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Neela Badrie
Editor

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*A Three-Legged-
Stool Model for agricultural policy formulation in
CARICOM countries*

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Abstract

Globally and within the Caribbean, agriculture's contribution to economic development is recognized. With respect to CARICOM countries, various initiatives are pursued, nationally and regionally, to formulate agricultural policy in pursuit of increased output from the sector. Initial optimal results are unlikely from among the myriad approaches to these attempts at agricultural policy formulation. Instead, the path to the best policy strategy for any designated agricultural environment is an iterative one that builds on three key fundamentals: relevant theory, focused empirical analyses and facilitating institutions. The theory elucidates the decision environment of the producer and consumer. Empirical analyses evaluate extant strategies and present concrete feedback for relevant market issues and policy impact. Institutions provide a framework for various market transactions and support systems. It is argued that these rudiments can be envisaged as three pillars of agricultural policy formulation requiring equal emphasis for optimal policy impact. The inter-relationship and relative importance of these fundamentals is examined within the context of the design and impact evaluation of agricultural policy. The motivation for proposing the application of this three-legged-stool model to agricultural policy formulation within CARICOM countries is that the current practice of uneven emphasis on these fundamentals may result in policy prescriptions that foster sub-optimal goal impacts.

Keywords: Agricultural policy formulation; three-legged stool model; CARICOM countries

Agecon classification: Agricultural and Food Policy

Introduction

Economic growth is a precursor for economic development. History demonstrates that for both large and small countries the overall growth experience has been due primarily, though not exclusively, to increases in agricultural productivity. Johnson (1997) posited that constraints to increased food production in developing countries consisted mainly of technical and technological information, reasonably priced non-farm inputs and governmental policies that affect incentives. He expressed

confidence in farmers' abilities to meet the challenges for increased output, given a supportive policy environment that was non-discriminatory to agriculture, particularly through trade and macroeconomic policies. Timmer (1998), among others, discussed the role and influence of the policy environment on agricultural growth and Bates (1998) posited that political considerations are also influential.

Given the myriad approaches to national agricultural policy formulation, this paper argues that the path to the best policy

strategy is a targeted one involving the interaction of three key fundamentals: relevant theory, focused empirical analyses and facilitating institutions. The paper is organised such that a synopsis of the economic contribution and characteristics of Caribbean agriculture is presented in the first section. Section 2 discusses the inter-relationship of theory, empirics and institutions in relation to agricultural development, dubbed a three-legged stool model. The next section evaluates some country policy strategies and experiences utilising the elements of the model. Then the distillation of some policy formulation lessons precedes conclusions.

The Economic Contribution and Characteristics of Agriculture in the Caribbean

Contribution to economy

Agricultural output is non-uniform across the economies of the CARICOM countries. Gordon et al (2007) reported agriculture value added in the gross domestic product (GDP) in 2003 ranged from 31.4 percent and 27.9 percent respectively in Guyana and Haiti, to 3.8 percent and 1.1 percent, respectively in Antigua and Barbuda and Trinidad and Tobago. They also reported (Table 1) that, measured in constant 2000 US dollars, the sector's output in 2003 for these countries was \$194.57 million for Guyana, \$0.78 million for Haiti, \$23.42 million for Antigua and Barbuda and \$106.93 million for Trinidad and Tobago (World Bank, 2007). In Guyana, agriculture was the largest among the three sectors: agriculture, industry and services. For most countries, the services sector contributes in excess of 50 percent to GDP, with agricultural output exceeding 10 percent of the GDP in only five instances (Table 1) (Gordon et al., 2007).

The agricultural sector is also critical for

employment, absorbing over twenty percent of total employment in five countries: Haiti (50 percent), Belize, Dominica and Guyana (about 30 percent) and Jamaica (20 percent) and more than 10 percent in only two others: St Lucia and St Vincent and the Grenadines (Table 2). This contrasted with the services sector that absorbs over 50 percent of employment in all but two countries: Guyana (48 percent) and Haiti (39 percent) (Gordon et al., 2007). Besides providing employment, domestic food supplies and the export of primary products, the sector is also integrated with domestic manufacturing at various enterprise levels: large, medium, small and micro. Large and medium firms use both local and imported raw materials while the small and micro ones use primarily local raw material (Rolle, 2003). Firms are multi-faceted, operating in more than one area. Few operated solely in agriculture as compared with those involved in agriculture and manufacturing (Gordon and VanSickle, 2007).

The economic linkages between the agricultural and tourism sectors vary depending on the characteristics of the tourism product and country (Mc Bain, 2007). The tourism product from all-inclusive resorts and large international hotel chains has fewer linkages with the local economy. In addition, leakage of earnings is considerable because of importation of inputs and repatriation to foreign owners and tour operators. This is evident in countries such as Antigua and Barbuda, The Bahamas, Jamaica and St Lucia, yet there are instances of stronger linkages with agriculture in Nevis and Jamaica because of the successful establishment of projects targeted to local agriculture (Mc Bain, 2007). A Caribbean Hotel Association co-sponsored study of members' purchasing patterns revealed variation in sources of supply across food groups with supplies of vegetables, dairy products and meat being predominantly

sourced locally as opposed to regionally or extra-regionally. The study indicated that supplies of fish, fruits and eggs were predominantly sourced extra-regionally (Tourism Global Inc, 2007).

In summary, the agricultural sector is linked to the industrial sector at various levels and is a contributor to aspects of food security in the region. This is manifested through attributes such as the provision of jobs, its role in the domestic food supply and its contribution to foreign exchange earnings. The sector is also moderately linked to the region's tourism sector.

Some characteristics of Caribbean agriculture

Paul (2002) identified four groups of producer enterprises across the Caribbean: (1) many small traditional subsistence farmers with small mixed-cropping family farms on marginal hilly lands; (2) a few commercially oriented small farmers, targeting the domestic market with occasional intra-regional exports; (3) a few larger commercial farmers concentrating on the extra-regional export market; and (4) a few unproductive large farms, idle because of absentee ownership. In an earlier study, LeFranc (1994) found that the Jamaican small farm sector was heavily involved in production for exports as well as for the domestic market.

Paul (2002) also identified constraints impacting many of these farming systems as: (1) a policy environment skewed to larger commercial farmers; (2) the inherent low productivity of the marginal holdings of small farmers together with increased risk from periodic adverse agro-ecological conditions; (3) poor supporting infrastructure such as access roads, affecting the quality and marketability of the output; (4) a high dependence on imported inputs and the associated environmental

problem caused by excess residues; (5) weak marketing systems and arrangements, particularly for the non-traditional commodities; (6) weak agricultural support systems, especially research and development (R&D); and (7) increased competition consequent upon the opening of markets after globalization. More recently the Jagdeo Initiative (JI), the current CARICOM agricultural policy strategy, identified nine priority sectoral constraints namely: (1) limited and inadequate levels of new investments; (2) deficient and uncoordinated risk management measures; (3) fragmented and disorganized private sector; (4) inadequate research and development; (5) outdated and inefficient agricultural health and food safety systems; (6) inefficient land and water distribution and management systems; (7) inadequate transportation systems particularly for perishables; (8) weak and inadequate information and intelligence systems, weak markets and lack of linkages and participation in growth market segments; and (9) lack of skilled human resources (CARICOM Secretariat, 2007b).

There is considerable disparity in the available agricultural land across CARICOM states and differences in the cross-country agro-climatic conditions and the in-country micro-climates (Gordon *et al.*, 2007). The Caribbean countries' macroeconomic environment varies greatly with nine different macroeconomic price sets facing the economic agents in the agricultural sector, because of the different exchange rate regimes (Gordon *et al.*, 2007).

Deficiencies in the institutional and infrastructural frameworks persist as illustrated by the JI constraints cited above. In 1991, land distribution arrangements were mentioned as detrimental to increased agricultural productivity (Shearer *et al.*, 1991). In 1996 the government of Trinidad

and Tobago proposed investment in land and access roads development, marketing infrastructure and drainage and irrigation improvements as a precursor to increasing sectoral output (Moe, 1996). In the same year the government of St. Kitts and Nevis also indicated that improved infrastructure was a prerequisite to increased agricultural output (Douglas, 1996). It is posited that there has been minimal change in this status quo given the recent preparedness of the Caribbean Development Bank to invest in access roads and related agricultural infrastructure requirements (Bourne, 2007). The continuing need for improvements in the irrigation infrastructure was substantiated since irrigation improvement featured within several national project proposal summaries presented to the 2007 Agricultural Donor Conference (CARICOM Secretariat, 2007a). These diverse sector characteristics, while not exhaustive, illustrate issues that should be factored into any agricultural policy formulation process intended to stimulate increased output.

Juxtaposition of Theory, Empirics and Institutions re Agricultural Policy

Some key theoretical considerations

Stevens and Jabara (1988) observed there is a high propensity for agricultural development practitioners to pursue sector development goals without knowledge of or attention to the economic theory pertaining to the activities of the economic agents in the sector. They indicated that knowledge of the theory underpinning the experience of agricultural development can enable practitioners to better utilise the scarce available resources in designing and implementing effective agricultural growth and development policies and strategies. Some issues of importance in this context

are the influence of technological change on growth in output; being able to effect an improvement in traditional agricultural practices; access to land and cultivation rights; and the meso-economic and macroeconomic policy environments.

Ruttan and Hayami (1998) demonstrated that output growth and technological change in the agricultural sector occurred through a process of dynamic interaction of resource endowments, cultural endowments, technology and institutions. They noted that the efficient interaction of these characteristics is influenced by the impact of extant relative prices and discussed how changes or differences in one of the four elements could induce changes in the others on account of the prevailing market dynamics. Consequently, Ruttan and Hayami (1998) concluded that multiple technological paths to increased agricultural output exist across countries, each influenced differently by the efficient use of the respective country factor endowments. So, two similar sets of resource endowments may induce different technological, cultural and institutional changes in two countries because of differences in other characteristics and market conditions. These changes are endogenous to the economy in question and represent a dynamic response to market conditions and differences in the respective characteristics.

Schultz (1998) posited that traditional agricultural practices can be enhanced through a concentration on agricultural research and the improvement of the technical capability of farmers with training. He characterised these farmers as responsive to incentives, efficient resource users, refusing to mimic neighbour with like practices, having limited capital for investment and achieving low returns on capital investment, using the traditional technology (Schultz, 1964). He advocated that such farmers will respond to prevailing

market incentives to increase output given the requisite technical capacity and technology. Stephens and Jabara (1988) observe that Schultz's model partially explains the incidence of agricultural growth in a country and provides a capacity enhancement basis for increased agricultural productivity among traditional farmers.

Agrarian reform is an important policy issue in developing countries, since access to land is a means of sustainable livelihood. Therefore, peasants' access to land is very important. Binswangser and Elgin (1998) observed that land reform policies, conferring on the poor ownership rights or permanent cultivation rights to specific parcels of land, could be considered successful when they result in increased income, consumption or wealth. The converse holds if the poor were worse off than before.

Both the macroeconomic environment and meso-economic variables impact the effect of agricultural policy. Timmer (1998) analysed the impact of macroeconomic policy on agriculture. He demonstrated how the macro prices - wage rates, interest rates, land rental rates, foreign exchange rates and the rural-urban terms of trade - are determined by a government's macroeconomic policy and in turn influence the production and investment decisions of producers. A study by Zezza and Llambi (2002) identified market mechanisms and public administrative procedures as the two main channels for the transmittal of policy signals to economic agents. They showed that these meso-economy channels are endogenous to an economy and serve as a filter of the policy signals. As a consequence, they concluded that within a country context, the meso-economic variables are applicable at the national, regional and local levels, when undertaking public policy formulation and analysis (Zezza and Llambi, 2002).

Economic theory asserts that an economic agent makes production decisions under the assumption of optimising behaviour. In so doing for the extant production operations, the economic agent must consider *inter alia*: the availability and cost of the inputs or factors of production, the prices of the outputs, the markets for the outputs, and the technology available to produce the desired outputs.

Central to all of the above is the decision-making framework of the producer/economic agent within agriculture which Timmer (1998) addresses with considerable insight. He observed that decisions must be made with respect to, *inter alia*, crop selection, inputs, production technology, harvest times, sales, storage, and home consumption. Timmer (1998) emphasises that because economic agents in agriculture take decisions in their self interest, the challenge facing agricultural policy makers and planners is to persuade the multitude of farmers to separately take their individual decisions such that collectively these reinforce achievement of the national goal.

The role and value of empirics

Traditionally, empirical analyses can and have been applied in evaluating the results of agricultural policies, globally. Empirical investigations have also been used in evaluating the administrative, economic and social environment in which agricultural development activities occur. Some instances of the use of empirics in evaluating policy measures and strategies are described below.

The Department for Environment, Food and Rural Affairs (DEFRA) of the government of the United Kingdom (UK) implemented a regional food strategy, *inter alia*, to increase turnover and market share of food products that met specific criteria (AERF Division, 2002). Gorton and Tregear

(2008) reported that a turnover target of 25 percent over a five year period was against time bound baseline data. The policy prescription included an outline of the rationale and the policy delivery path as well as specific policy measures, target beneficiaries and commodities. Following quantitative and qualitative empirical research conducted among producers of the targeted food items, Gorton and Tregear (2008) confirmed that easily attaining the turnover target was likely. Their research also identified some apparent impreciseness in the policy's focus and impact measurement parameters.

Lawson (1988) conducted an empirical investigation of the impact of Ecuadorian agricultural policy on the producers in that country. She reported that these policies were implemented in the context of a sector that was comprised of both traditional and modern farming systems, diverse land tenure arrangements and farmer literacy levels, with production for both domestic and export markets. The sector was also characterised by credit market imperfections and information asymmetries. A key conclusion of her analysis was that the non-differentiated nature of the national agricultural policy resulted in a differential social and spatial impact that created significant uneven economic change (Lawson, 1988).

The empirical evaluation of agricultural development interventions in the highlands of Ethiopia (Bekele, 2006) conclusively demonstrated the importance of consultations with farmers prior to the design and formulation of micro-level programmes within any umbrella macro level development policy and strategy. This investigation of agricultural policy impacts clearly highlighted that farmers' preferences are influenced by their specific socio-economic conditions and the agro-ecological circumstances of their location.

Bekele (2006) suggested that there was need to tailor program elements to cater to socio-economic and agro-ecological differences across the country in addition to socio-economic differences within the same agro-ecological settings. One striking characteristic of the area was land degradation because of water induced soil erosion. This catalysed widely implemented soil and water conservation projects but there was weak voluntary adoption of the conservation practices outside the project areas. This failure was attributed to reliance on temporary incentives and coercive actions. To redress situations such as this, Bekele (2006) advocated planned interventions specifically incorporating farmers' needs. He emphasised that understanding such micro level issues will contribute significantly to macro level policy formulation.

Over the period 1997 to 2004 the government of South Africa implemented a policy of spatial development initiatives to promote investment and development in selected geographical areas and sectors (Mitchell et al, 2008). The sectors targeted were agro-tourism, industrial and a mix of the two, with a focus on investment in small, medium and micro enterprises as well as improved basic infrastructure and services. Consequent upon the results of a structured baseline survey in 1997 used to establish development indicators and follow-up comparable surveys in 2000 and 2004, Mitchell et al (2008) concluded there was a general decline in the socio-economic status of the residents in the target areas. Among the policy deficiencies identified were weak communication links with local leaders and others in the target communities and a narrow sector focus. This evaluation by Mitchell et al (2008) demonstrated the relevance of epidemiological evaluation of development impacts, using community based empirical analysis.

In essence, the role of quantitative analysis of agricultural policy is critical in evaluating the overall policy impact and its contribution to the achievement of the stated goals. In their presentation of the application of the policy analysis matrix technique to agricultural development Monke and Pearson (1989) point to the role of quantitative analysis in monitoring the relative consistency of objectives, constraints and policies.

Institutions in agriculture

The World Bank clarified the term 'institutions' in its World Development Report 2003, stating:

Institutions are rules, organisations and social norms that facilitate coordination of human action. On the informal end, they go from trust and other forms of social capital (including deeply rooted norms governing social behaviour) to informal mechanisms and networks for coordination. On the formal end they include the procedures and organisations for making, modifying, interpreting and enforcing rules and laws (from legislature to central banks) (World Bank, 2003 p38)

Nobel laureate Douglass C. North (1998) excluded organisations from his concept of 'institutions' but focused his work on the effect on economic performance of temporal changes in the rules and social norms. He posited that norms provide a context for rules and that informal norms are culture specific and less amenable to change than rules. As a consequence, the imposition of rules from the developed world to economies in the developing world will result in an outcome different than anticipated (North, 1998). North advocated that economic performance will be enhanced by the efficient adaptation of institutional structures over time. Given the

role of social norms, it is implicit that there may be a long-term change in these.

Elliott and Palmer (2008) researched the impact of institutions on the Caribbean economic performance, with a focus on Jamaica. Their conclusions supported the arguments of earlier Caribbean scholars who claimed that Caribbean institutions contribute to the region's ongoing underdevelopment and poverty. This research highlighted the existence of adverse land tenure arrangements since many farmers did not own the land on which they worked and consequently lacked access to credit; a situation that directly impacted agricultural output negatively. The research of Elliott and Palmer (2008) confirmed that, for Jamaica, formal institutions influence economic growth and advocated that there was need for more research on the impact of both formal and informal norms on development.

Dorward et al (2004) empirically examined the interaction of institutions and policies to promote agricultural growth among the poor in selected countries in Africa and Asia, under conditions of increasing trade liberalisation and reductions in public sector agricultural investment. They observed that, despite instances of the acknowledgement of the importance of agriculture there were extensive policy failure experiences. These fuelled doubts about the effectiveness of technical and technological support, concerns about financing and implementation costs, and reservations about appropriate financing and delivery models. The Dorward *et al.* study proposed, in light of the current liberation policies that are unsupportive of intervention in financial, input and output markets, the establishment of a system of 'transitional' institutional arrangements designed to support and promote reliable and effective market mechanisms in which rural small farmers can efficiently participate. They also observed that many

rural economies need catalysts to promote proper functioning markets and these are best determined by policy analysis that incorporates the rural non-farm economy and differentiates among the circumstances of respective rural economies. A key policy conclusions of the Dorward *et al.* (2004) study is that rural structural change is facilitated by policy analysis promoting carefully sequenced targeted measures that differentiate among rural population sub-groups.

Hayami and Ruttan (1985), reviewed the circumstances influencing agricultural growth in the United States and Japan over the past century and concluded that the successes achieved in both countries was due, in large measure, to institutional innovation particularly with respect to the enhancement of the scientific and technological capacity in the countries. Among other things they observed that both countries based their evolving institutional structures on practices existing in the United Kingdom and Germany, yet they did not undertake direct transfers. Each country developed systems peculiar to their circumstances, an approach advocated for developing countries (Hayami and Ruttan, 1985). Hayami and Ruttan also caution developing country governments about the maintaining of interventions past the time when their effectiveness diminishes.

The above discussion illustrates that institutions have a pivotal role in contributing to the functioning of markets, whether well established or embryonic, as well as to the evolution of a vibrant agricultural sector. The existing institutional framework also influences the production decisions as evidenced by the findings pertaining to Jamaica of Elliott and Palmer (2008) as well as policy impacts as shown by Dorward *et al.* (2004). However, for successful institutional innovation, efforts must be tailored to the institutional support needs of specific economic agents. In

essence, targeting is essential. As advocated by the World Bank (2003), markets can be an effective coordinating mechanism but they need the support of rules, whether formal or informal, traditional or modern.

While it is possible to develop policy drawing upon a multitude of paradigms, policy formulation grounded upon established theoretical principles is the assured way of achieving desired program goals. Complementary to any approach in the design of policy and the evaluation of the policy impact, utilising empirical techniques is critical to the assessment of the effectiveness of the given policy. The output of such evaluation can effectively guide any future policy refinement activities. In addition, as illustrated by the experiences described above, the presence of appropriate rules in the economy under consideration, be they formal, informal, traditional, or modern, is *sine qua non* for the effective and efficient functioning of agents in those economies. Drawing upon the icon of a three-legged stool, these three areas can be considered the three legs supporting effective agricultural policy formulation.

A Review of Some CARICOM Countries' Policy Experiences

Utilising this three-legged model we can proceed to review the agricultural policy formulation experience in some of the CARICOM countries. As a prelude to this, it is useful to briefly review the food demand profile of the countries, based on an analysis of food imports. The top ranking food import division varies across the countries (Table 3). The food division, 'meat and meat preparations' (SITC 01), holds the top rank for each of the members of the Organisation of Eastern Caribbean States (OECS). Cereal and cereal preparations (SITC 04) is has the top rank for Barbados,

Guyana, Jamaica, and Suriname. In Belize it is dairy (SITC 02) and for Trinidad and Tobago it is vegetables and fruit (SITC 05). Evidence of the variation in countries' consumer demand, reflected by the top four food import division rankings, is in Table 3.

A summary of policy goals and associated policy focus for selected CARICOM countries is presented in Table 4. The policy areas are categorised into three groups: commodity specific, institutional and trade related. Information on the respective country policy areas was drawn from the series of studies sponsored by the CARICOM Secretariat under the competitiveness study component of the Regional Transformation Programme for Agriculture authored by Singh *et al.* (2005a; Singh *et al.*, 2005b; Singh *et al.*, 2005c; Singh *et al.*, 2005d; Singh *et al.*, 2005e; Singh *et al.*, 2005f; Singh *et al.*, 2005g) and (2007).

A review of the agricultural policy profile for the selected countries (Table 4), as well as a perusal of the respective reports, indicates the likely need for a more precise targeting of policy measures in order to facilitate impact evaluation and possible policy refinement. The Jamaica report provides data demonstrating: decline of the production of yams over the period 1998-2003; fluctuating but relatively stable production of bananas and stable output of coffee and cocoa over the same period (Singh *et al.*, 2005d). They also report export data on several other commodities that are the target of the country's agricultural policy¹. This confirms that the database is available to permit empirical evaluations of the various policy measures being implemented. The decline in the output of yams may be due to the overlooking of the theoretical framework influencing farmers' production decisions

pertaining to yams or other target commodities. However, there is also evidence that there are institutional deficiencies in that country, among others, pertaining to the grading and packaging of produce supplied to supermarkets by local farmers (Gordon, 2009). Gordon reported that farmers do not grade their produce and expect the supermarket to take whatever is delivered. They become annoyed when their consignment is graded and some produce rejected by the supermarkets. Other country reports do not convey the existence of similar databases but it is unlikely that these do not exist.

Livestock is one area of commodity specific policy focus of Barbados (Table 4). This addresses consumer demand since 'meat and meat preparations' is the fourth ranked food import group for that country (Table 3) and is evidence of a market driven policy. In Barbados, the institutional focus also appears to be relevant to the creation of an environment facilitative of economic agents in the sector. However, this assumption can be confirmed or refuted by the appropriate empirical evaluations.

The commodity specific focus of Belize's policy measures (Table 4) also appear market driven, addressing cereals, vegetables and fruits and livestock feed, three among the top four food group imports of that country (Table 3). But the review of Belize's agricultural policies by Singh *et al.* (2005b) indicates that current land tenure arrangements pose a dilemma for agricultural producers that is not receiving attention, an indication of weak or non-supportive appropriate institutional arrangements.

Gordon (2009) reports on a number of apparent unintended consequences of existing agricultural, trade and fiscal policy measures in some CARICOM countries. Among these are a shift in the supply of dasheen from the domestic to the export market influenced by an export promotion

¹ Sweet potato, yams, mangoes, papayas, fish/crustaceans/mollusks and cut flowers.

drive for the commodity in one country; the promotion of the expansion of pig production while simultaneously applying a value added tax (VAT) on annual production levels exceeding \$10,000 in another; and the suppression of the domestic poultry industry's demonstrated capacity to produce A grade chicken by the continued importation of B grade chicken meat in a third. Many of these unintended policy consequences can be alleviated with greater attention to relevant theory in combination with targeted empirical evaluations and institutional support.

Policy Formulation Lessons

Theoretical considerations point to the endogenous nature of macroeconomic and meso-economy issues influencing the economic agent in agriculture. These circumstances suggest that the policy formulation process must be predominantly nationally focussed for it to be successful in goal achievement.

Another key lesson distilled from the analysis above is that the policy formulation process should be targeted, based on criteria such as domestic or export market requirements, producer capacity and preparedness to meet market requirements and the requisite suite of technical and technological support. Targeting will also promote the optimisation of agricultural production and support activities in light of the differential agro-ecological conditions that exist within countries. It seems appropriate to dedicate or establish a multi-disciplinary team of policy analysts charged with the responsibility of applying and implementing elements of the model in accordance with national policy goals. Given the importance of macroeconomic policy issues, it will be critical for personnel from the finance ministry to be integral participants in such a team. The recommended targeting of the policy

formulation process will also allow for a more structured application of the relevant producer related theoretical framework with the empirical analyses and institutional support requirements.

Conclusion

The approaches to agricultural policy formulation are multitude and it is unreasonable not to expect instances of policy failure. However, such policy failure occurrences can be reduced (Hathaway and Rossmiller, 1993). Most countries have agricultural policy units within the respective agriculture ministries, albeit of varying capacity and capability. Policy analysts are also located within the finance ministries. In light of the strong influence of macroeconomic policies on the decision making framework of agricultural economic agents, an effective policy formulation team is one that combines technical resources from both agriculture and finance, perhaps with leadership from agriculture. The adoption of a targeted policy formulation strategy will promote a more efficient deployment of these resources, while simultaneously informing on any need for unit enhancement and capacity building. Further, the juxtaposition of targeted policy formulation and the embracing of the approach suggested by this model with the application of the three fundamentals of theory, empirics and institutions, seems likely to minimise the occurrences of policy failures and contribute to their redress in a structured manner whenever they may occur. In addition, this strategy establishes a more definitive link between the stated policy goals and the ensuing outcomes, since the empirical analyses serve to evaluate the impact of extant policies by providing concrete feedback. Taken collectively, the above illustrations suggest that a more optimal policy process may likely be obtained by embracing the

application of this three-legged model to agricultural policy formulation. Such a strategy will of necessity be more targeted and will have a more direct and quantifiable impact on national policy goals and objectives. Consequently, it is also likely to be associated with increased consumer welfare and national food security. Because the three-legged model strategy will require a more focused approach to policy design and implementation, it will likely redound to a more efficient utilisation of available resources. To the extent that national goals and objectives are in harmony with regional goals and objectives, the suggested policy formulation approach will also be supportive of the regional initiatives.

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Table 1: Selected Economic Performance Indicators for CARICOM Countries: 2003

Countries	Output Indicators			
	GDP Total (constant 2000 USD) (‘000)	GDP Agriculture %	GDP Industry %	GDP Services %
Antigua/ Barbuda	735,108.864	3.77	21.08	75.15
The Bahamas ²	4,938,247.680	N/A	N/A	N/A
Barbados	N/A ³	4.47	16.12	79.41
Belize	1,002,899.968	16.65	17.49	65.86
Dominica	255,990.720	18.28	23.07	58.65
Grenada	425,590.496	9.77	24.14	66.09
Guyana	728,679.744	31.44	27.19	24.26
Haiti	3,711,993.088	27.92	16.97	55.11
Jamaica	8,491,644.928	5.49	31.66	62.84
St Kitts/ Nevis	341,550.560	3.03	28.09	68.99
St Lucia	682,979.776	5.27	18.11	76.62
St Vincent/ Grenadines	344,594.816	8.76	24.48	66.77
Suriname	1,012,462.656	10.67	21.36	67.96
Trinidad/ Tobago	10,401,797.120	1.1	51.53	47.37

Table 2: Selected Economic Performance Indicators for CARICOM Countries, 2003

Countries	Employment Indicators		
	Employment Agriculture %	Employment Manufacturing %	Employment Services %
Antigua/ Barbuda	N/A ⁴	N/A	N/A
The Bahamas	3.0	15.8	80.9
Barbados	4.6	17.6	66.8
Belize ⁵	27.5	17	55.3
Dominica ⁶	27.3	18.2	57.8
Grenada ⁷	13.8	23.9	58.6
Guyana ⁶	27.8	22.6	47.9
Haiti ⁵	50.6	10.7	38.7
Jamaica	20.4	17.4	62.1
St Kitts/ Nevis	N/A	N/A	N/A
St Lucia	11.4	17.7	52.7
St Vincent/ Grenadines ⁸	15.4	19.7	56.3
Suriname ⁵	6.1	14.5	75.4
Trinidad/ Tobago ⁹	6.9	28.4	64.4

² Data for the year 2002,³ Data not available

Source: Gordon et al., 2007

⁴ Data not available⁵ Data for year 1999⁶ Data for year 1997⁷ Data for year 1998⁸ Data for year 2001⁹ Data for year 2002

Source: Gordon et al., 2007

Table 3: Top Four Food Import Divisions by Country (Excluding Miscellaneous), 2006

Food Divisions (SITC sub-groups)	Countries												
	Antigua/ Barbuda	Barbados	Belize	Dominica	Grenada	Guyana	Jamaica	Montserrat	St Kitts/ Nevis	St. Lucia	St. Vincent/ Grenadines	Suriname	Trinidad/ Tobago
Meat/ Meat Preparations (01)	1	4		1	1			1	1	1	1	2	
Dairy (02)	4	3	1	3	2	2		4		4	4		3
Fish (03)							3		4				
Cereals (04)	3	1	2	2	3	1	1	3	3	2	2	1	2
Vegetables & Fruit (05)	2	2	4	4	4	3	2	2	2	3	3	3	1
Sugars (06)						4	4					4	4
Coffee/Tea/ Cocoa (07)													
Animal feeds (08)			3										

Source: Developed from 2006 food import data provided by the CARICOM Secretariat.

Table 4: Agricultural Policy Matrix for Selected CARICOM Countries

Country	Policy Goals	Stated Policy Focus		
		Commodity Specific	Institutional	Trade Related
Barbados	Increase sector contribution to GDP Reduction of food import bill	Sugar, cotton, Livestock (poultry, beef, dairy, sheep, pigs), fish/seafood	Marketing support, food safety, technical & technological support, modern legislation, finance, land tenure, water	Tariffs, agricultural health
Belize	Satisfy population food/nutrition needs Employment creation Earn foreign exchange	Sugar, citrus, bananas, papaya, hot peppers, exotic fruits (unspecified), fish/seafood, aquaculture, rice, corn/sorghum, oil seeds (sesame/soy beans), beans (red kidney/black/ cow peas), root crops (cassava/ coco yams), vegetables, livestock (including poultry), domestic livestock feed	Marketing support, technical & technological support, Irrigation/water, market infrastructure, finance & investment	Tariffs, licenses (import & export), agricultural health
Guyana		Sugar, rice, germplasm supply, livestock, fish/seafood	Marketing support, technical & technological support, rural development centres, water management, modern legislation (food safety), land tenure, transport infrastructure, drainage & irrigation, finance & credit, investment	Tariffs, agricultural health, export taxes
Jamaica	Growth of output Improved quality of rural life Increased efficiency Improved productivity	Bananas, cocoa, domestic food crops (incl. hot peppers, sweet potato, papaya, coconut, small ruminants), coffee, citrus, livestock (incl. beef, dairy, poultry), fisheries/seafood, spices & herbs	Market support (incl. marketing intelligence), financing & investment, sanitary & phytosanitary systems, rural development, infrastructure (feeder roads, irrigation), modern legislation (agri. health), export facilitation, land policy (incl. crop zoning), praedial larceny containment legislation, human capacity building, specific tax exemptions, information technology (agri. business information & geographical information systems (GIS))	
St. Lucia	Reduction of food trade deficit Increased food security Expansion of agro-processing Increased utilization of locally produced agricultural commodities by the tourism sector	Banana, fisheries, aquaculture, livestock (incl. poultry, pork), food crops (cabbage, lettuce, tomatoes, sweet peppers, cucumber, sweet potato, yam, plantain), cut flowers	Agricultural trade facilitation, marketing systems & infrastructure development, improved agricultural health and food safety systems (incl. grades & standards), rural development enhancement, enterprise development facilitation, investment facilitation, infrastructure (incl. irrigation, roads & port), technical & technological support, land use policy (incl. zoning), praedial larceny containment legislation, finance & credit, risk management (agricultural insurance), price ceilings, consumption taxes (ad valorem), water (catchment/conservation)	Tariffs, licensing, quantitative restrictions,

Table 4 continued....

Country	Policy Goals	Stated Policy Focus		Trade Related
		Commodity Specific	Institutional	
Trinidad/ Tobago	Improved output with resource conservation Increased benefits from international trade Greater agro-industry development Increased agricultural incomes Enhanced food security Increased private investment in the sector Improved efficiency of agricultural marketing More efficient agricultural land markets	Sugar, coffee, cocoa, citrus, food crops (cassava, yams, sweet potato, plantains), hot peppers, citrus, ginger, passion fruit, pineapple, papaya, sapodilla, livestock (water buffalo, ruminants within an integrated farming system)	Technical and technological support, financial assistance programmes, promotion of grades and standards for sanitary and phytosanitary regulations (agricultural health regulations in need of modernization), market research/market access facilitation/marketing intelligence, financial incentives (machinery/equipment/ Infrastructure), agricultural credit facilitation, praedial larceny containment, rural development enhancement, land tenure & land use policies (including zoning), drainage & irrigation & water management	Tariffs, import surcharges, licensing, export licensing, export financing

Source: Developed from agriculture policy analysis reports authored by Singh *et al.* (2005a, 2005b, 2005c, 2005d, 2005e, 2005f, and 2005g).