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NICARAGUA
POVERTY ASSESSMENT
Raising Welfare and Reducing Vulnerability

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CURRENCY EQUIVALENTS
US$1 = 13.34 Córdobas (2001)
US$1 = 10.58 Córdobas (1998)

FISCAL YEAR
January 1 to December 31

ASDI	Swedish Agency for International Development
BCN	Central Bank of Nicaragua
CAFTA	Central American Free Trade Agreement
CAS	Country Assistance Strategy
DANIDA	Danish International Development Agency
DPR	Development Policy Review
EFA	Education for All Initiative
ENACAL	Public Water and Sanitation Company
GDP	Gross Domestic Product
GNP	Gross National Product
GON	Government of Nicaragua
HIPC	Highly Indebted Poor Countries
IDB	International Development Bank
IDF	Institutional Development Fund
IMF	International Monetary Fund
LSMS	Living Standards Measurement Survey
MARENA	Ministry of Natural Resources and the Environment
MECOVI	Program for Improving Living Standards Measurement Surveys (for its acronym in Spanish)
MDG	Millennium Development Goal
MECD	Ministry of Education, Culture, and Sports
MINSA	Ministry of Health
NGO	Nongovernmental organization
NORAD	Norway Agency for Development
OPS	Organización Panamericana de la Salud
PRGF	Poverty Reduction and Growth Facility
PRS	Poverty Reduction Strategy
PRSP	Poverty Reduction Strategy Paper
RPS	Red de Protección Social (Social Protection Network)
SimSIP	Simulations for Social Indicators & Poverty
TA	Technical Assistance
UNDP	United Nations Development Programme
UNFPD	United Nations Population Fund

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The Poverty Assessment Team: Acknowledgments

The Government of Nicaragua, the World Bank, and the Nicaragua Program for Improving Living Standards Measurement Surveys (MECOVI) program collaborated to contribute to the Nicaragua Poverty Reduction Strategy Paper (PRSP) Progress Report, World Bank Country Assistance Strategy (CAS), and International Monetary Fund (IMF) Poverty Reduction and Growth Facility (PRGF). This report is the product of that collaboration.

The World Bank's task team included Florencia T. Castro-Leal (Senior Economist and Task Manager); Benjamin Davis, Arianna Legovini, Leopoldo López,, Marco Stampini, and Patricia Parera (Consultants and authors of background papers); Carlos Sobrado (Economist, LCSPP); Kalpana Mehra (Research Analyst, PRMPR); and Diane Steele (Household Survey Coordinator, DECRG). Peter Lanjouw and Neeta Sirur are peer reviewers. Luz Anaeli Solis provided excellent administrative assistance and coordinated the production of the report.

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EXECUTIVE SUMMARY

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i. This report is part of a broad collaborative effort Government of Nicaragua, the World Bank, and the Nicaragua Program for Improving Living Standards Measurement Surveys (MECOVI) which contributed jointly to the Nicaragua Poverty Reduction Strategy Paper (PRSP) Progress Report, The World Bank Country Assistance Strategy (CAS), and The International Monetary Fund (IMF) Poverty Reduction and Growth Facility (PRGF). to update the knowledge related to poverty in Nicaragua, using the results of the 2001 LSMS survey.

ii. This poverty assessment is one of the results of this collaboration and was launched with three broad objectives: (1) to update the poverty profile for Nicaragua with data from the 2001 LSMS survey and assess key changes between 1998 and 2001; (2) to review progress with respect to PRSP targets and Millenium Development Goals (MDGs), including an analysis of those areas where advances have been weak to orient greater public attention; and (3) analyze the dynamics of families moving in and out of poverty using panel data from the 1998 and 2001 LSMS surveys, in order to obtain clues about strategies that may have led to improving incomes.

A. PROGRESS IN POVERTY REDUCTION, PRSP AND MDG TARGETS

iii. **Nicaragua has made significant progress in reducing poverty over the last decade**, despite its status as one of the poorest and least developed countries in Latin America. Poverty and extreme poverty declined consistently from 1993 to 1998 and again to 2001 at the national level and for urban and rural areas. Overall poverty declined from 50.3 percent in 1993 to 45.8 percent in 2001, while extreme poverty fell from 19.4 percent to 15.1 percent in the same period. Moreover, changes in poverty at the national level indicated an acceleration of the pace of poverty reduction in the period 1998-2001 in contrast with 1993-1998.

iv. **Although poverty declined significantly more in rural than urban areas, poverty and extreme poverty continue to be overwhelmingly rural**. More than two-thirds of rural inhabitants are poor in contrast with less than one-third in urban areas. Similarly, more than 25 percent of those in rural areas are extremely poor versus about 6 percent for urban residents.

v. **Progress in poverty reduction between 1998 and 2001 reflect significant income gains for most Nicaraguan households as well as lower food prices**. Income gains are the result of the record of broad-based growth witnessed in this period,

associated with extraordinary levels of investment following Hurricane Mitch an in spite of drought and declining coffee prices. The decline in overall poverty is closely related to income gains concentrated in all but the highest decile of the population, which has resulted in a significant reduction in (consumption) inequality. Reductions in extreme poverty are largely associated with the decline in relative prices of key food staples (i.e., rice and beans) that constitute about one-third of the diet of the extremely poor. These findings indicate that the welfare levels of the extreme poor in Nicaragua are very sensitive to food price behavior.

vi. **Better-off families in Nicaragua exhibit high educational levels, small family sizes, residence in Managua and the Pacific Region, and diversified incomes**. By contrast, moderate and extreme poverty, in both rural and urban areas, is consistently associated with low educational levels (particularly for females), large family sizes, location in the Central region, and dependence on agricultural activities. In rural areas, the poorest of the poor are the group of *minifundia* owners and agricultural wageworkers characterized by low levels of all assets and instability of employment. Families dedicated primarily to the production of staple crops and involved in agricultural wage labor activities are engaged in subsistence and food security strategies, and therefore unlikely to overcome poverty, except for those who manage to accumulate a sufficient level of assets. Better-off rural families diversify into market crops, livestock production, and participate in both nonagriculture and agriculture wage activities. However, most rural families, nonpoor and poor alike, lack access to agrarian institutions (i.e., technical assistance, financial services, and producers' organizations) that improve the likelihood of successful agriculture. Moreover, being poor means living at risk. Most poor people do not have access to formal insurance mechanisms or social safety nets to protect them, in either rural or urban areas, and most of the time they undervalue the risks associated with natural disasters.

vii. **Poverty changes between 1998 and 2001 varied substantially by region**. Poverty fell by over 10 percentage points in the Pacific Rural area, followed by less spectacular reductions in Atlantic Rural, Pacific Urban, and Central Urban. At the same time, there was some deterioration in Managua and in the coffee-dependent Central Rural region. In the latter region, smallholder farm families who lacked mobility experienced significant declines in income and primary school enrollments as a result of the sharp drop in world coffee prices. While the recent increase in poverty rates in the Central Rural region did not fully offset substantial gains obtained in the mid 1990s (1993-1998), it demonstrates the high degree of vulnerability of specific populations to commodity shocks. In contrast, the large decline in poverty rates in the Pacific Rural region is probably explained by the income effect that resulted from post-Hurricane Mitch reconstruction efforts. Trends in extreme poverty mirrored broadly the pattern of change observed for overall poverty, with a 14.5 percentage point reduction in the Atlantic Rural region and a significant increase of 5.7 percentage points in the Central Rural region.

viii. **Despite overall gains in poverty, nearly half of all PRSP targets are not currently on track**. Targets for improvement in under-five mortality, access to

reproductive healthcare services, access to drinking water and sanitation, and reduction in illiteracy had not been met by 2001. On the other hand, targets have been met for extreme poverty, net primary enrollment, infant mortality, maternal mortality, strategy for sustainable development, and chronic malnutrition. However, some target levels were set very modestly vis-à-vis the Millennium Development Goals (MDGs) for 2015, and raise concerns for sustained future performance. Achievement of intermediate indicators is mixed, with less than half demonstrating satisfactory performance.

ix. **The areas where indicators show least progress since 1993**, raising concerns for prospects of future poverty reduction, include the following:

- **Fertility rates continue to be high in Nicaragua, particularly among adolescents with no education, and a large unsatisfied demand for family planning services continues**. The global fertility rate remains considerably above the Latin American average and although births per woman have declined, the rate of decline has slowed down. One-fourth of women 15 to 19 years old were mothers in 2001 or had been pregnant. Low education levels are closely associated with adolescent pregnancy. Almost one-half (46 percent) of adolescents with no education have been pregnant at one time, as compared to only 5 percent of those with higher education.

- **Progress in education is mixed.** Though primary enrollment accelerated and secondary enrollment improved considerably, indicators of efficiency for primary have not improved. Moreover, most young children do not receive any early childhood development, and youth and adult literacy rates have remained practically stagnant.

- **Productive infrastructure has been practically stagnant since the early 1990s**. Little progress has been made in electrification since the early 1990s. Although progress has been made in access to paved roads, there are wide regional disparities. Progress has largely been concentrated in urban areas, most likely the result of post-Hurricane Mitch road reconstruction efforts. Improvements have occurred in all urban regions, but only the Pacific Rural area has benefited among rural areas, with the Central Rural and Atlantic Rural showing some deterioration.

- **Basic water and sanitation infrastructure has progressed very modestly**, with less than half of the homes in rural areas having access to safe basic services. Moreover, water management practices tend to turn water unsafe. Although access to sanitation seems to be considerable, more than one-half of all latrines are untreated. Moreover, sanitation conditions in densely populated slums appear to have worsened.

- **Diarrhea and upper respiratory infections for children under five show little progress since the early 1990s**. Although the prevalence of malnutrition has consistently fallen over the past decade, one in five children still remain chronically malnourished. Infant and child mortality are also at high levels, but improved substantially along the 1990s.

x. **Continued progress in Nicaragua's MDGs and PRSP goals is closely linked to the recovery of growth**, particularly with respect to achieving the target for poverty reduction in 2015. For education, key bottlenecks are related to improvements in the quality and coverage of primary education. To this effect, the Education for All Initiative (EFA) recently initiated in Nicaragua should improve the likelihood of achieving the MDG target of universal primary education. To lower maternal mortality, greater efforts will be needed in improving access to reproductive health services which should increase birth spacing, limit high fertility and diminish the share of births that take place in the home. Progress in the under-five mortality and chronic malnutrition categories raises concerns about future gains there, given the minimal progress in the diarrhea and acute respiratory categories, which are also linked to low access to safe water and sanitation services. Access to water has improved, although only one-fourth of households have access to piped water inside their homes. Water becomes contaminated mainly through unsafe practices with respect to accumulation for drinking water, the fact that domestic animals have access to the family's drinking water, and lack of chlorination or failure of families to boil water. Access to sanitation seems high, but one-half of latrines are untreated. Illiteracy rates in Nicaragua, as in other countries, have proven difficult to improve in the medium term. For the future, improvements in the quality of basic education programs and targeted adult literacy programs for the young will be key.

B. Prospects and Successful Strategies for Broad-based Growth and Poverty Reduction

Broad-Based Growth

xi. **Macroeconomic stability and broad-based growth were closely associated with progress in reducing poverty in Nicaragua during the 1990s**. However, much of the progress is associated with factors that will be exhausted in coming years: the reutilization of lands and infrastructure that had been left idle or underused in the 1980s and the post-Hurricane Mitch reconstruction. Thus, for broad-based growth to continue contributing to poverty reductions, future efforts need to focus more on increasing productivity. Growth promotion needs to continue to be supported by cross-cutting policies and incentives to enhance productivity. Key interventions to consider include improvements in education coverage and quality, infrastructure, governance, financial services (access and stability), land and home titling, as well making use of broader international trade opportunities.

Education

xii. **Among human capital investments, education stands out as critically linked to poverty reduction and improved productivity**. Key interventions in education for Nicaragua are universal primary education and literacy programs. Primary education requires increased coverage and improved quality, precisely the focus of the upcoming Education For All (EFA) program. Adult literacy needs improved targeting to young adults (15-24 years old) with the highest potential private and social rates of return.

Productive and Basic Infrastructure

xiii. **Increased access to productive and basic infrastructure is closely associated with improved productivity, poverty reduction, and reduced infant and child mortality**. Households with access to rural roads have a one-fifth smaller chance of being in poverty. Similarly, where households have access to safe water, particularly those with pipes inside the home, and sanitation, rates of child malnutrition and prevalence of diarrhea, both closely associated with infant and child mortality, are considerably lower. Going forward, Nicaragua needs to improve household's access to rural roads and increased access to safe water, including better water management practices, and sanitation. While some public infrastructure allocation decisions, such as rural roads and other physical investments for productive purposes could incorporate economic dynamism criteria, they need to be coordinated with private sector investment decisions. Using poverty allocation criteria is likely to be the optimal strategy for most upcoming decisions about investments on basic infrastructure (water and sanitation) and human capital.

Financial Services

xiv. **The current system of provision of financial services to families would need to be significantly modified to benefit a broader base in Nicaragua**. Increased competition and efficiency would promote lower interest rates, while wider use of better technology, innovation, and design of new products would permit to fit cash flow better (particularly cash flow profiles of the poor). Increased outreach of financial services, a broader term including savings, insurance, transfers, and payments, by supervised financial institutions (including cooperatives for instance) might be a better financial product than cash credit for Nicaraguan families below or near the poverty line. In addition, credit failure in Nicaragua is also associated with difficulties lenders face in differentiating "good" clients versus "bad" clients. Consequently, improvements in credit information systems could greatly enhance the performance of financial services in Nicaragua.

Population

xv. **Poor households in Nicaragua tend to exhibit high fertility and large family sizes as well as high maternal mortality**. Where an additional child less than five years old is present, estimated for the typical Nicaraguan family, the chance of being in poverty is higher by as much as 25 percent. Key issues are high fertility and the almost nonexistent birth spacing, particularly among adolescents. Increased access to reproductive and perinatal healthcare services for women are critical to progress in this area.

Health

xvi. **Health services need to prioritize maternal and child care**. Maternal mortality is associated with three high-impact healthcare interventions: access to family planning, early prenatal care, and birth attended by trained personnel. In addition, maternal

mortality is also inversely correlated to female literacy levels. Child and infant mortality are influenced mainly by five policy-relevant interventions, with more than half closely associated with the mother's healthcare and status: prenatal care, births attended by qualified personnel, access to piped water, access to family planning services, and breastfeeding practices. Most reproductive and maternal health care is provided by nurses, midwives, and community health workers rather than doctors, making the availability of skilled care within the community an important component of women's health.

Social Protection

xvii. **Access to timely and targeted social protection interventions can help protect the welfare of the critically poor, break the poverty trap, and prevent the loss of human and/or physical assets at times of crises**. Early findings from an ongoing Bank study on shocks and social protection indicate that measures to protect investments in children's education, health, and nutrition, such as conditional cash transfers, can be important in ensuring that short-term shocks do not result in long-term losses in human capacity and the inter-generational transmission of poverty. The findings also suggest that the welfare effects of a shock such as the current coffee crisis appear to be linked, at least in part, to households' economic mobility and adaptability to changing economic circumstances. Interventions to address social protection issues in Nicaragua could include targeted transfers (in association with other programs), and measures that strengthen economic mobility to help families manage risk and, thus, protect themselves from economic shocks. Fast-responding, workfare programs linked to infrastructure (such as adoquinado roads), which can be started and stopped in response to sudden shocks, could also be used.

CHAPTER I. NICARAGUA'S UPDATED POVERTY PROFILE

A. THE EVOLUTION OF POVERTY 1993, 1998, AND 2001

1.1 **Poverty and extreme poverty declined consistently from 1993 to 1998 and again to 2001 at the national level and for urban and rural areas**. Moreover, changes in poverty at the national level indicated an acceleration of poverty reduction in the period 1998-2001 in contrast with 1993-1998. The most recent period shows about the same decline in percentage points as the earlier period, but poverty is being measured in a three-year versus a five-year period (Table 1.1).

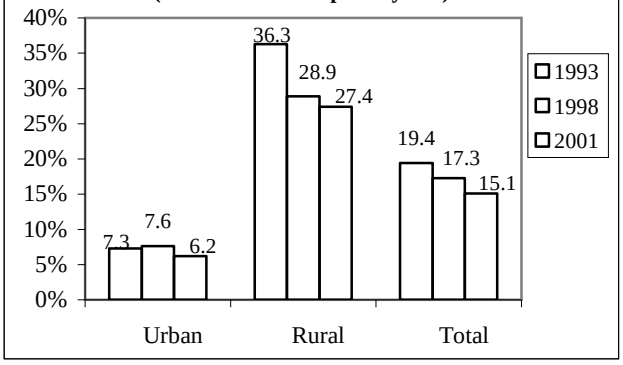
Table 1.1: Nicaragua: Poverty Trends, 1993–1998–2001 (%)

	National			Urban			Rural		
Year	Incidence[b]	Change	Annual Change[c]	Incidence[b]	Change	Annual Change[c]	Incidence[b]	Change	Annual Change[c]
All Poor[a]									
1993	50.3	..	..	31.9	..	..	76.1	..	..
1998	47.9	-2.4	-1.0	30.5	-1.4	-0.9	68.5	-7.6	-2.1
2001	45.8	-2.1	-1.5	28.7	-0.4	-0.4	64.3	-0.7	-0.3
Extremely Poor									
1993	19.4	..	..	7.3	..	..	36.3	..	..
1998	17.3	-2.1	-2.3	7.6	+0.3	+0.8	28.9	-7.4	-4.5
2001	15.1	-2.2	-4.4	6.1	-1.4	-6.6	24.7	-1.5	-1.8

Source: Nicaragua LSMS 1993, 1998, 2001. (a) "All poor" throughout this report includes the extremely poor; thus, the extremely poor are a subset of the poor. (b) Incidence measured by the Headcount Index (Po) is the share of the population whose total consumption falls below the poverty line. (c) Annual change is calculated as the geometric mean for three and five years, respectively.

1.2 **Although poverty declined significantly, more in rural than urban areas, poverty and extreme poverty continue to be overwhelmingly rural** (figure 1.1). More than two-thirds of rural inhabitants are poor in contrast with less than one-third in urban areas. Similarly, more than 25 percent of those in rural areas are extremely poor versus about 6 percent for urban residents.

Figure 1.1 Extreme Poverty Headcount Index
(% below extreme poverty line)



1.3 **Poverty and extreme poverty declined at the national level (there was even an accelerated decline), but rural areas where poverty is highest observed a deceleration in both poverty and extreme poverty reduction**. Poverty and extreme poverty reduction at the national level accelerated their performance in 1998-2001 in contrast with 1993-1998. However, once disaggregated, extremely poor urban areas are the only ones showing this acceleration in poverty reduction, which is not observed for urban overall poverty, neither for rural extreme and overall poverty. These differences can be explained by subregional shocks in 2001, such as the coffee crisis and drought.

Table 1.2: Nicaragua: People in Poverty, 1993–1998–2001 (thousands)

Year	All Poor			Extremely Poor[a]		
	National	Urban	Rural	National	Urban	Rural
1993	2,100.0	777.0	1,323.0	810.0	178.2	631.8
1998	2,303.4	797.4	1,506.0	834.6	199.6	635.0
2001	2,385.5	914.6	1,470.9	783.4	188.3	595.1

Source: Nicaragua LSMS 1993, 1998, 2001.
(a) The "extremely poor" throughout this report are included in "all poor"; thus, the extremely poor are a subset of the poor.

1.4 **In spite of a consistent decline in poverty, the absolute number of people in poverty increased, but there were notably fewer in extreme poverty** (table 1.2). The number of poor people in 2001 increased by almost 300,000 since 1993. For extreme poverty reduction a significant gain is that the number of extremely poor people has declined by about 30,000, the progress coming mainly from a reduction of close to 35,000 in rural areas.

Box 1.1: Measuring and Comparing Poverty

A key objective of this poverty assessment follow-up is to compare poverty during 1998-2001.[1] Given that the 1998 and 2001 LSMS have generated comparable consumption aggregates,[2] a more standard methodology of minimum caloric intake was applied to determine the poverty lines and the corresponding poverty rates.[3]

To compare the 1998 and 2001 LSMS, the 1998 extreme poverty line was determined by computing the annual cost to buy a bundle of food that provides 2,187 Kcal/day.[4] The same consumption patterns were observed for families in the 1998 LSMS. The per capita annual extreme poverty line in 1998 was estimated at C$2,489 or US$237.

The general poverty line is the extreme poverty line plus an additional amount for the share dedicated to nonfood consumption. The share of nonfood consumption used for the poverty line is the same as that for households whose food consumption is around C$2,489. The observed share (41.1 percent) yields an overall poverty line of C$4,223 (C$2,489 for food plus C$1,734 for nonfood) or US$402 per year in 1998.

To generate the 2001 extreme poverty line, the cost of the same bundle of food was computed using new prices.[5] The extreme poverty line for 2001 was C$2,691 or US$202. For the nonfood items in 2001, the same amount used in the 1998 estimation is updated using the change in the consumer price index for the same period of time (42.2 percent). The general poverty line in 2001 was C$5,157 (C$2,691 for food plus C$2,466 for nonfood) or US$386 per year.

In both years, a person is considered poor if his/her total per capita annual consumption was below the general poverty line, and a person is considered extremely poor if his/her total per capita annual consumption was below the extreme poverty line. The corresponding poverty rates are reported in Table 1.2. Poverty comparisons between 1998 and 2001 are deemed technically valid because the consumption aggregates have the same components and because the level of welfare associated with the extreme poverty line is kept constant by means of pricing the same bundle of food and by updating the nonfood portion of the general poverty line.

[1] See Annex 1 for more detailed information on the consumption aggregate and poverty lines.

[2] The measure of consumption in both 1993 and 1998, as in most poverty studies, does not include implicit in-kind transfers through government programs in the social sectors (see Annex 1). Thus, poverty estimates most probably overstate the poverty level by a few percentage points, particularly since the poor more often consume public services than the nonpoor.

[3] Because of difference in the data sources, this was not possible to do between the 1993 and 1998 LSMSs

[4] With the population estimates for Nicaragua and the minimum caloric requirements table (Recomendaciones Dietéticas Diarias del INCAP, Instituto de Nutrición de Centro América y Panamá (INCAP) y Organización Panamericana de la Salud (OPS), Guatemala, abril, 1996), the weighted average of 2,187 Kcal/day was computed for Nicaragua.

[5] Because of demographic changes in the 1998-2001 period, the minimum caloric requirement weighted average increased from 2,187 to 2,200 Kcal/day. The food bundle was adjusted to take into consideration the new conditions (increase of 0.6 percent.).

1.5 **The major factors explaining poverty reduction between 1998 and 2001 were bolstered considerably by post-Hurricane Mitch reconstruction efforts**. Decomposition analysis (box 1.2) indicates that the source of the performance for overall poverty was closely related to broad-based economic growth, reinforced to a large extent by Post-Hurricane Mitch reconstruction investments. Falling inequality, observed in the decline of the consumption share of the highest decile by 2.3 percent and an increase in these shares for the other nine deciles confirmed by a reduction of the consumption Gini in two points, is the major contributor in overall poverty reduction. By contrast, reductions in extreme poverty can mainly be explained by the relative price performance of food staple prices, in particular rice and beans. The relative price of rice and beans, staples that constitute about one-third of the diet of extremely poor and one-fourth of that of the poor (table 1.3), increased relatively less than other basic food prices (figure 1.2). These two crops have also benefited from post-Hurricane Mitch programs such as incentives for bean production and *libra-por-libra* for rice.

Table 1.3: Consumption of Major Food Items

Food item	Extremely Poor		Poor		All Nicaragua	
	%	cumulative %	%	cumulative %	%	cumulative %
1 Rice	15.3		14.0		9.8	
2 Beans	12.3	28	9.4	23	6.1	16
3 Corn	9.3		5.5		2.7	
4 Sugar	8.4		6.9		5.1	
5 Tortilla	5.7	51	4.8	41	4.3	28
6 Eggs	5.3		4.6		3.8	
7 Vegetable oil	4.9		4.8		3.6	
8 Coffee	3.9		3.2		2.2	
9 Milk, fresh	3.7		5.2		5.2	
10 Cheese/cream	3.3		4.0		3.9	
11 Chicken	3.1	75	4.4	67	4.4	51

Source: Nicaragua LSMS, 2001.

1.6 **A pro-poor tax reform with distributional objectives to the most needy would need to incorporate exemption from the value-added tax only those items consumed by the extremely poor**, or at most the overall poor, and not the entire consumer's basic basket. Three-quarters of the food consumption of the extremely poor in Nicaragua consists of only 11 items, and half of four basic food staples: rice, beans, corn, and sugar. Given that food constitutes almost two-thirds (60.6 percent)[6] of total consumption of the extremely poor, the evolution of prices of these four food staples has a critical impact on budget allocation decisions of extremely poor families in Nicaragua. A recent tax reform was approved in Nicaragua by the National Assembly using pro-poor arguments for exempting all 49 items in the consumer's basic basket. However, the evidence from analyzing food and consumption patterns of the extremely and overall poor indicates that three-quarters of their food consumption consists of only 11 and 14 items, respectively.[7] In consequence, a tax reform to favor the most needy would need to focus on exempting from the value-added tax at most either 11 or 14 items if the target population are either the extremely poor (15.1 percent of the population in Nicaragua) or the overall poor (45.8 percent of Nicaraguans).

[6] See Annex 3 table on consumption patterns for different groups in Nicaragua.

[7] Bread (3.5 percent), beef (2.4 percent), and plantain (2.4 percent) complement the items in Table 1.3 to get 75 percent of food consumption being 60 percent of total consumption for the overall poor).

Box 1.2: Poverty Decomposition in Nicaragua between 1998 and 2001

Changes in overall and extreme poverty in Nicaragua between 1998 and 2001 can be decomposed in four factors (see Annex 1): changes in per capita consumption (*wealth*); changes in poverty lines value (*food prices*); changes in inequality (*inequality*); and an interaction term. For urban and rural poverty, the decomposition includes changes in the urban-rural population distribution (*U/R*). Mathematically, the $j^{th.}$ poverty rate for the $i^{th.}$ year (P_{ji}) – where j = extreme poverty and j = overall poverty, and where i = 1998 and i = 2001 – can be expressed as a function of the average per capita consumption (c_i), the value of the poverty lines (p_{ji}), the level of inequality (q_i), an interaction term, and the urban-rural composition (u_i).

Poverty Decomposition National = Consumption + Food Prices + Inequality + Interaction

alternatively: $P_{j2001} - P_{j1998} = f_j(c_{2001}, p_{j2001}, q_{2001}, u_{2001}) - f_j(c_{98}, p_{j98}, q_{98}, u_{98}) =$

$f_j(c_{2001}, p_{j2001}, q_{2001}, u_{2001}) - f_j(c_{1998}, p_{j2001}, q_{2001}, u_{2001}) +$
$f_j(c_{2001}, p_{j2001}, q_{2001}, u_{2001}) - f_j(c_{2001}, p_{j1998}, q_{2001}, u_{2001}) +$
$f_j(c_{2001}, p_{j2001}, q_{2001}, u_{2001}) - f_j(c_{2001}, p_{j2001}, q_{1998}, u_{2001}) +$ Interaction

Poverty Decomposition Urban/Rural = Consumption + Food Prices + Inequality + Interaction + U/R Ratio

where: Urban/Rural Ratio: $f_j(c_{2001}, p_{j2001}, q_{2001}, u_{2001}) - f_j(c_{2001}, p_{j2001}, q_{2001}, u_{1998})$

Key factors explaining reductions in poverty are as follows. Food prices declined, and thus it is cheaper to acquire the minimum 2,199 Kcal/per capita/day in 2001 than in 1998. Inequality decreased; the consumption share of the highest decile declined by 2.3 percentage points, whereas it increased for the other nine deciles. The relative weight of urban areas increased from 54.3 to 58.3 percent; however, this reclassification of households from rural to urban marginally increased poverty in both urban and rural areas.

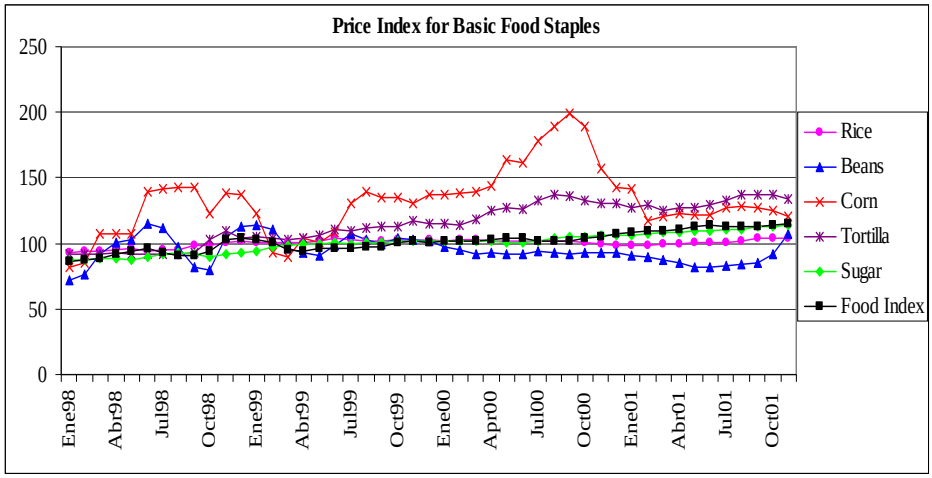
Poverty Decomposition 1998-2001

Poverty	1998	2001	Total Change	Components				
				Wealth	Food prices	Inequality	Interaction	U/R
National								
Extreme	17.3	15.1	100.0%	+7.8%	**-75.0%**	-25.0%	-7.8%	-
Overall	47.9	45.8	100.0%	+46.7%	0.0%	-153.3%	+6.7%	-
Urban								
Extreme	7.6	6.1	100.0%	+7.5%	**-72.5%**	-27.5%	+2.5%	-10.0%
Overall	30.5	28.7	100.0%	+32.0%	0.0%	-100.0%	+56.0%	+12.0%
Rural								
Extreme	28.9	24.7	100.0%	+9.3%	**-101.3%**	-33.3%	+36.0%	-10.7%
Overall	68.5	64.3	100.0%	+14.6%	0.0%	-48.8%	+85.4%	-51.2%

Extreme poverty reductions are largely explained by falling food prices. Cheaper food explains about 75 percent of the reduction in extreme poverty at the national level and in urban areas, and explains all the reduction in rural areas. The reduction in inequality explains the other 25 percent at the national level and in urban areas.

Overall poverty reductions have falling inequality as the key driving force; however, reductions in overall urban and rural poverty generated by the reduction in inequality were largely offset by the reclassification of households from rural to urban (see Annex 3, tables A10, A11, and A12)**.** Food prices had practically no effect in overall poverty changes. Reductions in inequality as measured by the consumption shares by deciles were validated by the consumption Ginis between 1998 and 2001 at the national, urban, and rural levels, with reductions of 2.1, 2.5 and 2.5 points, respectively (see Annex 3, table A24).

Figure 1.2



Source: National Consumer's Price Index System, Central Bank of Nicaragua (BCN).[translate abbreviations]

Table 1.4: Nicaragua: Poverty Evolution by Region, 1993-1998-2001 (percent)

	Incidence of and Change in Poverty Headcount Index						Incidence of and Change in Extreme Poverty Headcount Index					
Region	**1993**	**1998**	**2001**	**Change 1993-98**	**Change 1998-01**	**Change 1993-01**	**1993**	**1998**	**2001**	**Change 1993-98**	**Change 1998-01**	**Change 1993-01**
National	**50.3**	**47.9**	**45.8**	**-2.4**	**-2.1**	**-4.5**	**19.4**	**17.3**	**15.1**	**-2.1**	**-2.2**	**-4.3**
Urban	**31.9**	**30.5**	**30.1**	**-1.4**	**-0.4**	**-1.8**	**7.3**	**7.6**	**6.2**	**+0.3**	**-1.4**	**-1.1**
Rural	**76.1**	**68.5**	**67.8**	**-7.6**	**-0.7**	**-8.3**	**36.3**	**28.9**	**27.4**	**-7.4**	**-1.5**	**-8.9**
Managua	29.9	18.5	20.2	-11.4	+1.7	-9.7	5.1	3.1	2.5	-2.0	-0.6	-2.6
Pacific												
Urban	28.1	39.6	37.2	+11.5	-2.4	+9.1	6.4	9.8	5.9	+3.4	-3.9	-0.5
Rural	70.7	67.1	56.8	-3.6	-10.3	-13.9	31.6	24.1	16.3	-7.5	-7.8	-15.3
Central												
Urban	49.2	39.4	37.6	-9.8	-1.8	-11.6	15.3	12.2	11.1	-3.1	-1.1	-4.2
Rural	84.7	74	75.1	-10.7	+1.1	-9.6	47.6	32.7	38.4	-14.9	+5.7	-9.2
Atlantic												
Urban	35.5	44.4	43	+8.9	-1.4	+7.5	7.9	17	13.1	+9.1	-3.9	+5.2
Rural	83.6	79.3	76.7	-4.3	-2.6	-6.9	30.3	41.4	26.9	+11.1	-14.5	-3.4

Source: Nicaragua LSMS 1993, 1998, 2001. (a) Departments by region: Managua includes Managua Urban and Managua Rural; Pacific includes Chinandega, Leon, Masaya, Granada, Carazo and Rivas; Central includes Nueva Segovia, Jinotega, Atlantic Region) and Rio San Juan. (b) Nicaragua's population share by region in 1998 is: Managua 27.7%, Pacific Urban 19.7%, Pacific Rural 14.1%, Central Urban 10.9%, Central

1.7 **Poverty changes varied substantially by region** (table 1.4). In particular, the Central Rural region showed an increase in poverty between 1998 and 2001, which was expected to a certain extent, given the coffee crisis and drought. Although poverty increased in this region, substantial gains obtained in the early 1990s (1993-1998) were not fully offset. The impact of the decline in coffee prices on poverty was concentrated subregionally in the Central Rural region, as this region accounts for close to 80 percent of coffee production in Nicaragua. These findings confirm the high degree of vulnerability of poverty reduction gains in Nicaragua to idiosyncratic shocks such as a change in terms of trade due to a severe decline in coffee prices (box 1.3). The extent of the impact of the coffee crisis was most probably not fully captured by the LSMS 2001, given that this was the first year when coffee prices declined. The Pacific Rural region, for the same period, showed the largest decline in overall and extreme poverty, largely explained by post-Hurricane Mitch reconstruction efforts. From 1993 to 2001, progress in poverty and extreme poverty reduction was highest in the Pacific Rural and Central Urban and Rural areas; Managua showed substantial progress in overall poverty reduction but not as much in extreme poverty.

Box 1.3: The Poverty and Social Impacts of the Coffee Crisis in Nicaragua

A steep decline in the world coffee price, resulting from a worldwide structural change in the coffee market, has had a dramatic impact on the coffee economy in Nicaragua and on families that depend on coffee-related income. Between 1998 and 2001, the average price received by Nicaraguan coffee exports dropped by 61 percent, from US$151 to US$59 per quintal (100 pounds). While the quantity of coffee exported actually increased between the 1997/98 and 2001/02 harvest seasons, the value of exports actually declined 41 percent over the period, from about US$184 to US$109 million.

An ongoing World Bank study finds this coffee crisis has also led to significant declines in well-being among households that remained involved in the coffee economy over the period. Analyzing LSMS panel data from rural Nicaragua, 1998-2001, the study finds that 23 percent of rural households had one or more members working as coffee producers or coffee laborers in at least one of the two survey years. There appears to have been considerable movement of people in and out of the coffee sector during the period, however, as only 16 percent of rural households earned income from coffee in any given year.

Movements in and out of the coffee sector appear to have been important to how the crisis affected different households. Neither households that exited or entered the coffee economy experienced declines in welfare between 1998 and 2001. Rather, it was the 8 percent of households that *remained* in the coffee sector over the period that experienced serious negative effects of the crisis. These included:

Income losses. While, on average, rural households in the panel experienced increases in per capita incomes of 30 percent over the period, coffee-sector households experienced income declines of more than 25 percent. Because households generally have multiple sources of income, the effect of the coffee shock on household income was less than the drop in the world price. Nonetheless, the effect on household incomes was substantial.

Declines in consumption. Even though coffee-sector households adopted strategies to reduce the impact of the crisis on their consumption, the effect on household welfare was considerable. Per capita consumption among households that stayed in the coffee sector over the period declined by more than 16 percent between 1998 and 2001. This compares with increases in per capita consumption of nearly 12 percent, on average, among rural households in the panel.

Increases in poverty. Declines in consumption have translated into greater poverty rates among coffee households. The incidence of poverty among coffee households increased by more than 2 percent between 1998 and 2001, in contrast to overall declines in poverty of more than 6 percent among rural panel households during the same period. The incidence of extreme poverty also increased by almost 5 percent, compared to declines in extreme poverty of more than 14 percent among all rural panel households.

Setbacks in schooling and child nutrition. The coffee crisis has also adversely affected child schooling and nutrition in coffee households. For example, net primary enrollment rates declined by more than 5 percent among coffee households from 1998 to 2001, while they increased by 10 percent among all rural panel households. At the secondary level, net enrollment rates stagnated among coffee households while they increased by two-thirds (from 19 to 32 percent) for the entire rural panel. And while the incidence of underweight children dropped by more than 6 percentage points among non-coffee households, reductions in the underweight incidence among coffee households was not statistically significant.

An important insight from the study is that household participation in the coffee economy during the period did not, by itself, imply falling welfare or rising poverty. Households that entered, as well as exited, the coffee sector between 1998 and 2001 shared in many of Nicaragua's gains over the period. Instead, the welfare effects of the crisis appear to be linked, at least in part, to households' economic mobility and adaptability (or the lack thereof). The study is analyzing the factors that affect economic mobility, to help identify interventions that could strengthen households' abilities to respond to economic shocks.

While ongoing work associated with this study is continuing to identify policies that could strengthen households' abilities to respond to economic shocks, early findings already suggest two broad areas where public intervention could help. First, measures to protect investments in children's education, health, and nutrition can be important to ensure that shocks do not result in long-term losses in human capacity. Second, measures that strengthen economic mobility are important to help families manage risk and thus protect themselves from economic shocks.

Source: "Shocks and Social Protection: Lessons from the Coffee Crisis in Central America," World Bank, Latin American and Caribbean Region, forthcoming 2003.

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B. FERTILITY AND MATERNAL HEALTH

1.8 **Fertility rates continue to be high in Nicaragua, with modest progress in births per woman and unsatisfied demand for family planning services**. The global fertility rate went from 3.6 in 1998 to 3.2 in 2001, remaining considerably above the Latin American average. Although births per woman declined for all groups between 1998 and 2001, the speed of this decline slowed down, in contrast to the period 1993-1998 (figure 1.3), meaning the current trend in births per woman without any additional intervention would keep global fertility rates high in the future. Moreover, adolescent fertility is the highest in Latin America, with 119 births per 1,000 women 15 to 19 years old during the period 1998-2001, compared to 81 in Central America and Mexico and 65 worldwide (box 1.4). This is concomitant to other youth-related hardships such as higher-than-national unemployment and poverty rates. However, unsatisfied demand for family planning services showed almost no progress between 1998 and 2001, and remained around 15 percent nationwide, with almost one in five women with no education being unable to limit or space childbearing (figure 1.4).

Figure 1.3 Births Per Woman (15-49 yrs)

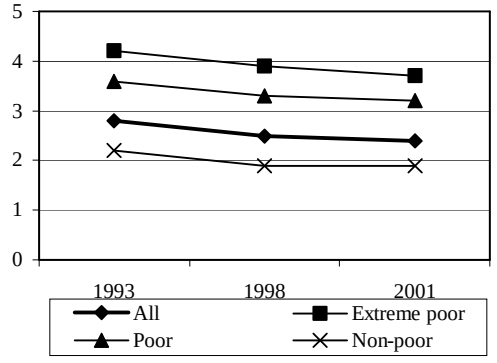
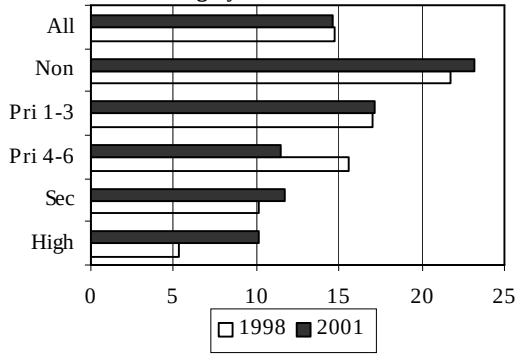


Figure 1.4 Unsatisfied Demand for Family Planning by Women's Education



Box 1.4: Nicaraguan Youth at-a-Glance

- **Some 21 percent** of the entire population (approximately 1 million youth) are between the ages of **15 and 24.**
- **Adolescent fertility rate** is the **highest** in Latin America: 119 births per 1,000 women age 15-19 (compared to an average of 81 for Central America and Mexico and 65 worldwide).
- Almost **half of all pregnancies** occur in women ages 15-19, as do more than **half of maternal deaths**, and **21 percent of all newborns in the country** have adolescent mothers.
- Among 15- to 24-year-olds, the estimated **HIV/AIDS prevalence rate is between .05 and .08 percent in women and between .17 and. 26 percent** in men (compared to between .22 and 1.97 percent. in other Central American countries).
- In 1990-2000, **the percentage of 15- to 24-year-olds in the population grew by 40 percent** (compared to a growth of 32-38 percent in Costa Rica, Honduras, and Guatemala, 25 percent in El Salvador, and 6 percent and 9 percent in Panama and Mexico, respectively).
- The labor force is made up 39 percent by 15- to 24-year-olds.**Twenty percent** of all 15- to 24-year-olds are unemployed.
- **Thirty percent of 15- to 24-year-olds are poor,** and **49 percent are extremely poor.**
- **Almost 25 percent of all urban 15- to 24-year-olds do not study or work.**

Source: "Youth in Nicaragua Policy Note," World Bank, Latin American and Caribbean Region, forthcoming 2003. Sources are: World Bank, *Nicaragua Poverty Assessment*, February 21, 2001; UNDP *Human Development Report* 2000; "*Políticas de Juventud en América Latina: Evaluación y Diseño, Informe Nacional de Nicaragua,"* Héctor Goglio, April 1995, International Development Research Centre (Canada); *"Política Nacional para el Desarrollo Integral de la Juventud",* November 2001; CEPAL, "*Vulnerabilidad Social y Económica de los Jóvenes Marginados en México, El Salvador, Nicaragua, y Panamá."* August 2001.

1.9 **Adolescent pregnancy is common in Nicaragua, particularly among rural women and women with no education**. Although pregnancy among adolescents has declined slightly in the past few years, still one in every four women 15-19 years old in 2001 were already mothers or had been pregnant, compared to 27 percent in 1998 and 32 percent in 1993.[8] Fertility among adolescent women was 119 births per 1,000 women 15-19 years old for the period 1998-2001; however, adolescent fertility in rural areas was more than 60 percent above that of urban adolescents. Even though adolescent fertility declined by about 8 percent between 1998 and 2001, more significantly, education was critically associated to adolescent pregnancy. Almost one-half (46 percent) of adolescents with no education had ever been pregnant, compared to only 5 percent of those with higher education. In fact, both characteristics are most probably cause and consequence of one another.

1.10 **Maternal health has improved, but increased attention is needed to increase institutional births and improve health skills of those attending births**. Initial data for maternal mortality indicate substantial improvements from 148 to 125 per 100,000 live births in the two years 1999-2001. Based on recent performance, trend analysis suggests the MDG and PRSP maternal mortality goal for Nicaragua can indeed be achieved by 2015. Nevertheless, the two most relevant intermediate indicators show significant improvements in early prenatal and prenatal care (figure 1.5), but minimal progress in institutional births and births attended by skilled health staff. In particular, prenatal care coverage for rural extremely poor women improved by more than 50 percent, from 50.6 to 78.2 percent, in less than 10 years from 1993 to 2001 (figure 1.6). Given the high rates of coverage in urban areas, additional progress will require focusing more on rural areas in general, especially on improving the timing of the initiation of care, on increasing the average number of visits per woman in rural areas, and on improving the quality of care.

Figure 1.5 Prenatal Care Coverage

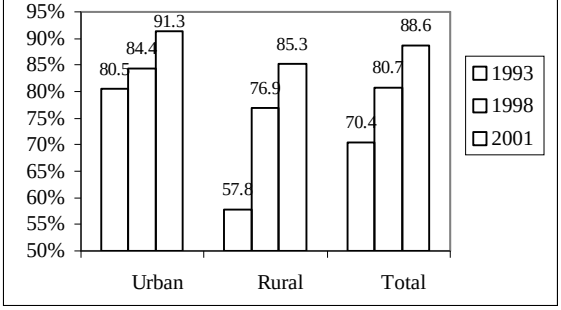
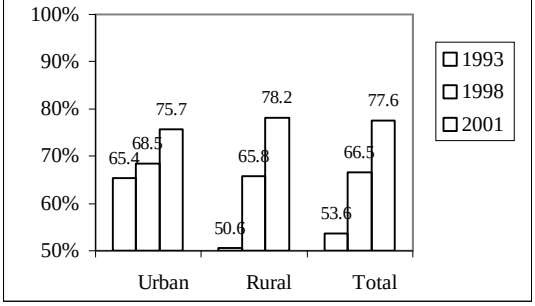


Figure 1.6 Prenatal Care Coverage, Extremely Poor



1.11 **More than one-fourth of all deliveries among the extremely poor are at the mother's house, and mothers are attended mostly by midwives** (table 1.5). A concerted group of actions is required among health providers to identify high-risk pregnancies and potentially high-risk deliveries in a timely manner by improving the existing referral system and homes for mothers, increasing the number of births that take place attended and in medical institutions, and improving the health skills of those attending births, including midwives. To improve maternal health indicators would require a strategy that encompasses actions to provide better skills to those attending extremely poor mothers. Even though prenatal care coverage among the extremely poor has improved dramatically in the past decade, half of extremely poor mothers continue to deliver at home. These efforts, therefore, must include improving the ability of care

[8] Family Health Survey1993; DHS 1998 and DHS 2001.

providers to effectively address differences in those cultural values that give rise to preferences to deliver at home.

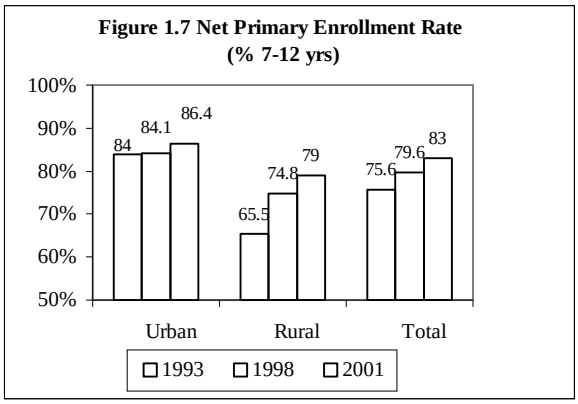
Table 1.5: Nicaragua: Maternal Health Indicators for Delivery

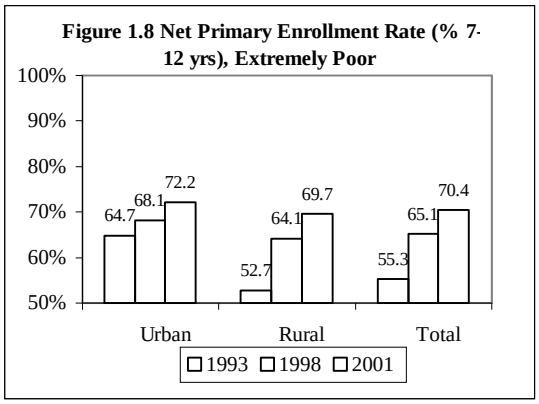
	Where Gave Birth					Birth Attended by			
	Public Facility	Private Facility	Midwife's House	Patient's House	Other [(c)]	Doctor	Nurse	Midwife	Other
National	67.8	4.0	2.3	25.5	0.4	70.0	2.5	23.6	3.9
Extremely Poor	43.6	0.6	4.3	51.4	0.2	42.3	2.1	45.7	9.9
Not Extremely Poor	73.1	4.8	1.9	19.8	0.4	76.1	2.6	18.8	2.6
Poor	59.0	0.7	3.0	37.0	0.3	57.1	2.9	34.1	5.8
Nonpoor	77.7	7.7	1.5	12.7	0.3	84.3	2.0	12.0	1.7

Source: Nicaragua LSMS 2001. (a) Includes Public Hospital, Public Health Center, and Polyclinic INSS. (b) Includes Private Hospital and Private Clinic. (c) Includes NGO Clinic and Other.

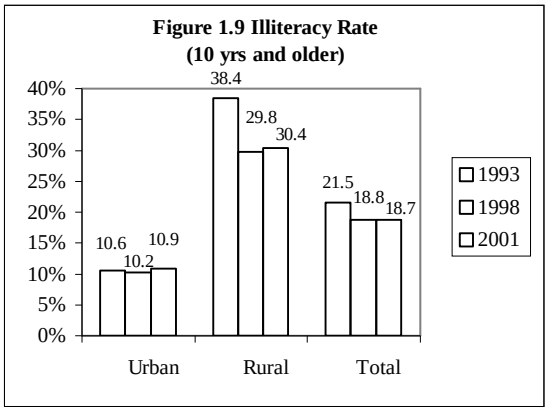
C. SOCIAL OUTCOMES, HOUSING CONDITIONS, AND BASIC INFRASTRUCTURE

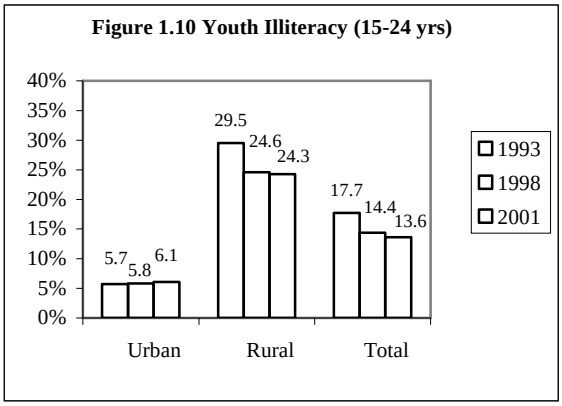
1.12 **Progress in education was mixed. Although primary enrollment accelerated and secondary enrollment improved considerably, preliminary indicators of internal efficiency for primary did not improve, and youth and adult literacy were practically stagnant**. Primary enrollment rates accelerated their performance during the 1998-2001 period as compared to the period 1993-1998 (figure 1.7). In particular, rural primary enrollment for the extremely poor went from about 50 to almost 70 percent in the period 1993-2001 (figure 1.8). Secondary enrollment rates saw substantial improvements, particularly in urban areas and even among the extremely poor. However, indicators of internal efficiency for primary enrollment, such as promotion rate of third graders in rural areas and proportion of children finishing primary in six years, have not been progressed.





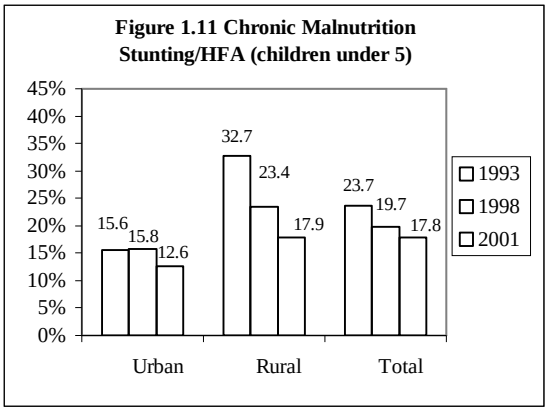
1.13 In rural areas, economic problems (demand factors) and distance (supply factors) are equally relevant in explaining the lack of school attendance. An exception is for the rural extremely poor, as almost half do not attend school for economic reasons. In urban areas, demand factors are overwhelmingly the most important factor. Monetary problems are quoted by close to two-thirds as the reason for not attending school.

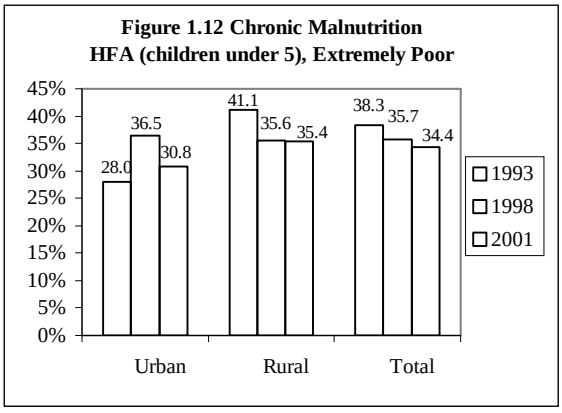




1.14 **Youth and adult literacy exhibited only modest performance** and, particularly during 1998-2001, seems to have stagnated (figures 1.9 and 1.10). This is a reason for concern, given that Nicaragua has a low literacy rate by low-income country standards. Mean years of schooling improved slightly, from 4.5 in 1993 to 4.9 in 2001, but there were great disparities by groups. While the extremely poor in rural areas have on average about 2.5 years of schooling, the nonpoor in urban areas have attained 6.5 years or 4 years more than the former.

1.15 **Infant and child mortality showed the most impressive progress, with more than a 20 percent reduction in three years**. However, the proportion of fully immunized children slipped from 80 to 72 percent between 1998 and 2001,[9] demonstrating the need to ensure sustainability of these gains. Moreover, the performance of other intermediate indicators for child health was mixed. Children, especially those groups of under age five and age three, are priority groups for human capital and poverty reduction. Although infant and child mortality improved substantially and the prevalence of malnutrition has consistently fallen over the past decade, nearly one in five children remains chronically malnourished (figure 1.11). Further reductions in malnutrition will require focusing on rural areas, where the chronic malnutrition rate is 50 percent higher than that at the urban level, and on the extremely poor, where the incidence is almost twice the national average (figure 1.12).





[9] DHS 2001.

1.16 **Stagnant progress in the prevalence of diarrhea and upper respiratory infections for children under five is a reason for concern**. Incidence of the two most prevalent child diseases in those under five remained practically stagnant since 1993.[10] Upper respiratory infections improved between 1993 and 1998 but worsened again in 2001 to almost one in every four children under five (figure 1.13). Similarly, among panel respondents, about one in every four children under five had had an episode of diarrhea in the previous month. For the Central Region, in both urban and rural areas, diarrhea was reported for almost one in every three children under five (figure 1.14).

Figure 1.13 Upper Respiratory Infections (children under 5)

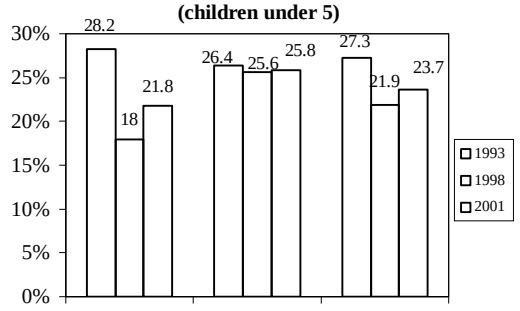
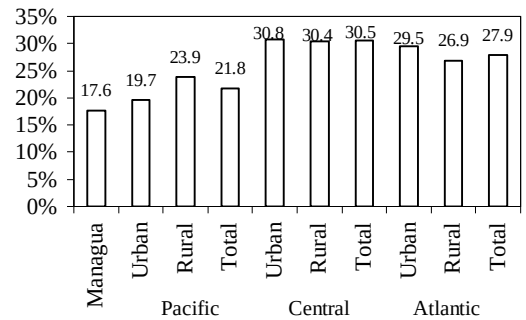


Figure 1.14 Diarrhea by Region in 2001 (children under 5)



1.17 The severe impact of diarrhea on malnutrition is well established, so future progress in this area will be critical for further improvements in child health. Behavioral patterns as well as a very modest performance for water and sanitation are contributing factors to the lack of progress in child health. Poor hygiene practices associated with poor infrastructure require both educational campaigns as well as improved water, waste, and garbage management solutions in addition to progress in water and sanitation infrastructure. Common behavioral practices include[11] the need to accumulate water because of lack of running water, access of domestic animals to family's drinking water, lack of chlorine, failure to boil water, untreated latrines, and garbage dumping.

Figure 1.15 Access to Water

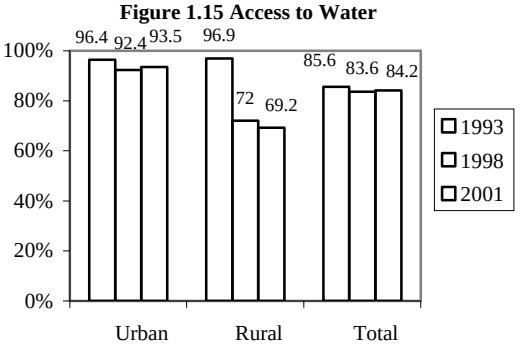
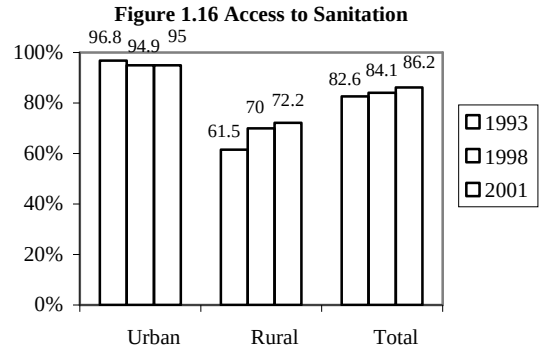


Figure 1.16 Access to Sanitation



[10] The contrasting trends for the incidence of upper respiratory infections and diarrhea between the LSMS and DHS surveys reinforce the finding of a stagnant performance. LSMS and DHS surveys were both collected in 1998 and 2001. The LSMS shows a higher incidence of diarrhea for children under five in 2001 as compared with 1998, while the reverse trend is reported by the DHS. Likewise, the LSMS shows a lower incidence of upper respiratory diseases for children under five in 2001 from 1998, but the DHS reports increased incidence for the same period.

[11] World Bank (2001). Qualitative Poverty and Exclusion Study.

1.18 **Water and sanitation performance is very modest**. Access to safe water was more or less stagnant, at about 85 percent in 2001 (including public/private wells) or around 70 percent from administrative records]. Although water coverage was relatively high at the national level (figure 1.15), great disparities prevail in access to safe water. Less than half of all homes in rural dispersed areas have access to safe water. Thus, achieving further progress will require more expensive investments and more creative solutions as well as improved water management practices by households to have an impact on general, and particularly child, health status.

1.19 **Sanitation access seems to be considerably high, but more than one-half of all latrines are untreated or about one-third of all sanitation services.** More than 85 percent of the population had access to sanitation in 2001, but progress in that area has been more or less stagnant (figure 1.16). A reason for concern is that sanitation conditions in densely populated slums appear to be even worse than in extremely poor rural areas, where about 40 percent of all urban sanitation services are untreated latrines (table 1.6). Untreated latrines in urban areas are a real reason for concern. Other concomitant concerns that explain the poor health status of young, urban children are mothers having to leave their children in the care of other, older children and the lack of "patios" in which to grow home gardens.

Table 1.6: Nicaragua: Access to Sanitation

Type of Sanitary Service	Urban				Rural			
	All	Extremely Poor	Poor	Nonpoor	All	Extremely Poor	Poor	Nonpoor
Latrine/lavatory - Not treated	32.1	42.7	42.05	29.2	38.4	35.9	37.5	39.7
Latrine/lavatory - Treated	26.9	32.5	34.5	24.6	31.8	22.7	26.8	38.9
Toilet discharges into sewers	26.9	1.5	7.5	32.6	0.2	0.3	0.1	0.4
Toilet discharges into cesspool	9.0	0.6	4.0	10.5	1.8	0.0	0.2	4.1
Toilet discharges into river/stream	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0
There is none	5.0	22.7	12.0	3.0	27.8	41.1	35.3	16.9

Source: Nicaragua LSMS 2001.

1.20 **Housing conditions have worsened considerably**. Overcrowding (defined as more than three persons in the same room), has increased by almost two-thirds (table 1.7). More than two-thirds of Nicaraguans lived in overcrowded homes in 2001, and more than three-quarters of the extremely poor lived in overcrowded conditions. In addition, the use of firewood for cooking improved only slightly at the national level, declining for those who were not extremely poor. Major concomitant health and social problems for Nicaraguans include resilience of upper respiratory infection in children under five and domestic violence.

1.21 **Productive infrastructure is stagnant for access to electricity**. Electrification showed essentially no progress, at about 70 percent since 1993. The nonpoor group even showed worsened access from 1993 to 2001. Among the extremely poor in rural areas, not even one in every five homes had access to electricity. The off-grid rural electrification project soon to finalize its preparation phase will bring most needed access to this basic service. In rural areas, on average, not even half of Nicaraguans have access to electricity.

Table 1.7: Productive Infrastructure and Housing Conditions

	Electricity			Access Road Paved		Overcrowding		Firewood for cooking		
	1993	1998	2001	1998	2001	1998	2001	1993	1998	2001
Nicaragua	**69.8**	**68.7**	**72.2**	**22.3**	**42.2**	**23.9**	**37.8**	**75.0**	**66.7**	**63.6**
Extreme Poor	30.3	24.4	26.0	7.4	11.0	54.0	75.6	98.0	98.6	99.9
Not Extreme Poor	62.1		77.7	-	46.0	-	33.2	90.7		59.2
Poor	49.8	43.3	46.3	11.0	21.4	41.3	64.3	93.5	84.3	94.3
Non-poor	90.1	84.8	87.1	29.6	54.2	11.2	22.5	56.3	45.6	45.6
Urban	**-**	**90.7**	**91.8**	**31.5**	**58.2**	**16.3**	**31.6**	**-**	**47.1**	**44.8**
Extreme Poor	-	52.5	50.4	11.4	19.0	52.3	80.9	-	98.1	99.5
Not Extreme Poor	-		93.6	-	59.9	-	29.5	-		42.4
Poor	83.8	72.9	75.0	15.0	37.9	35.6	66.3	84.2	87.1	85.2
Non-poor	97.3	96.0	96.7	36.5	64.1	9.9	21.5	47.9	34.8	32.9
Rural	**-**	**40.0**	**41.0**	**10.5**	**16.8**	**35.7**	**47.6**	**-**	**92.2**	**93.2**
Extreme Poor	-	15.5	18.6	6.1	8.6	54.5	74.1	-	98.7	100.0
Not Extreme Poor	-	-	47.1	-	19.0	-	40.4	-		91.3
Poor	29.9	28.1	29.0	8.9	11.4	44.5	63.1	99.0	97.9	99.8
Non-poor	61.5	57.3	58.2	12.8	24.4	16.0	25.4	89.8	83.7	83.5

Source: LSMS 1993, 1998, 2001.

1.22 **Although progress has been made in access to paved roads, there are huge regional disparities** (Table 1.8). There has been progress, but concentrated in urban areas, where access nearly doubled and in the Pacific region—most likely showing the impact from both Hurricane Mitch and attendant road reconstruction efforts. Improvements have occurred in all urban regions, but only the Pacific rural region has benefited among rural areas, whereas in the Central Rural and Atlantic Rural regions access to paved roads actually worsened. In household responses, more than one-third in the Pacific Urban region said road conditions improved since 1998, but almost one-third in the Central Rural region said they had worsened. A clear infrastructure backlog prevails in Nicaragua in terms of roads both for productive purposes and for access by the poor to roads. The most productive agricultural areas of the country are in the Central Rural and Atlantic Rural regions, where poverty is most widespread. Adoquinado solutions for roads remain a cost-effective solution, with significant spillovers benefits to the rural poor.[12] The most important economic advantages are: costs are lower than asphalt; roads require little maintenance; no major equipment is required either to build or to maintain them; the adoquin roads can resist floods better than asphalt; technology is simple and the skills developed can be applied to house building and community projects; supervision costs are about one-half those for an asphalt or gravel-paved road; adoquin roads are faster to build than asphalt; and all-weather roads are more resilient to the deterioration associated with the heavy rains in Nicaragua.

Table 1.8: Main Access Road Is Paved

Year	All	Managua	Pacific Urban	Pacific Rural	Central Urban	Central Rural	Atlantic Urban	Atlantic Rural
1998	22.3	32.6	37.8	11.0	19.2	12.1	13.6	0.2
2001	42.2	72.4	57.1	31.6	34.4	9.0	33.3	0.0

Source: LSMS 1998 and 2001.

1.23 Beneficiary assessments have shown significant spillover benefits of adoquin roads. These include increasing utilization of health and educational facilities, improving health status (by eliminating heavy dust clouds in the dry season and slippery, muddy surfaces in the rainy season), and promoting job creation. They also promote local development by using local materials, labor, and technology, and improve community and local involvement in planning and decisionmaking in subproject selection and design, potentially increasing sustainability in the long run.

[12] Box 2.6. World Bank 2001. Nicaragua Poverty Assessment. Report No. 20488-NI.

CHAPTER II. PROGRESS IN MDGS AND PRSP GOALS

The Nicaraguan PRSP Goals and Targets

2.1 In September 2001, the Nicaraguan government presented its Poverty Reduction Strategy Paper to the Boards of the World Bank and IMF. A new government took office in January 2002 and confirmed its commitment to the broad principles and priorities expressed in the PRSP. The Nicaraguan PRSP[13] rests on four pillars: broad-based growth with an emphasis on productive employment and rural development; greater and better investment in human capital of the poor; better protection of vulnerable population; and strengthening of institutions and good governance. It also included three cross-cutting themes: reducing environmental degradation and ecological vulnerability; increasing social equity; and promoting decentralization.

Box 2.1: The Nicaraguan PRSP Goals, Targets, and MDGs

PRSP goals (**MDGs**)	Targets
Goal 1. Reduce **extreme poverty**	Target 1. Halve, between 1995 and 2015, the proportion of people whose income is less than the extreme poverty line.[14]
Goal 2. Increase **access to primary education**	Target 2. Ensure that, by 2015, 90 percent of boys and girls alike will be able to complete a full course of primary schooling.
Goal 3. Reduce **maternal mortality rate**	Target 3. Reduce by three-quarters, between 1994 and 2015, the maternal mortality ratio.
Goal 4. Reduce **infant and under-five mortality**	Target 4. Reduce by two-thirds, between 1994 and 2015, the infant mortality rate and child mortality rate.
Goal 5. Achieve universal access to reproductive healthcare services	Target 5. Provide access to reproductive health services for all individuals of appropriate age by 2015.
Goal 6. Implement **National Strategy for Sustainable Development**	Target 6. Implement a sustainable development strategy by year 2005.
Goal 7. Reduce chronic malnutrition	Target 7. Reduce chronic malnutrition to 7 % by 2015.
Goal 8. Increase access to **water** and sanitation	Target 8. Increase to 100 % national water coverage by 2015.
	Target 9. Increase to 95 % national access to sanitation by 2015.
Goal 9. Reduce Illiteracy Rate	Target 10. Decrease illiteracy rate to 10 % by 2015.

Source: GON. PRSP. A Strengthened Economic Growth and Poverty Reduction Strategy, July 2001.

2.2 The Nicaraguan PRSP used the MDG framework for selecting goals and targets.[15] There are 9 PRSP goals, 10 targets (box 2.1), and 28 intermediate indicators. Among the nine PRSP goals, five are also MDG goals and one more is an MDG target. These are: reducing extreme

[13] Tile in Spanish is *Estrategia Reforzada de Crecimiento Económico y Reducción de la Pobreza* (ERCERP).

[14] The general poverty line in 1998 was US$403 per capita per year (US$1.1 per capita per day); a person consuming less than this amount is considered poor. The extreme poverty line is US$212 per capita per year (US$0.58 per capita per day); a person consuming less that this amount is considered extremely poor and cannot meet the minimum daily caloric requirement even when the entire consumption is devoted to food.

[15] Because of lack of data, the baseline year for the Nicaraguan PRSP is 1994 for maternal mortality, and infant and under-five mortality, and 1995 for poverty; this instead of 1990 as established in the MDG framework. Note that if PRSP targets for 2015 were to extrapolate figures back to 1990, the target would change.

poverty, achieving universal primary education, reducing child mortality, improving maternal health and ensuring environmental sustainability, and increasing access to safe drinking water.

2.3 A few important additions to and omissions in Nicaragua's PRSP goals in contrast to MDGs are described below.

i. Four additional PRSP goals were adopted which do not have MDG targets. These are infant mortality (jointly with child mortality), chronic malnutrition, access to reproductive healthcare services, access to sanitation (jointly with access to water), and illiteracy.

ii. MDG goals for promoting gender equality and empowering women and for combating HIV/AIDS, malaria, and other major diseases were not established in the Nicaragua PRSP. Gender equality in Nicaragua is associated with family violence and labor markets issues rather than differences in access to education or school enrollment. HIV/AIDS is not yet a public health hazard in the proportions of other heavily indebted poor countries (HIPCs) countries, such as those in sub-Saharan Africa. Thus, no specific PRSP goals or quantitative targets were set.

A. ARE NICARAGUAN MDGS AND PRSP GOALS ON TRACK IN 2001?

2.4 Progress in MDGs and PRSP goals in Nicaragua has been generally satisfactory, but there are concerns for sustained future performance relative to several goals. Although about half of the PRSP goals were on track in 2001 comparing actual versus targets (table 2.1 and figure 2.1), performance was mostly unrelated to PRSP, as implementation just begun in 2001. PRSP targets for 2001 were very modest vis-à-vis MDGs for 2015, and in consequence several have been met. Six PRSP targets showed satisfactory performance: extreme poverty, net primary enrollment, infant mortality, maternal mortality, strategy for sustainable development, and chronic malnutrition. Five PRSP targets are not currently on track and need additional efforts to sustain future improvements: under-five mortality, access to reproductive healthcare services, access to drinking water and sanitation, and illiteracy. Further, achievement of intermediate indicators is mixed, with less than half of them having a satisfactory performance (see Annex 4).[16]

Table 2.1: Nicaragua: Progress toward Meeting PRSP Goals and MDGs

PRSP goals **(MDGs)**	Data Source	Actual Data				Target 2001	On Track?	Target 2005	PRSP 2015 target
		1993	1998	1999	2001				
Extreme Poverty (%)	LSMS	19.4	17.3	…	15.1	…	Yes	16	9.7
Net Primary Enrollment (%)	MECD	75.6	79.6	…	81.1	77.9	Yes	83.4	90
Maternal Mortality (per 100,000 live births)	MINSA	…	…	148	125	…	Yes	129	40
Infant Mortality (per 1,000 live births)	DHS	…	40	…	31	…	Yes	32	20
Child Mortality (per 1,000 live births)	DHS	…	50	…	40	…	Partly	37	24
Access to Reproductive Health Services (%)	MINSA	…	…	21	24.5	22	Partly	23	100
National Strategy for Sustained Development	MARENA	(to be implemented by 2005)					Yes		
Chronic Malnutrition (%)	LSMS	23.7	19.7	…	17.8	17.9	Yes	16a	7
Access to Water (%)	ENACAL	…	…	66.5	70	69.5	Partly	75.4	100
Access to Sanitation (%)	LSMS	82.6	84.1	…	86.2	85	Partly	88a	95
Illiteracy Rate (%)	LSMS	21.5	18.8	…	18.7	18.5	No	16a	10

Source: DHS, LSMS, administrative records from ENACAL, MARENA, MECD and MINSA, GON PRSP (2001) and PRSP First Progress Report (2002). (a) Goal is for 2004.

[16] This evaluation focuses on goals and targets selected by the Government of Nicaragua in the PRSP. It evaluates progress using baseline years set in this official document, but in some cases clarification about the correct baseline data is incorporated. The Nicaraguan PRSP sets targets for 2001 for most but not all indicators; thus, performance is evaluated for those with quantitative targets and/or clear benchmarks. For those indicators without 2001 targets but with targets for 2005 and 2015, the 2001 actual data are contrasted with the projected target in 2001 in accordance with future targets and past behavior.

Box 2.2: Monitoring PRSP and MDGs

The process of monitoring the Poverty Reduction Strategy has several advantages: it make it possible to track progress in achieving PRS goals; it helps evaluate public choice supporting government actions; it reveals causes of success or failure, allowing effective management of the strategy and identification of needed improvements; it permits mobilization and the generation of consensus for public support of the target; it offers opportunity for greater involvement of civil society in the process; and it acts as a means for improving accountability in the use of resources and increasing transparency.[17]

General Concepts

Goals - the objectives a country or a society want to achieve
Indicators - the variables used to measure progress toward the goals
Targets - the quantified level of the indicators set by a country to be achieved in a given timeframe

Types of Indicators

Indicators can be classified in two groups, intermediate indicators and final indicators. The first set can be subclassified into input and output indicators, and the latter into outcome and impact indicators.

Intermediate Indicators

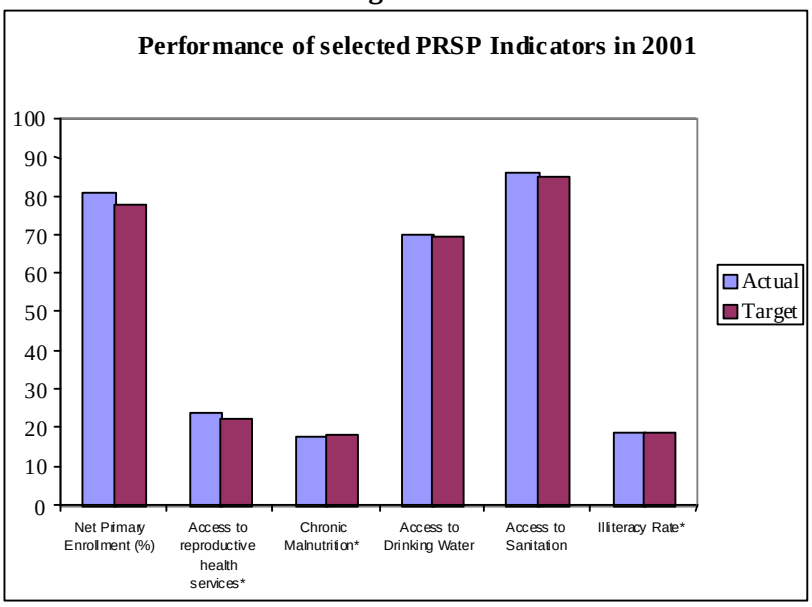
Input Indicators - financial and physical indicators of resources used
Output Indicators - the intermediate goods and services generated

Final Indicators

Outcome Indicators - access to and use of goods and services and satisfaction of beneficiaries
Impact Indicators - effects on key dimensions of well-being (improvement in living standards)

Source: Pain (2002).

Figure 2.1



Note: Performance of PRSP goals with quantitative targets for 2001.

2.5 Satisfactory progress of about half of the MDGs and PRSP goals reflects the overall positive growth performance during the second half of the 1990s, the priority given by the government to improving the coverage of basic social services and generous amounts of donor assistance, especially in the aftermath of Hurricane Mitch.

[17] Pain, Chris, An Introduction to the Challenges and Issues in the PRSP. June 2002.

B. WILL MDGS AND PRSP GOALS BE ACHIEVED BY 2015?

2.6 MDGs and long-term goals that may possibly be achieved are extreme poverty, under-five mortality, access to water, and access to sanitation. It is unlikely that the targets for universal primary enrollment, maternal mortality, and infant mortality will be reached. Access to reproductive healthcare services, chronic malnutrition and illiteracy are very unlikely to be achieved (table 2.2 and box 2.3). Among all MDGs and PRSP long-term goals, under-five mortality, diarrhea and acute respiratory infection, access to reproductive healthcare services, access to water, access to sanitation, and illiteracy are worrisome.

Table 2.2: Nicaragua: Achievement of MDGs and Long-Term PRSP Targets

PRSP Goals **(MDGs)**	**Base**	**Actual 2001**	**Forecast 2015**	**PRSP 2015 Target**	**Target for 20015 Will Be Achieved?**
Extreme Poverty (%)	19.4 (1993)	15.1	11.5 [b]	9.7	Possible
Net Primary Enrollment (%)	…	81.1	83.0 [b]	90 [c]	Possible [d]
Maternal Mortality (per 100,000 live births)	160 [a]	125	63.4	40	Unlikely
Infant Mortality (per 1,000 live births)	58 [a]	31	26.6 [b]	20	Possible
Under-Five Mortality (per 1,000 live births)	72 [a]	40	34.5 [b]	24	Possible
Access to Reproductive Health Services	…	24.5	39.8	100 [c]	Very unlikely
Chronic Malnutrition (%)	19.9 (1998)	17.8	12.3	7	Unlikely
Access to Water (%)	…	70	84.5	100 [c]	Unlikely
Access to Sanitation (%)	...	85	87.9	95 [c]	Possible
Illiteracy Rate (%)	19 (1998)	18.7	16.4	10	Very Unlikely

Source: PRSP, LSMS 2001, PRSP First Progress Report, and own estimates. (a) The base year for MDGs is 1990, but the Nicaragua PRSP First Progress Report explains that data for this year are not always available and, thus, the closest year was used, which in most cases was 1993 or 1994. (b) Estimated on the basis of SimSIP elasticities for LAC; methodology cited in World Bank Technical Paper No.467. (c) National target. (d) This is unlikely if the goal is set to achieve the MDG target of universal primary education.

Box 2.3: Performance Evaluation Criteria in Reaching MDGs

Results are presented in four performance evaluation criteria: likely to achieve, may possibly achieve, unlikely to achieve, and very unlikely to achieve. Definitions vary for each target.

Percentages are obtained by dividing the forecasted value in 2015 by the base year (1990 or 1993/94 for Nicaragua) and multiplying by 100, except for net primary enrollment, as the objective is to reach universal coverage. Thus, a result close to 0 percent indicates the level of the indicator in 2015 is different from 1990, while a result close to 100 percent means the value in 2015 is close to 1990.

Target	Likely	Possible	Unlikely	Very unlikely
Reduce extreme poverty by 50 % Reduce under 5 mortality by 50 % Reduce illiteracy by 50%*	0 – 50 %	50 – 60 %	60 – 80 %	> 80 %
Achieve universal primary education Universal drinking water access* Access to Sanitation * Access to reproductive healthcare services*	95 – 100 %	90 – 95 %	80 – 90 %	< 80 %
Reduce infant mortality by 2/3 Reduce under 5 mortality by 2/3 Maternal mortality* Chronic malnutrition*	0 – 33 %	33 – 50 %	50 – 75 %	> 75 %

Source: World Bank. Hicks and Wodon, Reaching the MDGs in Latin America: Preliminary Results. June 2002.
* Added to original table.

Box 2.4: Analyzing the Prospects for MDGs and PRSP Goals in Nicaragua Toward 2015

Determining if Nicaragua's MDGs and PRSP goals would be achieved by 2015 implied estimating forecasts using a combination of approaches and data sources, such as: data from SimSIP goals; updated country-specific data applied to SimSIP goals regressions and recalculations using the Stata statistical package; the POVCAL statistical package to estimate responsiveness of poverty to growth and its predicted values; and SimSIP goals estimated elasticities to growth.

POVCAL - A tool to obtain the elasticity of poverty to growth

POVCAL assists with routine poverty assessment work by using sound and accurate methods for calculating poverty and inequality measures. It requires any of the various types of grouped income distribution data typically available, such as income shares by deciles of households ranked by per capita income. Data requirements are low; essentially what is needed is access to grouped distributional data and the poverty line. The program estimates the Lorenz curve, Gini index, headcount index, poverty gap index, Foster-Greer-Thorbecke index, and the elasticities of these poverty measures with respect to the mean of the distribution. It does all this for two alternative specifications of the Lorenz curve: the General Quadratic (Villasenor and Arnold) and the Beta model (Kakwani).[18]

SimSIP Goals - Assessing the Realism of Development Targets

SimSIP (Simulations for Social Indicators and Poverty) is a set of user-friendly Excel-based simulators that facilitate the analysis of issues related to social indicators and poverty. Many of the indicators correspond to the targets and areas of focus put forward in the MDGs. The simulations/targets for future levels can be based on either historical trends or model-based elasticities. For historical trends, four different ways of fitting a historical trend line across the available data at the country level are considered for each indicator and each country. The best fit is selected. The second alternative is to rely on an econometric model yielding elasticities of the indicators to economic growth, population growth, urbanization, and time. These elasticities have been estimated with two different econometric models using worldwide panel data sets, and they are allowed to vary with a country's level of economic development and urbanization.

2.7 Continued progress in Nicaragua's MDGs and PRSP goals is closely linked to the recovery of growth,[19] particularly to achieve the target for poverty reduction in 2015. For education, key bottlenecks are related to improvements in internal efficiency of primary education. To this effect, the Education for All Initiative recently initiated in Nicaragua could have sufficient impact to make it possible to achieve the MDG target of universal primary education. Maternal mortality is associated with births at home and low access to reproductive healthcare services (with a goal of 100 percent for 2015), which in turn increases birth spacing and impacts high fertility. Under-five mortality and chronic malnutrition raise concerns about future prospects, given minimal progress in diarrhea and acute respiratory diseases, which are also linked to low access to safe water and sanitation services. Access to water has improved; however, only one-fourth of households have piped water inside their homes. Water becomes contaminated mainly through unsafe practices in accumulating drinking water, access of domestic animals to the family's drinking water, and lack of chlorine and families' failure to boil water. Access to sanitation seems high; however, one-half of latrines are untreated, which is equivalent to one-third of all sanitation services in the country. Illiteracy rates in Nicaragua, as in other countries, have proven to be difficult to improve in the medium term; internal efficiency of education and young adult literacy programs will be key.

[18] Shohua Chen, Gaurav Datt, and Martin Ravallion. POVCAL, A program for calculating poverty measures from grouped data.

[19] Projected values for 2015 assume PRGF program targets for medium-term economic growth will be achieved as follows: 2003 (3 percent), 2004 (4.5 percent), and 2005 (5 percent). After 2005, the long-term GDP real growth rate is projected at 3.9 percent.

C. COUNTRY-SPECIFIC POLICY INSTRUMENTS ASSOCIATED TO MDGS

2.8 Governments and donor agencies want to ensure that their investment strategies contribute to the broader developmental objectives of reducing poverty and protecting the environment. This requires a clear understanding of the complex interactions between government and project outputs and the ultimate goal or desired impact to be achieved. Governments are under increased pressure to use their scarce resources as cost-effectively as possible toward committed goals and targets. Therefore, it is crucial to understand which projects, delivery systems, and outputs are most likely to achieve the desired impact, and also to understand which factors contribute to the success or failure in achieving those goals.

2.9 Country-specific policy instruments associated to MDGs and PRSP goals are identified in Nicaragua using the determinants analysis (see box 2.5) for poverty, school attendance, infant and child mortality, malnutrition, and incidence of diarrhea and maternal mortality. The most relevant policy tools and largest contributors to improving these goals include: female literacy; family size and number of children under five; breastfeeding practices; prenatal care and institutional births; piped water inside the house (or use of safe drinking water); electricity; house and land title; sanitation (toilet and/or safe latrine); rural roads; and vaccination.

Box 2.5: Identifying Country-Specific Determinants of MDGs and PRSP Goals in Nicaragua

A multivariate analysis on the basis of the Living Standard Measures Survey (Nicaragua - LSMS 1998), was used by several academics and practitioners to determine relevant variables and marginal contribution to impact key dependent variables, such as infant mortality, maternal mortality, etc.[20] Main findings of these studies are used to describe the direction and strength of the explanatory variables in each of the proposed models.

Using the determinants analysis of MDGs and PRSP goals implies selecting a set of variables (z) to estimate the likelihood of an event. The variables included in the model are a combination of individual (that is, human capital endowments), household (that is, assets and other proxies of income), and community level (access to adequate health and sanitation facilities) factors that are hypothesized to have a significant impact on the probabilities of the event.

$$\text{Prob (event)} = 1/(1 + e^{-z})$$

$$\text{Where } z = \beta o + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \ldots + \beta_n X_n$$

The marginal effect of an explanatory variable on the probability of success of the outcome variable is obtained by multiplying the beta coefficient times the derivate of the cumulative distribution function valued at the mean. Given that we are working with samples and estimations, there is always a level of inaccuracy. The level of significance (one, five or 10 %) indicates what the probability of being wrong is about the impact of the explanatory variable on the outcome variable, or how confident we can be about our findings (see Annex 5).

C1. Poverty

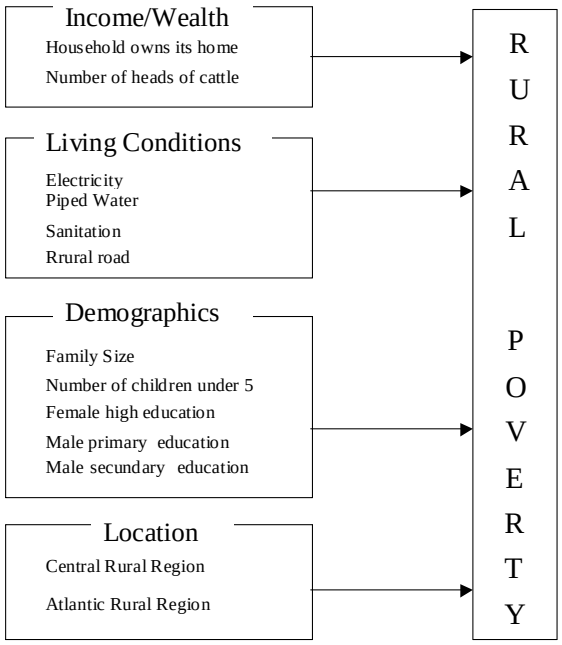
2.10 Poverty in urban and rural areas of Nicaragua is greatly associated with low education (for females more significant than for males), large family size, number of children under five, and lack of access to electricity. Each child under five increases the probability of being poor by 25 percent. The probability of being poor in Nicaragua is reduced by more than one-tenth if the

[20] Background papers to the Nicaragua Poverty Assessment (2000) Report No. 20488-NI. Sobrado (2000), The Probability of Being Poor; Davis and Murgai(2000), Between Poverty and Prosperity; Kruger (2000) Determinants of Primary School Attendance; Muñiz (2000), Determinants of Infant and Child Mortality; and Dayton(2000), Do Public Health and Water Services Improve Child Health in Nicaragua?

family owns its house. However, if the family is in the Central Rural region, the probability of being poor increases by one-fifth. Rural prosperity is associated with larger plots, number of heads of cattle, land titling, water inside the house or property, and existence of sanitation system (toilet/latrine). In rural areas, female education and family size are the most important contributions to reducing the likelihood of being poor. Moreover, access to a road has a substantial and statistically significant impact on the extremely poor in rural areas.

Figure 2.2

Determinants of Poverty for Rural Households



2.11 Female secondary and higher education are highly correlated with lower poverty, each decreasing the probability of being poor by one-fifth (which is about three times higher than male primary or secondary education) (see Annex 5). This reinforces the relevance of female education in Nicaragua as a crucial policy instrument in improving household welfare.

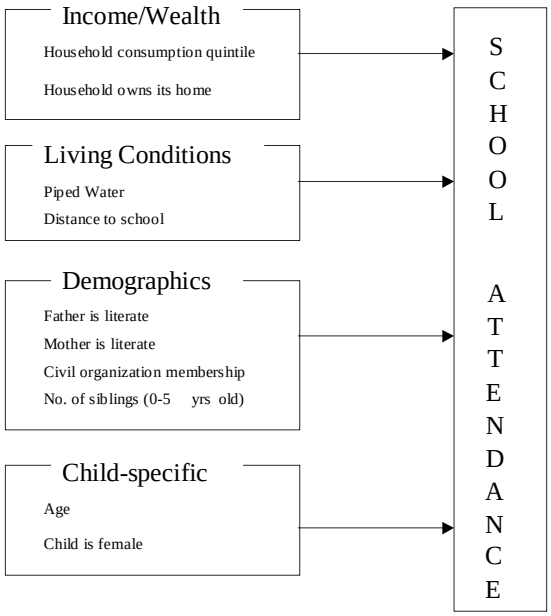
C2. Education

2.12 School attendance for children 6-14 years old is strongly influenced by the age of the child, sex, household income level, mother's level of literacy, access to piped water, home ownership, father's literacy, membership in civic organizations, number of siblings, and distance to school. Children that belong to better-off households are five times more likely to attend school than a child that belongs to a family in lowest quintile. The effect of the mother's literacy is significant: A child whose mother is literate has a 6.5 percent higher probability of attending school than a child whose mother is not. By contrast, a father's literacy has only half that effect on a child's attending school. The effect of distance from school is negative, as expected; closeness to school encourages attendance.

2.13 Accumulated experience offers strong evidence that certain key actions determine good child health outcomes.[21] In Nicaragua, effective interventions include breastfeeding and appropriate complementary feeding in young children; immunization; appropriate management of acute respiratory infection, pneumonia, diarrhea, and malaria; measures to prevent malaria; and access to qualified medical personnel. Important reductions in child mortality would mean increasing coverage of known effective interventions among poor children.

Figure 2.3

Determinants of School Attendance for Children 6 to 14



C3. Infant and Child Health

2.14 Malnutrition, at both national and household levels, is significantly affected by income growth. Worldwide, a strong relationship exists between child malnutrition and gross national product (GNP) per capita. Moreover, causality runs both ways: just as lack of income contributes to malnutrition, malnutrition can prevent income growth through effects such as delayed or reduced schooling, reduced productivity, vulnerability to infection, and higher incidence of adult nontransmissible diseases.[22]

2.15 Child and infant mortality in Nicaragua are influenced mainly by five policy-relevant interventions: prenatal care, births attended by qualified personnel, access to piped water, access to family planning services, and breastfeeding practices. Prenatal care is the single most influential health input in reducing infant and child mortality: For mothers who have received prenatal care, child mortality decreases by one-third and infant mortality by one-fifth. Access to piped water can decrease child mortality by 16 percent and infant mortality by 10 percent. Breastfeeding decreases both by about 10 percent. Additionally, effective family planning and

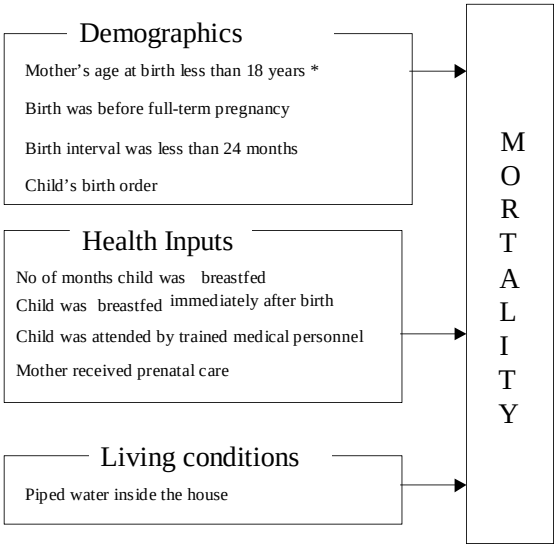
[21] World Bank. Health, Nutrition and Population Development Goals. Measuring Progress Using the Poverty Reduction Strategy Framework. November 2001. p.10.
[22] *Ibidem*, p.27.

vitamin supplement programs are key for rural areas, whereas better sanitation seems to be the most influential factor for urban areas in general.

2.16 Efforts to improve child and infant mortality in Nicaragua will require more targeted efforts focusing on the extremely poor and rural areas. While prenatal care coverage has improved in recent years, there remains substantial room for improvement, especially among the extremely poor, whose coverage rate is 77 percent. Similarly, improvements in the percentage of births attended by trained birth attendants will also have to focus on the extremely poor, who deliver more than half (51 percent) of their births at home. Moreover, less than half of all homes in rural dispersed areas have access to safe water, one in five women with no education has an unsatisfied demand for family planning, and exclusive breastfeeding at the age of six to seven months is only 3.2 percent.[23]

Figure 2.4

Determinants of Infant and Child Mortality



* Only for infant mortality

2.17 Breastfeeding practices and access to piped water are both critical factors affecting the prevalence of malnutrition as well as the incidence of diarrhea among extremely poor children under five. Vaccination status also plays an important causal role in affecting the rate of malnutrition among this group. In 2001, less than three in four (72 percent) children 18-29 months old were fully vaccinated,[24] and there were only relatively minor variations in the rates of rural vis-à-vis urban areas. Both access to piped water (currently to only 84 percent of the population in Nicaragua, without significant improvements over the last eight years) and breastfeeding practices, as noted in the previous paragraph, are a matter of concern in Nicaragua. Progress in these areas will be key if improvements in reducing the rate of malnutrition are to continue.

[23] DHS 2001.
[24] DHS 2001.

Figure 2.5

Determinants of Malnutrition (stunting in children under 5)

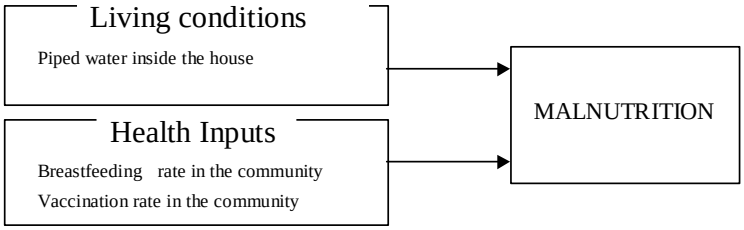
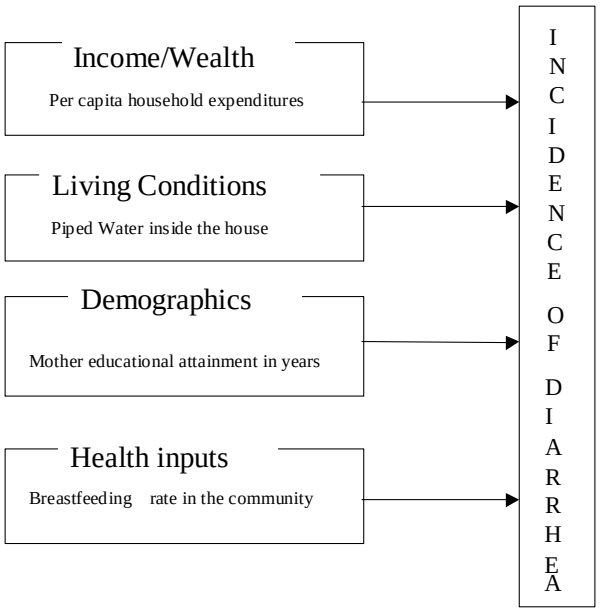


Figure 2.6

Determinants of Incidence of Diarrhea (children under 5)



C4. Maternal Health

2.18 Three main strategies can reduce maternal mortality: increasing birth spacing and preventing unwanted pregnancy; preventing complications from pregnancy; and preventing death when complications do arise. Factors that affect birth spacing and unwanted pregnancy include early marriage, early childbearing, unwanted pregnancy, access to contraception, whether or not coercion or violence is involved, and family size preferences. Preventive measures to reduce complications from pregnancy include access to prenatal care, adequate nutrition, treatment for sexually transmitted infections, management of existing conditions such as malaria, availability of and access to skilled care during delivery, active management of third-stage labor, postpartum care, and the availability of abortion care. Factors determining the final outcome of complications occurring during pregnancy and delivery include access to skilled care, use of emergency obstetric services, and the quality of available obstetric services.[25] For women and couples planning pregnancies, there are significant barriers of relevance for policy and program

[25] World Bank. Health, Nutrition and Population Development Goals. Measuring Progress Using the Poverty Reduction Strategy Framework. 2002. pp. 13-14.

design, such as cultural values and religious beliefs, which are as important as economic and physical barriers to services.

2.19 The availability of good care is essential not only for reducing maternal mortality during pregnancy and childbirth, but also to ensure a healthy pregnancy in the first place, to reduce both maternal and perinatal morbidity, and to reduce perinatal mortality. Most reproductive and maternal health care is provided by nurses, midwives, and community health workers, rather than doctors, making the availability of skilled care within the community an important component of women's health. The factors that influence whether people use health services include distance, knowledge, cost, quality, and culture. There is a strong correlation between the presence or lack of a skilled attendant at delivery and the maternal mortality ratio; the presence of a skilled attendant significantly reduces maternal deaths. The quality of the network of obstetric services is generally poor, but in particular rural areas need substantial improvements in early referral of high-risk deliveries, quality of referral services (secondary obstetric care), access to transportation, and safe blood.

2.20 Current available evidence indicates that high-impact policy actions to decrease maternal mortality rate are female literacy, access to family planning, early prenatal care, and birth attended by trained personnel.[26]

[26] Neither the 2001 Demographic and Health Survey (DHS) nor the 2001 Living Standard Measurement Survey (LSMS) has samples large enough to capture maternal mortality. On the other hand, the measurement error of Ministry of Health administrative records for maternal mortality is unknown.

CHAPTER III. RAISING WELFARE AND REDUCING VULNERABILITY

3.1 This chapter examines in detail the consumption dynamics of a panel of Nicaraguan households between 1998 and 2001 by making use of the 1998 and 2001 panel surveys of living conditions (see box 3.1 for an explanation of the methodology for analyzing the panel).[27] The objective is to identify potential successful strategies and policies to raise welfare and overcome poverty in Nicaragua. Both urban and rural families were studied, focusing more on rural areas, given the greater extent and depth of poverty in rural Nicaragua.

Box 3.1: Analyzing Panel Households in Nicaragua: An Asset-Based Typology

This chapter uses several key findings of the study by Davis and Stampini (2002), who analyzed the dynamics of families moving in and out of poverty using panel data from the 1998 and 2001 LSMS surveys. The availability of panel data offers an opportunity to analyze which families left and entered poverty, and how; it also allows for a description of their characteristics. This study builds upon the typologies constructed for the analysis of rural families using the 1998 LSMS (Davis and Murgai, 2000). These household typologies tried to balance detail/desegregation and statistical representation, and they involved choosing relevant assets and balancing those assets, determining choices by Nicaraguan households versus assets truly exogenous to outcome variables. Panel data provide an opportunity to judge the exogeneity of assets upon which these typologies were built, and allow for reconstruction of typologies in light of new information.

Using the 1998 LSMS, Davis and Murgai (2000) constructed two statistically representative typologies. The first typology was limited to farm households that owned or used land for agriculture or livestock production during the survey period. The second one broadened the scope of agricultural/livestock producers typologies used previously by Davis, Carletto, and Sil (1997) and by Maldidier and Marchetti (1996) to include all rural families. The farm household typology uses labor experience and education, and the rural family typology uses major productive assets, such as land, cattle, and human capital. Given that heads of cattle tend to be associated with access to land, both are not needed. Education is used as a proxy for labor market participation. Land and education are considered exogenous assets determining to a large extent the choices made by Nicaraguan rural families.

Land assets are measured by land in control of households during the survey period, regardless of whether the land is owned or rented. Families are then categorized by farm size (less than 2 mzs or *minifundia*, 2-5 mzs or small, 5-20 mzs or medium, and more than 20 mzs or large). Families with large farm sizes are a small sample in the survey, thus preventing their further and more classic categorization into those with at least 100 mzs or more. Nonfarm households have the average educational level for Nicaragua: four years or more. and four or more years of education). A category for urban households dedicated to agriculture is also added. Finally, as land markets are not perfect, the farm typology distinguishes between owners and renters of land. While the land rental market is very active in Nicaragua, credit and insurance market constraints are sufficiently binding to merit separation of owners and renters.

3.2 Nonpoor and moderately poor families were analyzed separately from the extremely poor. These two groups have distinct determinants and face distinct risks and vulnerabilities associated with specific strategies for moving towards prosperity and/or confronting poverty. In consequence, these findings call for adapting and targeting national policies and programs tailored to the particular needs of each group, be it nonpoor, moderately poor, or extremely poor. Looking at nonpoor and moderately poor households implies analyzing their characteristics and identifying which families moved into prosperity or fell into poverty, and how. The role of

[27] The Living Standards Measurement Surveys of 1998 and 2001 are panel with close to 85 percent of households interviewed in 1998 interviewed again in 2001.

agriculture in Nicaragua is found to be different for the nonpoor and moderately poor vis-à-vis the extremely poor. For the former, agriculture is of relevance in improving welfare levels, under certain conditions, while for the latter it is associated with subsistence and food security. Institutions are critically associated with improving welfare levels. However, some currently available forms of credit have not been successful in reducing poverty. Among the poorest of the poor, changes in poverty look at their main risks and vulnerabilities and present the results of a review of poverty programs in Nicaragua proposing policy recommendations.

A. WELFARE DYNAMICS – THE NONPOOR AND MODERATELY POOR

3.3 Although Nicaragua is one of the poorest countries in Latin America measured in gross domestic product (GDP) per capita, poverty and extreme poverty consistently, although modestly, declined during the 1990s.[28] The incidence of poverty at the national level dropped from 50.3 to 45.8 percent, and that of extreme poverty from 17.3 to 15.1 percent between 1998 and 2001.

Table 3.1: Entering and Exiting Poverty, 1998 and 2001 Panel Households

Poverty Categories	Total	Rural	Urban
% Headcount Poverty			
1998			
Moderate poverty	27	38	18
Extreme poverty	13	22	5
All poverty	40	60	23
2001			
Moderate poverty	25	35	17
Extreme poverty	11	19	4
All poverty	36	54	21
% of Panel Households			
Overall			
Not poor in both 1998 and 2001	52	30	70
Exiting any kind of poverty to not poor	13	17	10
Entering any kind of poverty from not poor	9	11	7
Moderate poor in both 1998 and 2001	12	17	8
Exiting extreme poverty to moderate poverty	5	9	2
Entering extreme poverty from moderate poverty	4	7	2
Extremely poor both in 1998 and 2001	6	10	2

Source: Davis and Stampini (2002).

A1. Who Are the Nonpoor and the Moderately Poor?

3.4 There was a modest but significant decline in moderate poverty among all households between 1998 and 2001. Moderate poverty among all panel households also fell, from 27 to 25 percent, with moderate rural poverty falling from 38 to 35 percent and moderate urban poverty falling from 18 to 17 percent. Notably, these modest changes mask big movements by households among poverty categories, particularly in rural areas (table 3.1). Relative to 1998, the consistent decline in poverty and extreme poverty concealed an active movement of more than two-thirds of rural households in and out of poverty. Among urban households much less change was evident, with approximately 80 percent remaining in the same category. Thus, rural poverty dynamics was concomitant with the highest poverty rates. The 6 percent drop in rural poverty among panel households is the combination of the 17 percent that left poverty and the 11 percent that entered. Another 9 percent moved from extreme to moderate poverty, compensated by 7 percent who moved in the opposite direction.

[28] As measured by the Living Standards Measurement Surveys of 1993, 1998, and 2001.

Box 3.2: Which Families experienced Raising Welfare between 1998 and 2001 in Nicaragua?

Rural families moving toward prosperity between 1998 and 2001 were smaller, had higher levels of education, increased their participation in nonagricultural wage labor and nonagricultural businesses, and either reduced their participation in farming and agricultural wage labor or diversified into market crops and livestock production. Poor rural families increased their welfare levels by increasing their participation in nonagricultural economic activities and their levels of education. Allocation of family labor to nonagricultural activities, either as wage earners or as self-employed, provided higher levels of consumption.

Among urban families, movements in and out of prosperity were less evident. More prosperous families in urban areas shared characteristics similar to those in rural areas: higher levels of education and less participation in agricultural activities. Smaller family size was strongly correlated with reduced probability of being poor for urban families.

Source: Davis and Stampini (2002).

A2. What are the Strategies for Raising Welfare?

3.5 Livelihood strategies among Nicaraguan families are constantly changing as part of their welfare raising strategies (box 3.2). The overall drop in poverty from 1998 to 2001 was modest, but it conceals the large movements of families in and out of poverty. In rural areas, agriculture is one important source of income. In urban areas, welfare stability is found in the formal sector, based on education. The rural nonpoor, and particularly the urban nonpoor, showed much more stability of employment. Families continually accumulate and deplete production assets. Large and medium-size landholders often fall or are at risk of falling into poverty, a reflection of the fact that commercial agricultural production in Nicaragua still lacks efficient agrarian and financial institutions and infrastructure. Strategies for improving welfare levels are associated with nonagricultural wage employment, off-farm opportunities, agricultural self-employment, education, paved roads, smaller family sizes, and access to productive assets (table 3.2 and 3.3).

Table 3.2: Summary of Consumption Equation Results for Panel Households

	Poor				Nonpoor			
	rural		urban		rural		urban	
	C level	*C quan*	*C level*	*C quan*	*C level*	*C quan*	*C level*	*C quan*
PATHS - LABOR								
Nonagricultural wage labor	+							
Nonagricultural self-employment	+		-			+		
Agricultural self-employment	-	-					+	
POLICIES								
Education	+	+	+	+	+	+	+	+
Paved road			+				+	+
ASSETS								
Heads of cattle	+	+			+	+		
Nonagricultural business assets			+	+			+	+
Home assets	+	+	+	+	+	+	+	+
DEMOGRAPHIC								
Household size	-	-	-	-	-	-	-	-
Age, head of household				+	+	+	+	+

+ or - indicates the sign of the significant (at 10 percent) variables

C level = 2001 level of consumption, OLS

C quan = 2001 level of consumption, quantile regression

Source: Davis and Stampini (2002).

Table 3.3: Successful Strategies for Raising Welfare and Exiting Poverty for Nonpoor, Moderately Poor, Extremely Poor[29]

NONPOOR	MODERATELY POOR	EXTREMELY POOR
Successful strategies: • Accumulate land and other assets • *Produce nontraditionals (fruits, vegetables, etc.)* • *Diversify into livestock production* • Use corn as input for livestock • Use high-yield variety seeds • Use fertilizers, pesticides twice as much as poor households • *Increase use of credit, although still low (15 %)* • Increase use of farming equipment • *Education* • *Family size* • *Land title*	**Exit Strategies:** • Combine on-farm with off-farm activities • *Nonagricultural wage labor* • *Nonagricultural self-employment* • Increase number of heads of cattle and working animals • Combine production of three major basic crops with marketable crops • *Education* • *Family size* • Migration (remittances)	**Exit Strategies:** • Combine on-farm with off-farm activities • *Nonagricultural wage labor* • *Nonagricultural self-employment* • Increase number of heads of cattle and working animals • Combine production of three major basic crops with marketable crops and/or nonagricultural wage labor/self-employment • *Education* • *Family size* • Socialization of risks • *Direct cash transfers*
	Subsistence and Food Security Strategies: • Agricultural self-employment and/or agricultural wage labor • More land as a subsistence and food security strategy • Production of three major basic crops • Lack of diversification	**Subsistence and Food Security Strategies:** • Agricultural self-employment and/or agricultural wage labor • Agricultural activities using on-farm family labor • More land as a subsistence and food security strategy • Production of three major basic crops • Lack of diversification
Determinants: • Small family size • Medium/high levels of Education • Location – Pacific region and Managua	**Determinants:** • Large family size • Low levels of Education • Location – mostly Central region	**Determinants:** • Large family size • Low levels of education • Location – mostly Central region
Constraints: • Drought, infestation & low prices • High input prices • Insufficient access to credit • Insufficient access to technical assistance • Poor productive and basic infrastructure	**Constraints:** • Drought, infestation & low prices • High input prices • Lack access to credit • Lack access to technical assistance • Lack access to productive infrastructure and poor basic infrastructure • Exposure to risk associated with agricultural and livestock production	**Constraints:** • Drought, infestation & low prices • High input prices & lack of capital • Lack of financial services • Low levels of agricultural technology • High transaction costs • Lack paved roads, electricity & piped water • Low human capital and asset base • Cultural patterns perpetuate risk and vulnerabilities

[29] The distinction between what constitutes a poverty exit strategy and a subsistence strategy vis-a-vis a policy instrument is blurred. For example, increasing education levels is both a household choice and a government policy instrument. The use of *italics* indicates both a household level strategy and a desirable policy instrument.

Education and Demographics

3.6 **The role of education in moving raising welfare levels is crucial across all household groups both in rural and urban areas**. Any level of education, particularly for females, is associated with higher welfare. Households that manage to exit poverty have greater education, on average, than those who stay behind or those who enter poverty. Education is also important in household consumption. Where a female with primary education is present, per capita household consumption is 10 percent higher; where one with secondary education is present, more than 20 percent higher; and, where one with higher education is present, more than 25 percent higher (Davis and Murgai, 2000). In non-poor families, only secondary education and above is associated with higher levels of consumption. Thus, female education is clearly a welfare increasing policy.

3.7 **Demographic changes are closely associated with changes in poverty status**. Families having fewer members are less likely to be poor and enjoy higher levels of consumption. Moreover, the presence of small children (under five years old) is linked to lower consumption. Between 1998 and 2001, entering poverty was associated with an increase in the number of family members, two-thirds of this on average due to the birth of a child.30 Families entering poverty showed an increase of about one-fifth in the number of family members (from 4.8 to 5.8 members). By contrast, on average, families exiting poverty showed a drop by almost one-fourth in the number of family members (from 6.5 to 5.3 members).

Agriculture's Role in Improving Welfare

3.8 The primary sector has been identified as an important contributor to Nicaragua's economic growth and poverty reduction, particularly in rural areas where most of the poor live.[31] Nicaragua has been a country with a traditionally large primary sector as a share of GDP, at about 20 percent in 2000,[32] but slowly loosing importance while other sectors grow dynamically and contribute to rural areas. The primary sector has also regularly occupied a sizeable share of the economically active population, at 38 percent in 2001.[33]

3.9 Agriculture and livestock constituted the most dynamic sector of the economy, with an average annual growth rate of more than 8 percent from 1994 to 2001.[34] The agricultural sector in Nicaragua faces the challenge of sustaining high rates of growth. Most recent agricultural growth can be attributed to expansion of land under cultivation, which cannot continue indefinitely, in contrast to productivity improvements. Agricultural labor shows very low levels of productivity; similarly, low levels of input usage in capital and technology characterize agricultural production.

3.10 Diversification into market crops, livestock production, and nonagricultural wage activities are characteristic of nonpoor families. Families dedicated to traditional vis-a-vis nontraditional agriculture show different poverty dynamics. Traditional farming in Nicaragua is mainly production of the three major crops (corn, beans, and sorghum), while nontraditional farming means producing mainly fruits and vegetables. Traditional farming is associated to

[30] Davis and Stampini (2002), Annex 7, Table A7.8.
[31] Government of Nicaragua PRSP. ERCERP, 2001.
[32] BCN (2003). System of National Accounts, Base Year 1994.
[33] BCN (2002).
[34] *Ibidem*.

higher levels of poverty than those moving in and out, and those mixing traditional with nontraditional farming.[35] Although the overall structure of agricultural production did not change much in Nicaragua between 2001 and 1998 (with the share of families in each crop being basically the same in both years), corn and beans were the dominant crops, involving about 75 percent and 60 percent of all crops, respectively. Rural families involved in nontraditional farming increased in 2001 to 73 percent (fruits) and 25 percent (vegetables), respectively, from 65 and 16 percent in 1998. Most of the movement into nontraditional farming occurred in the Pacific region, where rural families producing vegetables doubled and those producing fruits increased by 25 percent.

3.11 Cattle holdings are associated with higher welfare levels.[36] Nonpoor rural families evidently have more land and cattle assets than the poor and extremely poor, but a notable difference among poverty groups is that the nonpoor increased their participation in livestock production between 1998 and 2001 while this decreased for the other two groups. Almost 40 percent of nonpoor rural families had cattle holdings in both years, compared to 23 and 16 percent for the moderate and extremely poor, respectively. Herd sizes were much larger in 2001 among the nonpoor (11 for nonpoor versus 2.5 for poor versus 1 for the extremely poor), associated with larger sizes of pastureland, suggesting large-scale production. Thus, nonpoor rural families can be identified by being associated to livestock production, which reduces their exposure to risk.

3.12 Although the incidence of total poverty among rural panel families declined between 1998 and 2001 (from 60 to 54 percent), these findings mask interesting group dynamics. Movements in and out of poverty among rural families are common and indicative of transitory poverty associated with exposure to risk, a characteristic of Nicaraguan agriculture. Rural families with larger poverty declines have family members participating in nonagricultural wage labor, however, combining participation in both nonagricultural and agricultural wage labor with either land or no land is associated with the largest poverty declines. Thus, mixing wage labor sources is among the most successful land-labor welfare increasing strategy.[37] Many of these rural families have substantial land and cattle holdings, combining agriculture with livestock production, and live in relatively isolated areas, evidenced by low levels of access to electricity and schools (Davis and Murgai, 2000).

3.13 Location and farming practices are also key contributors to prosperity. Nonpoor families are located mainly in the Pacific region and Managua. Most nonpoor families producing corn use it as an input into cattle production. Higher shares of the nonpoor produce vegetables. Nonpoor families involved in agriculture use high-yield variety seeds, fertilizers, and pesticides almost twice as much as the poor. Three times as many nonpoor families receive credit, although the overall level of coverage, 15 percent, is exceedingly low. These families also have much greater access to farming equipment.

3.14 Major constraints cited by both nonpoor and moderately poor are drought (about 70 percent), infestations (about 65 percent), and low prices (about 50 percent). The extremely poor

[35] Annex 7, Table A 6.12, 60 percent of rural families produce corn in 2001, 48 percent produce beans and 20 percent vegetables; in each category those in extreme poverty are 79 percent and 70 percent, respectively for corn and beans vis-à-vis 17 percent for vegetables.

[36] Annex 7. Table A 6.10.

[37] Annex 7, Table A 6.16, see poverty status by land-labor strategy for rural families. Drop in poverty is the largest for families in column (9), both wage labor sources with land, and column (10) both wage labor sources with no land.

identify distance to market and lack of roads as major problems, suggesting that among these families transaction costs are the major impediment to commercializing surplus production. The most common complaint across all income groups are high input prices and lack of capital.

The Role of Institutions in Supporting Agriculture

3.15 In Nicaragua, the operation of input and output markets is hampered by low levels of infrastructure and lack of asset accumulation. Agriculture is riskier than other economic activities. These two crucial factors call for public and private agrarian institutions to facilitate successful production. Access to agrarian institutions is extremely low (table 3.4). Most rural families in Nicaragua lack access to the classic agrarian institutions (technical assistance, credit, producer's organizations) needed for successful agriculture. In addition, most rural families are poor or at constant risk of falling into poverty.

3.16 Some visible changes have occurred in market participation and functioning of land markets, indicating that access to agrarian institutions could help accelerate this progress. Families involved in agriculture are now more integrated in the markets as compared to 1998. Market participation even increased for families producing corn and beans as their main crop. The share of families producing corn and selling it increased from 29 percent in 1998 to 37 percent in 2001, and that of for beans from 31 to 37 percent, respectively, for the same years. Ownership of and access to land have broadened, with a larger number of families, both rural and urban, being landowners.[38] These changes, along with higher flexibility of entering and exiting agricultural production, indicate better functioning markets.

Table 3.4: Access to Agrarian Institutions
(share of rural families involved in agricultural production in both 1998 and 2001)

Institutions	1998	2001
TA exists in community	24	26
Used Technical Assistance	16	13
provided by gov't	7	5
provided by NGO/project	6	5
Credit for agriculture	9	10
from bank	2	2
from NGO/organization	6	8
from friend	3	1
Credit for nonagriculture	1	2
Organization or project	9	11

Source: Davis and Stampini (2002).

3.17 Already low levels of access to credit and technical assistance stagnated or fell further during 1998-2001. The share of families involved in agricultural production in both years and using technical assistance fell from 16 to 13 percent between these years, while access to credit remained practically stagnant (9 to 10 percent) as did participation in producers' organizations (9-11 percent). Families using these services in both years were extremely few, with technical assistance at 5 percent, credit at 2 percent, and producers' organizations at 3 percent. Moreover, agrarian institutions tend to provide services in a package, and producers not belonging to an association are commonly excluded from accessing any such service. Whether in agriculture or livestock production in either or both years, the majority of families participating in producers' organizations received technical assistance (provided in equal proportion by government or by

[38] Annex 7, Table A 7.21, the Gini for total land declines among rural households from 88 to 85 from 1998 to 2001. Tables A7 II.1 (rural) and A7 II.2 (urban) show the share of families owning land increasing.

nongovernmental organizations [NGOs]), and approximately one-quarter received credit (almost exclusively from an organization or NGO). Similarly, of those receiving technical assistance, approximately 20 percent received credit, and from one-third to one-half participated in an organization or project. Finally, among those receiving credit, 20 percent also used technical assistance and 30 percent participated in an organization.

Impact of Credit on Family's Welfare

3.18 **In Nicaragua, credit coverage is low and performance is poor**. Evidence from the literature identifies access to credit as a key factor in overcoming poverty. On average, only about one-fourth of Nicaraguan families received some kind of credit in either 1998 or 2001. The performance of the Nicaraguan micro financial market is poor and characterized by low efficiency, high interest rates, and overfunding by donors. In 2001, average loan size was U$49 for business and US$37 for agricultural loans. Average annual effective interest rates were significantly higher for business loans (94 percent) than for agricultural loans (37 percent). In 1998, 285 microfinance institutions spent 50 cents of every dollar loaned—more than twice the international average—and charged effective interest rates considerably higher than the Latin American average. The combined loan portfolio accounted for less than half of the US$100 million in historical donor funding.

3.19 **Although effective in benefiting the top of the distribution, cash loans granted to Nicaraguan families might not be a poverty-reducing instrument**. A recent study for Nicaragua argues that some forms of cash loans are not effective for all poverty groups (see box 3.3 on methodology).[39] Findings of this study indicate existing forms of cash credit in Nicaragua may have pushed the extremely poor and those close to the poverty line into even more debt and more poverty between 1998 and 2001. This is probably the result of extreme poor families using credit proceeds for consumption needs, and entering a vicious circle of indebtedness. Looking at the impact of credit in Nicaragua by decile, the results are disappointing. In general, the top of the distribution commonly benefits when accessing credit, while the condition of poor families seems to deteriorate. Households in the top quintile of the distribution, borrowing either short- or medium-term loans, most commonly collect the greatest benefits. Moreover, only the 10th decile seems to gain consistently from borrowing across different outcome indicators. In 1998, more than one-half of loans went to the top two quintiles, and only one-fourth went to the bottom two (the poor). The situation improved somewhat in 2001, with one-third of cash loans reaching the bottom 40 percent of the distribution, thanks to outreach activities.

3.20 Expansion in currently available forms of cash lending (business and agricultural loans) in Nicaragua could apparently worsen poverty indicators (see Annex 8). Assuming existing forms of cash loans were made widely available, poverty incidence would increase by 4 percentage points as simulated for the years between 1998 and 2001 rather than decline by 4 percentage points as it actually did. Moreover, expansion of cash loans is also associated with an increase in the depth and severity of poverty. This, of course, is a likely result of granting credit to extreme poor families who would be better served by transfers, to supplement urgent consumption needs, rather than credit resources. Expansion of existing forms business cash loans could apparently have a negative impact on income and consumption of the poor and near poor, with causality testing establishing that the worsening conditions are the effects of, and not the cause for, seeking credit (see box 3.3 on methodology). Comparatively, agricultural cash loans seem to be more effective than business cash loans in reducing contemporaneous poverty incidence. Available

[39] Legovini (2002) makes use of information on business and agriculture cash loans obtained from the 1998 and 2001 LSMS panel surveys applied to a sample of about 4,000 Nicaraguan families.

forms of agricultural cash loans seem to help families close to the poverty line, but could apparently harm those below in the medium term. When all agricultural households are assumed to have had access to a cash loan, poverty incidence falls, but depth and severity of poverty worsen in most cases. People close to or above the poverty line commonly borrow to invest and expand; therefore, credit may be helpful. On the other hand, people at the bottom may borrow as a survival strategy when times are bad, and mostly for consumption, meaning that in the medium term they could end up being worse off by borrowing than by not borrowing. Consequently, low and even middle deciles, in the case of agricultural cash loans, are often associated with worsening outcomes. This suggests that risk and vulnerability affect families differently. When income fluctuates in low-income households, the obligation to make loan payments may increase the variability of income even further and may cause families to default.

Box 3.3: Analyzing the Distributional Impact of Loans in Nicaragua: Are the Poor WorseOff?

The Legovini (2002) study addresses the question of whether the impact of financial markets on household outcomes is positive, distributionally neutral, and/or poverty-reducing. It argues that most studies conducted so far have not addressed these issues. It also argues that most have been done by the financial institutions themselves, trying to evaluate sustainability and health of the financial services, but that they fail to measure the effectiveness of financial services in reducing poverty (Gail and Foster 1996, Cheston and Reed 1999). A few studies focus explicitly on poverty (Hulme et al. 1995, Zaman 1999 –all treating the case of Bangladesh).

Legovini uses a sample at the national level, adopting standard methods from the literature for evaluation of social programs, analyzing the results not only on average but also across the income distribution. The evaluation question addresses the problem of missing data. For example, what would be the income of a borrower had he or she not borrowed? Statistical theory is used to estimate sample average of hypothetical outcomes using observations, for example, nonborrowers who are observationally equivalent to the borrowers.

The study uses propensity score matching techniques to build a control group following Rosenbaum and Rubin (1985) and Heckman et al. 1997. The study relies on 1998 and 2001 LSMS panel data for Nicaragua. Selection models are used to estimate propensity scores and match respondents according to their probability of obtaining a loan in either 1998 or 2001. Average treatment effects between the treated group and the control group are estimated for several 2001 outcome variables to establish the medium-term effectiveness of 1998 cash loans and the short-term impact of 2001 cash loans. The results incorporate households that borrowed from banks, NGOs, cooperatives, money lenders, family, and friends in both periods, that is, households that borrowed from a provider other than store credit or forward sales providers. The distributional impact of these gains is evaluated by estimating decile-specific treatment effects, which are then used to simulate poverty indicators under a variety of different assumptions regarding the levels of coverage and access to lending services. These simulations are used to assess the potential of cash loans in reducing poverty. Poverty measures are simulated under different conditions in order to estimate the overall impact of credit services on poverty for the entire country. The question addressed is whether the availability of credit services increases or decreases overall poverty and by how much. Several simulations are performed for both consumption- and income-based measures of poverty. Simulated poverty indicators include the Foster-Greer-Thorbecke poverty indices (FGT(a) for a=0,1,2). These are the headcount ratio, the average normalized poverty gap, and the average squared normalized poverty gap. These are measures of incidence, depth, and severity of poverty, the last weighing more heavily observations at the bottom of the distribution.

Finally, a qualitative response model is used to estimate the probability of obtaining a loan. Equations are estimated for both 1998 and 2001 to measure the short- and medium-term impacts of credit on 2001 outcome variables. In 2001, business loans and agricultural loans are estimated independently on the tested and accepted hypothesis that there are separate markets for the two types of loan servicing different clients in different locations.

Source: Legovini (2002).

3.21 The current system of provision of financial services to families would need to be significantly modified to benefit a broader base in Nicaragua. Increased competition and efficiency would promote lower interest rates, while wider use of better technology, innovation, and design of new products would permit to fit cash flow better (particularly cash flow profiles of the poor). Increased outreach of financial services, a broader term including savings, insurance, transfers, and payments, by supervised financial institutions (including cooperatives for instance) might be a better financial product than cash credit for Nicaraguan families below or near the poverty line. In addition, credit failure in Nicaragua is also associated with difficulties lenders face in differentiating "good" clients versus "bad" clients. As a result of information asymmetries between lenders and borrowers, lenders might find it more difficult to identify potential risks among low-income borrowers than high-income borrowers. Consequently, improvements in credit information systems could greatly enhance the performance of financial services in Nicaragua.

B. POVERTY DYNAMICS ? THE POOREST OF THE POOR

B1. Who Are the Extremely Poor?

3.22 This section focuses on identifying successful strategies to exit from extreme poverty and to prevent falling into extreme poverty, in contrast to the previous section that attempts to identify successful strategies to generate prosperity while focusing on the nonpoor and moderate poor. This section uses the same methodology as the previous one to examine in detail the consumption dynamics of a panel of Nicaraguan households by making use of the 1998 and 2001 panel surveys of living conditions (LSMS) with close to 85 percent of households interviewed in 1998 interviewed again in 2001 (see box 3.1 for an explanation of the methodology for analyzing the panel).

Box 3.4: Subsistence Strategies among Poor Families in Nicaragua

Extreme and chronic poor in Nicaragua are characterized by the largest family sizes, the lowest levels of education, the worst dwelling characteristics, the highest dependence on on-farm agricultural activities and off-farm agricultural wage labor, and the least participation in nonagricultural wage labor. The poorest of the poor in Nicaragua comprise a mix of *minifundia* and agricultural laborers who live mostly in the Central Region. These families tend to move from extreme to moderate poverty and vice-versa, depending on the success of their subsistence and food security strategies. Extreme and chronic poor tend to accumulate and lose assets and change and combine different productive activities very quickly. Rural households with higher welfare levels tend to have higher education and be dedicated to nonagricultural activities.

Source: Davis and Stampini (2002).

3.23 The poorest of the poor in Nicaragua are characterized by being owners of *minifundia*[40] and working as agricultural wage earners (box 3.4). Low levels of all assets and instability of employment characterize these families. Agriculture and agricultural wage labor constitute subsistence and food security strategies. These do not constitute poverty exit strategies, except for those few able to accumulate a sufficient level of assets. Instead, potential paths out of poverty for these families include nonagricultural self-employment and wage labor, including migration, cattle husbandry, and direct transfer programs. Small land owners face essentially the same situation as *minifundia* owners, but increased land holdings provide somewhat better potential for succeeding in agriculture.

[40] Minifundia is fewer than two manzanas.

3.24 Similar to moderate poverty, a modest but significant decline in the incidence of extreme poverty occurred during 1998-2001. Among panel households, extreme rural poverty fell from 22 to 19 percent and extreme urban poverty from 5 to 4 percent. Poverty dynamics indicate that, although 9 percent of rural households moved out of extreme and into moderate poverty, 7 percent entered into extreme poverty, with 10 percent remaining in the same category.[41]

B2. What Strategies Overcome or Perpetuate Extreme Poverty?

Education, Demographics and Location

3.25 **Education is strongly associated with higher welfare**. Where families have more educated members, consumption is higher. Further, female education has a greater effect than male education on higher welfare, and is highly significant. Moreover, the mother's literacy impacts by one-fifth the probability of school attendance among extremely poor children. Female literacy is also a critical factor associated with maternal mortality, which stood at 125 per 100,000 births in 2001 and is one of the highest in Latin America.[42]

3.26 **Smaller family sizes enjoy higher levels of consumption**. As in nonpoor and moderately poor families, one of the main characteristics associated with extreme poverty is family size. From 1998 to 2001, households in the panel moving from moderate to extreme poverty increased their family size from six to seven members; in two out of three families with an additional member, the increase is associated with the birth of a new member.[43] Evidence indicates larger family sizes are strongly associated with lower consumption levels.

3.27 **Poverty and extreme poverty have a strong regional component**. Living in the Central region, compared to the Pacific, is associated with lower levels of consumption. While this regional bias can be explained partly by its historical backwardness, the fall in coffee prices most likely played a significant role in the Central region's inadequate economic performance. Although the full effect of the decline in coffee prices on poverty might not have been captured fully in 2001, as it was the first year of the crisis, the Central region is the only region where poverty increased during the period 1998-2001. This was particularly relevant for the rural poor who were dependent on agricultural wage labor from coffee, generating one-third of agricultural employment annually.[44] Larger families and location are also associated with lower welfare for urban households; in fact, only urban families in Managua, the country's capital, have significantly higher levels of well-being as compared to urban families in other cities.

Agriculture's Role as a Subsistence and Food Security Strategy

3.28 **Agricultural activities, both off and on farm, constitute subsistence and food security strategies among the extremely poor**. Where families dedicate labor to on-farm agricultural activities, per capita consumption levels are unambiguously lower. Moreover, families allocating labor to nonagricultural activities, both wage and self-employment, have higher levels of consumption. This does not mean, however, that all on-farm agricultural activities are associated with poverty. In fact, household ownership of cattle and working animals is associated with higher levels of consumption among the poor, suggesting that certain types of asset accumulation

[41] Davis and Stampini, 2002.
[42] GON, 2002.
[43] Davis and Stampini (2002), Annex 7, Table A7.8.
[44] BCN, 2001.

in agriculture increase welfare. The negative sign on the share of household allocation to agriculture implies decreasing returns to agricultural labor and suggests that household surplus labor finds refuge in on-farm production. For the urban poor, the results are mixed. Notably, allocation of family labor among the urban poor to nonagricultural self-employment is associated with lower levels of consumption.

3.29 **The most destitute group in Nicaragua constitutes families dependent on both on-farm activities and agricultural wages**. Families with small farm sizes are just as poor as landless agricultural wage earners. Although econometric analysis indicates no clear association between land size and consumption, the combination of land-labor strategies used by families tended to translate in a worsening of poverty for those with land in 1998 in contrast to those without land. Therefore, agriculture—for the smallest and the poorest—was not a major factor enabling families to exit poverty, but rather was used as a subsistence and food security strategy. Agriculture, for the smallest and the poorest, absorbs excess labor and contributes to food security. Nonagricultural wage labor alone is preferable to participating in both agricultural and nonagricultural wage labor. Those involved in nonagricultural wage labor alone or both saw the incidence of poverty fall by twice as much as those in agricultural wage labor alone

3.30 Major constraints for the extremely poor are high transaction costs, lack of financing, and low levels of agricultural technology. Presumably, many of these extremely poor families could be involved in potentially viable agriculture but lack access to key agrarian institutions and basic infrastructure such as paved roads, electricity, and piped water. Access to paved roads, a measure of isolation, is most relevant for the poorest families. Access to the current forms of credit does not seem to contribute to reducing poverty. The main problems associated with agricultural production, as identified by the poor are drought, infestations, and low prices. The poorest, however, rank as major issues the lack of roads and distance to market because they see these translating into higher transaction costs and major impediments to commercializing surplus production. They also rank input prices and lack of financing as major constraints to overcome extreme poverty.

3.31 Current farming practices among the poorest families focus mainly on subsistence and food security strategies. Extremely poor families in Nicaragua involved in agriculture produce mostly basic grains (corn and beans) mainly for self-consumption. Most nonpoor families involved in agriculture use corn as feed for livestock. Families producing the three major crops (corn, beans, and sorghum) have higher levels of poverty than those moving in and out of the production of these crops into market crops, cattle husbandry, and nonagricultural activities. A high share of the poorest produces beans in Nicaragua. Since beans are a subsistence crop used for self-consumption and a major food staple, performance in prices and yields of this grain is closely associated with the risks and vulnerabilities in welfare levels faced by the poorest.

People's Perceptions of Risks and Vulnerabilities Associated with Being Extremely Poor

3.32 The lack of capacity to anticipate and manage risk in Nicaragua is present at all levels. Government institutions and the international community tend to focus on mitigation and recovery efforts rather than preparedness. Family cultural practices, especially among the poorest, tend to include few preventive measures and may even encourage practices that increase their exposure.

3.33 Risk management, perception, and value of risk and vulnerability are determined by cultural and social processes and behaviors together with institutional readiness at the local level. Perceptions can contribute to worsening the consequences of individual, idiosyncratic, and

covariate shocks. Risk and vulnerability are perceived as relative and subjective concepts, with different sectors and socioeconomic groups attributing to them different meanings. Perceptions are of utmost importance because they determine and condition how people and families prepare to face shocks and how they manage them.

3.34 All socioeconomic groups in Nicaragua perceive individual economic risks, low levels of nutrition, and lack of adequate health services as the most serious shocks. Both urban and rural families consider economic hardships as the highest risks. Serious risks that can immediately translate into economic hardship are illness of family members, especially of the head, children under six, women during and after pregnancy; and illness associated with domestic violence against women and children. Other important risks associated with poverty come from social disintegration and crime, related primarily to alcoholism and theft.

3.35 A second group of most relevant risks in Nicaragua is associated with the environment, including major natural disasters as well as everyday environmental degradation associated with being extremely poor (for example, stagnant water resulting from lack of sewage systems), or the association of both (water problems increase during the rainy season). Extremely poor families in Nicaragua have high awareness of individual and idiosyncratic risks, but natural risks are generally perceived as normal occurrences, and families tend to make decisions that increase their exposure to them. For instance, families perceive floods caused by rains as being normal occurrences, but floods caused by hurricanes as natural disasters. How do they distinguish? Death toll and loss of infrastructure are the main indicators associated with the classification of a natural disaster vis-à-vis a normal occurrence. Local authorities also tend to make the same distinctions as extremely poor families. Thus, families tend to remain in high-risk areas prone to floods during the rainy season.

3.36 Droughts in Nicaragua are not perceived as natural catastrophes but as normal, chronic, recurrent events. Drought affects all socioeconomic groups, but to different extents. Drought has different impacts depending on the agro-ecological zone and crops. For instance, drought affects more seriously the dry tropic than the humid. Its impact is more severe on basic grains, such as beans, than on sugar cane. The impact on livestock depends not only on the altitude but also on the kind of pasture, land use, and grazing practices. Drought has a greater effect on small livestock breeders, because smaller breeders have worse land and deficient farming practices. Survival strategies among the poorest include selling wood as an alternative income strategy, which contributes to deforestation, which in turn causes environmental damage. Risk mismanagement feeds a process of accumulated social vulnerabilities. Moreover, drought in Nicaragua is still associated with periods when family members lose weight seasonally and adjust their diet toward available food staples (for example, when corn is expensive and scarce, tortillas disappear from the diet of the extremely poor). In addition, lack of land titling, financing, and sustainable development plans, together with the impact of the coffee crisis, has worsened unemployment and food security, which has contributed to increased malnutrition and school dropout.

3.37 The coffee crisis caused serious economic loses to all coffee producers and processors, large and small. As a result, many have abandoned this crop. The crisis has affected labor demand, increased unemployment, and reduced income of wage workers, with the consequent reduction of spending and consumption, which in turn has affected commercial activities and services such as transport. The crisis had a more severe impact on coffee workers who were living in coffee plantations and processing plants. Many coffee workers have become homeless, and most lack sufficient skills to transfer easily to other activities, so they tend to move into

subsistence agriculture, if they have access to some land, or worse, to depend on handouts. Municipal governments have also been affected, as tax collection has declined.

3.38 In Jinotega, some large producers (300+ *manzanas*) still perceive the crisis as an unexpected, random event that could be the result of natural causes, such as the always expected frosts in Brazil that benefit the rest of Latin American producers. Others still perceive the current coffee crisis as being part of the past trend in international business cycles for coffee, occurring more or less every three years. Producers acknowledge internal and external risks, which when combined, increase their exposure. Most common internal risks are lack of legal support, financial insecurity, civil insecurity, high transaction costs, and low productivity. External vulnerabilities are associated with international prices, terms of trade shocks, little access to specialty markets, and minimal access to international financial markets. Exposure to risk varies for producers, processors (*beneficiador*), and traders. Coffee processors, especially dry coffee ones, have the best insurance systems among all, protecting their infrastructure and possible coffee losses. Insurance covers the period from storage to transport to port. Processors also have international transport insurance through arrangements with transport companies.

Box 3.5: Good and Innovative Risk Management Practices

Appropriate risk management of the coffee crisis has been observed in a number of communities in La Campana, Verapaz, Tuma la Dalia, and Jinotega. Organic coffee producers have been able to manage the crisis better by signing agreements with alternative markets under a prenegotiated coffee price (US$126 per quintile). The degree of social capital and organization has contributed to mitigate the risk. Coffee producers socialized the risk and adopted innovative production and commercialization practices.

Informal and Formal Strategies to Manage Risk

3.39 Most extremely poor families resort to survival strategies to manage risks. Most Nicaraguans do not have health or life insurance or any other business insurance protection. Most common informal family strategies include reducing consumption and diversifying the use of family labor and of physical assets. By reducing consumption, extremely poor households are exposed to malnutrition and even periods of hunger. Population groups at higher risk are children, pregnant women, and the elderly and handicapped.

Box 3.6: Remittances

The Central Bank of Nicaragua (BCN) estimated remittances at US$345 million in 2001, contributing to 14.4 percent of GDP. The Economic Commission for Latin America (ECLA) estimated remittances to be twice as high in 1999. Monthly remittances for families can vary between US$70 and US$150. A potential poverty exit strategy could be to use remittances in an organized manner. Some pilot experiences sponsored by the Inter-American Development Bank are taking place in El Salvador. Transfer centers could lower transaction costs, while remittances could be complemented by development funds and used for productive investments and savings rather than just for consumption. Household welfare could improve, stimulating the economy and generating wealth.

Source: FAO/Ford Foundation study (forthcoming, 2003).

3.40 Remittances, informal credit, and exchange of goods and services also constitute informal, noncommercial strategies (box 3.6). Among commercial transactions, the most common are in-kind loans offered at *pulperias* (small grocery stores) for extremely poor people to access food and other basic goods. Some families share production by sharing and exchanging assets in order to establish a productive activity. Livestock and crop production are the most common forms of

shared production. The two parties equally share risks and profits, but sometimes this arrangement increases people's vulnerability if the activity is not profitable. Extremely poor people tend to undervalue production costs and benefits. Basic accounting skills are low, so the poorest often invest more than profit and do not attach a value to their labor in monetary terms.

3.41 Among formal strategies to support families manage risk, a pilot program in Nicaragua is the *Red de Proteccion Social* (RPS – Social Protection Network). The RPS provides cash to extremely poor households in return for sending their children to school and having well-child checkups. Recent pilot evaluation results indicate that transfers have been successful in increasing incomes and human capital through education programs and food security.[45] However, RPS has been associated with some social division within the community among beneficiary and nonbeneficiary families. Since the program distributes bonuses to women, it is reported by families to be associated with some increased domestic violence and encouragement for men to stop working, given that basic needs are met. Thus, assessing the best targeting mechanism and gender approach could reduce undesirable associated effects.

B3. How Well Have Poverty Programs Responded to the Poor?

Box 3.7: Main Risks Affecting Nicaraguans, Most among the Poor, Children, and Women

- Nearly 800,000 children age zero-six do not receive **any early childhood development.**
- More than 100,000 poor children age zero-six suffer **frequent illness** and 170,000 suffer **chronic malnutrition.**
- **Failure to attend school** affects roughly 300,000 poor children and youths, of whom about half (130,000) report cost as the main reason for nonattendance.
- Nearly 600,000 poor people **do not consult** health care services when ill, and of those, 22 percent report cost as the main deterrent, while 12 percent report distance as the deterrent.
- **Low skills affect earnings prospects** of nearly 1.5 million people in the Nicaraguan labor force who have less than [a] third-grade education.
- Nearly 300,000 poor families live in **low-quality housing;** three-fourths of these hold **no title** to housing, posing a strong disincentive to invest in home improvements.
- Some 200,000 poor families **lack access to electricity**, 100,000 **lack adequate sanitation**, and 63,000 **lack access to a safe water supply.**
- Nearly 300,000 women and their children are **victims of domestic violence.**
- Some 250,000 women and 230,000 children suffer **anemia**, hindering their learning capacity.
- Nearly 3.5 million people, or 70 percent of Nicaraguans, report not participating in any community activity, suggesting extensive **social fragmentation, isolation, and social exclusion.**
- **Poverty among the elderly is comparatively less prevalent**, affecting 100,000 people.

Source: A Review of Selected Poverty Programs in Nicaragua's PRSP Portfolio (May 2001). Numbers are calculated using the 1998 LSMS.

3.42 Increased coverage is needed for several underserved population groups by key programs (box 3.7), as described below.

i. *Provision of integrated childhood development for children zero-six years of age, and especially zero-three*, because of the crucial relevance of early child development in improving later educational attainments and, in turn, breaking the intergenerational transmission of poverty. Emphasis should be given to childhood nutrition and promotion of proper family feeding and hygiene practices.

[45] IFPRI, 2002.

ii. *Defrayment of the private costs of schooling for children 7-12 and 13-18 years*. Cost is the most important factor reported by poor families for their children not attending school. Poor education quality and lack of physical access are the other two factors. There are some direct transfer pilot initiatives, which on the basis of evaluation could be scaled up.

iii. *Improvement of access to land and house titling*. The extremely low coverage of property titles in Nicaragua limits the ability of the poor to use one of their largest assets, and to improve land and housing markets. Lack of titling also reduces incentives to invest in their own housing, thereby swelling the apparent need for public housing solutions. Only 35 percent of extremely poor households and 49 percent of nonpoor households have clear title to their property. Expansion of titling programs is also a priority for housing programs, as titling efforts could help reduce the need to expand coverage by promoting owners' investments in home improvements.

iv. *Expansion of coverage of basic services*. Although relatively well designed, program coverage remains low, especially in rural areas. Complementary programs to improve household water use and hygiene practices are needed. Access to piped water strongly influences infant and child mortality and school attendance. For rural children, access to piped water has a notable 9 percent point impact on school attendance.

v. *Reduction of incidence of domestic violence*. Almost one-third of Nicaraguan women report having been physically abused, frequently when their children are present and often during pregnancy. However, no program in the sample reviewed addresses this issue. Several promising initiatives to address domestic violence are outside the PRSP portfolio. Thus, the issue needs to be given higher priority.

vi. *Shifting donor financing from individual projects to broad programs*, incorporating a better balance of recurrent and investment spending. Key issues would be to define clear programs subject to formal evaluation and monitoring.

3.43 Substantial financial resources are devoted to poverty programs in Nicaragua. Close to one-tenth of GDP (7.6 percent) is allocated to programs delivering services and benefits intended for the poor. A recent review[46] of selected poverty programs in the Nicaragua PRSP portfolio (table 3.5) shows that less than one-third of the resources programmed for the following five years (US$232 million) are likely to benefit the poor by addressing identified risks and vulnerabilities. About one-half of total investments in the program sample (US$372 million) either lack adequate supporting information to determine their pertinence, or need to be modified to improve effectiveness in addressing given risks or actually reaching the poor. Approximately 14 percent of expenditures over the period (US$114 million) will not benefit the poor at all. These projects are mainly for housing and rural sectors, many subject to a variety of design problems requiring more than minor modifications to adequately reach the poor. In some cases, the project design leaks benefits to the nonpoor, and in other cases, the project concept may not appropriately respond to the identified problem. The remaining 10 percent (US$77 million) is devoted to institutional strengthening efforts that may enable line ministries to deliver better services in the future.

[46] The Review of Selected Poverty Programs was prepared for the Technical Secretariat of the Presidency of the Government of Nicaragua (May 2001) by a team of consultants under the leadership of Nancy Gillespie.

Table 3.5: Selected Poverty Programs in PRSP Portfolio, 2001-2005 (US$ millions)

Risk Category	Programs							
	Total		Appropriate		Need Reformulation		Not Appropriate	
	Number	US$	Number	US$	Number	US$	Number	US$
Risks children 0-6 yrs	5	31.9	2	5.2	3	26.7		
Risks children 7-12 yrs	11	173.4	2	43.9	8	121.9	1 [a]	7.6 [a]
Risks youths 13-18 yrs	5	41.9	1	4.7	3	29.5	1 [a]	7.7 [a]
Low and unstable income	14	119.2	1	5.3	9	68.5	4	45.4
Poor housing and lack of titling	6	116.4	2	48.0			4	68.4
Health	14	163.9	5	50.4	7	51.1	2 [a]	62.4 [a]
Lack of basic services	6	58.4	5	45.4	1	13.0		
Environmental risks and natural disasters	6	24.3	1	3.3	5	21.0		
Personal and social risks	8	14.0	2	0.3	6	13.7		
Geographic isolation and social exclusion	4	51.3	3	25.2	1	26.1		
Total Sample:	**79**	**794.7**	**24**	**231.7**	**43**	**371.5**	**12**	**191.5**
Share of total	100%	100%	30%	29%	55%	47%	15%	24%

Source: A Review of Selected Poverty Programs in Nicaragua's PRSP Portfolio. Note: "Appropriate" programs address the risks of the poor; "Need Reformulation" are projects that could address the risk of the poor, but needing reformulation or where information is insufficient to assess their appropriateness; and "Not Appropriate" are projects that do not appropriately address the risks of the poor. (a) projects for institutional strengthening of line ministries.

3.44 Program resources are heavily concentrated in four areas: education, health, rural development, and housing. Health and education projects tend to be more consistent with sector policies and strategies than rural development and housing projects. In the health and education sectors, infrastructure investments offer a relatively higher weight to financing of quality of service provision. Given extremely low per capita financing of basic health and education programs in Nicaragua (US$19 per capita in health and US$61 per primary student), infrastructure investments carry a high opportunity cost. For rural development programs, the extremely low coverage and leakage of benefits to the nonpoor implies a very high cost per beneficiary.

3.45 Key areas where resource allocation appears inadequate include attention to health, nutrition, and educational development of children zero-three, access to legal title for housing and property, and attention to personal risks, especially domestic violence. Well-designed and explicit policies are key to establishing consistency among sector objectives, programs, and expected results. Disaster response projects also lack a consistent strategy.

B4. Key Operational Lessons for Poverty Programs

3.46 Better definition and implementation of poverty programs in Nicaragua require a series of key actions within sectors, as described below.

i. *Establish and/or review sectoral strategies* to prioritize goals better and define specific targets. A considerable number of programs deliver benefits not appropriate to the needs of the population. Benefits invite capturing the nonpoor if they are too large (housing programs transferring more than US$2,000), or if they require managerial or financial capabilities beyond those of the poor (for example, delivery of a herd of 25 cattle, or housing programs requiring access to credit). The benefit need not compete with the

development of private markets (for example, donation of machinery for the sale of machinery services to agricultural cooperatives).

ii. *Complement sectoral strategies with a systematic policy framework*, identifying priority actions, defining clear timetables for specific targets, and establishing the commitment of responsible agencies for implementation to guide operational allocation of available resources.

iii. *Evaluate cost-efficiency of programs by sector* to select appropriate standards and policy guidelines and to avoid overlapping in provision of similar benefits and targeting of the same population groups. Duplication and fragmentation of activities prevail across most sectors focusing on the poor (primary health care programs use 8 different models; school backpacks are provided by 3 separate programs; school infrastructure is delivered by 5 distinct programs; teacher's training is delivered by 3 different programs; and rural development programs employ 13 different approaches). Duplication leads to differences in quality, cost, and, most important, excessive burden on administrative overheads.

iv. *Provide programs with a system for monitoring and evaluation (M&E)* to ascertain success of reform and impact. Deficiencies are found in most M&E efforts, especially when there is a lack of relevant and quality information. Very few projects have baselines that allow for assessment of program outcomes or impact, and they tend not to share information with government institutions, similar programs, or the public. This is detrimental to learning and exchange of best practice from other programs. In addition, because program information is so deficient and programs are financed from a wide variety of sources, program accountability is weak, a factor which reduces managerial quality and program impact.

v. *Reform individual projects, streamlining ineffective and inefficient projects to expand high-impact and cost-effective program coverage on the poor*. Despite substantial spending on poverty programs, coverage for significant priority groups is inadequate to reach PRSP goals. Projects have shortcomings in identification, characterization, and quantification of potential beneficiaries. Projects with easily identifiable beneficiaries, such as those targeting immediate victims of Hurricane Mitch, or those combining the use of the poverty map with personal or housing characteristics (young children, children of school age, houses with dirt floors), are more likely to reach intended beneficiaries. However, programs lacking criteria to verify beneficiary eligibility (some rural development and housing programs), or exit criteria to terminate benefits (food distribution programs, food for work, temporary employment programs) are more likely to leak benefits to the nonpoor.

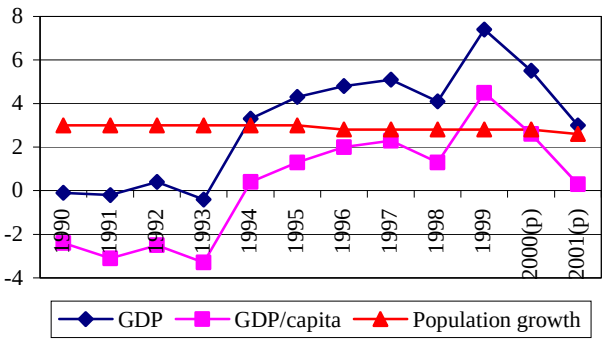
vi. *Increase the country's leadership and ownership of external aid allocations.* Nicaragua's high dependence on external aid and serious coordination deficiencies among donors exacerbates policy consistency problems and overburdens scarce managerial capacities. Most donors tend to select activities to be financed without due attention to the government's leadership and ownership. Clear sector strategies can help to a certain extent. Nicaragua's reliance on external financing—which is available for investment but not, as a rule, for recurrent spending, and especially not for salaries—greatly distorts the balance of public spending. In the case of the health and education sectors, for example, recurrent financing is scarce relative to infrastructure financing, and this distorted balance is impeding progress toward sector goals. Financing recurrent spending occurs only exceptionally.

CHAPTER IV. PROSPECTS AND SUCCESSFUL STRATEGIES FOR BROAD-BASED GROWTH AND POVERTY REDUCTION

A. PROSPECTS FOR POVERTY REDUCTION

4.1 **Given past performance, GDP growth of at least 5 percent per year on average is required to achieve the poverty reduction target set by the PRSP, consistent with the MDG, of cutting extreme poverty by half by 2015**. Nicaragua's economy has experienced a recovery since 1993, which has had a beneficial effect on poverty. GDP averaged an annual growth of 4.5 percent during 1994-2001 and per capita consumption of 1.5 percent. However, this period exhibited the highest rates of economic growth observed since the 1970s, that is, 7.4 percent in 1999 and 5.5 percent in 2000, and was fueled largely by post-Hurricane Mitch reconstruction investment and the economic activity it generated.

Figure 4.1 Gross Domestic Product (Rate)



4.2 **Poverty in Nicaragua was very responsive to economic growth** between 1993 and 1998 as well as between 1998 and 2001,[47] given the rural focus and labor-intensive nature of growth. Thus, the future sources and levels of economic growth are key for Nicaragua's continued efforts in poverty reduction, particularly as those factors related to post-Hurricane Mitch reconstruction efforts have concluded.

Table 4.1: Nicaragua: Poverty Projections under Alternative Annual Growth Scenarios

Index	Actual 2001	Observed 1994-2001 4.5% GDP and 1.5% GDP/cap [a]			MDG and PRSP Goal 5.15% GDP and 2/155% GDP/cap [b]		
		2005	2010	2015	2005	2010	2015
Overall Poverty	**45.8**	44.3	39.9	35.5	44.3	38.6	33.3
Extreme Poverty	**15.1**	14.4	12.5	10.6	14.4	11.9	**9.7**

Source: Nicaragua LSMS 2001 and Staff estimates. (a) Mean observed rates, 1998-2001. (b) Estimated mean rates to achieve PRSP and MDG goals of cutting poverty by half in 2015 with respect to 1995.

4.3 Nicaragua's growth prospects appear now less favorable than in the late 1990s. This is largely the result of external shocks associated with a drop in commodity prices for coffee, one of Nicaragua's main export products, and slow growth in international economic partners. However, projections in the Poverty Reduction and Growth Facility (PRGF) program agreed with the IMF include growth of 4.5 percent for 2004. Such expectations, hinge on a recovery of

[47] Elasticities of poverty to growth are on average 1.5 for overall and 2 for extreme poverty for 1993-2001.

international conditions for the required fiscal adjustment to have a positive effect on the economy. Such projections rely on the strengthening of a sustainable macroeconomic environment with the foreign debt alleviation that will ensue after Nicaragua reaches the Enhanced High Indebted Poor Countries Initiative (E-HIPC) initiative completion point, plus current efforts to improve the investment climate, including negotiation of trade agreements including Central America Free Trade Agreement (CAFTA). These improvements in the macroeconomic and business environment are expected to attract foreign and domestic productive investments which should, in turn, translate to higher growth rates.

B. SUCCESSFUL WELFARE RAISING STRATEGIES

4.4 The main purpose of any prosperity-generating and poverty reduction strategy is to improve welfare levels and bring stability of income in both rural and urban areas. To achieve these goals, a comprehensive strategy requires cross-cutting policies as well as instruments tailored to the needs of the nonpoor, moderately poor, and extremely poor (box 4.1 and 4.2). Defining a comprehensive broad-based growth strategy includes economy-wide policies to promote exports of traditional and nontraditional products beyond productive clusters; to diversify to other economic activities; to support insurance mechanisms; and to improve access to physical infrastructure, financial services, and technical assistance

4.5 In the future four key interventions will be crucial for continued poverty reduction and to achieve the MDG and PRSP goal of cutting poverty by half by 2015: broad-based economic growth, productive and basic infrastructure, education, and appropriately designed safety net interventions. These are expected to be further explored among the requirements of broad-based growth for Nicaragua in the upcoming Development Policy Review.

4.6 **Broad-based economic growth** requires attraction and participation of domestic and foreign private sector investments. Past factors contributing to poverty reduction indicate that labor-intensive activities, such as postharvesting, particularly geared toward exports, could have substantial contributions to broad-based growth. Key interventions include improvements in the investment climate, increased access to institutions such as financial services, broadening of international trade opportunities, and expansion of land and home titling.

4.7 Financial services need to urgently improve penetration, efficiency, and cost-effectiveness under an environment of fair competition provided by an adequate regulatory framework. Increasing access to financial systems requires establishing better targeting mechanisms and determining whether specific forms of credit are good or bad for poverty reduction (not just whether credit actually reaches the poor or not). Lending technologies need to be reassessed and modernized. Inefficiencies in the provision of financial services in Nicaragua impose severe costs on borrowers, such as interest rates well above Latin American averages. Efficiency in financial services needs to build capacity, increase competition among providers, and improve the regulatory frameworks. Loans need to be provided to people who are likely to have the asset base, and human and working capital, and access to markets requirements to make borrowing profitable beyond its costs. Repayment structures need to be consistent with wide income fluctuations and periodicity of cash flows typical for agricultural activities. Most important, other nonfinancial but complementary services may need to be provided to ensure that producers can successfully invest, manage risk and repay. These may include: insurance services to address most common shocks (for example, health or life insurance or any other business insurance protection); technical assistance services to advise at the investment, production, postharvesting and marketing stages; and warehousing services to improve asset management, particularly to help poor farmers avoid buying high and selling low as a survival strategy.

4.8 **Productive and basic infrastructure.** A renewed emphasis needs to be placed on productive and basic infrastructure, such as improved roads, electricity, piped water, and sanitation. Productive infrastructure also contributes to business development and facilitates access to job markets. Increased agricultural productivity, access to agricultural output and input markets, and off-farm labor activities are closely associated with the availability of both.

Box 4.1: Successful Strategies for Nonpoor and Moderately Poor

POLICY PRIORITIES AND INSTRUMENTS	**ASSET ACCUMULATION**	Education	Support increases in enrollment and attendance, particularly for women; Improve productivity, including farms; Develop Non-Ag Alternatives; Distance learning (if feasible)
		Land (ownership and rental)	Support commercial agriculture, for those with potential; Off-farm activities, for those w/out potential in agriculture
		Cattle	Facilitate commercial production
		Physical Capital	Facilitate investments in assets, including farming equipment
	DEVELOPMENT FUNDS	Medium and Small Business	Facilitate exports, commercial activities and non-traditional agriculture
		Remittances	Facilitate productive investments and savings; Support transfer centers to reduce transaction costs
	INSTITUTIONS	Technical Assistance	Support commercial production, agriculture for those with potential, including non-traditional exports; Support vertical integration w/pre- and post-harvesting activities
		Financial Services inc. Credit	
		Producers' Organizations	
		Market Information	
		Sanitary and Fitosanitary Services	
	INFRASTRUCTURE	Roads, Electicity, Water and Sanitation	Improve productivity and access to input / output markets, and thus support commercial activities; Improve school attendance; Key to reduce malnutrition and, reduce infant and child mortality
	POPULATION	Migration and Reproductive Healthcare Services	Assess population flows; Increase birth spacing and reduce unwanted pregnancy, particularly among adolescents; Key to reduce maternal mortality
	HEALTH	Maternal and Child Healthcare	Support prenatal care, institutional births, breastfeeding and vaccination; Key to reduce maternal mortality and, reduce infant and child mortality
	SOCIAL PROTECTION	Cash Transfer Programs	Avoid leakage to non-poor; Incorporate mechanisms to be turned on and off in response to specific sub-regional crises

4.9 **Coverage of basic water and sanitation infrastructure is deficient in Nicaragua**. Lack of access to safe water and safe sanitation is associated with lack of progress in the incidence of child diseases such as diarrhea and acute respiratory infections, which are, in turn, associated with child and infant mortality and malnutrition. Only one-fourth of Nicaraguan households, on average, have access to safe water (piped water inside the house) and only one-third, on average, to safe sanitation (treated latrine or toilet). Most of the extremely poor lack basic services, which is symptomatic of structural poverty. These conditions can improve

significantly through cost-effective and well-targeted programs for provision of basic services in water and sanitation. However, substantial improvements in basic infrastructure and child diseases can be attained only through high and sustained levels of broad-based economic growth that, in turn, would improve general living standards and income levels.

4.10 **Education** is associated with increasing welfare across all socioeconomic groups in both rural and urban areas. Thus, expanding coverage and improving quality of education can be powerful wealth-generating and poverty-reducing instruments in Nicaragua. In particular, improving internal efficiency, including retention, promotion, achievement, and completion, would positively impact family welfare.

4.11 **Safety nets** interventions need to be designed so that they can be activated and de-activated in response to specific crises (e.g. coffee price shock). This, in the future, could be critical to aid in preventing people from losing their assets, human or physical, in times of crisis. Poor people's coping strategies have shown to be ineffective in breaking the cycle of poverty, mainly because of the limited assets they own that can be used in times of distress. Often, interventions such as credit flows, tend to be literally consumed by households, generating a vicious cycle of greater poverty and indebtedness. In addition to conditional cash transfers, to guarantee that children continue attending school, an adoquinado program to build rural roads, such as the one being implemented by the Ministry of Transport, financed by the World Bank, could prove to be a very useful component of Nicaragua's safety net strategy. Such a program could be used to attend to subregional crises. The adoquinado program has proved to have significant spillover benefits beyond those associated with rural roads.[48] Adoquinado roads increase access to markets for rural inhabitants, and thus enhance opportunities for producers to improve income levels by moving agricultural produce out faster, which improves their ability to obtain better prices. In addition, as a workfare option, the program has shown that it is both labor-intensive and leaves a tangible and useful productive investment behind. Further, the program is well targeted to the poor, develops local skills, and has important spillover effects, including improvements in health conditions.

C. SUCCESSFUL STRATEGIES TO EXIT FROM POVERTY AND TO PREVENT FALLING INTO POVERTY

4.12 Poverty, in both rural and urban areas, is consistently influenced by low education (particularly for females), large family size, and dependence on agricultural activities (box 4.2). In rural areas, the poorest of the poor are the group of *minifundia* owners and agricultural wageworkers characterized by low levels of all assets and instability of employment. Families dedicated primarily to the production of staple crops and involved in agricultural wage labor activities are engaged in subsistence and food security strategies, and therefore unlikely to overcome poverty, except for those who manage to accumulate sufficient assets. Small producers share almost the same characteristics of the poorest of the poor, but increased land holdings provide them somewhat more potential to succeed in agriculture. Poor farmers lack access to agrarian institutions (credit, technical assistance, and producers' organizations) necessary for successful agriculture. Moreover, being poor means living at risk. Most poor people do not have access to formal insurance mechanisms or social safety nets to protect them, in either rural or urban areas, and most of the time they undervalue the risks associated with natural disasters.

[48] World Bank (2001). Nicaragua Poverty Assessment. See beneficiary responses in Box 2.6.

4.13 Key priorities emerge for a wealth-generating strategy. Targeting specific groups and designing programs that respond to the needs of these different groups is crucial to improving the condition of the poor in Nicaragua.

4.14 **Education is a key welfare raising strategy**. Education is a successful strategy for the poorest of the poor, in both urban and rural Nicaragua, because it prevents families from falling into poverty and helps them exit poverty. Thus, education investments need to continue, expanding coverage in rural areas, incorporating improvements in quality, and targeting conditional transfers as demand incentives to the poorest families.

Box 4.2: Successful Exit and Subsistence Strategies for the Extremely Poor

POLICY PRIORITIES AND INSTRUMENTS	**ASSET ACCUMULATION**	Education	Support increases in enrollment and attendance, particularly for women; Improve productivity, including farms; Develop Non-Ag Alternatives; Distance learning (if feasible)
		Land (ownership and rental)	Facilitate small scale, economically viable activities for those with potential; Support agriculture as subsistence and food security, risk averse strategy, for those w/out potential
		Cattle	Facilitate livestock for savings and risk
		Physical Capital	Facilitate investments in assets, including farming equipment
	DEVELOPMENT FUNDS	Small and Micro Business	Facilitate Off-farm and Non-Ag Alternatives, particularly for women heads
	INSTITUTIONS	Technical Assistance	Support small scale, economically viable activities; Support agriculture as subsistence and food security, risk averse strategy
		Financial Services inc. Credit	Higher chance of success if sufficient human capital and asset base
		Producers' Organizations	Facilitate access to institutions, markets and economies of scale
		Market Information	
		Sanitary and Fitosanitary Services	
	INFRASTRUCTURE	Roads, Electicity, Water and Sanitation	Improve productivity and access to input / output markets, and jobs; Improve school attendance; Key to reduce malnutrition and, reduce infant and child mortality
	POPULATION	Migration and Reproductive Healthcare Services	Assess population flows; Increase birth spacing and reduce unwanted pregnancy, particularly among adolescents; Key to reduce maternal mortality
	HEALTH	Maternal and Child Healthcare	Support prenatal care, institutional births, breastfeeding and vaccination; Key to reduce maternal mortality and, reduce infant and child mortality
	SOCIAL PROTECTION	Cash Transfer Programs	Support human capital development and reduce consumption poverty directly; Reassess targeting and gender approach of RPS and other similar programs.
		Informal Insurance Mechanisms and Risk Management Strategies	Support access to markets, and further accumulation of assets and capital; Tailor interventions, incorporating prevention, mitigation and recovery

4.15 **Family size is significant among all contributing factors to exit poverty and prevent families from falling into poverty in Nicaragua**. Smaller family sizes among panel households enjoyed higher levels of consumption. Thus, nonpoor and moderately poor families have fewer members, while a main characteristic associated with extreme poverty is larger than average family size. Increased access to reproductive health care services can contribute to increase birth

spacing and reduce unwanted pregnancy, which is particularly high among adolescents, and which is closely associated in Nicaragua with maternal mortality, and infant and child mortality.

4.16 **Assets and location are key for exiting poverty**. Ownership of assets, such as heads of cattle and working animals, contributes to increase consumption. Moving in and out of production of subsistence crops and socialization of risks contribute to poverty reduction but is not a prosperity entry path. People living in the Central region have the highest probability of being poor. Nonagricultural self-employment and wage labor, such as remittances from migration, constitute potential poverty exit paths.

4.17 **Current available forms of cash credit** seem to be a detrimental poverty reduction strategy for the very poor. Available forms of cash loans, although effective at strengthening growth prospects for the overall economy, seem to harm those below the poverty line. Borrowing for the poor may be used more as a survival rather than an investment strategy. Moreover, the very poor commonly lack the human, social, and physical capital, and access to markets required to generate a profit when using some forms of credit. For the extremely poor, it is necessary to reassess the type of financial services and targeting mechanisms. The very poor might be better off with small grants that would allow them to build an asset base and develop productive skills so that they could be placed in a better position and as a result make a profit from future loans.

4.18 **Direct cash transfers** and other income support programs, such as workfare, are in the short term a viable poverty reduction strategy for the extremely poor. However, this not a poverty exit strategy but a survival one. Agricultural wage employment and agriculture are also subsistence and food security strategies. These need to be accompanied by medium- and long-term policies to decrease dependence on low-return activities and support poor people in generating income, and to move toward increased productivity in all activities. Poor people need to have access to assets such as human capital, relevant training, and technical assistance to be able to increase their productivity, diversify their production, and acquire the necessary skills to enter the labor market. Production incentives need to support increased productivity and diversification and encourage complementary off-farm and nonagricultural wage employment. Female-headed households in poverty, in both rural and urban areas, rely disproportionately on nonagricultural self-employment and could greatly benefit.

4.19 **Informal insurance mechanisms** are used in the absence of formal social insurance. Many families in extreme poverty rely on subsistence agricultural production to assure their survival. These households require better access to basic agrarian institutions. Although government programs have reached some of the poorest farmers with technical assistance, access remains very low, and efforts need to focus on access to markets and further accumulation of agricultural assets and capital.

4.20 **Risk management strategies**. Exposure to risk and vulnerabilities seem to have increased in Nicaragua between 1998 and 2001. Regardless of the source of the crisis, the poor typically develop coping strategies designed to minimize vulnerability at the community or family level. However, these coping strategies can perpetuate vulnerability and poverty. Integral risk management requires incorporating institutional, normative, and cultural changes to modify perceptions and decisions regarding risk management. Designing effective risk management strategies means understanding the causes of the problem without neglecting prevention, mitigation, and recovery efforts at the macro and micro levels. The macro level comprises government (central and local), the private sector, and civil society organizations. The micro level involves communities and families. Strategies to address vulnerabilities of particular groups

need clearly defined tailored interventions, which may entail direct transfers in some cases and access to insurance markets in others.

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