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SOCIO ECONOMIC POLICY, TRADE & INVESTMENT

Evaluating Agricultural Competitiveness using the Domestic Resource Cost (DRC) Measure

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Abstract

This article introduces the Domestic Resource Cost (DRC) measure which can be utilized to evaluate the foreign exchange earning/saving potential of commodities or activities. Its key contribution to policy analysis is to identify efficient activities and provide additional information to the decision making process.

key words: *relative efficiency, comparative advantage, competitiveness, opportunity cost, shadow value, value-added, border prices, domestic resource cost.*

Introduction

In the 1980s, there was an upsurge of interest in the commercialization of non-traditional (fresh tropical fruits/vegetables) commodities among Caribbean countries. This interest was spawned by the need to diversify the agricultural sector in order to stimulate employment and income through trade-induced growth. The erosion of preferential market access for bananas, nutmeg and spices and, to a lesser degree, sugar and citrus, intensified the search for commodities with competitive potential in domestic, intra-regional and international markets. The process of ex-ante commodity identification and the criteria for commodity selection featured prominently in this search. Experience has shown that many of the agricultural diversification initiatives undertaken have met with limited success. While export market signals for these commodities may have been favourable, the level and extent of their ability to generate net foreign exchange earnings was largely unknown. Such information may be gleaned from the DRC measure which has been applied since the 1950s in developed and developing countries to measure the relative desirability of export-promoting or import-substituting projects/initiatives.

Selecting Agricultural Alternatives - The Method

Selection of economic alternatives should be guided by the traditional Heckscher-Ohlin theory of comparative advantage. According to the theory, a country's trade structure is biased in favour of those products which use more of factors/resources in relative abundance. In the Caribbean, these factors traditionally refer to land, labour and capital (technology) but more recently, factors such as finance, management and entrepreneurial culture have also become important. An assessment of the comparative and/or competitive advantage of commodities with respect to traditional and newly emerging factors is critical in identifying those

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commodities which possess the greatest possibilities for expanded production and trade.

> *Gains from trade follow from comparative/ competitive advantage. The theory illustrates that even if countries are inefficient in the production of all commodities, they can expect to gain from international competition. If countries specialise according to their comparative advantage, they can prosper through trade regardless of how inefficient, in absolute terms, they may be in their chosen specialty.*°
>
> °Ref: The Economist, Jan/Feb 1996

According to Barkema, Drabenstott and Tweeten (1990), while comparative advantage applies to a world of efficient, undistorted markets, competitiveness applies to the world as it actually is (with inefficiency and distortions)[1]. Comparative and/or competitive advantage may be measured at the international or national level. For the former, the efficiency of production is compared between two or more trading countries and the country with the lowest opportunity costs, or the most efficient production structure in relation to other producers is said to possess a comparative advantage. At the country level, the same argument may be applied to the assessment of competitive advantage except that the firms/industries become the unit of observation.

Given the prevailing world prices of the output and related inputs, all things being equal, firms/industries with the lowest opportunity costs are more likely to be internationally competitive. The analysis of the competitive advantage of competing commodities may be compared in terms of their ability to earn/save a unit of foreign exchange.

While governments are concerned with other macro-economic objectives such as employment generation, growth and development of highly open economies will depend critically on international trade and the ability to earn foreign exchange to pay for imports. Given the concern of many Caribbean countries with balance of payment problems, assessing net foreign exchange earning capabilities of exports is a most important consideration.

Commodity Viability

A suggested major criteria for the production of the commodities targeted under the various diversification programmes is the ability of these commodities to earn or save foreign exchange. The determination of the viability of an activity and the costs to the economy of earning or saving foreign exchange through its introduction or expansion should, therefore, constitute a critical consideration in the commodity selection process.

Conventional measures used in Project Analysis to determine which commodity to promote/discourage among various alternatives include:

- Net Present Worth
- Internal Rate of Return
- Benefit-Cost Ratio

These measures provide a quantifiable basis upon which activities/projects may be ranked based on their capacity to contribute to the development of the economy. They do not, however, provide a measure of the costs to the economy (in domestic currency) of earning/saving a unit of foreign exchange. While several measures based on financial analysis provide an indication of private profitabiity, their failure to account for factor market distortions or social costs, results in their unsuitability for analysis of competitiveness. The determination of the cost of earning/saving foreign exchange is essential to the assessment of commodity competitiveness. The DRC is a static, social cost-benefit measure of the efficiency of domestic production as an export or as an import-substitute. The DRC is not a competing but a complementary measure that takes into consideration the effects of the external economy on the viability of proposed activity/project.

Domestic Resource Cost

The DRC is a measure of the value of domestic resources required in order to earn one dollar's worth of foreign exchange. The DRC is measured as the sum of domestic resources and non-traded inputs valued at their opportunity costs or shadow price (D) divided by the net international value-added (IVA). IVA is measured as the world [border (B) price of the commodity minus the cost of imported/traded inputs used in its production (C)]. Unlike category D, inputs in category C are valued at

world prices which are adjusted for all market distortions. Whether a commodity is imported or exported affects the adjustment of the border price.

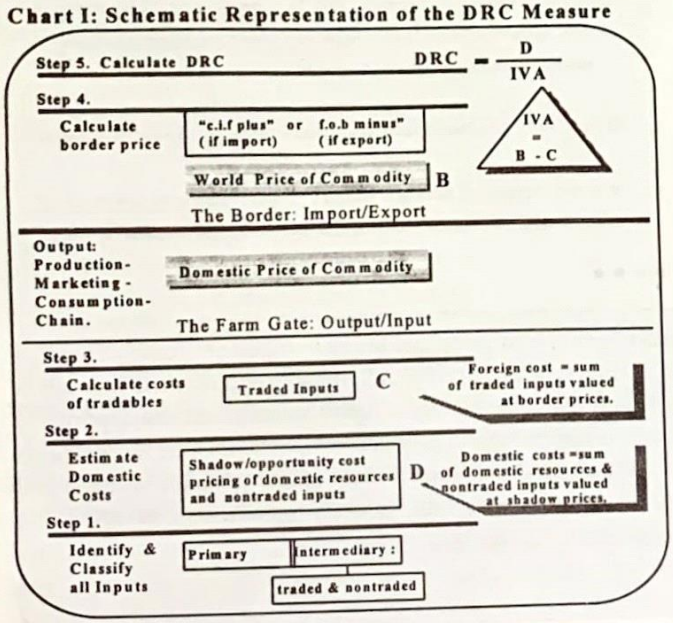
$$DRC = D/IVA$$

Since foreign exchange costs are subtracted from the value of production, the DRC therefore measures the efficiency with which foreign exchange can be saved or earned in a particular production process.

Measuring of the DRC requires micro level data obtained through detailed costs of production budgets which account for and classify input costs according to origin. Structuring meaningful DRCs requires a solid grasp of the technologies used, the cost breakdown and the disaggregation of the production structure into either primary factors (domestic resources) and intermediary inputs, which are further subdivided into groups of traded and non-traded.

Proper application of the DRC measure also requires a knowledge of alternative markets for inputs, foreign exchange markets and options available to the economy including the world market price of all goods (assumed to be exogenous). The relevance of the world price as an efficiency benchmark is not dependent on the competitiveness of world markets since regardless of how world market prices are determined, they represent what the country would have to pay or would receive when trading internationally. In this regard, therefore, the DRC provides a measure of one country's ability to compete under prevailing world prices. Chart I provides a schematic diagram of the important analytical steps in measuring the DRC.

Chart I: Schematic Representation of the DRC Measure



Interpreting the DRC:

A DRC ratio which lies between 0 and 1 implies that the activity is either (a) a net earner/saver of foreign exchange, or (b) can compete with other domestic activities for resources. A DRC ratio which is greater than 1 is indicative of inefficiencies at some stage of the production process, since the cost of the activity exceeds the gains or savings in terms of foreign exchange earnings. Ranking of activities/commodities based on DRC results is done according to the relative position of the ratio vis-a-vis other activity/commodity ratios, i.e. the DRC for commodity 'A' relative the DRC for all the other commodity DRCs. Thus in interpreting the DRC, comparisons based on the absolute value of the DRC are meaningless.

Application of the DRC in the Caribbean

One of the first detailed application of the DRC in the Caribbean was in the joint OECS/ADCU-IICA study of competitiveness of the non-traditional agricultural sector in the OECS. The study assessed the relative efficiency and foreign exchange earning capabilities of 31 commodities across 8 OECS territories on the basis of prevailing prices, costs, agricultural policies, market conditions and production technology. The resulting DRC values were used as one of the indicators of commodity competitiveness.The study indicated however that before a final determination of competitiveness could be made, several non-quantitative factors (such as economic infrastructure - cold storage facilities, transportation networks, credit, market information systems, and operating infrastructure) which also impact industry/commodity ability to compete would have to be incorporated into the analysis. Taking these into consideration, the study concluded that OECS countries in general, possessed a strong competitive advantage in the production of certain tropical fruits, root crops and tubers. The results for cut flowers and temperate vegetables were however less encouraging. Of equal importance was the study's finding that the competitive advantage which existed varied both across countries and commodities.

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That the OECS/ADCU-IICA study cautions against the use of the results as the sole basis for encouraging or discouraging non-traditional crop production is of major significance. Other studies have utilized the DRC criteria as the only measure of competitiveness. The lack of incorporation of distortions arising from foreign exchange markets and non-quantitative factors into such analyses has been a major failing of these studies. One should also consider whether the cost or benefit identified is supportive of broader development objectives and within this expanded context, whether sufficient grounds exist for maintaining or modifying the activity. By considering social and private costs, as well as the effects of market distortions, the DRC-based economic analysis makes the opportunity costs of such modifications more transparent. In this regard, the study provided a strong objective base for policy evaluation of commodities under agricultural diversification programmes in the OECS.

Summary and Conclusions

Application of the DRC measure is useful in placing in proper context the expectations of Caribbean countries regarding their ability to participate meaningfully in international markets. Unlike other measures, incorporating world markets into the DRC analysis provides useful insights into critical areas, such as, market potential and competition. Even under the assumption of price-taking behaviour on the part of Caribbean country producers, domestic firms and industries can benefit by improving their analysis of market opportunities. For markets where increased competition is evident, the pursuit of product differentiation and niche (boutique) marketing to increase producer returns continues to be a viable strategy.[2] Successful product differentiation has been developed for Jamaican coffee, Caribbean rums and liqueurs and New Zealand kiwi fruit, to cite a few cases.

At the macro and meso levels, the DRC measure underscores the critical importance of exchange rates and the efficacy of policies aimed at taxing or subsidizing the agricultural sector. The work undertaken in the OECS and its subsequent extension to include the case of cherries in Barbados, highlights the fact that producer returns will vary vastly by country as well as by farm-size and technology differences.[3] This work also indicated that marketing infrastructure and operating institutions may alter a firm's competitiveness by acting through marketing and distribution costs. In general, while labour cost was found to be a factor impacting competitiveness, labour market sensitivity analysis could provide no support for the view that wage rates were a major inhibitor of agri-food competitiveness.

The application of DRC as one criteria for the prioritization of diversification alternatives suggests the need to reinforce the process of policy reforms which have begun to unfold among Caribbean countries. Finally, the analysis suggests that far too often the type of interventions necessary to improve agri-food competitiveness are in fact quite basic in nature, such as, the application of proper varietal selection (passion fruit, ornamentals), production technology (vegetables), post-harvest practices (golden apple) and marketing principles (virtually all commodities studied). DRCs provide a reference base from which the costs/returns of actions aimed at addressing these various shortcomings can be measured in terms of their impact on the overall competitiveness of agri-food commodities.

1. Barkema, A., Drabenstott, M., Tweeten, L.. 1990. The Competitiveness of US Agriculture in the 1990s. Agricultural Policies - a New Decade. ed. Kristen Allen. Resources for the Future and National Planning Association. Washington, DC.

2. Reyes, A.. 1994. "A Roadbed for Jamaica's Agricultural Export Development" IICA/Jamaica.

3. IICA. 1996. "Competitive Potential of Selected Caribbean Tropical products in the US and regional markets. Third Regional Workshop on Tropical Fruits, IICA in Trinidad & Tobago.

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A productive agriculture offers many benefits: food for local consumption; raw materials for agro-industries; employment that generates income, which in turn encourages other industrial, commercial and service activities; export markets that can be identified and met to generate hard currency. The national economy also benefits from import substitution and opportunities for increased taxation. BUt for agriculture to be productive it is not enough to produce, products must be marketed. Farmers have to learn the hard lesson that it is no longer enough to expect production to drive the market; success will come from producing what the market demands. Policy-makers and planners need to accept that farmers and others in the agricultural production chain can only work within the frmework of the policies that they put in place.

Source: SPORE, No. 61 February 1996.

The Critical Role of Agriculture in Feeding and Employment Generation

Dr Reeza Mohammed, Minister of Agriculture, Land and Marine Resources, Trinidad & Tobago

The world's population has been rapidly increasing, especially over the last 3 decades. It is estimated that at the present rate of growth, the world's population will increase from the present 6 billion to 10 billion by the end of the 21st century. Already, there exists a grave situation in which millions of the world's population are inadequately fed, especially in terms of the quality of available foods. Food nutrition, in addition to food availability, is a major crisis for food policy-makers. As a result of these developments, the devastating spectacle of mass starvation and death in certain parts of the world is quite familiar to the world community.

The major challenge facing food policy-makers at this time is to buttress the global supply and demand for food in a changing world environment, where the pressures are not only on the price of food, but also on prices for agricultural inputs, such as, land, labour and technology. Notwithstanding these pressures on the food availability equation, other major factors impacting on the food availability, namely:-

a. extreme and unusual weather conditions world-wide: floods, drought, extreme heat and winter conditions;

b. new entrants on the demand side in the world food markets;

c. global trade reform/liberation;

d. new pest and disease problems, especially in the developing regions;

e. meeting the challenges of maintaining the sustainability of the natural resource base and sustainable development generally.

All these changes have grave implications for agriculture worldwide and, more specifically, in Trinidad and Tobago and the wider Caribbean. For example, trade reform no doubt provides certain threats for food security and availability, as is the case currently confronting Caribbean banana producers, with respect to the special arrangements in the European Community for ACP producers and the Latin American banana producers who are aggressively seeking to gain access to the European Community markets. Unless Caribbean banana producers are able to protect their market share, they may well find that the regional industry could experience serious decline.


DR REEZA MOHAMMED

On the other side however trade reform may also result in expanding opportunities for certain Caribbean exports. The entry of Portugal into the European Community has meant increased quota allocations for Caribbean sugar. These changes all tend to put upward pressures on world prices and food availability.

Trade liberalization also provides opportunities for Caribbean producers and, in particular, relatively high cost Trinidad and Tobago producers, to address their competitiveness.

In this regard, the agriculture sector is expected to play an increasingly more important role in the provision of an adequate food supply (both quality and quantity) to a rapidly increasing world population, the generation of employment opportunities and development of rural communities. This is especially so in other Caribbean states which do not possess abundant natural resources, high levels of energy reserves and strong industrial and manufacturing sectors.

In recognition of the foregoing, the Government of the Republic of Trinidad and Tobago (GORTT), through the Ministry of Agriculture, Land and Marine Resources (MALMR) has formulated, and is presently implementing, an agricultural development policy which seeks to place agriculture in a pivotal role in the development of the national economy. Special emphasis is placed on:

a. the provision of adequate food supplies at affordable prices to the national community as a whole but more specifically, to the poorer segments of the community;

b. providing appropriate employment opportunities within the rural communities with a view to enhancing integrated rural development; and

c. achieving some measure of food security in the uncertain world food supply environment, especially where access is becoming less certain.

In an effort to attain these policy objectives, several strategies have been formulated by the MALMR, which is spearheading the implementation.

Some of the major components of the strategic programme are:

1. Land

GORTT has strengthened its programme of land distribution. It is envisaged that within the next 3 years, approximately 6,000 acres of arable land will be made available to farmers in an effort to radically boost the present level of food production.

2. Education and Training

A programme is in place to provide education and training from primary to the tertiary levels. The focus is now shifted to provide for graduates from the system to gainfully engage in farming. Additionally, intensive training is provided for farmers at the MALMR's Farmers Training Centre in Centeno.

3. Markets and Marketing

The critical role of the provision of markets and marketing information in the overall development strategy has long been recognized. Consequently, the policy seeks to provide timely and relevant market information to the domestic farming community. The development of a capability in market intelligence, especially in the foreign markets, is critical in developing new opportunities for local exporters. Additionally, the provision of adequate marketing facilities for farmers' produce is also necessary.

4. Credit

The Agricultural Development Bank (ADB) provides credit to the agricultural community on relatively favourable terms and conditions for investments. Agro-processing and fisheries enterprises are also supported through this facility.

5. Research and Development

An on-going programme of relevant research and development is indispensable, if the sector is to continue expanding production and enhancing its competitiveness both in the domestic and foreign markets.

6. Extension

Appropriate technology from the researchers to the farming community is accomplished mainly through a programme of extension services which also provides for transmission of problems being experienced by domestic producers to the researchers.

7. Infrastructure

Support is provided to farmers mainly in the areas of access road development and maintenance, as well as, water management systems. It is recognized that a lack of adequate irrigation and drainage infrastructure is a major impediment to productive year round farming.

8. Institutional Collaboration

Emphasis is being placed on the formation and revitalization of agriculture cooperatives in an attempt to harness and share the scarce available resources. The MALMR supports and collaborates with these producers' groups in planning for the development of the sector.

The MALMR also actively cooperates with regional organizations especially CARICOM. The Standing Committee of the Ministers of Agriculture is a major forum for collaboration and coordination of agricultural developmental policies and efforts among the member states of the region.

This Ministry also works actively with international organizations such as the Inter-American Development Bank (IADB), the Food and Agricultural Organization (FAO) and the Inter-American Institute for Cooperation in Agriculture (IICA). These organizations provide technical, as well as, financial support to the sector.

The Ministry also collaborates with regional and local organizations, such as, the University of the West Indies (UWI), Caribbean Agriculture Research & Development Institute (CARDI) and Caribbean Industrial Research Institute (CARIRI), mainly in the development of appropriate technology for transfer to the farming community.

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9. Youth in Agriculture

The GORTT is seeking, through the MALMR, to encourage the entry of young people into the agricultural sector as effective business men and women. Eligible youths will be given special consideration with respect to availability of land, training, credit and technical support in order to facilitate their efforts at becoming successful entrepreneurs.

10. Gender Sensitivity

The provision for equity and fairness in the distribution and control of available resources and the benefits to be gained in exploiting the use of these resources is uppermost in the policy framework of the Ministry.

11. Incentives

MALMR continues to provide direct support to certain sub-sectors in the form of subsidies in order to encourage continued production of strategic commodities. At the same time, it is recognized that under the new global conditions, especially the requirements of trade liberalization, direct subsidization will be reduced and/or eliminated. Notwithstanding this fact, GORTT has recognized that it is imperative that domestic producers be provided with the necessary opportunity to acquire new technology and adopt other advanced methods to reduce their costs of production levels, which will allow their operations to be viable without external support.

12. Sustainability

Measures have been adopted to protect the environment with special emphasis on sensitive areas such as watersheds and wetlands. In utilizing available resources, farmers are being sensitized to the need for employing sustainable methods of exploitation for the national benefit and that of its progeny.

MALMR in articulating its leading role in the development of agricultural policies, recognises the important roles of all other stakeholders - public, private, local, regional and international - which operate within or impact on the sector. These actors are equal partners in the agricultural development effort.

Conclusion:

The roles of the partners must be given every opportunity to contribute in the global effort, so that the agricultural sector can continue to expand its roles and provide adequate supplies of nutritious food and employment opportunities for the local population in particular, and the world, in general.

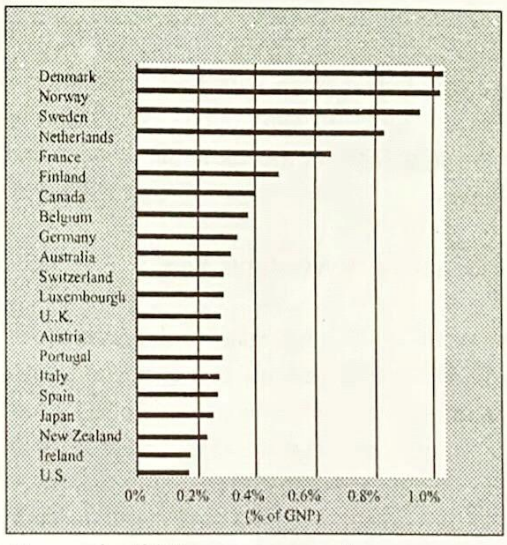
International Assistance - Myths and Realities

Myth: *Even with recent reductions, the United States remains the most generous nation in the world when it comes to foreign aid.*

Reality: *In total dollars, the US ranks second to Japan in foreign economic and development assistance. But in terms of its gross national product (GNP) allocated for foreign aid, the US ranks last among 21 industrialized nations. The average American taxpayer spends less than 16 cents a day in federal taxes on AID's humanitarian and development programs.*

Myth: *Foreign aid is a welfare give-away program. Once on the dole, developing nations remain on it forever.*

Reality: *Since 1962, more than two dozen countries - from Botswana to Uruguay - have graduated from foreign aid assistance programs and become US trading partners. One prominent example is South Korea, which currently imports three times as much in US goods each year as it received in US aid during the entire decade of the 1960s.*



Economic Aid Donors compared
(1993 Disbursements as a % of GNP)

Extracted from: Cooperative News International. Volume 8/No.3/1995

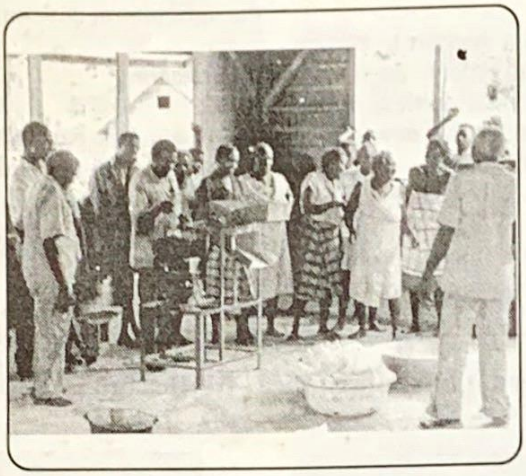
SUSTAINABLE RURAL DEVELOPMENT

Women's Role in Food Security

Women in developing countries play significant roles in maintaining the **three pillars of food security** *food production*, *economic access to available food* and *nutritional security*. But they play these roles in the face of enormous social, cultural and economic constraints. *Women: The Key to Food Security*, a new International Food Policy Research Institute (IFPRI) Report, brings together the evidence on women's work in ensuring food security and examines ways to enhance women's ability to fulfill these roles.

Food Production:

According to authors, Agnes R. Quisumbing, Lynn R Brown, Hilary Sims Feldstein, Lawrence Haddad and Christine Pena, women account for 70 to 80% of household food production in sub-Saharan Africa, 65% in Asia and 45% in Latin America and the Caribbean, despite unequal access to land, credit, information and inputs such as improved seeds and fertilizer. Given equal access to resources and human capital, women farmers can achieve yields equal to or even significantly higher than those of men. Providing women with basic education would also help raise agricultural productivity and incomes, for better educated farmers are more likely to adopt new technologies.



Economic Access to Available Food:

In recent years, studies have shown that women, relative to men, tend to spend their income disproportionately on food for the family. Moreover, women's incomes are more strongly associated with improvements in children's health and nutritional status than are men's incomes. Poverty is a major threat to household food security and the combination of poverty and gender inequality poses an even greater threat because of the positive nutritional outcomes associated with increasing women's incomes. Women therefore require improved access to education and other resources that tend to raise income levels.

Nutritional Security:

The achievement of nutrition security entails assuring adequate protein, energy, micronutrients and minerals for all household members. Nutrition security depends not only on sufficient food for the household but also on factors, such as, health and child care, access to clean water and sanitation, and the nutrition status of mothers. Ensuring the nutrition security of the household is almost the exclusive domain of women. Nearly all nonfood inputs into nutrition require time investments and in general, the report shows these investments are made by women. Development of technology that relieves women's time burdens in agricultural production and household maintenance without sacrificing their ability to earn independent incomes is critical.

Conclusion:

By pursuing policies that will allow women to fulfill their potential in generating food security, the report concludes national governments and international organizations can tap an important source of agricultural growth to help meet the needs of the world's 800 million food-insecure people.

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