

PDWAE328

December 10, 1984

MEMORANDUM

TO: See Distribution  
FROM: Nicolaas Luykx *Nicolaas Luykx*  
SUBJECT: Cooperative Agreement with Caribbean Food and Nutrition Institute

The Caribbean Food and Nutrition Institute (CFNI) is conducting a research project entitled, "Food Price Subsidy and Market Analysis in Antigua and St. Vincent" which S&T/Nutrition is partially funding. The research focuses on food price and subsidy policies and practices and their impact on agricultural production, marketing, food consumption and ultimately nutrition and health status.

Dr. Benjamin Senauer (International Food Policy Research Institute and University of Minnesota) visited CFNI in Trinidad to review the status of the project and recommend changes in focus and analytical techniques.

Dr. Senauer will hold a debriefing on the status of the Cooperative Agreement with the Caribbean Food and Nutrition Institute (CFNI) on December 17, 1984 from 1:00 to 3:00 p.m. in Room 520 - SA-18. Please call me at 235-9062 if you would like a copy of Senauer's report or any background information.

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AN EVALUATION OF CFNI'S RESEARCH PROJECT ON FOOD  
MARKETING SYSTEMS IN ANTIGUA AND ST. VINCENT

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April 1984

2

AN EVALUATION OF CFNI'S RESEARCH PROJECT ON FOOD  
MARKETING SYSTEMS IN ANTIGUA AND ST. VINCENT

I. BASIS OF THIS EVALUATION

A. The following project documents were studied:

1. Project proposal - "Proposal for Assistance to Conduct Research in Food Marketing" by CFNI, October 1982.
2. Progress report - "Progress Report on Food Price, Subsidy and Market Analysis (Antigua, St. Vincent)," December 1983.
3. Project review paper presented at CFNI Staff Meeting - "Markets, Prices, and Nutrition," by Curtis McIntosh, April 1984.

B. Other research studies on the Consumption Effects of Agricultural Policies (CEAP) and papers presented at the Mid-Project Workshop on CEAP, November 7-10, 1983.

C. Visit to the Caribbean Food and Nutrition Institute, Kingston, Jamaica and discussions with Dr. Curtis McIntosh, principal investigator and Dr. A. W. Patterson, Director of CFNI, April 11-14, 1984.

II. EVALUATION OF THE OVERALL PROJECT

The overall project can be divided into five major objectives:

- (i) A description of the available data on the food system in each country (i.e., production, imports, and prices, etc.) for the 1960's to the present, with particular attention being given to the food policies and programs;
- (ii) A farm production and marketing analysis, which will especially focus on the effect of the various input subsidies on the farms interviewed;

- (iii) An analysis of the structure, conduct, and performance of the marketing system based on a survey of households/firms involved in food marketing;
- (iv) An analysis of individual food consumption and nutrient intake for calories and protein;
- (v) The development of alternative policies, particularly ones which would improve the diets of low-income people.

One's first reaction to this list of objectives is that it sounds extremely ambitious for a two-year project with only one major investigator. In addition, at this point the project has been underway for over a year. The anticipated completion date is February or March 1985, so there is less than one year to accomplish a great deal. However, this first reaction should be tempered by some further considerations. In particular, these are small countries which are being dealt with in this project. Antigua has a population of approximately 75,000 and St. Vincent about 110,000. Because of their small size one cannot reasonably expect a series of different research projects which would cover each of the above objectives separately to be carried out in these countries.

When analyzing some aspect of the food system and policies of a larger country, there is usually a base of previous research to build on and the expectations that other research projects will follow the current one. These assumptions are unlikely to hold true for these micro countries. The amount of resources, both time and money, which can and will be devoted to research on the food system and policies is a function of the country's size. More specifically,

4

CFNI covers some 16 or 17 Caribbean nations and needs to distribute its activities. Therefore, the broad focus of this project can be defended on the grounds that if the research is not conducted in this project, it may be years before it is conducted. In that case, food and nutrition policy in Antigua and St. Vincent will be formulated largely devoid of a sound knowledge concerning the food system.

Data are being collected using three basic questionnaires, which are related:

- (i) production and marketing activities of farm households,
- (ii) marketing activities of vendors and firms,
- (iii) family data and an individual 24-hour dietary recall.

The following groups are being surveyed, with the sample size for each country indicated after each:

- (i) farmers - 80
  - (ii) consumers (not in other groups) - 50
  - (iii) food shops - 60
  - (iv) food importers-wholesalers - 15
  - (v) supermarkets - 15
  - (vi) butchers - 15
  - (vii) vendors-higglers - 30
  - (viii) fishermen - 40
- Total = 305

The surveys are currently underway and should be completed in May. Therefore, there is really no opportunity to introduce any modifications in this aspect of the project. An impressive amount of groundwork was laid for the surveys. The principal investigator has worked on publicizing the project and surveys, and their importance, in each country. Six surveyors, who have been trained, are

5

involved in each country. The questionnaires appear to be well set up for easy coding and computer entry. One concern, though, is that some of the questions deal with quite sensitive topics regarding the detailed financial aspects of the farm or marketing operation. Respondents could prove less cooperative on these questions.

### III. CONSUMPTION PORTION OF THE PROJECT

The data base for the food consumption portion of the project will be the 24-hour dietary recall data collected for one individual in each household interviewed. If there is a child younger than five but not an infant in the household, the 24-hour recall data will be collected for that child. If there is not a child under five, someone else in the household will be selected.

In many ways it would be desirable to have food intake for every individual in the family or household food consumption or expenditure data, but since the survey is underway a change cannot be made. The principal investigator indicated that if he were to be asked now to collect household food consumption data, he would want to conduct the work on another island(s). There is, however, another possibility if more extensive food consumption data are believed to be necessary. A Food and Nutrition Survey was collected in Antigua in 1981. Curtis McIntosh, the principal investigator of this project, was involved in that survey. In addition, Peter Judson, who is on the staff of CFNI in Kingston, is now working with this data getting it ready for analysis.

This Food and Nutrition Survey collected data from 298 households in Antigua, plus an additional 28 households in Barbuda. Data on the

6

characteristics of the household and anthropometric data for the individuals were gathered. In addition, 24-hour food intake recall data were collected for individuals less than five and the whole household.

The principal investigator and myself discussed at considerable length the analytical techniques to be used in the food consumption/nutrition portion of the project. I laid out the following broad classification of techniques for consumption analysis:

- (i) Descriptive analysis: relate socioeconomic characteristics and food consumption and nutrient intake, particularly using tables and figures;
- (ii) Traditional cross-section analysis: standard Engel function analysis, including the estimation of income elasticities and family size elasticities;
- (iii) Estimation of time-series demand functions: possibly using a complete demand system;
- (iv) Disaggregated cross-section analysis: the estimation, in particular, of income and price elasticities by income strata.

Although the techniques are unsophisticated, analytical categories (i) and (ii) can still provide some very useful results. An important use of the results of the consumption portion of the project could be for planning purposes. One would like to be able to project changes in the pattern of food consumption given certain income and demographic changes. The necessary basis for such projections could come largely from (i) and (ii).

Under category (iii), the principal investigator indicated that the time-series data are probably quite unreliable. He also indicated

that he is considering using a Linear Expenditure System to estimate demand functions. I discouraged this approach. If the data are unreliable, then one should be very cautious in the utilization of sophisticated demand systems.

Although category (iv) may be beyond the scope of this project, I stressed the usefulness of having income and price elasticities by income strata for assessing the consumption and nutrition effects of policies. Many policies in market economies transmit their effect via commodity prices and one is particularly interested in the effect of policies on the lower-income strata, where the serious nutritional problems are concentrated.

Previous disaggregated consumption analyses have relied on either sophisticated but highly restricted models such as the Frisch methodology or modifications of the Linear Expenditure System, or on the innate variation in prices in the cross-section data because of time and/or space differences. The former approach is really too ambitious for this project, plus these models make the assumption of strongly separable utility functions. This assumption implies that the marginal utility of one good is unaffected by the consumption of any other good, which is certainly unrealistic for specific food items. With regard to the latter approach, the islands involved are too small and the survey period too short to observe actual price variation. However, there may be some difference in prices between the two countries which could be used for analysis.

A technique for approximating the disaggregated price elasticities was outlined for the principal investigator. This approach is suggested in C. Peter Timmer, Walter Falcon, and Scott Pearson, Food

8

Policy Analysis, World Bank, Johns Hopkins University Press, 1983.

In fact, this book was highly recommended to the principal investigator. The suggestion builds on the Slutsky equation which can be specified in elasticity form as:

$$e_{ij} = \epsilon_{ij} - \alpha_j E_i$$

where  $e_{ij}$  is the overall demand elasticity for commodity  $i$  when the price of commodity  $j$  changes,  $\epsilon_{ij}$  is the pure substitution elasticity,  $\alpha_j$  is the budget share, and  $E_i$  is the income elasticity.

Both the budget share and income elasticity by income strata can be obtained by traditional techniques of cross-section analysis. In the case of the own-price effect, in which  $i=j$ , we know that  $\epsilon_{ii}$  is negative. For basic food commodities, both the budget share and income elasticity tend to decrease as income rises, because of Engel's Law. Therefore, even if  $\epsilon_{ii}$  is constant across income classes, the overall price elasticity ( $e_{ii}$ ) will decrease in absolute terms (the negative number will become smaller) as one goes from lower to higher income strata. Timmer goes further though and indicates that previous empirical studies suggest that the pure substitution elasticity ( $\epsilon_{ii}$ ) tends to decline in absolute size as income rises at about half the rate of decline in the income elasticity for that commodity.

The core of the consumption analysis proposed in this project is indicated on p. 18 of "Markets, Prices, and Nutrition," by Curtis McIntosh. He proposes to specify regression equations with individual calorie intake as the dependent variable and household income, the cost of calories consumed, family size, sex of the head of household,

education of the head, residential status -- rural or urban, farm or non-farm, and age, weight, and height of the individual as explanatory variables. Since individual food intake data are being collected, such a specification is required, rather than a more typical specification which relates household food consumption or expenditure to household characteristics.

Another equation would also be estimated for protein intake. In addition, it was suggested to the principal investigator that additional regressions be estimated for the major food commodities. The commodity categories need to be very aggregate and cover just the basic staples, though. Otherwise, there is a problem of excessive zero-dependent variable observations, because that food was not consumed by the individual in the 24-hour period, which implies a truncated error distribution.

The use of the cost of calories as an explanatory variable in the calories equation is questionable. Since the price paid per calorie is a choice variable and not a given, it should not be thought of in normal price effect terms. In particular, in poor households in which calorie intake is low, the price paid per calorie is also low, so the relationship is a positive one, rather than the normal negative own price effect.

Furthermore, price of calories is really endogenous. There is, in a sense, a missing equation which would specify cost of calories as a function of such factors as household income and the level of calorie intake. Therefore, the calorie and protein intake equations which are proposed raise the issue of simultaneous equation bias, with price of calories and protein as explanatory variables.

A past criticism of this project has been that testable hypotheses have not been specified. This criticism is still largely true. However, the analytical techniques outlined above imply a number of hypotheses in terms of relationships between socioeconomic variables and food consumption, including the expected sign of the relations. There is probably not a great deal to be gained at this point by asking the principal investigator to specify specific hypotheses.

#### IV. THE CARIBBEAN FOOD AND NUTRITION INSTITUTE (CFNI)

I had the opportunity while in Kingston, Jamaica, to attend three days of CFNI's staff meetings. CFNI has responsibilities in relation to some 16 or 17 primarily English speaking Caribbean countries. At the staff meetings each member of the professional staff presented a paper on their current work. I was very impressed with CFNI and with the Director, Dr. A. W. Patterson.

Particularly impressive were the abilities of the staff to interact across disciplinary lines. The staff consists of professionals with backgrounds which include nutrition, public health, medicine, and agricultural economics. Because of this mix of backgrounds, the issue of nutrition is approached from both the health-nutrition link and the food-nutrition link. This combination is quite advantageous, because so often these two perspectives are split from one another.

My impression is that CFNI may well be in a period of transition from concentration on action programs to a greater amount of research work. As the programmatic capabilities of the individual countries in this area increase, this evolution of CFNI's focus is one which should probably be fostered by the donor agencies, which support the Institute. In particular more interaction between the CFNI staff and

11

their colleagues in other countries in the Caribbean and Latin America and the United States should be encouraged in relation to their research activity.

#### RECOMMENDATIONS

My recommendation is that the funding in question, of approximately \$50,000, be provided to the project. This funding represents only a small proportion of the funds which have already been committed to this project. One of the strongest arguments supporting this recommendation is that failure to provide these funds could seriously damage relations between CFNI and USAID/USDA. This consequence would be most unfortunate since CFNI is precisely the kind of institution in the food and nutrition area which USAID/USDA should be encouraging.

Dr. Patterson, the Director of CFNI, indicated quite clearly that they felt a commitment was made for the entire package of funding for this project. She does not view the funds in question as additional money, but funds that were already committed. The intricacies of this project's funding, with several agencies involved and various individuals, some of who have moved on to new positions, are complicated and such misunderstandings could arise.

On a substantive level, a major argument in favor of this project is the anticipation that its results could have a substantial impact on policy in the two countries involved. This project would appear to present one of the better opportunities for injecting the project results into the policy-making process. The principal investigator reports that both countries are rethinking their current food policies and are open to considering alternatives. Each country has a Food and

12

Nutrition Council which looks to CFNI for advice. In addition, the principal investigator, Curtis McIntosh, through this project and earlier work, has established contacts with government officials in each country.

The consumption portion of this project, if carried out as anticipated, should compliment the previous Consumption Effects of Agricultural Policy (CEAP) studies sponsored by the Nutrition Economics Group, OICD/USDA in a number of countries over the last several years. Many of these previous studies have made important methodological contributions. In the case of this project, the major contribution expected should not be methodological, but in the involvement of a local institution and the possibility of having significant impact on food policies and programs in the countries involved.

The results of the project will be contained in a report for each country and a conference will be held in each country at the project's termination. Dr. Patterson also suggested holding a regional conference, to which representatives from the various donor agencies would be invited. This latter conference should definitely be encouraged. At this conference, the Antigua and St. Vincent project could be treated as a guideline, which could be modified and improved, for carrying out studies of the consumption and nutrition effects of the food marketing system in other Caribbean nations.

The major risk in this project comes from its breath. As indicated earlier, the number of topics covered makes it very ambitious. My impression is that the principal investigator has the technical skills to carry out this work. However, there is less than a year left on this project and Dr. McIntosh's time is going to be spread

quite thinly across the major analytical portions of this project. He should be able to receive some assistance from staff at the University of the West Indies, in Trinidad, where his office is located. We particularly discussed assistance in the area of computer programming.

The progress of the project should be monitored. The areas in which technical assistance could most usefully be provided cannot be predicted at this point. A close monitoring would serve to identify where technical assistance might be necessary if progress on certain objectives is lagging, due in particular to the ambitiousness of the project's scope. One area in which technical assistance might play a most useful role is in drawing policy implications from the basic results of the project and in evaluating this project as a guideline for further research in this area in other Caribbean countries. Certain aspects of good policy analysis are in some ways an art. In addition, an outside perspective can be most valuable in evaluating a research project and providing suggestions for future work.

REPORT ON THE  
CFNI ANTIQUA/ST. VINCENT FOOD MARKETING PROJECT

Benjamin Senauer

November 1984

15

REPORT ON THE  
CFNI ANTIQUA/ST. VINCENT FOOD MARKETING PROJECT

The work on this report was completed during the period of November 25 through November 30, 1984 at the University of the West Indies in Trinidad. The objectives of this consulting work in relation to the Antiqua/St. Vincent Marketing Project were to review the progress, advise on the analyses, review the reporting plans, and examine the issues to be addressed at the country workshops.

PROJECT PROGRESS

The computer analysis of the survey data is now under way. Bruce Lauckner, a statistician/biometrician at the University of the West Indies, St. Augustine Campus, Trinidad, is carrying out the computer analysis under a contract with the Pan American Health Organization, with Curtis McIntosh as the supervising project officer. A copy of the contract with Bruce Lauckner is attached. This contract is particularly important because it provides a detailed outline of the analytical procedures that will be applied to the survey data.

While I was in Trinidad, Bruce Lauckner was producing a large volume of sample characteristics, means, and standard deviations for the survey which relates to Step 1.1 of the Scope of Work of the attached contract. The project timetable set aside the period September-December 1984 for computer analysis. The computer analysis is slightly behind schedule, but should be completed during January 1985.

Curtis McIntosh believes that holding two workshops, one in Antigua and one in St. Vincent, is the best strategy. These workshops would be used to present the project results, to receive feedback on the draft of the project report(s), and to make food policy recommendations for each government. The anticipated date for the two workshops is April 1985. The intention is to have a draft of the project report(s) ready prior to the workshops. One reason for holding a separate workshop in each country is so that a number of individuals involved with food and agricultural policy in each country can be invited, yet the group will not become unmanageably large in size. The strongest argument for holding two workshops, though, is that if only one is held in only one of the countries, the other country will almost certainly feel slighted and that the project was less concerned with their issues.

The USDA/CFNI contract referred to two reports which will be due -- Report # 3 which will cover the analysis of the data and Report # 4 which will provide a description of the methodology. Dr. McIntosh's present intentions are to produce one overall report which will cover the methodology, analysis, results, and policy recommendations for both countries. I personally cannot see whether it matters if the report is between one or two covers; what matters is the quality of analysis and presentation. I gave a copy of the Nutrition Economics Group (NEG) Report Guidelines to Curtis McIntosh and he understands that he needs to follow that format. The current time schedule is to have draft copies of the report available prior to the country workshops in April and a final copy available by July 1985.

This assessment of the project leads to three recommendations. First, that the best use of my second consultation would be to attend one or both of the country workshops and then stay on a day or two after the workshop(s) to discuss the draft manuscript and workshop response with Dr. McIntosh. This proposal is presented for the following reasons. The country workshops will be a primary vehicle for presenting the project results especially in terms of having a policy impact. In addition, Dr. McIntosh plans to have the draft report available for the workshops. The draft report should be ready sufficiently ahead of time to allow workshop participants to study it prior to the conferences. Finally, given the importance of these workshops, Dr. McIntosh has indicated he would like to have representatives of the donor agencies attend. The USDA/CFNI contract specifically stipulates that OICD will receive two invitations, which could be in addition to the participation of a consultant, if desired.

The second recommendation is that the two workshops be held close enough together so that individuals could easily attend both during one trip. Perhaps they could both be held in the same week, one early in the week and the other at the end, or perhaps on either side of a weekend.

The third recommendation is that after the final report has been submitted and all project work completed, Dr. McIntosh should pursue making a presentation based on his project work at a regional-level professional conference. The best choice might be the annual meetings of the West Indian Agro-Economics Society.

## ANALYTICAL PROCEDURES

At this point, only marginal modifications in the analytical procedures are possible given the nature of the contract with Bruce Lauckner for the computer analysis. Modifications to the contract's Scope of Work can only be made in writing by PAHO's Contracting Officer (see p. 3 of the attached contract). Overall, the analytical procedures seem to be in line with the study objectives and satisfactory techniques are proposed. The following issues, however, were discussed with Dr. McIntosh:

1. There may be a problem of a lack of variation in prices of the agricultural inputs and products in the cross-sectional survey. The survey did not extend over a long enough period of time to have price variation over time and the islands are too small for significant spatial price variation to exist. This problem may preclude getting satisfactory results on the supply yield functions proposed in 1.2 of the Scope of Work of the attached computer analysis contract. Perhaps some comparisons between the two countries could be made if there are price differences in inputs or products, as an alternative though.
2. The nutrient intake functions should be run with and without the cost of calories or protein or food cost variable. The reason for this suggestion is that price paid per calorie or protein unit or food expenditure is a choice variable. Poor households in which calorie intake is lower typically spend less per calorie than higher income households, so the relationship would be a positive one rather than the usual negative own-price effect.

3. Again, on the consumption or demand side, there is a lack of price variation because of the lack of spatial price differences in these small countries and the short time span of the survey collection. The problem is compounded by the lack of a sufficient number of years of time-series data to estimate time-series demand equations for the major foods. Dr. McIntosh has indicated that he will try to run time-series regressions, in addition to the cross-sectional analysis, if sufficient data are available.
4. On the consumption side, this project, along with the 1981 Antigua Food and Nutrition Survey which CFNI is analyzing separately, should provide information on who the malnourished are in these two countries and what the pattern of food consumption is. The cross tabulations and regressions should indicate how nutrient intake and food consumption change in relation to various socioeconomic factors. The marginal propensities to consume and/or income elasticities for calories, protein, and the major foods will indicate what can be expected to happen to nutrition and food consumption as economic development progresses and household incomes rise.
5. The consumption equations, 1.6 on the attached Scope of Work, should be structured to allow for the marginal propensity to consume (MPC) and/or income elasticity to vary by household income level. Past studies have found that the income elasticities for most foods are significantly higher at lower income levels. A functional form such as the semi-log or quadratic (with income and income squared) could be used. Perhaps one should also go

20

beyond functional form and run separate regressions for, say, 3 or 4 different income classes. Separate regressions might run into a problem of too small a sample size, however. Therefore, the best procedure might be to use dummy interaction terms for 3 or 4 income classes interacted with the income variable to allow for the income effect to shift according to income level. In other words, if  $Y$  = household income,  $C$  = consumption, and

$D_1 = 1$  if a middle income household; 0 if not

$D_2 = 1$  if a high income household; 0 if not

then  $C = a + bY + cD_1Y + dD_2Y$

$b$  = income effect for low-income households

$b + c$  or  $b - c$  = income effect for those with middle incomes

$b + d$  or  $b - d$  = income effect for those with high incomes;

The income breakpoints between the 3 or 4 groups could be structured to divide the households into equal thirds or fourths.

#### POLICY ISSUES

The Antigua/St. Vincent Project is not far enough along yet to draw firm policy conclusions. Curtis McIntosh and I did have, however, a lengthy discussion of the most crucial issues involved and the lessons that have been learned in other countries which relate to these issues. Before proceeding, it would probably be helpful to briefly describe the agricultural economy in each country and the nature of government intervention involved.

Both Antigua and St. Vincent are very small countries with populations of 80,000 and 120,000, respectively. Antigua is principally a

21

tourist economy with little agriculture (3 percent of GDP in 1978). The soil is shallow and the climate is dry. On the other hand, St. Vincent has little tourism, but does have a volcanic soil. The main crop is bananas, grown for export. Food marketing in each country is handled by a combination of private agents, including hucksters and higglers, and government bodies. In particular, St. Vincent has the government Marketing Corporation and Antigua the Central Marketing Corporation.

Government intervention primarily takes the form of certain agricultural input subsidies and the control of food prices. For example, Antigua has subsidized seeds, chickens, and various input services. In St. Vincent, the Agriculture and Cooperative Bank has provided loans to farmers at 7 percent. Two methods of price control are used. For domestic food products, a fixed price ceiling is set and for food imports, a fixed mark-up is established. Other forms of government intervention include the direct importation of some foods, the regulation of imports, and minimum price guarantees and contractual arrangements by the government marketing agencies. The primary food policy goals are to maintain low and stable food prices for consumers, to improve the nutritional status of the population, and to reduce reliance on food imports by increasing domestic production.

The following are some of the primary food policy issues that are relevant to Antigua and St. Vincent which the Food Marketing Project may be able to address, even if only partially in some cases:

28

## 1. Food Prices

Stated in its simplest form, the problem is that consumers want low food prices and farmers want high agricultural commodity prices, which is a basic dilemma confronted by all countries. How this issue is addressed is really at the core of a country's food policy. Many countries seek to maintain low and stable food prices, but this approach can seriously reduce the incentive for agricultural production. Antigua and St. Vincent, for example, both use price controls to keep food prices down. Governments have used various means to try to achieve both low food prices and a sufficient incentive for agricultural producers. The instruments used include providing input subsidies, squeezing the marketing margin, and using consumer subsidies; each of these will be addressed in turn.

## 2. Input Subsidies

Both Antigua and St. Vincent have used certain input subsidies. A strong argument can be made for subsidizing a modern input, such as fertilizer, when its use is below the optimal level, with the marginal value product of the input exceeding its marginal cost. Use by farmers may be sub-optimal due to a lack of knowledge, risk aversion, or financial constraints. On the other hand, input subsidies can be a problem when they distort the input mix out of alignment with the country's resource endowment. For example, if machinery is subsidized, farmers may use too capital-intensive an input mix in a labor surplus economy.

### 3. Marketing Margin

In an attempt to keep food prices low and the producer price incentive high, governments are frequently tempted to squeeze the marketing margin of private traders. An attitude exists that those involved in marketing functions are not performing a useful economic activity and are in a position to take advantage of both producers and consumers. This perspective may have some truth to it under conditions of imperfect competition. However, the best approach for government may be to try to move the system toward more competition and make investments which can improve marketing efficiency that reduce real marketing costs. Examples of such investments are improvements in the transportation network. If the government simply tries to squeeze the marketing margin through price controls, private traders may be driven from business due to a lack of sufficient return. The government then may be forced to directly assume a marketing function.

### 4. Consumer Subsidies

Perhaps the most widely used approach to the food price dilemma is the consumer subsidy. A multitude of specific approaches have been taken. A few examples are ration shops, food coupons, and subsidizing the marketing margin of a government marketing agency. A major problem with such subsidies is that they can become an enormous burden on the government budget and can become very difficult to reduce due to political protest. Political considerations suggest the benefits of the subsidy be made widely available, particularly to the urban

24

populace. However, nutritional considerations suggest the benefits should be targeted to the lowest income households in which malnutrition is most prevalent. Two approaches to targeted subsidies which deserve particular consideration are food coupons for poor household and subsidizing certain inferior foods. However, the former presents an administrative burden and the latter requires that the poor eat considerably more of a certain food(s) than do higher income families.

#### 5. Exchange Rates

The importance of the foreign currency exchange rate in a country's food policy has only recently been recognized. Many countries have overvalued currencies. This distortion causes the price of imports to be lower in terms of the domestic currency and the price of exports to be higher in terms of foreign currencies. Imports, including food imports, are increased and exports, including agricultural commodities, are decreased. In a sense, domestic farmers are forced to compete with food imports which have an artificially low price in terms of the domestic currency because of the overvaluation. An estimate needs to be made of the degree to which the exchange rate for Eastern Caribbean dollars, the currency used in both Antigua and St. Vincent, deviates from an open market equilibrium. If a secondary currency market, legal or illegal (black market), exists, what is the rate of exchange in the market in comparison with the official government exchange rate?

25

## 6. Theory of the Second Best

Theoretically at least, the optimal economic situation would be one of perfect competition and free trade. Significant distortions from this ideal exist in every country, though. Under these circumstances, government interventions that introduce additional distortions may produce a second best solution and yield a gain in the society's economic welfare. An appropriate example would be that if the exchange rate is overvalued and there is no chance for a devaluation, then a tax on food imports could protect domestic farmers from the unfair competition of artificially low-priced imports. Revenue raised through such an import duty could be used to fund farm input and/or consumer food subsidies. If the subsidy was limited to this source of funds, a burden on the government's general budget would also be avoided.

## 7. Government's Role

One of the lessons of recent years seems to be that the private sector under most circumstances can perform an activity more efficiently than the government. For example, when the state takes over agricultural marketing functions, a significant burden on the government budget has all too frequently been the end result. Government is best used to provide incentives and disincentives that direct private activity in the socially desired direction. Government also has an important role in distributional issues. Society, for example, may desire a more equitable distribution of economic well-being than the

market system yields. In small countries such as Antigua and St. Vincent, government may have to play a greater direct role in the economy than in larger countries. Many economic activities which in other countries would have a large number of competing economic agents in small countries might naturally evolve into monopolies, because of the small size of the total market. For example, if only one or two firms handle fertilizer imports, the potential exists for monopolistic exploitation of the situation.

#### 8. High Nutrient - Low Cost Foods

A country's food policy should encourage the consumption and domestic production of foods which are high in calories and protein, and other crucial nutrients lacking in the diet, in relation to the cost of the food. The poultry industry, which has grown very rapidly in many countries, and has frequently benefited from government action such as subsidies on feed imports, provides a counter example. Although chicken is a low-cost source of animal protein, it is expensive relative to vegetable protein. Higher income households benefit more from a subsidy to the poultry industry than the poor who would benefit more from a subsidy on a calorie staple.

#### REFERENCE MATERIAL

I brought a copy of Food Policy Analysis by C. Peter Timmer, Walter P. Falcon, and Scott R. Pearson to give to Curtis McIntosh. This book should be an excellent reference for the Antigua/St. Vincent

Food Marketing Study. The following sections were pointed out to Dr. McIntosh as probably being particularly useful:

- pp. 46-63 - on food consumption analysis
- pp. 150-180 - on the marketing system
- pp. 189-211 - on price policy, and especially
  - pp. 208-210 - on marketing efficiency
- pp. 230-234 - on the exchange rate
- pp. 271-293 - on food policy strategies, and especially
  - p. 288 - on input subsidies.

An additional reference which might be useful given the use of input subsidies in Antigua and St. Vincent is an article by Yujiro Hayami and Randy Barker comparing input vs. product subsidies, "Price Support versus Input Subsidies for Food Self-Sufficiency in Developing Countries," American Journal of Agricultural Economics, Vol. 58, No. 4 (November 1976, Part I), pp. 617-628.

28

PERSONAL SERVICES CONTRACT  
NO. CFNI-055-84

The Pan American Health Organization, ("PAHO"), with headquarters at 525 Twenty-third Street, N.W., Washington, D.C. 20037, United States of America, and Mr. Bruce Lauckner ("CONTRACTOR"), located at Tacarigua, Trinidad, W.I., hereby agree to the following

CONTRACT

1. The CONTRACTOR agrees to provide the following product (product, services or work) to PAHO in accordance with the stages or phases of execution specified herein and the General Provisions printed on the reverse side which are an integral part of this contract.

SCOPE OF WORK

To analyse Food Marketing Survey data to generate the following outputs for Antigua and St. Vincent:

- 1.1) Basic sample characteristics, means and standard deviations of relevant responses and proportions where applicable as per survey questionnaire.
- 1.2) Food production per acre will be regressed on various input costs - land preparation, planting, weed control, fertilizing, pest control, harvesting, (feeder stock, feed and veterinary services in the case of livestock), product price (own and related) for the food items for which data were collected, and the participation of the farmers/fishermen in subsidy schemes. Zero-one variables would denote sex, non-participation or participation and tenancy in the regression equation.
- 1.3) Price determination methods for farmers' inputs, products and degrees of satisfaction of farmers will be done by a simple tally of farmers' response.
- 1.4) The channels of distribution and proportion of farm and imported products handled by various distribution agents from farmer to consumer. Technical and economic efficiency indices will be calculated for the identified distribution channels. The technical index will be based on the cost of distribution of a speci-

These services shall be furnished during a period of 8 weeks which shall start on or about 25 September 1984 and shall be completed by not later than 20 November 1984.

2. PAHO will pay to the CONTRACTOR for these services, as total compensation, the sum of TT\$4,000 which shall be paid upon certification of satisfactory completion of the services in accordance with the stages or phases of execution or as specified here following:

fied quantity of foodstuff per unit of distance. The economic efficiency index relates profits to marketing costs.

Procurement and distribution costs would be analysed in relation to revenues in order to estimate profitability. Estimates of market shares based on the percent of total sales by the first to fifth largest firm by class of distributor would be calculated.

- 1.5) Methods of price determination, product promotion, unethical practices of competitors, competitive strategies, special services to the poor and so on will be summarized on the basis of distributors' response.
- 1.6) Regression equations relating individual caloric and protein intake as well as basic quantities of important foods to household income, weighted income of individual, cost of calories or protein or food cost, family size, sex of head of household, education of head of household, location (parish), age, weight and height of the individual, etc. using various functional forms.
- 1.7) Assessment of nutritional status based on weight for height, weight for age and arm circumference by occupation, income status, resident status, level of education and household size will be conducted using multiple regression incorporating zero-one variables.
- 1.8) Proportion of daily per capita income allocated to food intake by individual will be calculated using the ratio - cost of food consumed ÷ average household income per capita, weighted by the nutrient needs of the individual relative to average household needs.
- 1.9) Energy and protein adequacy ratios will be calculated by relating total energy and protein consumed to the recommended daily allowances for the individual.

3. If provided for under Scope of Work PAHO will pay to the CONTRACTOR travel, per diem allowances and incidental travel expenses, provided that PAHO shall not pay premium transportation costs and that per diem allowances shall not exceed the standard per diem rates of PAHO.
4. PAHO shall pay the Contractor upon presentation of an invoice showing contract number CFNI-055-84 and setting forth appropriate charges. Transportation ticket stubs, receipts for incidental travel expenses shall be attached to the invoice. The invoice shall be certified by the PAHO Project Officer as to satisfactory completion of services, prior to payment.
5. The performance of the services required under this contract shall be subject to the technical direction of the PAHO Project Officer, Dr. Curtis McIntosh.

The Project Officer named above is not authorized to change the SCOPE OF WORK as stated above. No oral statement by any person shall modify or otherwise affect the terms conditions, or specifications herein stated. All modifications to the Contract must be made in writing by PAHO's Contracting Officer.

This Contract shall enter into effect on the date on which it is signed by both parties.

IN WITNESS WHEREOF, the parties or their duly authorized representatives sign this Contract, in duplicate, at the respective places and on the respective dates indicated.

CONTRACTOR

*B. Lauckner*  
(signature)

Mr. Bruce Lauckner  
Statistician/Biometrician  
(printed name and title)

St. Augustine, Trinidad  
(place and date)

FOR PAHO

*A.W. Patterson*  
(signature)

Dr. A.W. Patterson, Director, CFNI  
Contracting Officer

Kingston, Jamaica  
(place and date)