

## **PERFORMANCE OF THE SCIENTIFIC RESEARCH COUNCIL FOR THE 2004/2005 FINANCIAL YEAR AND FOCUS FOR THE 2005/2006 FINANCIAL YEAR**

### **1.0 Purpose of Ministry Paper**

The main purpose of this Ministry Paper is to inform Parliament and the general public on the performance of the Scientific Research Council (SRC) during the 2004/2005 Financial Year and the main focus for the 2005/2006 Financial Year.

### **2.0 Mission**

The Mission of the SRC is to serve the productive sector, policy makers and the general public in order to enable sustainable development in Jamaica by:

- providing quality scientific and technological solutions (product/process research and development, policy advice, technology transfer);
- popularising science and technology through strategic alliances; and
- being customer-focused, with innovative, competent and responsive teams.

### **3.0 Role and Functions of the SRC**

The SRC was established by an Act of Parliament in 1960, with subsequent modifications to operating procedures.

Overall, the SRC seeks to contribute to economic growth by broadening the industrial base in a manner that focuses on the utilization of local resources. The SRC also provides technical support to existing industries to enhance their performance in increasingly competitive domestic and international markets. To that end, the Council is involved in:

- (a) development of new and improved marketable Jamaican value-added products;
- (b) commercialisation and subsequent sale of products and technologies based on local raw materials. (The objective is to reduce risks to entrepreneurs.)
- (c) provision of Science & Technology (S&T) information;
- (d) provision of technical support, training, and transfer of technology to the agro-industrial sector;

- (e) provision of technical support, training and advice for the management and optimisation of waste in several sectors, including tourism;
- (f) increasing public awareness of the relevance of science and technology to national development;
- (g) introduction of advanced agricultural technologies to enhance productivity in selected sectors;
- (h) economic management of important local resources in a sustainable manner; through partnership with local communities
- (i) facilitating and encouraging the development of a national innovation system; and
- (j) policy planning, implementation and management through national projects and committees of Government agencies.

#### **4.0 Priority Policy Issues**

Based on the National Industrial Policy (Cluster 3) and the National Science and Technology Policy, the SRC is mandated to support the agro-industrial sector in ensuring food security, strengthening export potential and improving quality of life.

#### **5.0 Highlights of Performance for 2004/2005**

The following outlines the achievements of the SRC in meeting the priorities of the Ministry for the Financial Year 2004/2005.

##### **5.1 Objective 1 - Customer satisfaction and welfare are increased and the quality of goods and services improved through provision of S&T solutions**

###### **5.1.1 Marketing of SRC Services**

- (a) Marketing plan for wastewater services and analytical services completed.
- (b) Brochure on wastewater services completed; website upgraded to accommodate interactive features; fliers completed to promote services of tissue culture, CEIS analytical services and cleaner production technologies.
- (c) Mass market corporate brochure upgraded.
- (d) Presentations made to: West Indies Aluminum Company (WINDALCO); Lascelles Group of Companies; hoteliers from the region at the Green Tourism Conference; Jamaica Hotels & Tourist Association (JHTA), and entrepreneurs at the PIOJ's Entrepreneurship Workshop; Jamaica Manufacturers

Association/Jamaica Exporters Association JMA/JEA membership at JAMPRO workshop.

- (e) Market research on sorrel industry completed.
- (f) Processing by Marketech Ltd. of requests via SRC's website, letters, telephone and walk in customers.
- (g) Preparation of business plan for commercialization of tissue culture, wastewater and meat processing technologies completed by consultants, through joint funding by SRC and Trade Development Project.
- (h) Promotional meeting held in Kingston on wastewater treatment technologies. Housing developers, building contractors, regulators and the media attended the meeting. Collaborators from Holland gave a 40 minute presentation and answered questions pertaining to the versatility and use of anaerobic systems in other countries.

### **5.1.2 Technical Assistance**

- (a) Reassessment of reports for eleven (11) factories and inspection of two (2) new factories.
- (b) Improvement of environmental and quality management systems in food processing. Rural leaders including three (3) members of the SRC team provided technical assistance to the participating twenty five (25) rural food processing enterprises in completing their work programmes for 2004. Most of the companies were adversely affected by Hurricane Ivan, impacting on the execution of their work programmes.
- (c) Provision of analytical services, technical assistance and consultancy/advice to clients in the areas of water/wastewater and food, as requested. Seven hundred and thirty four (734) samples were analyzed.
- (d) Completion of nineteen (19) nutritional facts panels and seven (7) nutrition labels for clients.
- (e) Assistance to clients, in sensory evaluation, product scales up and schedule processing.
- (f) Utilization of Pilot Plant by clients for over sixty (60) occasions
- (g) Assistance to secondary and tertiary level students in preparation of food products
- (h) Provision to clients, of technical advice on equipment
- (i) Extractions of essential oils/oleoresins from 2 plant species completed for clients.
- (j) Provision to fifteen (15) clients of technical assistance in the area of natural products.
- (k) Assessment of facilities of two (2) clients interested in producing castor oil.

- (l) Completion of feasibility study for the construction of a wastewater treatment system
- (m) Completion of environmental audit for one (1) coffee factory. Audit report submitted to National Environment Planning Agency (NEPA).
- (n) Completion of design of wastewater treatment systems for two (2) coffee factories.
- (o) Assistance to five (5) non-governmental organizations in preparation of proposals submitted to Environmental Fund of Jamaica (EFJ) for funding
- (p) Completion of proposal for a pond system at a large food processing company;
- (q) Carrying out of feasibility studies on implementation of wastewater treatment systems for twenty-five (25) customers
- (r) Preparation and submission of proposal to the Ministry of Agriculture for a client for construction of a biodigester at facility in Bodles, St. Catherine
- (s) Preparation and submission of proposal to the EFJ for construction of wastewater treatment system within Government-owned children's homes. Proposal approved.
- (t) Preparation and submission of proposal to the Cleaner Development Mechanism regional facility, for construction of wastewater treatment system for energy production at specific locations in Jamaica.
- (u) Preparation and submission of proposal to Air Jamaica for treatment of aircraft waste oil.

### **5.1.3 Training Services**

1. Completed training programmes for some fifty (50) persons in meat processing, juice processing and food additives.
2. Assisted the Coconut Industry Board in the preparation and standardization of processing criteria for various coconut products. Presented lecture on quality assurance in the production of bottled coconut water at a Coconut Board/Food and Agricultural Organization (FAO) workshop.
3. Trained seventeen (17) University of the West Indies (UWI) students and forty five (45) University of Technology (UTech) students in food processing
4. Trained one (1) client in canning of ackees
5. Assisted one (1) Peace Corps volunteer in the preparation of an application for funding to procure microscope and other teaching equipment for the Artemia Education Programme.
6. Achieved accreditation from National Committee on Technical Vocational Education and Training (NCTVET) for juice processing, meat processing and canning training programmes
7. Trained fifteen (15) persons in meat processing and fifteen (15) persons in juice processing at in-house workshops.

8. Provided training in nitrogen analysis and anaerobic wastewater treatment to German students.
9. Conducted three (3) nutraceutical awareness workshops (2 in Clarendon, 1 in St Catherine). Farmers and other community members participated.

## **5.2 Objective 2 - Customer needs and demands are satisfied through the development of new products (goods and services)**

### **5.2.1 Project Planning/Development**

1. Submitted proposal to the Bureau of Standards on “Microbiological Testing of Toilet Papers”.
2. Submitted joint publication with Dr. Roy Porter of the Chemistry Dept, UWI, on the biological activity of *Hyptis*, to an international peer reviewed journal.
3. Submitted proposal for soil remediation project to Air Jamaica. Proposal accepted.
4. Prepared and submitted proposal to University of the West Indies Centre for Environment and Development UWICED on “Port Royal composting and hydroponics” project.
5. Prepared draft proposal for the establishment of a regional testing facility for genetically modified (GM) Foods.

### **5.2.2 Technical Assistance**

- (a) Hardened one thousand one hundred and twenty (1,120) ginger plantlets and delivered close to four thousand (4,000) ginger plantlets as well as over two hundred and fifty (250) sugar cane plantlets to clients. Hardened one thousand five hundred)1,500 banana plantlets for the Banana Export Co and sold thirty (30) coffee plantlets
- (b) Signed contract with farmers association to produce four thousand five hundred (4,500) plantlets of sweet potato cultivars.
- (c) Provided one hundred and twenty nine (129) clients with technical assistance in various aspects of food processing. Thirty (30) clients utilized the Pilot Plant facilities for processing of foods (meats, herbs and spices).

### **5.2.3 Product Development**

- (a) Acquired equipment for pilot scale operations for nutraceuticals.
- (b) Completed field experiments in *Artemia* culture.
- (c) Effected extractions with the Supercritical Fluid Extractor and traditional methods.

- (d) Established OAS-funded Nutraceutical Project experimental cultivation plots in Clarendon in collaboration with RADA, to determine effect of climatic and soil conditions on yields of actives in each select plant species. Extracts analyzed and plots monitored. Completed a ten-month storage study on the shelf life of turmeric extracts.
- (e) Procured equipment and supplies for pilot-scale and product development work of the nutraceutical project.
- (f) Completed testing of over one hundred (100) plants and prepared a database of Jamaican plants with anti-oxidant properties. A total of twenty four (24) of the one hundred (100) plants screened were found to have exceptionally strong anti-oxidant activities.
- (g) Initiated eighteen (18) new plants in culture. Maintenance of gene bank plantlets continued. Initiated twenty eight (28) cultivars of banana. Initiated and sub-cultured eighteen (18) cultivars of sweet potato. Completed in vitro conservation of anthurium, orchid and musa.
- (h) Initiated trials using the low-cost technology glove box. Glove Box constructed in-house.
- (i) Completed the protocol for processing and storage of minimally processed commodities and ready-to-eat meals.
- (j) Completed technical report on the sorrel stabilization project.
- (k) Completed product development of a Jamaican soup
- (l) Completed draft document on the preparation of a fish sauce and vegetables
- (m) Implemented plan for research work with graduate student on the development of phytochemical and pharmaceutical agents
- (n) Developed a series of personal care product samples which were showcased at the JMA/JEA expo

### **5.3. Objective 3 - Utilization of technologies is increased in the productive sector**

#### **5.3.1 Technology Transfer/Contract Services**

- a) Implemented public education programme entailing radio and television presentations; and displays at JMA/JEA Expo, Green Expo, Green Tourism Conference, and Denbigh Agricultural Show;
- b) Implemented public education programmes
- c) Published over ten (10) newspaper articles SRC adapted technologies
- d) Submitted technology transfer: draft training manual on bottling of coconut water, to the Coconut Board/FAO, and assisted a major food processing company in production of new product.

- e) Commissioned biodigester Upflow Anaerobic Sludge Blanket (UASB and reed bed) at the Caribbean Cement Company. Completed UASB at Rural Agricultural Development Agency (RADA) Twickenham Industries along with an operations and maintenance manual for the system. Six (6) other wastewater treatment systems were completed throughout the year including the construction of a 100 m<sup>3</sup> biodigester septic tank Biodigester Septic Tank (BST); two 150 m<sup>3</sup>; two 50 m<sup>3</sup> BST; and on 10 m<sup>3</sup> BST.
- f) Assisted a major food processing company in production of a new product.
- g) Completed and submitted final environmental audit document for coffee interests.
- h) Sold four (4) formulations and completed technology transfer.
- i) Completed a design for a wastewater treatment system at a coffee factory
- j) Delivered training in glove box technology for the propagation of tissue cultured plantlets to eight (8) young persons from inner-city communities. The project was funded by the Social and Economic Support Programme.
- k) Shared SRC's work in anaerobic waste management systems at workshop on environmentally sound technologies for small island developing states (SIDS), held in St. Kitts and Nevis

#### **5.4. Objective 4 - S&T is an integral component of national policies**

- (a) Contributed to national development through advice given to the following committees on science and technology:
  - I. National Coordinating Committee for Biosafety (NEPA)
  - II. National Planning Council (NPC)
  - III. Development Council
  - IV. National Commission on S&T
  - V. Jamaica National Commission to the United Nations Education & Science Commission
  - VI. Project Pre-selection Committee of the Ministry of Finance & Planning
  - VII. Steering Committee of the National Quality Infrastructure Project
  - VIII. Technical Committee to the IDB-funded Quality Jamaica Project
- (b) Made presentations on various aspects of S&T at the following:
  - i. Medical Assoc. of Jamaica Symposium
  - ii. Lascelles Group of Companies
  - iii. WINDALCO
  - iv. NCST on the "Impact of SRC on Business Development"

- v. President, Jamaica Hotel and Tourist Association on SRC's Wastewater management solutions.
  - vi. Denbigh Agricultural Show.
  - vii. Caribbean Ministers of Agriculture on Agro-biotechnology.
- (c) Contributed to the development of a revised draft of the national S&T policy.
  - (d) Prepared draft National Biotechnology Strategy and co-ordinated public consultations and a Caribbean Forum on the commercialization of biotechnology.
  - (e) Participated in the Research Consortium, which comprises UWI, UTech, Northern Caribbean University (NCU), University College of the Caribbean (UCC) and HEART/NTA, in promoting the value and applications of research and development.
  - (f) Conducted meetings with the World Intellectual Property Organization (WIPO), and discussed patents, licensing, training and profit generation from licensing.
  - (g) Signed memoranda of understanding with the University of the West Indies, Mona and Water Resources Authority, and joint projects initiated.
  - (h) Participated in the preparation of Draft Strategic Plan for the National Commission on Science and Technology (NCST)
  - (i) Participated in Foresight Exercise on Agricultural Development and Land Use.
  - (j) Participated in the Barbados Plan of Action Meeting.
  - (k) Increased sensitization efforts to the Energy Ministers' Bulletin.
  - (l) Developed an electronic newsletter on SRC's activities, products and technologies for development agencies, embassies and, public and private sector organizations.

## **5.5. Objective 5 - Continual sensitisation on the national, regional and international importance and value of S&T**

### **5.5.1 Publication and Dissemination of S&T Information**

- (a) Printed thirty (30) copies of the Jamaica Journal of Science and Technology Volumes 12 & 13 December 2001 & December 2002 respectively. Also completed Volume 14 (2003) of the Jamaica Journal of Science and Technology. This issue focused on biotechnology.

- (b) Work continued on the proceedings of the 13<sup>th</sup> and 15<sup>th</sup> annual national conference on S&T as well as on the occasional papers. Completed conference proceeding for the current (17<sup>th</sup>) Annual National Conference on S&T. These were available at the 17<sup>th</sup> conference.
- (c) Completed Petroleum Statistics (PETSTATS) tables for six (6) countries; prepared 1985-2002 data on energy consumption in fifteen (15) Caribbean countries by sector, product and retail prices, for the Caribbean Development Bank (CDB).

### **5.5.2 Science Education & Popularisation of S&T**

- (a) Held summer science camps for primary school students in May Pen, Kingston and Bluefields in collaboration with the Bureau of Standards, Jamaica. Over one hundred and seventy (170) students participated.
- (b) Co-ordinated the 18<sup>th</sup> annual conference on S&T and other S&T month (November) activities including a press conference, S&T mall exhibitions and an S&T and Innovation Gala Awards banquet. The theme of the S&T conference was “*S&T for Economic Development: Transforming Research Results and Traditional Knowledge into Viable Businesses*”. There were six (6) overview papers, twenty-six (26) short paper presentations, six (6) poster presentations and two (2) panel discussions. Prepared and sold CD-ROM of the conference proceedings.
- (c) The prestigious SRC/JPSCO Young Scientist 2003 Award was presented to Dr. Mishka Stennett of the Centre for Marine Sciences, UWI for her outstanding work in restoring Jamaican coral reefs.
- (d) Recognized top achievers in CSEC/CXC and CAPE in select subjects. This was done in collaboration with JPSCo, and Bureau of Standards Jamaica (BSJ).
- (e) Coordinated seventh consecutive staging of annual Inventors/Innovators Exposition.
- (f) Hosted 2<sup>nd</sup> Annual Nutraceutical Symposium
- (g) Participated in the JMA/JEA exhibition; Denbigh Agricultural show and the 2<sup>nd</sup> Caribbean Environment Forum and exhibition held in Trinidad. Roving exhibition on S&T mounted by the Documentation Centre at the Cross Roads and King Street post offices.
- (h) Satisfied ninety-seven (97) requests for S&T information
- (i) Visited eighteen (18) schools to assess the status of their science societies and distribute a book titled: “Profiles of Some Eminent Jamaican Scientists”, under the National Technology Innovation Awards Programme (NTIAP), a BSJ/SRC project
- (j) Conducted a series of science workshops in which over fifty-five (55) students from eight (8) corporate area primary schools participated. Also conducted an IT workshop for science teachers in collaboration with Ministry of Education and Organization of American States (OAS). Over thirty (30) teachers participated.
- (k) Sold fourteen (14) CD-ROM copies of PETSTAT regional data to the World Bank
- (l) Printed one thousand (1,000) copies of the S&T Bulletin for distribution to schools

- (m) Completed the lesson plan on “Artemia - Living Things” and presentations were made to forty-four (44) students at Lyssons Primary school; forty-two (42) students at Allman Town Primary School and forty-five (45) students at Yallahs Primary School
- (n) Launched innovative programme to sensitize communities to Science & Technology through a joint Postal Corporation/SRC project. Roving Exhibition took place in Brown's Town, Walkerswood, Black River, Malvern, Trinityville and Morant Bay with relevant posters mounted and left in place for 6-8 weeks.

## **5.6. Objective 6 - The SRC has a dynamic, innovative, responsive, efficient and effective team**

### **5.6.1 Corporate Development/Institutional Strengthening**

- a. Developed a performance management system for the SRC and a recruitment policy and accompanying procedure manual.
- b. Provided training in customer care and marketing to all levels of staff. Four (4) staff members were trained in Food Additives, six (6) in minimally processed foods/convenience meals by KRAFT volunteers; and two (2) were trained in Hazard Analysis and Critical Control Point (HACCP) at Ebony Park Heart Academy.
- c. Effected infrastructural improvements in the Pilot Plant and the Artemia laboratory in Yallahs.
- d. Readied analytical laboratories for accreditation, with all required documentation in place, as indicated below:
  - Completed the calendar for internal quality audits
  - Completed the first quality management review of the department. Recommendations have been implemented
  - Maintained quality records satisfactorily
  - Completed external mock audit by the Jamaican Accreditation Body. Results indicated that the laboratories should be ready for accreditation once the identified corrective actions are implemented.
  - Training in laboratory assessment programme of the National Quality Infrastructure Project provided to staff. One officer subsequently identified and trained as a technical assessor.

## **6.0 Strategic Linkages and Cooperation Agreements**

1. Activities of the work programme relating to HACCP training continued. Nine staff (9) members were trained in HACCP 1 and management consultancy.

2. Companies were assigned to the participants in the programme and full implementation of the consultancy services to the companies began. Members of the SRC team completed gap audits of companies selected under the BSJ/SRC programme.

## **7.0 Capacity Building**

1. Three (3) staff members of the Natural Products Unit completed internships at AMSAR Institution, Indore, India; INBio, Costa Rica; and nutraceutical conference at VitaFoods, Geneva, Switzerland.
2. SRC participated in a Chromatography Workshop at UWI
3. Eighteen (18) employees were trained at MIND in Project Proposal Preparation. Seven (7) proposals were developed for submission/implementation as a result of the training.
4. Equipment was procured for the Low Acid Canned Foods project

## **8.0 Priority Projects/Programmes for Financial Year 2005/2006**

### **8.1 Increased Client Productivity and Product Quality**

- (a) The work programme for 2005/2006 will be implemented as under the MOU between SRC and BSJ. This includes the training of SRC staff in HACCP systems – level 2, ISO 9000 and ISO 14000 under the IDB-funded Quality Jamaica Project; and preparation of at least four (4) food processing companies for HACCP certification.
- (b) Work programmes/action plans relating to other Memorandum of Understanding (MOU's) will be implemented as agreed. This includes the MOU's with RADA, UWI and UTech.
- (c) Marketing/Public Education - Creative and innovative marketing approaches will be utilized to reach businesses suffering from low productivity. A public education programme will be implemented as planned.
- (d) Feedback mechanisms will be implemented to measure and report on the impact of the services of SRC on clients.

### **8.2 New Products and Processes**

- a) OAS Nutraceutical Project will be completed by March 2006, with protocols established for standardized actives from selected plants.
- b) Formulations/protocols for new natural products from at least one (1) indigenous material will be completed by March 2006
- c) Implementation of approved projects previously submitted for funding will be effected

- d) At least six (6) project proposals (including nutraceuticals, tissue culture) will be submitted to funding agencies by March 2006.
- e) Research and development (R&D) programmes for select species for a three (3) year period will be developed by December 2005. The research work on the Temporal Immersion System will be completed and protocols developed for commercialization.
- f) An Environmental Management System model will be established at the SRC by March 2006 and technical assistance will be provided to enterprises as requested in this area.

### **8.3 Utilization of Technologies**

- a) Training programmes for external customers will be developed according to marketing strategy and needs analysis within two (2) months of completion of surveys where relevant. Specific training programmes will be completed in wastewater management and in food processing.
- b) Increased promotion and utilization of the anaerobic waste treatment technology in the hospitality and agro-processing industries as well in as residential sub sectors, will be undertaken
- c) Adaptive research and application in energy-related technologies will be effected.
- d) There will be increased use of in vitro plant propagation and other areas of biotechnology in communities and the agricultural and agro-industrial sectors.
- e) Utilization of molecular biology techniques in screen and “fingerprinting” plant genetic resources will take place.

### **8.4 S&T Awareness and Popularisation:**

- a) The guest speaker programme to popularise S&T, targeting select Government ministries and private sector firms, will be implemented as planned. Focus group discussions will be held and quarterly e-newsletters will be disseminated to embassies and development agencies as of April 2005
- b) Information packages (including S&T Policy Bulletin and advisories) will be prepared for each quarter and disseminated to appropriate ministries as of April 2005
- c) Information on technologies and S&T related issues will be presented to at least six (6) communities by March 2006
- d) The second phase of a programme designed to assist pilot schools in improved performance in science for students at the Grade Six Achievement Test (GSAT) level will be completed by March 2006
- e) A new project to popularise S&T in high schools will be implemented

## 8.5 Internal Capacity Building:

- a) At least one (1) conference/seminar each in the areas of biotechnology, food processing, and wastewater management, will be attended by March 2006

## 8.6 Institutional Strengthening

8.6.1 Upgrade of Food Pilot Plant and other laboratories

8.6.2 Maintenance of the Plant

8.6.3 Accreditation of analytical laboratories

## 9.0 Budgetary Allocation

The actual expenditure for Financial Year 2004/2005 and Approved Expenditure for Financial Year 2005/2006 are presented in Table 9.1 below.

**Table 9.1: Actual Expenditure (2004/2005) and Approved Expenditure (2005/2006)**

<b>Categories of Expenditure</b>	<b>Actual Expenditure (2004/2005) (\$M)</b>	<b>Approved Expenditure (2005/2006) (\$M)</b>
Compensation of employees	108,135	105,902
Travel expenses and subsistence	11,236	12,240
Rental of property, machinery, equipment	336	666
Public utility services	9,766	7,689
Purchases of other goods and services	35,352	10,716
Equipment (capital goods)		
<b>Total</b>	<b>164,825</b>	<b>137,213</b>

**Phillip Paulwell**  
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**May 20, 2005**