Brazil's Food Security and Food Assistance Programs to Reduce Poverty

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Abstract: Hunger in Brazil, according to its government, is caused by the insufficient incomes that limit access to food for more than a quarter of the population. Due to the nutritional deficiencies of this segment of the population, successive Brazilian governments have implemented a range of food assistance, anti-poverty, and well-being programs over the past 50 years. In January 2003, newly elected President Luiz Inácio Lula da Silva launched Brazil's Zero-Hunger Program, which has a goal of supplementing food access to roughly 50 million people within his 4-year term. To determine whether the goal of zero hunger can be met, two types of analysis were employed. With the help of the USDA-ERS Food Security Assessment (FSA) model, food availability and access are evaluated based on food production and imports trends. In this first approach, the general notion of food availability and access focuses on quantity rather than quality of food. In addition, in order to capture a quality aspect of nutritional adequacy—the need for a balanced diet that covers basic food groups—we use the concept of a healthy food basket as a second approach.

Keywords: Brazil, food security, income distribution, hunger, poverty, food assistance programs.

Brazil is a lower middle-income country with a population of 170 million and per capita gross national income of \$3,300 in 2002. Poverty and hunger afflict a large proportion of the population in part because this income is distributed very unevenly. The poorest quintile (20 percent of the population) owned 2.2 percent of the national income while the richest quintile owned more than 64 percent in 1998.^{1, 2}

ECLAC³ (the United Nations' Economic Commission for Latin America and Caribbean) places Brazil, a country of continental dimensions, in the region's high-poverty country group alongside less developed and much smaller Honduras, Nicaragua, Paraguay, Ecuador, and Bolivia. An estimated 46 million Brazilians are affected by hunger. The government diagnosis is that hunger in Brazil is caused by the insufficient incomes that hamper access to food of close to one-third of the population.⁴

The data seem to indicate at first glance that income distribution was unchanged from the previous decade, but Ferreira and Paes de Barros found on closer examination that while some groups appeared to have escaped poverty during the 1980s and early 1990s, there was a substantial increase in extreme urban poverty, (Ferreira and de Barros).

² These data on income distribution are taken from the World Bank Indicators 2002 based on a 1998 survey.

³ ECLAC, Social Panorama of Latin America 2002-2003, Chile, August 2003.

⁴ Poverty is defined as earning less than US\$1 a day and thus failing to obtain basic nutritional requirements (Instituto Cidadania).

In order to design policies to reduce poverty it is crucial to understand where the poor live and what demographic groups are mainly affected. Over 51 percent of the poor are concentrated in urban non-metropolitan areas, 23 percent reside in metropolitan areas, and 26 percent reside in rural areas. In terms of regional distribution, close to 54 percent of the poor households are found in the northeast part of the country, 30 percent are located in the southeast, 10 percent in the south, and 6 percent in the center-west. In terms of gender, more women than men are found to live in poverty as female household heads have less income than men. Forty-five percent of women over 15 years of age earn no income, compared with only 21 percent of men (ECLAC/CELADE; IBGE).

Brazil's Recent Economic Development

Brazil's macroeconomic environment can be broken into two distinct periods: the 1988-1994 debt crisis and the 1995-2003 recovery period. Brazil's debt crisis forced substantial economic changes. The 1980s economic growth model based on state-led import substitution industrialization led to a debt crisis and, subsequently, hyperinflation, which severely penalized the poorest segments of the population (from 1988 until mid-1994, Brazil experienced inflation levels well above 1,000 percent a year, except for 1990). Per family income in the 1990-94 period stood at 250 *Reals*, practically the same level as 1980. The proportion of poor people was around 43 percent in the late 1980s and early 1990s, and fell slightly to 41 percent in 2002.

In an effort to contain the hyperinflation, the Brazilian government launched the Real Plan, an economic program for monetary stabilization, fiscal adjustment, trade liberalization, and privatization in 1994. Following the adoption of the *Real Plan*, the number of poor people reached a peak of over 67 million (Faria). The economic deterioration and increases in social spending heightened the paradox of a country with significant social spending—(equivalent to 21 percent of gross domestic product (GDP)—but large inequities in the distribution of household incomes. Government expenditures and investment in social programs, together with direct income transfers, had an insufficient distributive impact: the highly skewed nature of Brazil's income distribution has remained much the same for the past 20 years, with a slight worsening of the situation at the beginning of the 1990s (Faria).

Food Availability in Brazil

The issue of food security has had a prominent place in Brazil's policy agenda for decades. On a national level, food availability in Brazil is more than sufficient for its entire population. Domestic production of food, plus imports, minus exports result in per capita food availability (in grain equivalent) of more than 340 kg per capita per year, about one-third more than per capita nutritional requirements. Brazil's average per capita calorie availability grew steadily over the last three decades at an annual rate of 0.7 percent; it reached 2,985 in 2000 (FAOSTAT). However, due to the skewed income distribution, the lowest income segments are consuming below the nutritional requirement.

Although agriculture accounts for less than 10 percent of GDP, it is an important part of the Brazilian economy. Brazil's agricultural exports are a major source of foreign exchange, and agriculture is a major source of employment in rural areas. During the 1970s and early 1980s, agriculture's share of national output declined in line with the import-substitution industrialization (ISI) policy and the rapid growth of the services sector. ISI was detrimental to agriculture as it channeled state resources into industry, including revenues from domestic and export taxes for basic staples. In the mid-1980s, state agricultural enterprises were privatized, price controls were eliminated, and minimum producer price supports and preferential rural credit were targeted to low-income farmers. The economic liberalization of the early 1990s, and domestic reforms and trade policies implemented between 1995 and 2002, have also significantly benefited the Brazilian agricultural sector, which has grown faster than national GDP every year since 1994 (EIU).

Agricultural production is well defined according to regions, altitude, soil type, and infrastructure availability. The northern part of the country (half of which is the Amazon) is populous and characterized by low incomes and high nutritional poverty. Thus, many social programs target this region. Some grains and staples like mandioca for the domestic consumption are produced here. The center-west is commonly called the Cerrados region and includes the states of Mato Grosso, Mato Grosso du Sul, and Goias. This region constitutes the new agricultural frontier, and reports the highest income levels and largest inequities. The southeast—the heart of agribusiness in Brazil, since it includes the states of Sao Paulo, Rio de Janeiro, Minas Gerais, and Espiritu Santo—accounts for 33.3 percent of total agri-

cultural exports and 42.1 percent of total agricultural imports; it also has the country's highest poverty rate for an urban metropolitan area. The traditional agricultural producing regions in the south are Parana, Rio Grande do Sul, and Santa Catarina, which account for one-third of grain production.

Brazil's main agricultural export products are soybeans and soybean products, coffee, meats and meat products, frozen concentrated orange juice, sugar and sugar products, and tobacco. Agricultural exports totaled \$24.8 billion in 2002 and have grown 6 percent per year over the last 2 decades (FNP Notas & Noticias). Export earnings are used in part to finance grain imports such as wheat for which growing conditions are poor, and corn, which is mainly used for feed in the rapidly expanding poultry sector.

Brazil's Experience with Food Security and Hunger Eradication Programs

Due to the nutritional deficiencies of the poorest segments of the population, successive Brazilian governments have implemented a range of food assistance, anti-poverty, and well-being programs and policies over the past 50 years. These programs have concentrated on investment in human resources and social assistance (retirement and pension systems, health, education, housing, and basic sanitation), and programs for combating poverty (social welfare, programs to support peasant agriculture, agrarian reform, rural development, and direct income transfers).

During the 1990s (the "reform decade"⁵) various programs were implemented. From 1996 to 1999, government policies led to the formulation of the Alvorada project for poverty reduction in less developed cities, the development of the Community Solidarity Program, and the incorporation of the *Bolsa-Escola* bursary project in federal programs.

In January 2003, newly elected President Inácio Lula da Silva and his team of economic advisors launched Brazil's Zero-Hunger Program, which constitutes the core of the social agenda of his administration. The program comprises 60 different initiatives with a goal of providing food access to 11.4 million families (or roughly 50 million people) within 5 years.

The program is to be supported by agrarian reforms, producer incentives, and the enactment of minimum agricultural income policies. Other initiatives include a Food Coupon Program (inspired by the Food Stamp program in the U.S.), food vouchers to be exchanged at government-licensed food outlets, and food banks to redistribute surplus food from supermarkets and restaurants. Additional initiatives will target low-income workers, while nutrition programs will supply food to pregnant women, new mothers, and babies. The School Meals Program aims to increase the quality of school meals using regional foodstuffs. Existing school meals programs will be expanded to cover siblings of children attending school and potentially be extended over school vacation periods. Other initiatives include food and nutrition campaigns to educate the population about healthy eating to prevent obesity and malnutrition.

In the fall of 2003, the government merged all existing income-transfer programs—until then administered by four different ministries—into one, called Bolsa Família (Family Fund). The schemes' combined budget is to reach to \$5.3 billion *Reales* in 2004 (about \$1.5 billion).

USDA/ERS Food Security Analysis

To determine whether President da Silva's goal of zero hunger can be met by 2007, we use two types of analysis developed by USDA's Economic Research Service (ERS). With the help of the USDA-ERS Food Security Assessment (FSA) model, food availability and access is evaluated based on food production and import trends. Also, we calculate the distribution and depth of food insecurity by estimating consumption levels relative to nutritional requirements by income group. The number of hungry people is calculated by identifying those income groups whose consumption falls short of nutritional requirements. After identifying the food insecure income groups within the country (i.e., the proportion of people whose diets are not nutritionally adequate), we estimated the income growth required to eradicate food insecurity.

The general notion of food availability and access focuses on food quantity rather than quality. In order to capture a quality aspect of nutritional adequacy—the need for a balanced diet that covers basic food groups—we use the concept of a healthy food basket. Food security can only be achieved if all households can purchase a sufficient amount of basic healthy food items. Furthermore, it is recognized that other basic necessities (shelter, education, health, etc.) besides food are

⁵ The 1990s have been termed "the reform decade" in Brazil because of the significant number of economic and administrative policy changes that took place.

required to maintain a basic standard of living. In most countries, the low-income group spends most of its income on food and very little on other essential expenditures. The food purchasing power threshold (FPPT) includes the cost of a healthy food basket plus other essential living expenses. The FPPT approach allows the estimation of the cost of eradicating hunger, and it highlights the impact of food prices on food security.

The next section will describe the FSA model with a focus on income distribution and its impact on food security, and will review the findings for Brazil. In addition, we will discuss the FPPT approach and estimates of the cost of eliminating hunger and income growth necessary for the low-income groups to be able to escape food insecurity.

The Food Security Assessment (FSA) Model

The FSA model used for this analysis is the same as used in this report in estimating food consumption and access in 70 low-income countries for a 10-year projection period. The reference to food includes

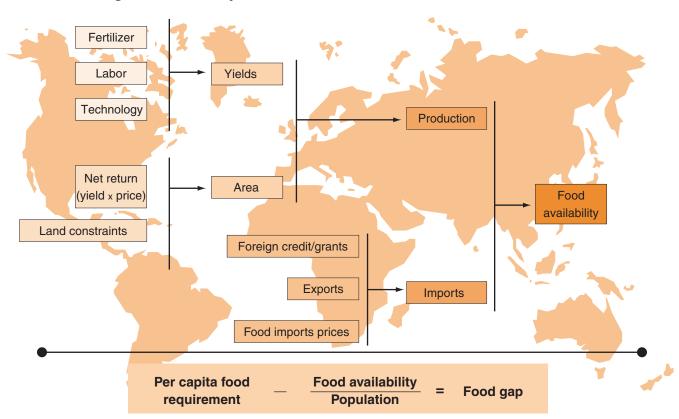
grains, root crops, and a category called "other," which includes all other commodities consumed, thus covering 100 percent of the diet. All of these commodities are expressed in grain equivalent (see Appendix 1—Food Security Model: Definition and Methodology for a detailed description of the model).

Factors Affecting Food Security

Food availability is the sum of domestically produced food and net imports (fig. A-1). Domestic production is a function of area and yields, and imports are affected by commodity prices and export earnings. The sufficiency of average food availability depends on the number of consumers. Individual households' access to food depends on their purchasing power, which is a function of income and income distribution as well as of prices of food and other living expenses.

Based on the FSA model and assumptions about price trends, yield growth, area expansion, and export earnings, we project average per capita food availability in Brazil to increase 13 percent by 2007.

Figure A-1 Factors affecting food availability



Source: Economic Research Service, USDA.

Access to Food

National-level estimates represent average food availability and mask the impact of unequal incomes on food security. In order to capture differences in access to food, we estimate food consumption at the disaggregate level, by income group. Food consumption for each income group is compared to the nutritional target which allows for estimating the number of people who live in hunger (i.e., who are unable to purchase sufficient food to fulfill nutritional requirements) and are, therefore, nutritionally vulnerable (fig. A-2). The shortfall between estimated consumption and the nutritional target highlights the intensity of food insecurity.

Initially, Brazil's population was divided into five equal income groups or quintiles. The lowest income group was further disaggregated so that the lowest 5, 10, and 15 percent of the population could be examined. Given Brazil's large population, even 10 percent of the population constitutes a large absolute number of people—more than 17 million in 2002.

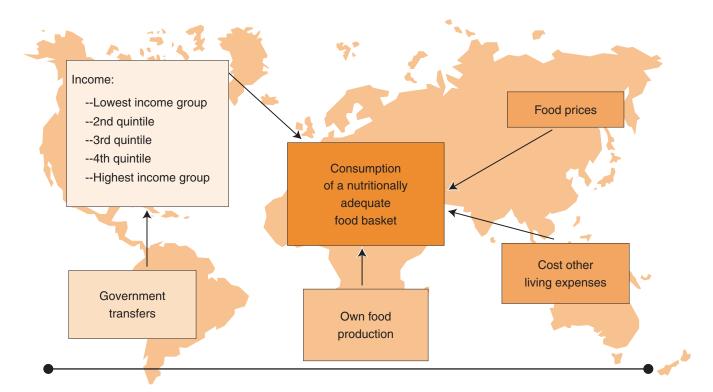
Insufficient purchasing power—a function of income and prices—is the most important cause of *chronic*

undernutrition among developing countries. We use an indirect method of projecting calorie consumption by different income groups based on income distribution data.⁶ The procedure uses the concept of the income/ consumption relationship and allocates the total projected amount of available food among different income groups.

According to the model results, the ratio of consumption to nutritional requirements for the poorest 10 percent of the Brazilian population in 2002 was estimated at 79 percent (i.e., the population in the poorest 10 percent group were estimated to be consuming only 79 percent of the nutritional requirement). The consumption/requirement ratio was estimated at 89 percent for the poorest 20 percent. The second poorest quintile was estimated to have access to 110 percent of requirements—meaning that consumption was 10 percent higher than requirements in this quintile, on average. These results imply that between 20 and 40 percent of the population (i.e., between 34 and 68 million people) in Brazil do not have sufficient incomes

Figure A-2

Factors affecting access to food



Source: Economic Research Service, USDA.

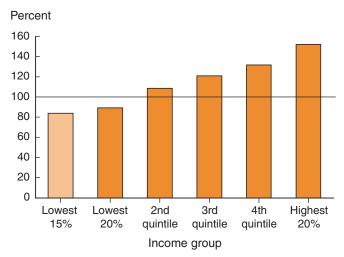
⁶ The method is similar to that used by Shlomo Reutlinger and Marcelo Selowsky in "Malnutrition and Poverty," World Bank, 1978.

to purchase enough food to fulfill their nutritional requirements (fig. A-3). However, by 2007, food production increases and GDP growth are projected to increase national food availability by 13 percent. This will help decrease the share of hungry people to between 15 and 20 percent of the population (fig. A-4).

A question arises as to how much income growth would be needed for the poorest income groups to fulfill requirements within 5 years. According to our estimates, incomes of the poorest 10 percent would have to grow 4 percent per year, more than double the historical income growth of 1.8 percent. Incomes of the poorest 15 percent would have to grow nearly 3 percent per year. On the other end of the spectrum, the

Figure A-3

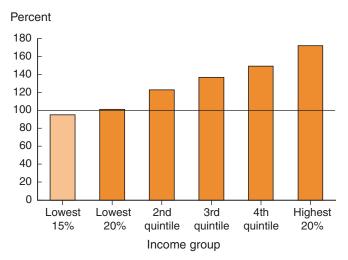
Consumption as a share of requirement in 2002



Source: ERS calculations.

Figure A-4

Consumption as a share of requirement in 2007



Source: ERS calculations.

highest income quintile is estimated to consume 52 percent more than nutritional requirements.

The current number of hungry people—roughly 50 million—equals that of official Brazilian estimates. It should be noted that the rough estimates of hungry people do not account for the fact that poor people may be able to feed themselves or supplement their diets with the help of subsistence farming or garden plots not considered in "income." There is no doubt that such food production, especially in rural areas, helps the poorest to survive.

Allowing for Nutritional Adequacy

While the FSA model allows for estimates of food availability by income group and the income growth required to eliminate food insecurity, it does not include two key factors: 1) prices of food items and 2) the quality aspect of nutritional adequacy. We estimated the Food Purchasing Power Threshold (FPPT) in order to account for both of these factors, as well as the fact that household expenditures must be allocated between spending on food and on other essential living expenses, such as housing, fuel, and education.

The cost of a food basket can furthermore reflect seasonal and local differences if appropriate price data are available. In this article we simplify the approach by using national average income data and an average of Sao Paulo and Rio de Janeiro food retail prices. Provided data were available, the ideal would be to replicate the analysis for several poverty-prone regions based on local income and price data. The FPPT approach to monitoring food insecurity has the flexibility to target vulnerable regions and populations on a timely basis.

The Food Purchasing Power Threshold Approach

The FPPT approach measures food insecurity by calculating the cost of a food basket and the cost of other basic necessities. This FPPT can then be compared to available income. Inadequate purchasing power is generally viewed as the main cause of food insecurity. The

⁷ A food basket approach formed the basis of official Brazilian household surveys. Different poverty lines derived from the cost of a food basket reflecting local eating habits and prices were constructed by Rocha. A description of the areas covered is found in Ferreira and Litchfield.

⁸ The prices are taken from Statistics on Occupational Wages and Hours of Work and on Food Prices, ILO, Geneva, 2001.

cost of a basket of food relative to income is a practical indicator of food security. Any decline in food costs and/or increase in income should improve the food security of a household. This approach also allows an estimation of the number of people who lack the purchasing power to satisfy their basic needs. By evaluating the size of the gap between per capita income and the FPPT, it is possible to more clearly determine the depth of poverty and hunger. Monitoring changes in food costs relative to the purchasing power of consumers can also provide information on the effectiveness of government food security policies and programs, the efficiency of marketing systems, and the investment required to adequately address the food insecurity problems.

To estimate the purchase price of the food basket, we distributed 2,200 calories⁹ among specific food and nutrient groups according to several criteria (see box, "Methodology on Food Basket Cost Calculation"). These criteria included typical Brazilian food consumption patterns, FAO/World Health Organization nutritional guidelines for developing countries, and standards from various U.S. government agencies.¹⁰ The goal was to have roughly 65 percent of daily calories coming from carbohydrates, 20 percent from fat, and 15 percent from protein.

The grains included in the healthy food basket are rice, wheat, and corn; fat is represented by cooking oil and protein consumption is ensured by including meat—mostly beef and poultry—and milk.¹¹

It is unreasonable to assume that even the poorest people will spend their entire income on food. High-income countries spend a relatively small percentage of their income on food. In the United States, for example, the percentage of household expenditures spent on food is roughly 8 percent. High-income countries typically spend a large share of their incomes on items that are not

considered necessities, such as recreation, etc. The poorer a country, the higher the share of income spent on food. However, we must still allow for expenditures on other necessities, such as housing and clothing. The share of food spending can vary considerably, depending on income level and whether the household is in a rural or urban area. Euromonitor International, a private provider of market analysis, reports that Brazil's share of total consumer expenditure spent on food was 17.6 percent in 2000. This is a national average and it is safe to assume that the low-income groups spend a considerably higher share of their total consumption expenditure on food. In this study, we assume two different scenarios: 1) the food cost share is equal to expenditures on other essential items, i.e. 50 percent each (this assumption is supported by data from the UN's 1996 International Comparison Project)¹²; and 2) food spending is 30 percent and other spending is 70 percent of consumption expenditures. These two scenarios are intended to offer a range of results.

Once we have determined the FPPT, we can compare it with available per capita income. The FPPT was compared to income levels in each of Brazil's income groups. Group income levels were calculated based on World Bank data on average 2000 per capita gross national income (GNI) and the most recently available income distribution data.

The ratio of available income to the FPPT is a meaningful indicator of the intensity of food insecurity. A ratio greater than 1 indicates that income levels exceed the FPPT and that people in that particular quintile, on average, are not vulnerable to food insecurity. Any number less than 1 indicates some degree of vulnerability to food insecurity for populations in that income group. The lower the number, the more severe the problem.

The annual cost of the healthy food basket in 2000 was \$235, which brings the FPPT to \$470 under the assumption that food spending is 50 percent of total consumption expenditures. The FPPT is \$780 when assuming that "other" spending is 70 percent of consumption expenditures (fig. A-5). Comparing these amounts to per capita income by income group shows that in both scenarios, between 20 and 40 percent of the population are estimated to be unable to purchase a

⁹ According to the Food Agriculture Organization, average consumption below 2,200 calories per person per day results in undernourishment.

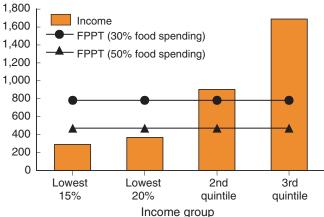
¹⁰ The standard for the percentage of calories from carbohydrates was recommended by the National Research Council's *Diet and Health Report*, 1989; the recommendation for the percentage of calories coming from fat (less than 30 percent) comes from *Nutrition and Your Health: Dietary Guidelines for Americans*, U.S. Department of Agriculture and U.S. Department of Health and Human Services, 2000.

¹¹ Retail prices were available for Sao Paulo and Rio de Janeiro. After calculating the food basket cost for both cities, the average was used for the simplified estimation employed in this paper.

¹² ERS calculations based on UN data for the share of personal consumption expenditures spent on food also support this finding. See as an example table 101 in Putnam and Allshouse.

Figure A-5
Income versus Food Purchasing Power Threshold (FPPT)





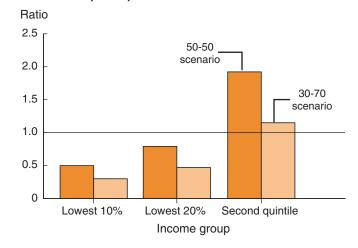
Source: World Bank Indicators, ERS calculations.

nutritionally adequate food basket—a result closely matching that of the FSA model. However, the ratios of income to FPPT are much lower than the consumption/requirement ratios obtained with the FSA model. Under the 50-50 scenario, the ratio of income to FPPT is estimated at 50 percent for the poorest 10-percent income group and at 79 percent for the lowest 20 percent of the population (fig. A-6). Under the 30-70 scenario, the ratios of income to FPPT are even lower—ranging from 30 percent to 47 percent for the same income groups.

Given that President da Silva's goal is to eliminate hunger within 4 years, we wanted to measure the income growth required to achieve this goal. Under the 50-50 scenario, incomes for the poorest 10 percent of the population would have to grow at an annual rate of close to 20 percent. For the poorest 20 percent, annual growth would have to be around 6 percent—more than 3 times the historical growth. Under the 30-70 scenario, incomes would have to increase by 35 percent for the poorest 10 percent of the population, and 20 percent for the poorest 20 percent of the population. This level of consistent income growth is highly unlikely. Targeted government programs seem to be a more promising option in meeting the zero-hunger goal.

What is the cost of supplementing income in order for the entire population to reach the food purchasing power threshold? The poorest 20 percent of the population had an average per capita income of \$368, or \$102 short of the lower FPPT. Multiplying this \$102 by the number of people affected yields a cost of \$3.5

Figure A-6
Ratio of income to Food Purchasing Power
Threshold (FPPT)



Source: ERS calculations.

billion for just 1 year. This is more than twice the entire budget of the Zero-Hunger program. This means that the same expenditure would be required in subsequent years because these cash transfers lack the long-term benefits that come with investment programs. The Zero-Hunger program is a mix of these transfers—which come with their own set of difficulties in targeting and misuse—and investment, for example in education. The link between improvements in education and poverty reduction is well known, ¹³ but the road to zero hunger is likely to take more than the 4 years envisioned by President da Silva.

Concluding Comments

Brazil, a country with a population of more than 170 million, has embarked on a path to eradicate hunger and poverty. The recent policy goal is to cut the number of hungry people to zero in the next 4 years. Poverty and hunger afflict a large proportion of the population in part because of highly skewed income distribution. The poorest income quintile (20 percent of the population) owned 2.2 percent of the national income while the richest quintile owned about two-thirds in 1998.

¹³ In the foreword of the *World Development Report 2000/2001, Attacking Poverty*, James Wolfensohn, president of the World Bank, sums up the report's recommendation of action in three areas, the first of which is "Promoting opportunities: Expanding economic opportunity for poor people by stimulating overall growth and by building up their assets (such as land and education)(.....)".

According to our results (based on the FSA model), between 20 and 40 percent of Brazil's population roughly 50 million people—do not have sufficient incomes to purchase the amount of food necessary to fulfill nutritional requirements. However, by 2007, increases in food production and GDP are projected to raise food availability by 13 percent. This will help decrease the share of hungry people to between 15 and 20 percent of the population or 4-5 percent annually. The FPPT approach, which covers basic nutritional adequacy, shows results that are similar to those from the FSA model, indicating that the number of vulnerable people will remain above 35 million people.

In sum, without policies that target the food insecure portion of the population, we project poverty to decrease, but remain significant through 2007. Cash transfers are valuable in alleviating immediate hardship, but investment in education and other long-term strategies have proven successful in reducing or eliminating poverty and food insecurity. Further ERS research will examine food policy formation, implementation of the food distribution system, and the effects of food policy and consumption on nutrition in Brazil.

Methodology on Food Basket Cost Calculation

The food items in each food group were chosen according to their importance in the Brazilian diet as indicated by the 2000 FAO food balance sheet and the availability of retail food prices. Food prices were mostly taken from the U.N. International Labour Office (ILO). The number of calories consumed per day was used to determine the share of each food item within its group. The cost of each food item was determined using domestic retail food prices as stated by ILO, which were converted into U.S. dollars using International Monetary Fund exchange rates. Next, the cost of each food group was calculated as the weighted average of the cost of individual food items

(the weight being each food item's share as determined by calories consumed per day). This calculation resulted in a price per kilogram of carbohydrates, proteins, or fat.

This cost was multiplied by the number of grams eaten from each food group in order to satisfy nutritional guidelines. The daily target was 2,200 calories per capita, comprised of 65 percent (1,430 calories) carbohydrates, 15 percent (330 calories) protein, and 20 percent (440 calories) fat. In order to convert these calories into grams of food, the food items' respective conversion rates were weighted according to the food items' share in the food group (Schmitt). The daily cost of the three food groups was aggregated and then multiplied by 365 to obtain the annual cost of the food basket.

¹ Statistics on Occupational Wages and Hours of Work and on Food Prices, October Inquiry results, 1999 and 2000, International Labour Office, Geneva, 2001.

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