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**GUYANA AGRICULTURAL EXTENSION IN A CHANGING ENVIRONMENT:
“TOWARDS THE FARMING SYSTEMS APPROACH”**

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ABSTRACT: Rapid agricultural growth continues to be the key to poverty alleviation and overall economic development of Guyana. Agriculture accounts for about 20% of the Gross Domestic Product and is the source of livelihood for nearly 35% of the population. Research and extension have contributed significantly to the transformation of the Agricultural sector; however, the effectiveness of extension services is challenged in the areas of relevance, accountability and sustainability. It is becoming increasingly evident that public extension by itself can no longer respond to the multifaceted demands of farming systems. Present day agriculture is defined by key concepts of stability, sustainability, diversification and commercialization; therefore, there is urgent need for reorientation of the philosophy of extension from a technology transfer mode to a technology application mode. This paper examines the use of the Farming Systems Approach in agricultural extension and recommends the use of this approach to address issues of financial sustainability, farmers' participation in programme planning, research-extension linkages, marketing and value addition in the Guyana's Agriculture sector.

Keywords: Guyana, Agricultural Extension, Farming Systems Approach.

Introduction

Rapid agricultural growth continues to be the key to poverty alleviation and overall economic development of Guyana. Agriculture accounts for about 25% of the Gross Domestic product and is the source of livelihood or nearly 35% of the population. The agriculture sector in Guyana has been successful in keeping pace with the rising food demand of the Country and the Region as a whole. The Caribbean has recorded a massive one Billion US dollars food import bill in 2010. Guyana's Vision for Agriculture 2020 seeks to change the view that agriculture is for subsistence livelihood while it also seeks to promote agriculture as a wealth generator and entrepreneurial enterprise, producing food and non-food commodities to meet local and export demands.

Research and extension played a major role in bringing about the changes in the Agriculture sector that we see today, however, extension faces important challenges in the areas of relevance, accountability and sustainability. The changing economic scenario in Guyana and the need for appropriate agricultural technologies and agro-management practices to respond to food and nutritional security, poverty alleviation, diversifying market demands, export opportunities, and environmental concerns is posing new challenges to the technology dissemination systems. It is expected that future agricultural growth would largely accrue from improvements in productivity of diversified farming systems with regional specialisation and sustainable management of natural resources, especially land and water. Effective linkages of production systems with

agro-processing and other value added activities including marketing would play an increasingly important role in the diversification of agriculture.

History of Guyana Extension Services

It is becoming increasingly evident that public extension by itself can no longer respond to the multifarious demands of farming systems. There is need for reappraisal of the capacity of agricultural extension to address, effectively, contemporary and future needs of the farming community. As the nature and scope of agricultural extension undergoes fundamental changes, the outlook is for a whole new policy for extension. The extension system has undergone many changes since it started with the founding of the Royal Agricultural and Commercial Society of British Guyana in March 1844 which was basically a co-operative effort by planters. Then in 1905, the department of Science and Agriculture was established with Agricultural Officers being posted in the different farming districts with the Ministry of Agriculture involved in a restricted numbers of research projects and varietal selection base in the Botanical Gardens. As of 1952, the extension division of the department of agriculture performed all extension service where field staff comprised of Agricultural Officers and field assistants were principally concerned with the execution of development programmes up to and until 2011. In June 2011 the National Agricultural Research and Extension Institute (NAREI) based at Mon Repos, took over the extension services and were responsible for all coordination of extension activities in the country.

The most significant development was the introduction of the Training and Visit (T&V) extension management system, starting in 1952, where the T&V extension was well suited to the rapid dissemination of broad-based crop management practices for the high yielding varieties that were released since the mid-1970s. The T&V system profoundly influenced extension practices and registered impressive gains in cultivated areas, because of the similarity between the agro-ecological conditions where technologies were generated and where they were ultimately used, and the favourable socio-economic situations and developmental infrastructure for their wider uptake. Indeed, the T&V system played an important role in ushering Guyana in becoming the “Breadbasket of the Caribbean”.

The focus of the T & V system being on disseminating technology for major field and vegetable crops, extension activities have been largely carried out by Crop Development and Support Services of the NAREI of the Ministry of Agriculture. The other line departments, such as the Guyana Livestock Development Authority (GLDA), Fisheries Department, The New Guyana Marketing Cooperation (NGMC), The Guyana School of Agriculture (GSA) and the Pesticides and Toxic Chemicals Control Board (PTCCB), have not been able to focus on extension due to lack of infrastructure, trained personnel and resources. The T&V system operated largely in the inter-personnel mode without planned and optimum utilisation of information support and with low level of involvement of farmers. The "top-down" approach generated uniformity rather than specificity and lacked focus on location specific needs of regions, disadvantaged areas, target groups enterprises, etc. The linkages between research-extension and farmer remained weak or non-existent. Media and information management largely remained in the public sector and

characterized by centralized operations. Farmer driven and farmer accountable feedback systems were not adequately developed.

The transfer of T&V extension approach to rainfed farming areas where fundamentally different production systems predominate and more importantly, local conditions vary widely, resulted in serious limitations and failures. The system well suited to the rapid dissemination of pre-set agronomic practices for the high yielding varieties, failed to respond to the more location-specific, risk-prone agriculture. Similarly, extending the system to programmes for natural resource management, sustainable agricultural practices such as integrated pest management, integrated nutrient management and to diversified agriculture such as high value horticulture, livestock activities and fisheries did not meet with success. Nor could the T&V system adapt to the more holistic Farming Systems Approach towards which the new thrust of both research & extension had begun to focus.

Towards a New Approach

There was growing recognition that the T&V extension approach needed to be overhauled in meeting the technology needs of farmers during the 21st century. First, it is recognised that extension should begin to broad base its programmes, by utilising a Farming Systems approach. For example, attention should be given to the needs of farmers in rainfed areas in the Hinterland, and to diversifying extension programmes into livestock, horticulture, and other high value commodities that would increase farm incomes. Secondly, to support and strengthen the Farming Systems approach, issues of financial sustainability, farmer participation in programme planning, and research-extension linkages, marketing and value addition would have to be concurrently addressed. Present day agriculture is defined by key concepts of stability, sustainability, diversification and commercialization. There is need for reorientation of the philosophy of extension from technology transfer mode to technology application and thus the need for the implementation of this new approach.

Present day agriculture is defined by key concepts of stability, sustainability, diversification and commercialization. There is need for reorientation of the philosophy of extension from technology transfer mode to technology application mode. Firstly I believe attention should be given to the needs of farmers in rainfed areas (especially those in Region 1, 7, 8 and 9) and to diversifying extension programmes into livestock, horticulture, and other high value commodities that would increase farm incomes. Secondly, issues of financial sustainability, farmer participation in programme planning, and research-extension linkages, marketing and value addition would have to be addressed.

In the context of meeting the holistic needs of increasing agricultural production in a sustainable manner, agricultural extension has a crucial role to play. Reforms in the system envisage an extension service more broad-based and holistic in content and scope, thus beyond agricultural technology transfer. Its normal task of transferring and disseminating appropriate technologies and agronomic practices would not be sufficient.

Extension agencies, services and workers will need to exercise a more proactive and participatory role, serve as knowledge/ information agents, initiating and facilitating mutually meaningful and equitable knowledge based transactions among agricultural researchers, trainers and primary producers. All this needs to be done in an effective and cost efficient manner.

Technology generation and its application will have to focus more strongly than before on the themes of optimization by producers of their available resources, sustainability, coping with diversity by adapting technology more specifically to agro-ecological or social circumstances aimed at creation of a policy environment that promotes profitable, productive and sustainable farming.

The areas of focus should be the following:

- (1) Institutional Restructuring and Management Reforms
- (2) Strengthening Research –Extension Linkages
- (3) Capacity building & Skill Up gradation
- (4) Empowerment of Farmers
- (5) Women in Agriculture
- (6) Use of Media & Information Technology
- (7) Financial Sustainability
- (8) Private Sector Role
- (9) Policy Framework

Farming Systems Approach

Policy reforms in Agricultural Extension envisage the replacement of the old single-discipline based, commodity-oriented approach of the Training and Visit (T & V) system by the Farming Systems (FS) approach. The FS approach considers the farm, the farm household and off-farm activities in a holistic way to take care not only of farming but also aspects of nutrition, food security, sustainability, risk minimisation, income and employment generation which make up the multiple objectives of farm households. FS considers interdependencies of the components under the control of members of the household as well as how these components interact with the physical, biological and socio-economic factors not under the household's control. The FS approach emphasises that research and extension agendas should be determined by explicitly defined farmers' needs through an understanding of the existing farming systems rather than perceptions by research scientists or extension functionaries.

Institutional Restructuring and Management Reforms

It is clear that no one uniform extension system will serve as a panacea to all regions. Even within Regions there will be a combination of various agencies and different institutional arrangements to address needs of differing agro-climatic zones as well as different sections of farmers. A menu of various models will be available to the Regions to select and adapt to their own requirements.

Restructuring The Extension Services will continue to remain central to Technology Dissemination, small & marginal farmers & economically challenged regions will need to be serviced by it. This implies that public extension functionaries will have to be placed in new decentralized institutional arrangements, which are demand-driven, farmer-accountable, bottom-up and have a Farming Systems Approach (broad-based). With supplementation from the private sector, media and Information Technology the public extension service would be made leaner and professional.

Improving Research-Extension Linkages

Promotion of Direct Interface Between Farmers and Scientists

The direct interface between scientists and farmers is the most ideal and should be undertaken wherever possible. It is an oft- repeated refrain that farmers learn best from scientists or other successful farmers. Moreover, transmission losses are minimized in the direct interface. However, there are relatively high costs attached to this direct mode of technology transfer and the outreach of scientists is limited.

Activating Existing Interface Mechanisms

Agricultural Research Committees of the NAREI and GLDA, initiated by Extension Department, hold national level interface, bi-annual meetings for improving research-extension linkages

The Setting Up of an Agro-Advisory Service

Linking Weather Data with Crop Data

Agro-ecosystem an assembly of mutually interacting organisms and their environment in which materials related to crop production are interchanged in a largely cyclical manner. An agricultural system functions with all its inputs and outputs. Inputs include all materials such as fertilizer, irrigation, pesticides etc. for proper functioning of the economic production system and outputs are the gains from the system in any form such as grains, leaves, stems, roots etc. Weather is one of the key components that control agricultural production systems and has a major impact on plants and animals as well as pests and diseases. Linking weather data with crop and livestock data will have a profound influence in how we manage our agricultural systems and as such it is recommended that an Agro-Advisory Services be established in collaboration with the Hydro Meteorological Department (Hydomet).

Research Priority Setting Based on SREP

Micro-level extension strategies reflected in the Strategic Research and Extension Plans (SREPs) based on PRA and developed jointly by the Regional Extension Department including the marketing department officials and scientists be formally

feedback into the research systems through a research priority setting mechanism in the NAREI and GLDA.

Capacity Building of Extension Functionaries

Formulation of HR Policy by Ministry of Agriculture

Central Government support for HR in Agricultural Extension Should be available to the MoA only after the formulation and adoption of a HR Policy and Action Plan through a systematic skill-gap analysis (Such a policy would incorporate compulsory training and skill upgradation of all extension functionaries). It would also build in an effective system of rewards and incentives for public extension functionaries.

Formulation of Training Plan for Extension functionaries

A long-term training plan should be developed by each Region based on a thorough skill gap analysis. A massive campaign will need to be launched for skill upgradation and capacity building of extension functionaries using resources of all training institutes such as GSA and UG. The training be divided into *Foundation Courses* comprising skill up gradation in (i) need assessment techniques including the role of participatory rural appraisal (ii) group formation (iii) development of entrepreneurial skills for agri-business (iv) agri-business management (v) WTO and its implications (vi) marketing of agricultural produce (vii) post harvest management (viii) conflict resolution and negotiations between different interest groups (ix) management of common property resources (x) use of different type of media (xi) communication (xii) project preparation (xiii) data collection, analysis and documentation. Foundation courses should be conducted jointly with scientists of NAREI and GLDA. *Professional Courses* should be conducted at GSA and UG in various subject matter disciplines.

The Guyana School of Agriculture to Take a Lead Role in Training

As mandated in the agriculture Vision 2020 the GSA expected to take a lead role in formulating and conducting appropriate training programs to meet the needs of the extension department as well as the farming communities. Short and medium term training in various subject matter disciplines to commence.

One Time Catch-up Grant for Training Infrastructure

One-shot up-gradation of physical infrastructure of GSA to be considered to revive the training institute to an acceptable level. Funding for this purpose to be made by the MoA and Central Government

Empowerment of Farmers

Involving Farmers in Setting Extension Agenda

Farmers' representation as major stakeholders will be ensured in all decision-making bodies of public and private extension services. Farmer will be involved in the planning and implementation of extension programmes through formal institutional mechanisms.

Implementation of Programmes Through Farmers' Field School (FFS)

By ensuring that all programmes in the field are planned and implemented through FFS. The GRDB model works very well and should be adopted. In this respect farmers would be able to influence both administrative and financial decisions.

Acquisition of Skills by Farmers

Training and acquisition of skills by farmers is a central part of the technology transfer system because of the new practices involved in production. Greater focus will be provided for (i) assessing farmers' needs and skills; (ii) distinguishing different dimensions of training such as awareness, knowledge, skills and reinforcement, and using appropriate channels and methods for each; (iii) different kinds of technologies and advice required by different categories of male and female farmers, the transfer mechanism (e.g. face-to-face, mass media, different types of groups) they prefer during different phases of awareness, trial and adoption of new skills and technologies (iv) use of information technology for improving the quality and accelerating the transfer and exchange of information; (iv) organising training programmes on system based and sustainable technologies such as Integrated Pest Management (IPM) and Integrated Plant Nutrient management (IPNM); (v) organizing training and taking initiatives for capacity building of farmers towards agricultural marketing. Capacity building, skill up gradation/training of farmers would be largely conducted through farmers' field schools with an active participation of scientists and extension personnel.

Women in Agriculture

Mainstreaming Women in Agriculture

Gender concerns need to be mainstreamed in the agricultural extension process. Public extension systems, which must disseminate new technology and information, are still largely male dominated. Hence the necessity to target women is to ensure that they receive information relevant to their work, particularly, with reference to crops and livestock.

Use of Information Technology

Information Technology revolution is unfolding, and has very high visibility. However, its benefits have remained confined primarily to the urban areas. Rural communities have

not been able to gain to the same extent from IT. As a means of agricultural technology transfer to farmers, information technology has had a limited impact. Even the vast potential of the broadcasting network has been tapped only minimally for extension.

Financial Sustainability and Resource Mobilization

Publicly funded extension will continue to play a predominant role in technology dissemination firstly because the large numbers of small disadvantaged farmers may not have access to or be able to afford any other kind, and secondly, because much of the new technology will not be commercially marketable for instance watershed management, land capability assessment and land use planning, breaking of yield ceilings sustainable management of natural resources and socio-economic research. But pressures on government expenditure mean that public funds will have to be more carefully targeted and more efficiently used.

Changing Role of Government

Role of State in Effective Regulation & Enforcement

As a multi-agency extension regime proliferates, the responsibility of the State for effective enforcement of legislation, which ensures quality control of inputs such as seed, pesticides, fertilizers etc., will increase. State's role as arbitrator of conflicts between various private sector extension agents will also increase and systems to address grievances will need to be developed. This role will increase as the number of private extension agencies grows. Guidelines for private agencies would be required. However, in the emerging pluralistic scenario the role of public extension would need to be redefined from one of solely a provider of services to become increasingly an appropriate mix of provider, coordination, facilitator and regulator. The large section of small and marginal farmers and landless labourers as well as remote regions would continue to need the services of the public extension functionaries, as they are not likely to be serviced by a competitive private sector in the near future. Public Extension's role would increase in arbitration of conflicts, assuring accountability of all service providers to the farmers and ensure transparency through provision of information. The overall environment of private provision of extension services deserves to be encouraged through policy reforms and institutional changes so that rural people's needs serviced more efficiently.

Conclusion

In the context of meeting the holistic needs of increasing agricultural production in a sustainable manner, agricultural extension has a crucial role to play. Reforms in the system envisage an extension service more broad-based and holistic in content and scope, thus beyond agricultural technology transfer. Its normal task of transferring and disseminating appropriate technologies and agronomic practices would not be sufficient. Extension agencies, services and workers will need to exercise a more proactive and participatory role, serve as knowledge/ information agents, initiating and facilitating

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References

- Alex, G., D. Byerlee, and M. H. Collion. 2004. *Extension and Rural Development: Converging Views or Institutional Approaches?* Agriculture and Rural Development Discussion Paper 4. Washington, DC: World Bank. (<http://siteresources.worldbank.org/INTARD/825826-1111129171182/20431824/DiscussionPaper4Final.pdf>)
- Anderson, J. R. 2007. *Agricultural Advisory Services*. Background Paper for the *World Development Report 2008 on Agriculture for Development*. Washington, DC: World Bank. (http://siteresources.worldbank.org/INTWDR2008/Resources/27950871191427986785/Anderson_AdvisoryServices.pdf)
- Cohen, J. M., and S. B. Peterson. 1997. *Administrative Decentralization: A New Framework for Improved Governance, Accountability, and Performance*. Development Discussion Paper No 582. Cambridge, MA: The Harvard Institute for International Development, Harvard University.
- Food and Agriculture Organization of the United Nations (FAO). 2006. *World Agriculture: Toward 2030/2050*. Rome: Food and Agriculture Organization of the United Nations. (<http://www.fao.org/es/ESD/AT2050web.pdf>)
- Kahan, D. G. 2007. *Farm Management Extension Services: A Review of Global Experience*. AGSF Occasional Paper. Rome: Food and Agriculture Organization of the United Nations.
- Qamar, M. K. 2005. *Modernizing National Agricultural Extension Systems: A Practical Guide for Policy-Makers of Developing Countries*. AGSF Occasional Paper. Rome: Food and Agriculture Organization of the United Nations
- Swanson, B. E. 2006. The changing role of agricultural extension in a global economy. Seminal paper in *Journal of International Agricultural and Extension Education* 13(3):5–18. (<http://www.aiaee.org/archive/Vol-13.3.pdf>)