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# The Quest for Increased Food Production in the Caribbean

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The issue of economic incentives and improved technology for increasing small farmers' food production has dominated the small farming systems in the developing world.

However, the agricultural policies for small farmers encounter priority problems in the form of major constraints on food production. The question is either to: (1) concentrate on increased output prices and input subsidies, or (2) replace crude tool technology (hand hoe, bush machete, etc.) with bottleneck-breaking technology in order to increase small farmers' food production.

Recommendations favor increased output prices to increase food production. In labor surplus, hand hoe technology-

oriented economies, prices paid to food producers affect output up to a level dictated by physical and technical factors. Crude tool technology creates physical constraints upon the supply of food and limits the production capacity.

A study using linear programming indicated little or no additional food production is likely to be forthcoming due to labor shortages for key activities during crop year, e.g., weeding, harvesting, etc. In order to obtain sustained increases in food production, it is necessary to introduce bottleneck-breaking technology that performs better than crude tool technology now being used. This should precede the other policies to ensure increased levels of food production.

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The need to increase food production in the Caribbean countries is obvious. The area has an average annual per capita food import bill of US\$200 and only 56% of the population receives the internationally recommended minimum daily level of protein intake. In 1980 the regional food imports were estimated at US\$700 million (Coutier, 1983). Clearly, inadequate food production is a major problem for the area.

The question faced by many developing regions, including this one, is how to effectively increase food output. Some economists advocate increasing prices to provide farmers with additional incentives. Others maintain that the most efficient procedure is to provide subsidies to increase the use of purchased inputs. Still other authorities contend that research must be undertaken to identify more efficient methods of production. Suffice it to say, the alternatives are numerous. The choice among them is not obvious.

## Farming Systems in Relation to Government Agricultural Policies

The so-called "farming systems" approach is basically oriented to the needs of small, peasant farmers. The social and economic environment of small, peasant farmers is characterized by insufficient resources at their command, *i.e.*, a limited supply of land, capital and technical knowledge. Frequently they are trapped in a circle of poverty. Further, malnutrition, hunger and—at times—famine characterize their circumstances. Different sets of agricultural policies have been formulated in an attempt to help small farmers increase their level of food crop production. However, these policies must deal with the problem of priorities, *i.e.*, output price supports versus input subsidies versus improved technology.

## A Methodological Approach to the Problem

A study, representative of Caribbean traditional farming conditions, undertaken with actual data from an African country, was done to determine the impact of increased producer prices, reduced input costs, and improved technology on increasing food crop production from the small farm agricultural sector (Kigoda, 1984).

A linear programming model of an entire region was used on a comparative basis between the existing production conditions and improved production conditions. Existing production conditions were used as a proxy for traditional agriculture commonly used by peasant producers. Traditional agricultural conditions distinguish themselves from improved ones in the sense that the latter utilizes a wide range of inputs, many of which are highly complementary to each other. These include not only conventional inputs such as land, labor and certain forms of capital but also other complementary inputs less conventionally noted by agricultural economists and policy makers. These are largely of a technical, educational and institutional sort (Mellor, 1962). Improved production conditions in the study, therefore, represented technology that had been determined to be physically possible in research trials for the region under study. It was assumed to be profitable, but as yet had not been adapted by food producers. The analysis was designed to determine:

1. How efficiently the region used resources given the existing conditions, and
2. Whether existing production resources can produce more output in response to the policy alternative considered, assuming farmers are profit maximizers.

Parametric programming, a post optimal analysis, was used to see the impact of increased prices above the current price levels paid to small food producers. The analysis also was used to see the impact of reduced input costs (a subsidy) on increasing food production.

### **Discussion of the Set of Agricultural Policies: Increased Output Prices, Reduced Input Costs and Improved Technology**

Among the different types of agricultural policies, agricultural economists and government policy makers have most consistently recommended increases in output prices for small food producers in order to stimulate an increased level of food production. This has been given first priority in most cases. At times the results have been disappointing. While price incentives appear to be necessary, they do not appear to be sufficient for eliciting additional production.

The regional analysis revealed some interesting results and suggests some priorities for stimulating food production. Increased prices paid to small food crop farmers affect total output only up to a level dictated by physical and technical constraints. That is, there is a limit to the extent to which higher output prices will stimulate additional production. The crude tool technology which has been passed from generation to generation (use of hand hoe, machetes) in the traditional setting, creates a major physical constraint upon the supply responsiveness of food crop producers and limits their production capacity. The most common bottlenecks of land preparation, weeding and harvesting have always translated into incomplete task performance, poor seedbed preparation, a physical burden to producers solely dependent on hand labor, and low food productivity for small farmers. Ironically, labor bottlenecks, given crude tool technology, constrain the supply responsiveness of farmers in some so-called labor surplus economies.

The combination of hand labor and rudimentary tools constrains the responsiveness of small farmers to price increases. Hence, high priority needs to be given to breaking the labor/technology bottleneck in a development strategy. Price policy alone will not suffice.

Reduced input costs in the form of subsidies will have substantial long term benefits given the extent and the level of farm implements used in farming operations. To the extent that the access to improved farm implements can be significantly improved, greater input availability and price incentives may facilitate increased food production among small farmers.

### **Conclusion and Recommendations**

The study has indicated that little or no additional food production is likely to be forthcoming in the short run due to labor (farm energy) shortages for key activities during the crop year in

some food crop producing regions. Due to the traditional nature of small food crop producers and the environment in which they work, there is no single policy which is necessary and sufficient to bring about increased food production. However, a strategized approach toward sustained increases in food production from small farmers should focus on the introduction of bottleneck-breaking technology which will perform better than the crude tool technology now being used in much of traditional agriculture. The dominant use of hand labor as a source of farm energy via the hand hoe, bush knife, etc., indicates the need for small scale, hand operated, power driven farm implements. Among other countries, South Korea has made rapid strides with this approach (Chung, 1983). Only after doing this will increased output prices and reduced input costs have dramatic impacts on the level of food production from the rural agricultural sector. A similar approach is likely to be necessary in implementing agricultural policies affecting the small farming systems in the Caribbean countries. That is to say, other policies probably should be preceded by improved, bottleneck-breaking technology. Continual neglect of this major constraint, to the extent it exists in the food crop subsector of the Caribbean as it does in the African country analyzed, will limit development. The other policies which require attention in formulating a development strategy include such things as input procurement, institution building, marketing and storage, natural resource use, education and communications, physical infrastructure, population growth, and the overall question of rural employment.

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### **References**

1. Chung, M.N. 1983. Review of Korean small farm economy with special emphasis on farm size questions. Ph.D. dissertation presented to the Graduate School, University of Missouri, Columbia, MO.
2. Courier. May-June, 1983. The Caribbean Food Corporation. Africa-Caribbean-Pacific European Community, Vol. 79.
3. Kigoda, M.A. 1984. Incentives for food crop production in Tanzania: with special reference to the Mbeya Region. Ph.D. dissertation presented to the Graduate School, University of Missouri, Columbia, MO.
4. Mellor, J.W. 1962. The process of agricultural development in low income countries. *Journal of Farm Economics* XLIV(3).