR-CRI through research can develop cassava varieties with the following attributes:

1. Higher starch content than 'Afiyasi'
2. Higher yields than 'Afiyasi'
3. Pest and disease resistant varieties adapted to our different agro-ecologies.
4. Cassava varieties that are suitable for pharmaceutical industries.
5. Varieties that give quality fermentable products eg. Industrial alcohol.
6. Varieties that can replace maize in animal feed production.

AREAS ENVISAGED AT CSIR-CRI FOR BIOTECHNOLOGY ACCELERATION TO FURTHER ENHANCE AND ADD VALUE TO THE SMALL-FARMER CASSAVA CROP

1. High root yields
2. Consumer preference
3. Nutritional enhancement
4. Resistance to major pests and diseases
5. Tolerance to drought
6. Improving Soil Fertility through the use of Micorhizza
7. Weed control
8. Early and late bulking
9. Descrease of Cyanogen content
10. Industrial Usage

REFERENCES

Berry, S. S. (1993). Socio-Economic aspects of cassava cultivation and use in Africa: implication for the development of appropriate technology. COSCA Working Paper No. 8. Collaborative Study on Cassava in Africa, IITA, Ibadan, Nigeria.

Nweke, F.I., J. Haleegoah., A.G.O. Dixon., O. Ajobo., B.O Ugwu and R. Al-Hassan (1999). Cassava Production in Ghana: A Function of Market Demand and Farmer Access to Improved Production and Processing Technologies. COSCA Working Paper No. 21. Collaborative Study on Cassava in Africa, IITA, Ibadan, Nigeria.