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INNOVATION: THE BASIS FOR A PROGRAMME OF RATIONALIZATION OF CARIBBEAN AGRICULTURE (With Special Reference to the Livestock Sector)

Vincent R. McDonald
(Howard University, Washington D.C., U.S.A.)

In keeping with the theme of this conference, the Impact on the Caribbean Region of Britain's Entry into ECM, and the Rationalization of Agriculture in the Caribbean,¹ this paper seeks to highlight one of the areas of concern in achieving a programme of rationalization.²

Difficulties of Rationalization

The introduction of a programme of rationalization has not had unanimous support among countries for the simple reason that rationalization might be effected in terms of a variety of values and goals. Thus what is rational from the point of view of one group of social scientists or policy-makers might very well be irrational for others. This possibility is one of the primary drawbacks to the achievement of a unified approach to collective action in establishing a viable alternative to the pending curtailment, if not disappearance, of portions of the United Kingdom market. An important example is the current renegotiation of the Commonwealth Sugar Agreement³ which becomes void at the end of 1974. Additionally, the current International Sugar Agreement, consisting of 34 exporting countries (including Antigua, Barbados, Belize, Guyana, Jamaica, St. Kitts/Nevis/Anguilla, and Trinidad & Tobago), which became operative in 1969, is also being renegotiated.

The effective introduction of a programme of rationalization within the region demands the coordination of a variety of services, programme agencies, and regional governments acting in harmony of thought and goals to further the economic needs of the region. The concerns shared by the countries of the Caribbean revolve around the uncertainties of the form of the relationship to be worked out with the European Economic Community (hereafter referred to as Market) vis-a-vis traditional Caribbean exports to that market.

The existing arrangements and practices of the Market are geared towards the protection of its associated territories. These countries, large in size and population, represent a vast source of primary inputs for the Market. Hence, while there are similarities with Caribbean production, they are obviously in a commanding position in relation to the potential benefits from economies of scale and, to some extent, location.

With Britain's entry into the Market, the establishment of a fair policy for handling the traditional arrangements of Britain and her Commonwealth partners (including the Caribbean) becomes paramount.

¹ For the benefit of this paper the Caribbean is considered as the present and former Commonwealth Countries. In my opinion, however, the ideas presented are applicable for the entire region.

² For the benefit of this paper, I define rationalisation as a conscious or premeditated action on the part of an individual or institution to rearrange the present use of available resources for the purpose of obtaining increased economic efficiencies.

³ Exporting members are Australia, Caribbean (Belize, Guyana, Jamaica and Trinidad & Tobago), East Africa, India, Mauritius, Swaziland and Southern Rhodesia (currently suspended). The U.K. has indicated that the Enlarged Community is morally committed to providing a secure and continuing market for quantities covered by the Commonwealth Sugar Agreement. However, the Hon. Michael Manley of Jamaica was forced to speak out against attempts by French Beet Sugar producers to undermine the refining of 1.4m. tons of Caribbean sugar as agreed in the Lancaster House Agreement of 1971.

It is quite clear from the situation facing these countries, that they are entering a phase of intense competition if they should continue to produce under the traditional patterns of the last several decades -- a pattern which is clearly similar to that of the Associated African States which are also major producers of commodities such as rice, coffee, citrus and sugar.

While the full implications of this broadening of the market are still to be determined, the process of adjustment with the Caribbean countries has been delayed as a result of the honoring of agreements which are still in existence. Such arrangement will come to an end in due course, however, and alternative approaches will be necessary. Caribbean countries might well have to reappraise their continued production of traditional crops (geared towards securing foreign exchange) under conditions where huge imbalances result from their inability to control prices. This problem is in addition to that of pursuing programmes of production of commodities catering to the needs of foreign factories, rather than meeting the nutritional and income needs of the people, and providing primary inputs for local manufacturing, livestock production and material for the expanding housing and other social services. Robert McNamara noted that:

If the developing countries are to secure the foreign exchange they need, and achieve fuller employment, they must substantially increase their manufactured exports. It is here that world demand grows most rapidly... these countries can produce at competitive cost products that generally have either a high labour content, or that utilize domestic materials.¹

In an effort to improve the relative position of their respective countries, it seems reasonable to assume that these countries, faced with the requirements of the new arrangements which they must adjust to, should now develop machinery to deal with this situation if they are going to maintain the stability and economic viability of the society.

A rationalization of existing patterns of production and trade should be pursued. Such a reassessment should provide a review of the existing mix of commodities and also foster the development of alternative policy and logistical services (marketing, transportation, etc.) which will ensure the countries' population a higher standard of living.

Such a policy of change, in my view, represents the introduction of a spirit of innovativeness on a national and regional scale.² A programme of innovation could take any of the following approaches. It might (a) be cost saving, (b) result in the creation of new products or (c) result in completely new institutions or new organizational approaches.

In the first, the same final product is offered but an improved technique results in cost per unit of output being decreased. In the second, the introduction and simultaneous promotion and acceptance of newly designed products, for example, plantain chips, breadfruit or banana flour, and wines -- catering to the latent demands of consumers -- are cases in point. In the last case, institutional changes, legislated in the public sector or introduced in the private sector, for example, *Cooperative Republic, Buy Caribbean* legislation, and vertical or horizontal business arrangements, all contribute to a new approach.

1 Robert S. McNamara, President, World Bank Group in address to the Board of Governors, Washington, D.C., Sept. 27, 1971.

2 Innovation in its technical sense represents the discovery and use of a new idea to a production method or to an institution.

Some Ideas Associated with Innovation

Man lives in a dynamic age. Innovations represent an important process in the rationalization of his behaviour. It affects what producers and consumers do. Most innovational theories are based on the presumption of a capitalistic system, hence, their applicability to the concern of the Caribbean as it is today is valid. I do not foresee a change in this area in the near future, in spite of the introduction of programmes of *participation* by governments throughout the region. Prime Minister Burnham, for example, outlines Guyana's resource utilization policies the following way:

*In the exploitations of these (God-given) resources we are prepared to enter in consortia with foreign investors but only on certain conditions and one such condition henceforth will be that government alone or government and cooperatives hold in each case no less than 51 per cent of equity.*¹

Economists seem to agree that innovations are important to both supply and demand. They stress the fact that innovations in business play a key role in the level of expectation -- hence capital moves to the innovator who helps to generate new enthusiasm for further investments. The theme is expressed in Schumpeter's works as he glorifies innovations as the precursor of economic growth. *Innovation is the setting up of a new production function it combines factors in a new way or consists in carrying out new combinations.*² He sees the country, therefore, benefitting from a series of innovations, which establishes the psychological climate for other economic activity in the various sectors. The innovator reaps the initial profits, but according to Schumpeter, cost-reducing innovations benefit not only the individual entrepreneur, but also consumers and society at large. He further contends that innovation can be viewed in the form of: (a) new markets, (b) new products, (c) new methods of production, (d) employment of new sources of factory inputs, and (e) reorganization of an industry (country) or part of an industry.³

J.B. Clark, on the other hand, emphasizes competition as a necessary factor of innovation. Competition forces firms to adopt the innovation and the resulting superior methods of production diffuse throughout the economy.⁴ while Marx views innovations as a factor in the destruction of the capitalist system. He feels that technological change would be labour saving, thus reducing the need for workers' skills and consequently resulting in low wages and unemployment.

1

L.F.S. Burnham, Hon. Prime Minister of Guyana, *Control of Our Natural Resources*. Feb. 23, 1971.

2

Joseph A. Schumpeter. *In Business Cycles: A Theoretical, Historical, and Statistical Analysis of the Capitalist Process*. Vol.1, First Ed., McGraw Hill Book Co., New York, 1939 -- points out for example, that "Railroads have not emerged because any consumers took the initiative in displaying an effective demand for their service in preference to the services of mail coaches. Nor did the consumers display any such initiative wish to have electric lamps or rayon stockings, or to travel by motor car or airplane, or to listen to radios or to chew gum. There is obviously no lack of realism in the proposition that the great majority of changes in commodities consumed has been forced by producers on consumers who, more often than not, have resisted the change and have had to be educated up to elaborate psychotechnics of advertising." (p.73).

3

Ibid.

4

John Bates Clark. *The Distribution of Wealth, A Theory of Wages, Interest and Profits*. The McMillan Co., New York, 1931.

Ronald P. Dove, in looking at the motives of the innovator, points out that, *thousands of farmers in the Meiji period made new departures, did things they had never done before, or did old things in new ways*. He lists four factors which might have stimulated these innovations: novelty, patriotism, submissiveness, and economic interest.¹

Further Arguments -- Pros and Cons of Rationalization

Countries of the Caribbean might well find that agricultural rationalization is the only path open to them in order to move the agricultural sector from the captivity of external forces.²

It is not a secret that these countries, while rich in tradition, have lacked the ability to maximize the use of their resources for the benefit of all their people. While blessed with beautiful beaches, blue skies and ideal temperatures, these countries have been shackled with the problems of unemployment among one out of every four members of its labour force. While endowed with exotic fruits and the potential for producing food crops, these countries have lacked the ability to exert even minimal control over pricing policies for their products.³ While their leaders dream dreams of where they wish to move, the realism of international interlocking arrangements have dictated where they must stand. Innovations (rationalization) can play an important role in the economic future of the region. The impact of such changes would be to influence production and the arrangements by which such products are used to satisfy the needs of the society. As innovation occurs, new linkages are developed which require further adjustments.

A look at available statistics suggests that already, some level of realignment is in effect -- over the period 1958 to 1968 there has been a substantial shift in the aggregate trade of the four independent Commonwealth Countries and the United Kingdom.⁴ Any unbiased look at the pattern of trade of the Caribbean countries reflects their dependent positions on a narrow range of primary commodities. Programmes of rationalization, the creation of economic blocs such as the Caribbean Common Market might be viewed as a liberating force in the search for development and diversification.

Typically, Caribbean economies are comprised of two economic strata. The first represents the subsistence sector where production continues under primitive conditions, following traditional and out-dated techniques. Then there is the more sophisticated market sector, encompassing the production of goods for exports rather than domestic consumption. This sector is a sort of foreign enclave within the economy, as its existence is to meet the needs of foreign consumption and industrial needs. George

1 Ronald P. Dove. "Agricultural Improvement in Japan: 1870-1900", *The Sociology of Economic Development A Reader*. Gayl D. Mess, Harper & Row Publishers, New York, p.569.

2 Control is not being advocated for control sake, but on the realization that the goals and objectives of a foreign profit maximising enterprise do not necessarily coincide with the goals and objectives of the society.

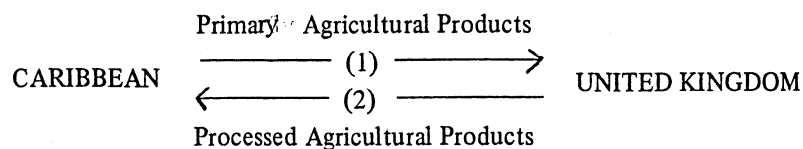
3 The world market prices of sugar have been extremely volatile and have reacted sharply to international tensions (even where the producing countries are not participants) or to changes in aggregate supply and demand. The world price was as high as 12.60 cents per pound during May 1963 when supplies were tight, to as low as 1.23 during January 1967. While the world sugar price does not directly affect the prices received by most Caribbean sugar exports, it does have an influence on the level of fluctuation present.

4 International Monetary Fund and International Bank for Reconstruction and Development. *Direction of Trade: A Supplement to International Financial Statistics*. Annual 1958-62 and Annual 1964-68.

Beckford has described this behaviour as being characteristic of Plantation Economies.¹ Sidney Dell, in discussing this characteristic of the agricultural sector in developing countries noted that:

*This sector has normally grown up in response to demand from the developed countries and it usually produces some basic foodstuff of agricultural or mineral raw material for export moreover, productivity in the market sector is usually very much higher than in the subsistence sector: the market sector will often have attracted foreign capital, which may introduce new techniques and relatively advanced capital equipment.*²

The channel of trade moves from the Caribbean to the U.K. and back again.



This situation minimizes the potential for expansion of economic activity within the Caribbean since it has created a dependency syndrome on the part of these countries for processed products. In addition, the demand for primary agricultural products in the *mother country* is such that there is a perpetual market for such commodities. The situation is exacerbated by the fact that demand in metropolitan areas is a function of consumer tastes for a very narrow line of products. As we look at the size of the countries in the area, the constraints faced are even more obvious.

It is in the presence of such conditions that this paper advocates a process of rationalization of the agricultural sector. To meet such an innovation it contends that adequate logistical recognition must be given to the rationalization of production and marketing, to meet not only the economic rate of returns criterion of investors (or innovators), but also the public needs for nutritional and life saving foods. The alternative is to consider whether an exclusive reliance on the price system by these countries is the most efficient approach toward development, or as Keith Griffin suggests, whether *a series of discriminating policies would be needed to accelerate growth, and for this reason the active intervention of the state in fostering development is essential.*³

A Simple Model for Viewing the Rationalization of Caribbean Agriculture

If we view the Caribbean as a region comprised of human and natural resources, a given level of capital goods, and its existing state of technology, a theoretical model can be developed of its production possibilities. We can use this model as a basis for viewing how a rational reallocation of resources might be pursued.

Assume that we are only capable of producing Sugar (for export) or livestock (for domestic

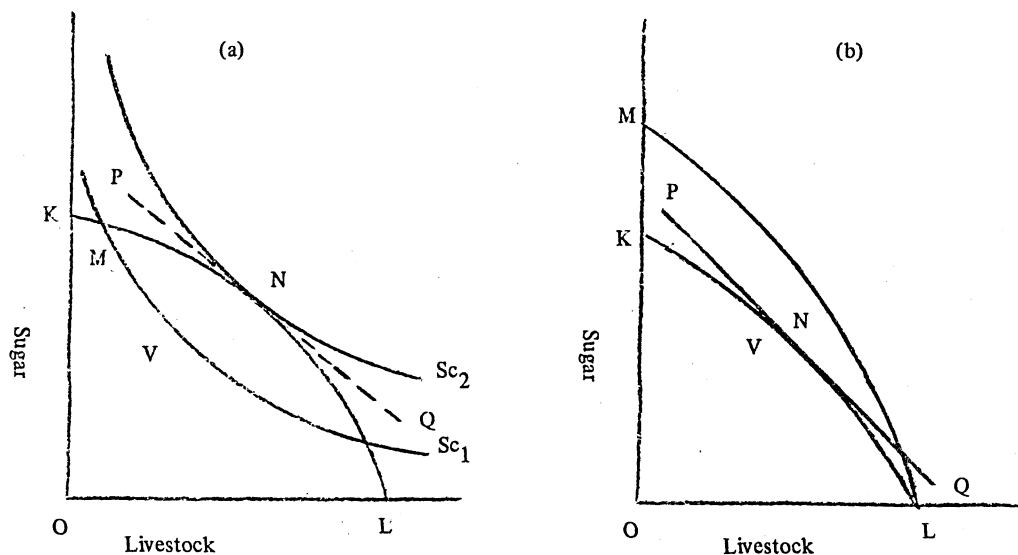
¹ George Beckford, *Persistent Poverty. Underdevelopment in Plantation Economies.* Oxford Univ. Press, New York, 1972.

² Sidney Dell. *Trade Blocks and Common Markets.* Alfred A. Knoph, New York, 1963, p.174.

³ Keith B. Griffin. "Reflection on Latin American Development." *Latin American Problems in Economic Development.* (Ed. Charles T. Nisbet.) Free Press, New York, 1969.

consumption). Since these are the only two sectors, the sum of their production less imports is equal to net regional product. Actually there are a variety of combinations of sugar and livestock that could be produced given the existing resources, skills, and technology. These possibilities are seen in the production possibility curve. In the diagram OK is the amount of sugar that could be produced if only sugar was produced, while OL is the number of livestock produceable if only livestock is produced. The curve KL traces out the technical possibilities of producing various combinations of the two goods; and is a maximum boundary of production (Figure 1, (a) and (b)).

Figure 1.



While any combination of production inside the curve is possible that would indicate a level of less than full employment. For example, if production in the region were at point V, it would be in short-run equilibrium but producing at less than its full potential. Any point such as M, at which the curve is cut by an indifference curve (SC_1) is clearly not optimal since the society can move to a higher indifference curve. The highest attainable indifference curve is tangent to the production possibilities curve. At this point, the slope of the indifference curve (marginal rate of substitution) is equal to the slope of the production possibilities curve (marginal rate of transformation). Increases in demand for sugar for export or larger government outlay could increase the short-run equilibrium level of income and production and propel the economy toward the production possibility curve.

If we assume that the economy is making use of all its factor inputs in producing, however, then we are faced with the question of what combination of output it will produce. The point of production along the curve KL is determined by the relative prices of the output. We would expect that that combination of sugar and livestock would be produced, at which the ratio of prices of the products equals the ratio of their marginal costs.

A choice must be made here, however, for the marginal cost also represents the value of other goods that cannot be produced when these resources of the region are shifted to one of the possibilities, for example, sugar. Any transfer of resources from producing sugar to that of producing livestock results in reduction of sugar exports, which is the cost of obtaining increases in livestock production -- this is the opportunity cost.

The criterion which should hold in this situation then -- a situation of rationalization -- is that available resources should move from such activities as the production of sugar and should be used in the production of livestock, as long as the marginal value of livestock produced for domestic consumption from these resources is greater than the marginal value of sugar produced from export or vice-versa. This is similar to saying that production of sugar will decrease as long as the marginal cost of producing it is greater than the price.

The allocation of the factors should continue in the economy until the value of marginal productivity is equal in each sector. At that point on the production possibility curve, the shift of a small amount of resources from production in the livestock sector to the sugar sector will cause a reduction on the quantity of one output, equal in value to the increase in quantity of the other output achieved.¹ The point on the production possibility curve at which the economy will eventually settle is where the slope of the tangent to the curve KL, (PQ in the illustrations) is equal to the inverse of the ratio of the prices of the products:

Any change that causes the production possibility curve to shift away from the origin causes an increase in the capacity of the region to produce. Among the factors which could cause this are improvements in technology or productivity, or shifts in the use of the factor inputs, including land.

Possible Areas of Innovations

From time to time economists have been accused of being able to identify problem areas without taking the essential second step of providing solutions for the existing problems. A major purpose of this paper is to identify areas in which innovations to the existing approaches will provide major dividends, and additionally, to discuss specific areas in which such programmes of innovation might be pursued. Among the many possible areas of innovations are:

1. In the production of food crops for local and interregional needs;
2. In the development of fishing and fish related industries;
3. In the expansion of forestry and the production of wood by-products;
4. In the introduction of multiple cropping techniques;
5. In the increased emphasis on sugar by-products rather than crude sugar;
6. In land use and land tenure arrangements;
7. In the acquisition and use of transportation facilities;
8. In the level of technology and research;
9. In a general programme geared towards finding new or additional products and markets from existing primary agricultural commodities, for example, spices;

1

$$p_s \cdot dq_s = p_l \cdot dq_l$$

where

p_s is price of sugar

dq_s is the change (\pm) in the quantity of exports (sugar) resulting from a shift in resources

p_l is price of livestock

dq_l is the change (\pm) in the quantity of livestock resulting from the same shift of resources.

Dividing both sides of the equation by p_s and dq_l , the equation can be expressed as:

$$\frac{dq_s}{dq_l} = \frac{p_l}{p_s}$$

10. In embarking on studies for the development of taxation techniques to use as a stimulant to agricultural output;
11. In the granting of incentives to the agricultural sector for capital investment and increased labour usage.

While each of the above represents areas of substantive possibilities for innovation, I wish to consider in detail the need for programmes of rationalization in two critical sectors: sugar and livestock.

(a) *Sugar*

The problems facing the Caribbean in the renegotiating of the Commonwealth Sugar Agreement was discussed before. The United Kingdom's entry into the Market was conditional on its acceptance of the instruments of EEC policy, such as the common external tariff and the common agricultural policy.

Sugar, which falls under Regulation No. 1009, amended by Regulation No.2485/69 of December 1969, has been one of the areas of concern in the Market negotiations. In keeping with the above policies, each year the Commission of EEC establishes the basic target price (which serves as a guide to producers), the intervention price (which is the basic guarantee to producers) and the threshold price (used as a base for fixing levies against other countries with the basic target price).¹

The United Kingdom, therefore, might well find itself substituting purchases from within the community, for while this arrangement may not satisfy the United Kingdom's total demand for sugar, it would reduce the volume needed from Commonwealth sources and more importantly, force these countries to find alternative marketing outlets. The result of such a policy will be crucial to the region as we look at sugar's role in these countries.

Throughout the region, there is no question that sugar has long been the mainstay of most of the Caribbean's economies. Among the beneficiaries of the industry are more than 53,000 cane farmers. Some 500,000 persons derive the bulk of their livelihood (directly or indirectly) from the sugar industry. It has been estimated that between 50 and 60 per cent of the total cost of growing and manufacturing a ton of sugar is accounted for by wages and salaries, with wage rates in the industry being generally higher than in other phases of agriculture.²

In 1968 it was estimated that of a total GDP of \$1,997 billion in the West Indies, sugar contribution was \$103.3m. Additionally, in spite of such formidable dependence, and the guaranteed outlet under the Commonwealth Sugar Agreement of over 800,000 tons per year, the Commonwealth countries lost \$5.4m. in 1969 and \$11.4m. in 1970,³ due to fluctuating price arrangements. While sugar exports to the U.S.A. have been increasing from 1965, the Caribbean countries have themselves become

¹ U.N. Economic Commission for Latin America. "The Free Trade and Trade Policy of the English-speaking Caribbean Countries." *The Caribbean Economies Perspectives on Social, Political, and Economic Conditions*. (Ed. Vincent R. McDonald.) M.S.C. Information Corporation, New York, pp.62-74.

² Statement before Committee on Agriculture House of Representatives, 92nd Congress. *Extension of the Sugar Act*. U.S. Government Printing Office, Washington D.C., 1971, p.271.

³ *Ibid.*

an important rapidly growing market for U.S. exports.¹ United States exports to the region increased from a value of \$178.5m. in 1965 to \$303.5m. in 1969, an increase of 70 per cent over the five years, or a rate of growth equivalent to more than 14 per cent per annum.

Correspondingly, the United States is also a major source of imports for the region, as is seen in the fact that its share of the total has increased from 22 per cent in 1965 to 26.4 per cent in 1969 (a sizeable adverse balance of trade with the United States amounting to some \$70m. a year). Agricultural products account for approximately \$50m. or about one-sixth of total exports to the region.²

Table 1. Quotas and Deficit Reallocation of Caribbean Sugar to the United States of America: 1961-1970

Year	Quota including deficit reallocation	Exports to U.S. (long term)	Percentage of Total Exports
1961	237,431	232,659	21.1
1962	159,418	159,073	15.4
1963	128,190	123,542	11.3
1964	128,120	136,833	13.2
1965	132,074	131,309	11.9
1966	157,933	155,973	14.9
1967	163,965	160,143	15.7
1968	190,305	188,942	18.0
1969	199,023	199,533	20.6
1970	188,610	188,026	20.5

Source: Committee on Agriculture, p. 287

What the data suggest is that in spite of major contributions of the sector, there is probably need for continued research and diversification of agriculture, if the huge trade imbalance is to be reduced. There is no doubt that diversification may present short-run difficulties, especially regarding the displacement of workers from the sugar industry; however, there seems to be no doubt that a thorough reorganization of the agricultural sector, making use of all factors of production, must be actively pursued.

(b) *Livestock*

As suggested in the model on rationalization, one option that Caribbean countries could take is to view the opportunity cost of producing sugar versus livestock. Such a choice is rational in the context of the Caribbean since it has been shown that although sugar has remained *king*, its contributions, while important, have not, up to this point, provided the basis for a *takeoff* that these countries need if they are to move into a state of *development*. Sugar, while crucial in each country, might well be channelled into serving as a base for a larger number of sugar-related products manufactured within the region.

1 *Ibid.* p.287.

2 *Ibid.*

It is my intention to argue here, therefore, that expansion in this sector (livestock) is also important and should be pursued not only to meet domestic consumption and nutritional needs of the people, but also as a source of foreign exchange on a regional and international basis.

A study of meat consumption in the Commonwealth Caribbean conducted by J.M. Mayers, found that between 1956 and 1967 per capita consumption rose from 31 pounds to 47 pounds, with consumption increasing from 59m. to 72m. pounds per year. During this same period, however, imports more than doubled, going from 51 to 140m. pounds.¹ It would seem a fair conclusion, therefore, that there does exist, given present real incomes, a softness in the supply of fresh livestock available for consumption within the region.

The current inefficiencies in the livestock sector throughout the Caribbean are not unique. An FAO report states:

*Livestock production in the developing countries is among the world's most inefficient industries. Better nutrition, management, breeding and disease control, better crop rotations, the prevention of solid erosion, and the integration of animal and plant agriculture leading to improved soil fertility are required to bring the industry out of its present widespread state of inefficiency.*²

As this study indicates there is a great deal of variation among countries and yields and returns in this sector. For example, looking at milk yield in this sector, Israel in 1964-66 had 4,900 kilograms per year, while Jamaica had 785. The result is that milk continues to be a negligible source of protein throughout the region. It is not surprising therefore, that it suggests that *some of the less traditional animals and birds are worthy of much closer attention than they have so far received: among these are goats, water buffalo, rabbits, hares, ducks, geese, guinea fowl and quail.*³

Caribbean countries should be prepared to take this step. In an effort to establish the need for livestock (beef, dairy, etc.) it is necessary to:-

1. Make estimates of the demand for such products throughout the region;
2. Project the level of demand on the basis of:-
 - (a) nutritional requirement of the region;
 - (b) changes in population;
 - (c) income elasticities of demand, and
 - (d) changes in income per capita;
3. Consider present arrangements -- source and cost of the region (including externalities); and
4. View overall the costs and benefits to the region resulting from the implementation of such a programme of substitution.

In my opinion, the above tasks are manageable and while there are presently some reasonable intuitive answers of what the findings would conclude, I would think that, given the existing lack of any real competitive position on the part of the countries of the region in this sector, they would want to cooperate rather than compete.

1 J.M. Mayers. "The Marketing and Demand for Meat in the Commonwealth Caribbean." *Proceedings of the Sixth West Indies Agricultural Economics Conference*. Held in Guyana, 1971.

2 FAO of the United Nations. *The State of Food and Agriculture*. Rome, Italy, 1968, p.97.

3 *Ibid.*

Estimates of supply and demand of livestock products for 1970 and 1975 indicate an imbalance in the region. All of the countries have deficit production with the exceptions of Guyana in beef, and Jamaica in poultry and fresh milk, for both 1970 and 1975 estimates. There is no evidence that this situation will change in the near future in spite of projects initiated by several of the Governments of the region.¹ Given the land availability, Guyana and Jamaica are in the best position to move into this area, but could well be joined by other countries in the region. Mayers, for example, forecasts that by 1980 the region will be consuming about 350m. pounds of meat -- an average of 60 pounds per head per year.² This figure would prove to be low if real income can be increased at a pace above three per cent per annum. The question might be raised: Where will this meat originate?

Livestock production has, until recently, always been mainly a peasant undertaking except for cattle ranching in Guyana. Recently, there has been a trend toward larger units, particularly in poultry and egg production and in beef production in Jamaica.³ In the case of Jamaica, expansions in the sector have benefitted to a major extent from the participation of the bauxite interests and a few enterprising farmers. The realism of the opportunities available for greater return in this sector through substitution of resources somehow has not emerged.

Fresh beef consumption in the region is restricted by supply and price. While important, consumers have not been in a position to purchase freely the amounts needed. A new approach incorporating the techniques of the best in livestock breeding, feeding, slaughter, and storage must be adopted. In addition, a well-developed marketing strategy must be carried out to ensure that production and consumption interests are both maximized.

Regional cooperation must be carried out in establishing the basis for livestock to become viable. Cooperative efforts towards this end should be geared to:

- (a) determining consumption patterns -- tastes and preferences;
- (b) establishing uniform production, grading and promotion;
- (c) creating viable marketing (domestic and export) arrangements; and
- (d) ensuring a *fair return* on investment.

Conclusion

The evidence might not be all in, but it seems clear that the potential increases in the agricultural sector is present in the Caribbean. Whether this opportunity can be seized and whether progress can be secured will depend on the development of successful strategies to meet the needs of the individual countries and region. In meeting these concerns, it is necessary to give local demands as important a weight as that of supplying regional needs.

1 In Jamaica, headlines of the *Daily Gleaner* read, "Livestock Mission Back from Cuba" Sept. 13, 1972; "Government, U.S. Interests on Cattle Project. Meat Processing Plant Included." Jan. 10, 1973.

2 J.M. Mayers. *op. cit.*

3 USDA. *Projected Levels of Demand, Supply and Inputs of Agricultural Products to 1975*. ERS Foreign 94, Government Printing Office, Washington D.C., 1963.

New approaches (Innovations) must be made in finding new markets (for example, Latin America, a region which has some natural advantages to us based on its relative geographical position must be courted). In addition, new approaches in marketing agencies and channels, transportation and storage, credit and financing, pricing and production incentives must be used as factors in ensuring that the rationalization of Caribbean agriculture will bring a new day to the region.