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## TABLE OF CONTENTS

### 1. Incidence of Public Spending

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# The Distribution of Social Expenditure in Nicaragua \*

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## *Summary*

This study identifies the direct beneficiaries of public social spending programs in Nicaragua. By applying an incidence methodology, the distribution of social expenditure is computed by socioeconomic strata, and its impact on the distribution of per capita consumption is estimated. The study is based on information obtained from the recent 2005 Living Standards Measurement Survey (EMNV), carried out by the National Statistics Institute (INEC). It concluded that social expenditure does not have a pro-poor bias: the different economic strata of Nicaraguan society essentially benefit uniformly from public spending programs. This is the consequence of a compensatory balance between programs that are focused on the most impoverished sectors (i.e. primary and adult education) and others that especially benefit highest income groups (i.e. universities). This study provides estimates of the degree to which each program is focalized. Unlike public social spending, expenditure that supports the Poverty Reduction Strategy (PRS) has a clear pro-poor bias, although there is sufficient margin for significantly increasing the degree to which PRS programs are focalized.

*Key words:* social expenditure, PRS, Nicaragua, incidence, distribution, poverty

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## 1. INTRODUCTION

Nicaraguan society, assisted by international organizations and foreign donors, makes a great effort to finance the public provision of a wide range of social programs aimed at improving the standard of living of the most impoverished population, and promoting human development in Nicaragua. The Nicaraguan Government provides education and health services at no cost or at subsidized prices, provides monetary transfers and goods to the neediest, offers housing programs, assists in the provision of water and sanitation services, the collection of garbage, the provision of public street lighting, and administers rural development programs as well as a range of other social welfare services.

In order to comprehensively evaluate this diverse group of activities, it is crucial that their current beneficiaries can be identified. Who benefits from public social expenditures? The answer to this question is obviously essential to evaluating the impact which state interventions have upon distributional equity, but it is also important that the efficiency of public expenditures be evaluated, inasmuch as the private and social benefits of an intervention vary according to the population groups that receive them.

The objective of studies carried out to determine the impact of the distribution of public expenditure, solidly based in economics, is to identify the beneficiaries of spending and classify them in strata according to their standard of living. Then, the impact of state public spending on the distribution of well-being among a nation's inhabitants can be evaluated and quantified. This study applies a traditional benefit-incidence analysis methodology to determine the beneficiaries of social spending in Nicaragua. The study attempts to contribute to efforts aimed at increasing the positive impact that public policies have on the most disadvantaged members of Nicaraguan society.

The study characterizes spending on social programs in Nicaragua—both those that correspond to so-called Public Social Expenditures (SPE) and programs that are part of the Poverty Reduction Strategy (PRS)—identifying their beneficiaries and estimating their redistributive impact. The main input for this study is the Living Standards Measurement Survey (EMNV), carried out in 2005 by the National Institute for Development Information (INIDE), previously known as the National Statistics and Census Institute (INEC), in the framework of the Nicaraguan Government's program to Improve Living Standards Surveys (MECOVI). This valuable survey, part of a group of Living Standards Measurement Surveys, was implemented in Nicaragua in 1993, 1998, and 2001. The EMNV enables us to better grasp the socioeconomic reality of the country, and assess the participation of the population in public social programs.

The rest of this study is structured in the following way. In section 2 we explain the main characteristics of an incidence study, and discuss the principal aspects of its implementation in the case of Nicaragua. In section 3 we present some basic statistics about public social expenditure, the Poverty Reduction Strategy, and the distribution of

consumption in Nicaragua. Sections 4 through 9 constitute the nucleus of this report, in which the distributional incidence of social spending in the sectors of education, health, housing, water and sanitation, social assistance and rural development are analyzed. Estimates of the distributional impact of aggregate social spending are presented in section 10 along with some simulation exercises, including the financing of spending and some hypotheses related to the inefficiency of spending management. Finally, section 11 concludes the study with some final comments.

## 2. METHODOLOGY<sup>1</sup>

This study documents and analyzes the coverage and incidence of social expenditure in Nicaragua. Both dimensions—coverage and incidence—are relevant to an analysis of social policies. An analysis of coverage allows us to know the proportion of the target population that enjoys some service or takes part in some public program. This analysis helps identify areas or strata of the population that lack a specific service or only scarcely participate in some program, and as a consequence can better guide the expansion of services.

The incidence analysis is interested in the distribution of a given program's benefits. The main concern is the degree to which a program is focalized. What proportion of total spending reaches the poorest sectors of society? This type of question is addressed in an incidence analysis. Extensive economic literature about this type of study is available.<sup>2</sup>

The two key instruments needed for a distributional study of social spending are available in Nicaragua: a detailed breakdown of social spending by activity, and a household survey providing information about participation in public programs. In both cases, available information is up to date, which is not common in most countries. Both the information on public spending and the household survey correspond to the year 2005, insuring that the results of this work fully reflect the current situation in Nicaragua.

The survey to be used is the Living Standards Measurement Survey (EMNV), conducted in 2005 throughout the entire Nicaraguan territory. This survey contains the responses of 36,642 individuals (6,898 households), representing a population of 5.1 million, covering an ample range of questions intended to characterize the socioeconomic and demographic situation of Nicaragua. The EMNV is a specially designed survey aimed at reflecting the social situation of the country, which includes a considerable number of questions

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<sup>1</sup> The methodology in this study is similar to that used in Gasparini *et al.* (2005) in the case of Honduras. Therefore, both the methodological explanations and the discussion concerning some results coincide with that study.

<sup>2</sup> Studies on the incidence of expenditure have a long tradition in economics. More recently, the contributions of Bourguignon and Pereira da Silva (2003), Kaplow (2003), Ravallion (2003), Van de Walle (2003), and Heckman *et al* (2002), among others, have revitalized discussions and contributions on this subject.

concerning participation in public programs, monetary transfers received from the State, and the benefits of public services. The EMNV pertains to a growing number Living Standards Surveys being conducted in Latin America. These surveys, promoted by the World Bank, have similarly structured questionnaires and are designed to reflect a nation's social situation with the greatest precision possible.

#### **THE STRUCTURE OF AN INCIDENCE STUDY:**

All spending incidence analyses consist of three essential stages:

##### *1. Definition of the individual well being variable*

In this study, household per capita consumption is used as the variable that determines levels of individual well-being. In function of this variable, the population is grouped into strata (in this case quintiles, or fifths of the population), or by levels of poverty (extreme poverty, non-extreme poverty, and non-poor).<sup>3</sup> There are numerous arguments for using consumption rather than income as the variable to indicate well being.<sup>4</sup>

##### *2. Identifying the beneficiaries of social programs*

The general assumption of this study, and common to literature on the subject of incidence, is that direct users or participants are those who benefit from a social program. This assumption ignores the potential benefits generated for those people who do not directly use a public service (externalities) and to factors of production. In the case of primary public education, for example, this implies considering the pupils of public primary schools as the beneficiaries (along with their families, as they will not have to pay for the education of their children), but ignoring as beneficiaries: (i) the rest of society, which in fact also benefits as it can count on a better educated population, and (ii) the teachers, who could be negatively affected (including in the long range) if the government should decide not to offer more public education.

##### *3. Assigning benefits*

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<sup>3</sup> The "consumption" registered by the survey implicitly includes state monetary transfers: these increase a household's purchasing power and help increase household consumption. One alternative methodology would be excluding such monetary support from consumption, in order to approximate the level of well being prior to state intervention. In this study, we prefer to use consumption without any adjustments as the indicator for well being, to be consistent with other Poverty Assessment studies and analyses. Altering the consumption variable would imply, for example, reclassifying the population by its level of poverty/non-poverty, which would prohibit comparing our study with others and with any other discussion about poverty based on the per capita consumption registered in the EMNV.

<sup>4</sup> See Deaton and Zaidi (2003) for general arguments. Gasparini et al. (2006) argue in favor of using consumption as the indicator in an analysis of the tax system in Nicaragua. In that study, equivalent adult consumption is used, rather than per capita consumption. In this study, we prefer to use per capita family consumption in order to insure consistency with other Poverty Assessment studies.

Once the second stage is completed, public spending is distributed among all programs based on the distribution of program beneficiaries. This implies the assumption that the benefit of public service provision—in monetary terms—coincides with the state’s average cost of providing this service. This assumption is quite restrictive, since it ignores inefficiency, corruption, and the possibility that the value to the program user (the “compensated variation”) differs from the cost of the service. The quality of public services received by each household is not estimated (in general, it is impossible to make such calculations based on the information in surveys); rather, the tax effort involved in providing the service to beneficiary families is estimated, on the basis of certain assumptions.

Additionally, this methodology ignores changes in the behavior of economic agents as a result of public policy changes. If a poor person receives a new governmental monetary support of \$100, the incidence study recognizes the \$100 increase in the person’s standard of living, but ignores, for example, the possibility that a private donor might reduce his/her donation to the poor person when learning of the increased government support. The available information, in this case and in most studies, impedes a more sophisticated analysis.

In some cases, the use of the “average cost of service provision” implies ignoring differences in the costs of providing services to different groups. For example, the cost per student in rural schools tends to be higher than in urban schools. Without access to information about costs broken down regionally, these differences are ignored in the analysis.

It is important to note that this methodology implicitly assumes that in the absence of state subsidies, an individual would buy the same service from the private sector at a similar unit cost as that provided by the state. In this sense, social spending allows resources to be saved when a service is received free of charge, but does not fundamentally alter decisions about consumption of the service. Therefore, it has no significant long-term impact.

Once the methodology’s first three stages have been completed, the benefit that each individual receives from specific public programs is estimated. If these benefits diminish as the household per capita consumption level goes up, the program is said to be “*pro-poor*.” If, however, these benefits increase with higher consumption levels, then the program is classified as “*pro-rich*.” Note that although the term used in literature is “pro-poor,” the concept does not involve any definition of poverty. Even in a society without poverty, spending is still considered “pro-poor” if it benefits those with a lower standard of living, even if they are not actually considered poor. A similar clarification applies to the term “pro-rich” as well.

Another commonly used term is *progressivity*. A program is classified as progressive if the benefit it generates—measured as a proportion of consumption—drops as the household’s level of consumption rises. It is possible to prove that progressive spending, if it is financed by proportional taxes, implies a more equitable distribution of well-being. Note, however, that it is possible for spending to be *pro-rich* (i.e. the individual benefits derived from spending increase as household consumption levels rise) and at the same time *progressive* (i.e. the benefits as a proportion of consumption drop as the level of consumption goes up). This distinction takes on great relevance in the case of Nicaragua where, as we will analyze later, a considerable group of programs have a pro-rich but also progressive incidence.

A state program’s degree of focalization can be determined by estimating concentration curves, which indicate the accumulated percentage of a program’s total spending assigned to each poorest  $p\%$  of the population. A program in which the same subsidy is assigned to each person has a straight 45 degree concentration curve (the diagonal of a 1 x 1 box). A pro-poor program is characterized by a concentration curve for spending above the diagonal. A program is progressive overall if—and only if—its concentration curve is always above the Lorenz curve (the “consumption concentration curve”).<sup>5</sup> If the concentration curve falls between the diagonal and the Lorenz curve, it is pro-rich although also progressive. As mentioned, various programs in Nicaragua share this trait.

A program’s degree of focalization is often computed on the basis of concentration indices (CI). These are calculated in a manner similar to the Gini coefficient for the distribution of consumption, and range between  $-1$  and  $1$ . To facilitate the reading of these values in this study, these indices are multiplied by  $100$ . Negative values indicate pro-poor spending. The higher the value of the index in absolute terms, the greater the degree of program focalization. The most well known index for the progressivity of spending is the one proposed by Kakwani. The Kakwani indicator for the progressivity of public spending benefits is equal to the Gini coefficient for distribution of the individual well being variable (in our case per capita consumption), minus the public program’s concentration index. A progressive program presents positive values for the progressivity indicator. Throughout this study, Lorenz and concentration curves are computed, as well as Kakwani concentration and progressivity indices, to illustrate the degree to which Nicaragua’s social programs are focalized and have redistributive impact.

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<sup>5</sup> This proposition is part of the Jakobsson-Fellman theorem (see Lambert, 2002).

### 3. PUBLIC SOCIAL EXPENDITURE AND DISTRIBUTION

The *per capita* GDP (Gross Domestic Product) in Nicaragua for the year 2005 was US\$910 (using the Atlas methodology), which situates this Central American country as the second poorest in Latin America and the Caribbean (World Bank, 2006). Nicaragua has 5.1 million inhabitants and an area of 130.3 thousand km<sup>2</sup>. The high level of debt (117.9% in 2005) and its poverty levels, led to Nicaragua's qualification for the HIPC (Highly Indebted Poor Country) initiative in 2000. This section provides an in-depth analysis of two aspects that are key to an incidence study of Nicaragua: the structure of social expenditure and the distribution of consumption.

#### 3.1. SOCIAL EXPENDITURE

Nicaragua has a unitary form of government, in which fiscal activity is mostly concentrated at the central level. The country is divided into departments, which in turn are made up of municipalities. The central government provides them with monetary transfers to finance most of their activities. This study is restricted to an analysis of public social expenditure by the central government. Available information about the structure of expenditure by Nicaraguan municipalities is insufficient for inclusion in this analysis. This is not a serious constraint, however, given the smaller budgetary relevance of local governments. On the other hand, although municipal expenditure is not analyzed, we do analyze the coverage and the structure of incidence of several services provided at the local governmental level (i.e., garbage collection and public lighting).

According to information from the Ministry of the Economy and Public Credit (MHCP), the central government of Nicaragua earmarked 9.107 billion cordobas (C\$) during the course of 2005 to the various activities included in Public Social Expenditure (SPE). These resources represent 43% of the central government's total expenditures and 52% of total expenditure excluding service on the public debt. Nicaragua's social spending represents 11.1% of its GDP,<sup>6</sup> and is used to finance services in the areas of education, health care, water, housing and social assistance. In addition to these resources, additional amounts are implemented by other institutions not included in the central government's consolidated budget (i.e., the Nicaraguan Social Security Institute, or INSS).

The present level of social expenditure in Nicaragua is the result of a slow process through which the government, since the year 1998, has devoted growing proportions of the GDP to social services. Graph 3.1 illustrates the evolution of social expenditure as a percentage of the GDP during the 1991-2005 period. Most of the effort to increase expenditures has been focused on education and housing.

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<sup>6</sup>This proportion is similar to the current one in neighboring Honduras.

Table 3.1 details the functional structure of SPE in 2005, according to the classifications used by the Ministry of Economy. Some C\$ 3.858 billion were allocated to education, representing 42.4% of total spending. Spending for health totaled C\$ 2.821 billion (31% of SPE). Another C\$ 1.502 billion were assigned to housing, representing 16.5% of the total expenditure. According to MHCP classifications, this function not only covers home construction, but also spending on water and sanitation services and investments in infrastructure in general. The area of housing also includes central government transfers to the municipalities, which are partly used for activities other than housing. In 2005, C\$ 824 million were allocated to social assistance services (9.1% of SPE), while spending on sports and culture represented 1.1% of spending.

The definition of SPE utilized by the government is consistent with that used in other countries, and includes a range of spending that is not directly linked to the objective of poverty reduction. Within the framework of the National Development Plan (PND), and agreements reached with the IMF and the World Bank that led to the PRGF agreement, the Nicaraguan government defined a series of programs whose main purpose was to attack the conditions that maintain poverty. These expenditures, which are related to the Poverty Reduction Strategy (or PRS spending), exclude those SPE programs whose relationship to the direct reduction of poverty is not clear enough (i.e., institutional strengthening programs or spending on universities).<sup>7</sup> At the same time, PRS expenditures include some programs that are not a part of SPE, and that do stimulate the sustained reduction of poverty (i.e., rural development). Additionally, PRS expenditure exceeds social spending, as it includes economic services administered by the Industry and Commerce Ministry, the Agriculture and Forestry Ministry, the Ministry of Transport and Infrastructure, the Ministry on the Environment and Natural Resources, and several decentralized institutions.

In 2005, PRS expenditure on social and economic services was C\$ 9.816 billion (11.9% of the GDP).<sup>8</sup> In the second column of Table 3.1, Poverty Reduction Strategy spending is presented by function, according to the MHCP classifications. The main item is Economic Services, accounting for C\$ 2.929 million cordobas, or 29.8% of the total SPE spending. The amount allocated to education, which excludes spending on universities, constitutes the largest social component of PRS expenditure, totaling C\$ 2.702 billion, and representing 27.5% of PRS spending. Resources are also allocated to health (22.8%), housing (14.1%) and social services (5.8%). Appendix A details the participation of different ministries and decentralized entities in the implementation of SPE and PRS spending.

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<sup>7</sup>After several revisions in 2004, the concept of PRS spending that is analyzed in this study was defined.

<sup>8</sup> In addition to social spending and economic services, PRS includes some spending on defense and central-level administration. Spending on social and economic services represents 91.6% of total PRS expenditures.

Responding to the objectives of an incidence study, the classifications of social expenditure and PRS expenditure used in this document differ slightly from those used by the MHCP. To analyze the distributional incidence of expenditure, the grouping of public programs into functions must respond partly to the availability and grouping of information in the household survey, a criterion that naturally is not applied in the MHCP classifications. Table 3.2 and Graph 3.2 detail the classification of public social expenditure utilized in this study. Of the total of the SPE analyzed, which totals C\$ 8.012 billion, 46.1% corresponds to spending on education. Within this category, primary education is the program with the highest budget, followed by spending on universities. Health expenditure analyzed in this study totals C\$ 2.750 billion, which finances a series of activities that promote health and prevent disease (vaccinations, informative campaigns), health rehabilitation services, and other smaller programs (i.e., environmental health). Spending on social assistance that is analyzed amounts to C\$1.272 billion. These funds cover the activities of the Ministry of the Family and the Emergency Social Investment Fund (FISE), and a large number of other smaller programs. Finally, the classification of “housing” covers only the programs specifically related to that sector that can be identified in the 2005 EMNV: the construction of homes and legalization of property deeds. Expenditures on these programs amounts to C\$ 294 million, representing 3.7% of the total SPE analyzed.

The classification of PRS spending analyzed in this study is detailed in Table 3.3 and the second section of Graph 3.2. The main differences with SPE are the exclusion of spending on universities, and the inclusion of spending on rural development programs. The total PRS expenditure analyzed in this document is C\$ 7.576 billion, 33.5% of which corresponds to education, 28.6% to health, 3.9% to housing, 16% to social assistance and 18% to rural development.

Table 3.4 summarizes the structure of the SPE and PRS expenditure analyzed in this document. In the following sections, the characteristics, structure, coverage and incidence of expenditure in each area are examined in greater depth. However, we will first look at the other fundamental component of a study of incidence: the distribution of consumption.

### **3.2. THE DISTRIBUTION OF CONSUMPTION**

Household per capita consumption is the variable in this study that defines the level of individual well-being.<sup>9</sup> The population is broken down into strata or percentiles in

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<sup>9</sup> The EMNV utilizes an extensive questionnaire aimed at revealing household consumption levels. Aggregate annual consumption revealed by the survey (C\$52.090 billion) is similar to that reported in National Accounts: C\$ 51.633 billion.

function of this variable, and is grouped according to levels of poverty. Table 3.5 presents the average values for per capita consumption by quintiles. Each quintile contains 20% of the population (individuals). Whereas the average person from the first quintile (the poorest) consumes an average of C\$ 262 per month, a person from the wealthiest quintile consumes an average of 8 times that amount (C\$ 1,980). Graph 3.2 illustrates the huge range in consumption levels found in this quintile of the population. Average consumption among the last decile of the population (the wealthiest 10%) is C\$ 2,656, while average consumption among the richest 5% is C\$ 3,489, and the nation's wealthiest 1% consumes an average of C\$ 5,743 per month.

Those pertaining to the poorest quintile of the population consume 6.3% of the total consumption registered in the EMNV. This percentage rises to 10.4% consumed by quintile 2, 14.8% by quintile 3, 21.8% by quintile 4 and 46.8% by the most affluent quintile.

In the Latin American context, Nicaragua is a country with a high level of inequality when the standard of living is compared with the current family incomes (SEDLAC, 2006, CEPAL, 2006). The distribution of consumption that emerges from the EMNV (Table 3.6) suggests a level of inequality that is relatively high on a world scale, but moderate in the Latin American context. The Gini coefficient for the distribution of per capita family consumption is 0.403. This value happens to be lower than the one calculated in neighboring Honduras with the 2004 ENCOVI survey (Gini coefficient: 0.459).

Inequality has been diminishing significantly in Nicaragua according to the data in the household survey. The Gini coefficient for the distribution of per capita family consumption fell from 0.494 in 1993, to 0.452 in 1998, 0.431 in 2001 and 0.403 in the recent 2005 survey. Part of the World Bank's Poverty Assessment, based on information gleaned from the EMNV, involved defining "consumer baskets" and poverty lines to help characterize the population as extremely poor, not extremely poor (or moderately poor), and non-poor. Table 3.7 groups the population of Nicaragua according to these three categories.

According to the defined poverty line, 14.9% of Nicaraguans live in extreme poverty, 31.3% in non-extreme poverty, and the remaining 53.8% are non-poor. Extreme poverty has dropped progressively in Nicaragua, from 19.4% in 1993 to the current 14.9%. Overall poverty dropped 5 points between 1993 and 2001, and has remained without significant changes between 2001 and 2005.

There is a strong association between area of residence (urban-rural) and levels of poverty. Most inhabitants of rural zones are poor (67.9%), whereas the far majority of urban inhabitants are considered non-poor (70.9%). Some 64.9% of the entire poor

population lives in rural areas, while more than 73.6% of the total non-poor population lives in the nation's cities.

Nicaragua can be divided into four well differentiated geographic regions. The Managua region is the most affluent. It is a basically urban area with a relatively low poverty rate compared with the national average (19.1% as against 46.2% nationwide). At the other extreme we find the Central and Atlantic regions, with average consumption levels only 50% of those in Managua. In both regions, rural population predominates (62% in the Central region and 69% in the Atlantic region). Some 60.5% of the Central region's population is poor, according to the poverty line used, whereas the percentage rises to 62.2% in the Atlantic region. These levels contrast with the 46.2% poverty level nationwide. Given the population differences in these regions, some 42.1% of Nicaragua's poor live in the Central region, whereas 18.9% live in the Atlantic region.

Statistics for the Pacific region are very similar to the national averages: the percentage of urban population is 42% (vs. 44% on a national level), and the poverty rate is 45.4% (vs. 46.2% on a national level). Some 29.4% of the nation's population lives in this region, and 28.9% of the nation's poor population.

Nicaragua's population includes a variety of indigenous groups, whose socioeconomic situation is, on average, worse than most of the population. Each respondent to the EMNV was asked if they considered themselves a member of one of Nicaragua's indigenous or ethnic groups. Some 4.6% of those surveyed responded affirmatively to this "self-defining" question.<sup>10</sup> The average income of an indigenous person is 79% of the Nicaraguan average. Some 23.8% of the indigenous population is extremely poor, in contrast to a rate of 14.2% among the rest of the population. The percentage of non-extremely poor is similar in both groups (33.4% among the indigenous population and 31.1% among the non-indigenous).

#### **4. EDUCATION**

There is abundant evidence that formal education plays a key role in all development and poverty reduction strategies. The government of Nicaragua, assisted by international organizations and donors, has undertaken a considerable economic effort to sustain and promote improvements in the area of education. In fact, education is the largest item in the Nicaraguan state budget. In 2005, nearly 3.7 billion cordobas were spent on education, which represents 46% of total public social spending. Focalized spending in the area of education surpassed C\$ 2.5 billion in 2005, which represents approximately one third of spending to support the Poverty Reduction Strategy (ignoring PRS spending on economic services).

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<sup>10</sup> Included are people pertaining to the Rama, Garifuna, Mayagna/Sumu, Miskitu, Ulwa, Creole, Xiu/Sutiava, Nahoa/Nicarao, Chorotega/Nahual/Mange and Cacaopera/Matagalpa ethnic groups.

The Nicaraguan educational system, like those in most of the world, is structured into four main levels (Table 4.1): (i) preschool education, for children under 6 years, (ii) obligatory primary education with a duration of 6 years, for children 7 to 12 years of age, (iii) intermediate and secondary education, with 5 years duration and (iv) higher education, which mainly consists of universities. This basic structure is complemented by technical education, adult education and special education programs.

The Ministry of the Family (MIFAMILIA) is responsible for early childhood education (0 to 4 years), and the Ministry of Education, Culture and Sports (MECD) is responsible for preschool, primary and secondary education. The National Council of Universities (CNU) is the main entity in charge of university higher education. Additionally, both the National Technological Institute (INATEC) and the National Institute of Technology (INTECNA) offer a variety of technical education programs.

Based on the strategy to decentralize the educational system initiated in 1993, autonomous schools were incorporated into the Educational Participation System (Law No. 413). These are schools that transfer important quotas of decision-making power to parents, teachers and students, who are grouped into a school governing council and directly assume the management and administration of their schools. The autonomous schools account for a significant number of primary and secondary level schools.

Table 4.2 presents different areas of spending on education corresponding to SPE and PRS spending. The main item in budgetary terms is public primary education (38.4% of SPE and 55.9% of PRS spending on education).<sup>11</sup> The adult education program, with a budget of C\$ 109 million, also generally provides primary level education. Basic spending for secondary education is around C\$ 250 million. This level of education only accounts for 6.8% of SPE expenditure on education (Graph 4.1). Also limited is the quantitative relevance of technical education financed by INATEC and INTECNA (1.8% of the SPE). Spending at the preschool level has even less budgetary importance (1% of the SPE and 1.4% of PRS spending on education). In contrast, the expenditure on universities accounts for an enormous portion of social spending: almost 30% of the SPE for education is devoted to higher level education. In fact, there are constitutional clauses which require that 6% of the general budget's total income be assigned to the universities.<sup>12</sup> This expenditure is not considered a priority for the Poverty Reduction Strategy, so it is ignored when computing PRS spending.

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<sup>11</sup> The spending amounts for primary and preschool education include non-general expenditures made by the MECD, and spending assigned to this level by MIFAMILIA.

<sup>12</sup> Article 125 of the Nicaraguan Constitution and Article 55 of Law No. 89 (Law on the Autonomy of Higher Education Institutions).

The educational budget is completed with a group of quantitatively less important programs (special education,<sup>13</sup> teacher training) and a group of expenditures that finance central level activities and programs of the Ministry of Education, Culture and Sports.

According to literature about the incidence of social spending, it is assumed that the users of public education services are the beneficiaries of social spending for education. In particular, it is assumed that government intervention through financing public schools (which provide education free of charge) generates a budgetary savings similar to the average cost of providing education to the families of public school students.

#### **4.1. PRESCHOOL EDUCATION**

Preschool education is divided into two levels. Whereas early childhood education is administered by MIFAMILIA and covers children up to 4 years of age, preschool education is mainly provided to children between 4 and 6 years of age, and is administered by the MECD. During 2005, the Nicaraguan government spending for preschool education was around C\$ 36 million. This sum was mainly assigned to sustaining a network of public preschools. Part A of section 4 of the EMNV, which investigates the situation of children under 7 years of age, has been a useful tool for identifying the beneficiaries of spending on preschool education.

Attendance at child care centers or school soup kitchens is low among children under 4 years (Table 4.3). Only 6% of children under 4 years of age attend a child care center, a Child Development Center (CDI), or soup kitchen facility for children/CICO. The CDIs provide a child care program in order to implement social protection interventions that respond to educational and nutritional vulnerability. The CICOs (Community Children's Soup Kitchens) are a non-formal preschool program financed by NGOs that look after children from 3 to 6 years of age.

Attendance at preschools rises to 38% among children 4 to 6 years of age, reaching the highest level (53%) among 5 year olds. Attendance at this level rises with the family's per capita consumption level. Whereas 79% of the children from the wealthiest quintile in the distribution of per capita consumption attend preschool, only 34% of the children from the poorest quintile do so. The difference in attendance between the extremely poor and moderately poor is great (for example, attendance among 5 year olds is 29% among the extremely poor as opposed to 51% of the moderately poor). Attendance of non-poor is significantly higher (67%), although it is far from 100%. The urban-rural differences

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<sup>13</sup> "This program attends to children and young people between the ages of 0-20 years of age whose motor, sensory or intellectual abilities are challenged in any way. The essential goal of this program is to provide children and young people with the skills they need to be able to be take part in their families, schools, employment and community in as complete and normal a manner possible." (MECD, 2004a)

are similar to the differences between poor and non-poor. The lowest rates of attendance at preschools correspond to the Atlantic region, which is the area with the highest poverty levels and highest percentage of rural population.

The EMNV enquires about the reasons why children do not attend preschool. Table 4.4 presents these answers, classifying the children between 4 and 6 years of age who do not attend preschool (or primary) by degree of poverty and area. A majority of parents whose children do not attend preschool believe that their children are not old enough to attend. After this reason, the poor mostly indicate the lack of preschools located close to the home and economic problems. It is interesting to note that among the non-poor, the absence of a preschool also seems to be an important inconvenience. It is, naturally, in the rural areas where this need is manifested with particular intensity.

As in almost all countries in the world, the place of public education in the Nicaraguan educational system is highly relevant. Unlike most other areas of the world, however, this central role of public education is also manifested at the preschool level. Some 82% of those attending preschool go to a state-sponsored center (Table 4.5). Attendance is not uniform by socioeconomic strata: whereas almost all children of quintiles 1 to 3 attend public preschools, about half of the children from the last quintile attend private facilities. Note that almost all of those attending preschools in rural areas attend public facilities. Preschool attendance in the Central and Atlantic regions is sustained almost exclusively by public preschools. More than 90% of those attending in those two regions attend public preschools.

Nicaraguan children who attend preschool remain an average of three and a half hours in the educational centers. This time increases according to income levels: from 3.2 hours among the poorest quintile to 3.9 hours among higher income levels.

Day care centers and preschools usually provide some kind of nourishment to the children. Some 61% of those attending these facilities indicate that their child attends a public preschool and receives some kind of nourishment at least some days per week. That percentage decreases with income level (from 74% in the first quintile to 39% in the last). The implicit food subsidy is more intense in the Atlantic region.

Some families make contributions to the preschool centers which their children attend. The greatest contribution is in work. Some 17% of the children attending preschools have parents who have contributed their labor to the school center. This contribution is slightly higher in rural areas and slightly superior among the non-poor.

A Nicaraguan child takes, on average, 12 minutes to get from his home to the preschool center. This time traveled is greater in rural areas, but does not vary by level of income.

Abundant literature is available about the importance of early childhood stimulation (Heckman *et al.*, 2005). If youngsters are not adequately motivated in the home,

preschool education takes on essential importance in achieving adequate levels of stimulation. Nicaragua still has a long way to go in expanding preschool education coverage. It is interesting that the two main reasons why parents do not send their children to preschool are the perception that it is not necessary (“they’re too young”), and the lack of access to preschool programs. Direct government intervention could easily have an impact on these impediments, whether through campaigns aimed at increasing awareness about the importance of preschool education, and/or through setting up more preschool centers.

Table 4.6 summarizes the main results of analyzing the distributional incidence of spending for preschool education. While each one of the first 4 quintiles of the distribution receives slightly more than 20% of the benefits of the expenditure, the wealthiest quintile receives 13%. Column (ii) expands this structure on a percent basis to the expenditure on preschool education, while column (iii) offers the expenditure per quintile in per capita terms, and column (iv) as a proportion of total consumption. Expenditure on preschool education (total and per capita) grows slightly between quintiles 1 and 3, decreases moderately in the 4th and more significantly in the 5<sup>th</sup> (Graph 4.2). In the analysis by percentiles, participation remains slightly above 1% from percentile 8 through 70, and then descends markedly. Graph 4.3 illustrates this participation, accompanied by a non parametric line of regression (the *lowess* estimate).

Calculated as a proportion of consumption, preschool education spending is clearly progressive, i.e. spending decreases as consumption levels go up. Graph 4.4 indicates that the concentration curve for preschool education is above the diagonal and the Lorenz consumption curve, suggesting that it is both progressive and pro-poor.

Table 4.40 shows the concentration indices for all of the educational programs analyzed in the study, together with the estimates of confidence intervals. The estimated concentration index for preschool education is  $-7.7$ , which reflects a slightly greater pro-poor expenditure.

We are able to characterize the incidence structure of a given program using simple aggregate breakdowns (Gasparini, 2006). A greater concentration of public spending for a specific program within a specific quintile of the population results from: (i) a greater concentration of the target population for a particular service within this quintile; and/or (ii) a greater rate of participation in use of this particular service; and/or (iii) a greater rate of public coverage of those participating in a particular service within the quintile in question. Table 4.7 details the results of such breakdowns for preschool education. The first row indicates the distribution of the potential preschool population: children between 4-6 years of age. The second row indicates the rate of preschool attendance by quintile, while the third row presents public coverage for the target population among those attending preschool, by quintile. The next section of Table 4.7 indicates the estimated incidence (which is very similar to the real incidence detailed in Table 4.6), and the

difference if there were totally equal spending allocations (20% per quintile). The final section quantifies the “reasons” why the participation of each quintile is different from the theoretical 20%. If we look at the case of quintile 1, the estimated incidence is 1.5 points higher than equal. If the rate of attendance and the rate of public coverage do not vary between quintiles, then the participation of quintile 1 in preschool education spending would be 6.4 points higher than equal participation. This significant positive “potential user effect” reflects the higher concentration of children in the poorest distribution quintiles. If, however, the distribution of children and the rate of public coverage were uniform, then the participation of quintile 1 would be 8.5 points below 20%. The negative “attendance effect” is the result of a preschool attendance rate that is significantly lower than average in quintile 1. Finally, the “public effect,” which arises from keeping the distribution of children and the attendance rates uniform, is positive for the 1<sup>st</sup> quintile, which has a significantly higher public coverage rate than average. In the aggregate, the positive “potential user” and “public” positive effects tend to compensate for the negative “attendance” rate, although only by a small margin. At the other extreme of population distribution, there are fewer children in the wealthiest quintile, they more frequently attend preschool, but they attend fewer public preschools. The three effects are similar in size, so that the aggregate effect becomes negative.

#### **4.2. PRIMARY EDUCATION**

As indicated, expenditure on primary education is the most important in budgetary terms within expenditures on education, and one of the most important components of all public expenditure of Nicaragua. Throughout 2005, the government allocated 1.421 billion cordobas to spending for basic primary education. This section examines the distribution of beneficiaries of expenditures that sustain the public school system in Nicaragua.

In the course of 2005, 89% of the children between 7 and 11 years attended the primary level of education.<sup>14</sup> Table 4.8 indicates the percentages of attendance by age, income, poverty level, geographic area and ethnicity. The school attendance rates rise significantly with higher levels of household consumption. On average, whereas 94% of non-poor children between 7 and 11 years of age attend primary school, that proportion falls to 84% for the poor. The percentage is a greater concern in the case of the extreme poor: one of every four children in families with consumption levels below the extreme poverty line does not attend primary school. While several Latin American countries are nearing the goal of universal primary school enrollment, Nicaragua still lags behind in this sense. Unlike other countries in the region, where the frontier of progress toward

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<sup>14</sup> The analysis is limited to the 7-11 age range, since many 12 year old children are enrolled at the intermediate/secondary level of education level.

educational development is in the mid to high levels, progress toward closing the gaps with respect to universal primary education enrollment is still needed in Nicaragua. Since the gap is substantially more severe among the poorer strata of the country, a successful policy in this sense will imply not only an increase in the economy's aggregate productive capacities, but a shift toward more equal opportunities and more equal incomes.

Graph 4.5 illustrates the drop in attendance rates at the primary level beginning at 11 years of age. It is notable how these rates drop abruptly for the non-poor, reflecting the timely culmination of the primary educational cycle, while the poor do so at slower rates. This pattern principally reflects higher rates of grade repetition among the poor.

It is interesting to note that the primary school attendance rate is somewhat higher among indigenous children than among the rest of the population. While 92.7% of children who have been "self-identified" (as indicated by their parents) as "indigenous" attend primary school, this percentage is 88.6% for the rest of the population. This relatively positive indicator is partially the result of special efforts by the government and international donors to improve the socioeconomic conditions of indigenous ethnic groups.

According to information from the 2005 EMNV, 70% of those attending primary level education indicate that they attend a non autonomous public school, whereas 19% attend autonomous schools (Table 4.9). These percentages differ substantially from what the MECD Statistics Department reports, according to which the participation of autonomous schools at the primary level would be 63.7%. This divergence could be due to a lack of knowledge on the part of parents of the specific status of the school which their children attend. While it is easy to distinguish between public and private, it is possible that a number of parents do not know that the public school to which they send their children falls into the "autonomous" category.

Among children who do not attend primary school, the main reason cited in the EMNV which justifies their non attendance is economic difficulties (Table 4.10), in particular in the case of poor families. The long distance from the school and a lack of interest constitute two other pertinent reasons behind the non attendance. Both the state and civil society have a fundamental role to play in alleviating the impact of these difficulties. Both actions on the side of demand (subsidizing access to education and making the population aware of the importance of schooling) and on the side of supply (facilitating geographic access to schools) seem to be necessary to reach the goal of full school enrollment in Nicaragua.

Despite the fact that the number of observations is insufficient for a more robust statistical analysis, it is interesting to examine the reasons which parents indicate would convince them to send their children to school (Table 4.11). Those who state that they do not send their children to school for economic reasons would require scholarships and

subsidies for school supplies. On the other hand, those who indicate a lack of interest in education hold that they would not send their children to school under any circumstance.

As mentioned above, state participation in the provision of primary education is high: 91.4% of the pupils at that level attend a state school (Table 4.12). In fact, almost all of those attending school from the first 3 quintiles (that is, all of the extreme poor and non extreme poor, and part of the non-poor) attend public schools. The proportion drops to 57.1% in the most affluent quintile. Public participation in the provision of education is particularly strong in rural areas and in the Central and Atlantic regions. There are no significant differences between the indigenous and other population groups in terms of access to state education.

Children from extremely poor families do not attend private schools. Among the children from moderately poor families who attend this type of school, more than half attend private schools subsidized by the Nicaraguan government. On the other hand, the great majority of the non-poor who attend a private school go to non-subsidized schools (70%).

As indicated above, the percentage of those who indicate that their children attend an autonomous school (18.8%) is much lower than the percentage reported by the Statistics Department of the MECD (63.7%). The report of the 2005 EMNV on attendance at autonomous schools shows somewhat less frequent attendance among the lower income strata. While 13% of the children from quintile 1 say they attend this type of school, the percentage rises to 23.5% among children from the 5<sup>th</sup> quintile. These differences must be interpreted with care, since they may partly be due to a lack of knowledge about the most common kind of public schools attended by lower income (and educational) strata.

Attendance at community and multi-grade schools decreases as consumption levels increase. Some 59% of extremely poor children attend schools in which children are taught in multi-grade classrooms. On the other hand, that situation only occurs among 12% of the children from the highest level consumption quintile.

A large proportion of public schools provide some kind of free food supplement to their pupils. Some 68% of Nicaraguan children who attend primary school receive a food supplement from a state-supported school. Both the percentage of those who receive public food supplements and the declared value of the subsidy decrease as income rises. Some 78% of the poor (55% of non-poor) receive a food subsidy at a public school, which has a declared value in the survey of C\$101.9 (C\$74.9) per capita. The percentage of students attending primary school who receive subsidized school supplies is substantially lower than the percentage receiving food subsidies (only 7%), but also clearly decreases as family income levels rise. Children identified as “indigenous” receive more school assistance in the form of food supplements and school supplies.

It is interesting to note that, compared with their counterparts in the wealthier quintiles, poorer children have fewer absences from school per month, though in contrast present

significantly higher rates of grade repetition. The differences of parents' subjective evaluations of school quality are not significant. On the other hand, there are differences in the time needed to travel to school, and in the means of transportation used. Children from quintile 1 spend an average of 6 minutes more getting to school than the children from quintile 5. Whereas 7.3% of children from higher income families utilize the public transport system, less than 1% of the children from quintile 1 are able to take advantage of that form of transportation. The great majority of those children live in rural or marginal urban areas which lack public transport services, so they arrive at school on foot, or riding animals or bicycles.

Table 4.13 presents the main distributional incidence that corresponds to primary level education. More than 50% of all spending at this level benefits the first two quintiles of the per capita consumption distribution. In terms of the benefits from primary level education (assuming the absence of inefficiency), a typical child from the poorest quintile receives the equivalent of C\$ 363 per year from spending on primary education.<sup>15</sup> These transfers are significant, which is reflected in the values of column (iv) of this table. The pro-poor character of spending on primary education is illustrated in Graphs 4.2 to 4.4

The results presented in Table 4.14 (and illustrated in Graph 4.6) suggest that the pro-poor character of spending for primary education is fundamentally linked to the higher concentration of children from the poorest strata of the population in public schools, and to a lesser extent to the more intensive use of public schools (as opposed to private schools) by the poorest students. The concentration curve found in Graph 4.4 indicates the significant pro-poor and progressive tilt of spending, which is confirmed by the value of the concentration index in Table 4.40 (-20.1).

The Nicaraguan government sustains an adult education program that mostly corresponds to the primary level. Recently, secondary education programs for adults have been initiated on a pilot level. Table 4.15 (section A) indicates a highly pro-poor incidence structure. Some 64% of the implicit subsidy of this program is assigned to persons from the 2 first quintiles of the consumption distribution. The results are diametrically different in the case of state subsidies to private primary education. 50% of those subsidies benefit families from the highest quintile (Table 4.15, section B). This subsidy is not utilized by any family from quintile 1, since their children either do not attend school, or attend public schools. The contrast between these two programs is clearly demonstrated in Table 4.40: whereas the IC of the adult education program is negative and high (in fact, the highest in absolute terms among all social programs), that of the subsidy to private primary education is high and positive (one of the highest among all social programs).

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<sup>15</sup> Given the absence of information, the division of public expenditure on primary education between public and private subsidized schools was estimated on the basis of the structure of those attending.

### ***Regional Differences***

As discussed earlier, there are marked socioeconomic differences in different regions of Nicaragua. These differences are reflected also in the results of the incidence of social expenditure. Table 4.16 shows the three basic components which determine the degree of focalization of public primary educational programs for each of the four regions into which Nicaraguan territory is divided: the distribution of school age children (7 to 11 years), the rate of attendance at the primary level, and the rate of attendance at public schools. These variables are presented by quintiles of the *national* distribution of per capita consumption. This ordering implies, for example, that the majority of school age children who live in Managua belong to the middle strata of the national distribution, which is a consequence of the fact that the households within Managua that in relative terms are middle-low income actually belong to higher strata in the national distribution. For example, an average person from the poorest quintile of the distribution in Managua has a per capita consumption level (C\$ 441) that is higher than the level of an average person from quintile 2 in the national distribution (C\$434).

The fourth section of Table 4.16 computes the incidence by quintile of the public primary education program. While the program is moderately pro-poor in the national aggregate, the results vary by region: public primary education has a stronger pro-poor character in the Central and Atlantic regions, and a greater incidence among the middle strata in the Managua and Pacific regions. It is important to stress that this result does not imply that within the Managua region expenditure is less focalized, but rather that the beneficiaries from the low to average income strata in Managua are better placed on the scale of national standard of living.

The last section of Table 4.16 provides the results of a breakdown of data intended to characterize the differences in the incidence of public primary education program by regions. In particular, the section shows the results of the comparison between the Managua and Atlantic regions. The focalization of spending on the lowest quintile is 23 points higher in the Atlantic than in Managua. This difference is explained by the difference between the two regions in terms of placement of school age children in the national distribution of consumption.

### ***Comparison with Honduras***

A recent incidence study of social expenditure in Honduras that used a similar methodology as the present study (Gasparini *et al*, 2005) allows the situation of Nicaragua to be compared with that of its neighbor. Table 4.17 summarizes the comparison, presenting the distribution of primary school age children, the rates of school attendance and the division between public and private schools for each country. The benefits of social expenditure on basic primary education are somewhat more focalized in

Nicaragua. This difference is fundamentally the product of the distribution of Nicaraguan school age children that leans slightly more toward the poorer strata than in Honduras, possibly as a consequence of differences in the fertility rates in the two countries. The school attendance rates among higher consumption strata are significantly greater in Nicaragua (see the second section of Table 4.17), which contributes to a lower level of focalization. This effect is in great measure compensated by the significantly lower use of public primary schools by the non-poor in Nicaragua in comparison to Honduras, which increases the relative degree of focalization in that country.

### *Comparison over time*

Nicaragua has conducted EMNV surveys since 1993, which allows comparisons to be made over time. The public primary education program in Nicaragua has become more pro-poor in the period between 1993 and 2005. The concentration index has risen (in absolute values) from 5.3 to 20.1.

Table 4.18 provides the results of a breakdown of the change in incidence of the public primary education program between 1993 and 2005. The distribution of school age children has changed very slightly. The most notable change is in quintile 5: while 15.8% of Nicaraguan children pertained to that quintile in 1993, that percentage drops to 11.8% in 2005. A more pronounced reduction in the rate of fertility among the highest income strata (SEDLASC, 2006) is one of the possible factors explaining this change.

The second section of Table 4.18 documents a strong rise in the rate of primary schooling, in particular among poorer children. Whereas in 1993 only 56.6% of Nicaraguan children between 7 and 11 years of age attended school, that percentage has risen to 79.1% in 2005. The third section of the table indicates that the slight rise in the percentage of attendance at public schools (from 89.3% to 93.7%) is the product of a small rise in attendance among the lower quintiles and a strong drop in attendance among the highest one: while in 1993, 70.9% of the children from the wealthiest quintile attended public primary schools, that percentage was reduced to 55.1% in 2005.

The fourth section of Table 4.18 illustrates the rise of the pro-poor bias of the primary public education program. The proportion of that program's benefits assigned to the poorest quintile rose from 20.7% to 25.9%, whereas the proportion of benefits received by the richest quintile was reduced from 15% to 7.7%. The last section suggests that the three effects alluded to above have determined the change in the program's degree of focalization. The most important factor explaining the increased degree of focalization among poorer children is the strong rise in this group's rate of school attendance. On the other hand, the reduction in the relative number of children from the highest quintile attending public schools—and the migration of this social stratum to private schools—has in large part influenced the profound reduction of the incidence of primary school expenditures on that quintile.

### 4.3. SECONDARY EDUCATION

In contrast to the primary school level, attendance gaps between poor youth and other youth is substantial at the secondary level (Graph 4.5). Whereas 51% of non-poor youth between 16 and 18 years of age attend secondary schools, only 15% of the extremely poor of this age range attend a secondary school (Table 4.19). The gap in education, which slightly favors indigenous children at the primary level, is reverted at the secondary level. While the national attendance rate for young people between 13 and 15 years of age is 46%, this rate drops to 32% for indigenous youth.

The great majority of those who attend utilize the services of public secondary schools (76%). A smaller fraction, though not insignificant (24%) attend private schools. Somewhat less than half of those who attend private secondary schools indicate that they attend schools subsidized by the Nicaraguan government (Table 4.20). Within state schools, the autonomous schools account for the majority. Regardless, as in the case of primary schools, the percentage of those attending autonomous schools indicated in the EMNV (45.8%) is lower than that reported by the Statistics Department of the MECD (64%).

Poor youth who do not attend secondary school justify (they or their parents) their absence from the educational system mostly on economic grounds (“lack of money”, “domestic labor” or “rural work/labor”, Table 4.21). For the non-poor these reasons are on average slightly less relevant. The difficult access to a school is mentioned with greater frequency in rural areas, but in any case the percentage is relatively low: 9.3% combining the various reasons related to the supply of education (there is room in the class, the grade is not taught, the school is far away or there are no teachers). Somewhat more than 20% of youth indicate that they are not interested in studies at that level. This percentage does not vary significantly by socioeconomic strata or geographic area. A majority of these youth report not being ready to attend a secondary school, under any circumstance (Table 4.22). In contrast, those who indicate that the main reason they do not attend school is because they are working, also indicate that they would be interested in going to school if there were scholarships, adult programs and more flexible class times. The greater majority of those who claim a lack of economic resources report in the survey that they would be prepared to study if a scholarship were offered.

The use of public schools is massive among the poorer strata of the population (more than 90%). On the other hand, for the more affluent, the percentage is close to 50% (Table 4.23). Public schooling is more marked in the rural areas and less so in Managua and among indigenous groups.

Among those who attend private secondary schools, the presence of state subsidies to the school is much more marked among the lower quintiles. The same thing occurs with the

share of young people attending public schools run on an autonomous basis. It is possible, also, that the degree of focalization of autonomous schools on the mid level are under-estimated, given the argument mentioned in the case of primary schools: some parents, mainly the poorer and supposedly less informed, may not know that their children attend autonomously run schools.

Poorer youth are less frequently absent from school, but their rate of grade repetition is significantly higher. A typical young person from the first quintile travels 17 minutes longer to secondary school than the typical young person from the highest quintile. His/her use of the public transportation system is significantly lower (17% versus 30% among the more affluent).

Table 4.24 presents incidence results. Of the total expenditure on public secondary education, 10.7% benefits families from the poorest quintile of the distribution. Incidence keeps rising until the 70<sup>th</sup> percentile, and then drops (Graphs 4.2 and 4.3). This inverted U is common in other countries. The poorer strata do not benefit from the expenditure on secondary education because they have low rates of attendance at that level. The “attendance” effect completely explains the program’s low incidence in quintiles 1 and 2 (see the breakdown in Table 4.25). The middle quintile (3) is the most benefited: slightly more youth than the average are concentrated in this quintile, and it has attendance rates and public school attendance rates higher than the average. Of these effects, the first and the last are reverted in the case of quintile 5, but the strong attendance effect almost compensates for that loss.

Graph 4.4 shows the concentration curve of the secondary education program, and also adds the curve for public subsidies to private secondary education.<sup>16</sup> Both programs are pro-rich (concentration indices of 10 and 36, respectively).

The regional differences in the degree of focalization of state subsidies to secondary education are determined by the concentration of the poorer population in the Central and Atlantic regions (Table 4.26). The comparison with Honduras (Table 4.27) indicates a greater focalization of expenditure in Nicaragua, the product of a higher rate of attendance among the poorer population and of a somewhat more intensive use of the public secondary education system.

Table 4.28 presents the results of breaking down the changes in the incidence of the public secondary education program between 1993 and 2005. As in the case of primary education, the secondary education program has become pro-poor, fundamentally on account of the rise in access to secondary education by poor youth. Whereas in 1993 less than 4% of the youth from quintile 1 attended a secondary school, that percentage rose to

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<sup>16</sup> This program’s remaining incidence results are ignored in this study for purposes of simplification.

17.4% in 2005. Though still low, this increase implies a very high proportional rise with respect to 1993.

### ***Technical education***

Nicaragua has an extensive number of technical education courses, financed mostly by two institutes, INATEC and INTECNA. Technical education includes intermediate and tertiary level programs in different specialties, trades and skill improvement. Given the impossibility of distinguishing each program in the EMNV, they will be analyzed as an aggregate.

Almost 70% of the beneficiaries of technical education belong to quintiles 4 and 5 (see Table 4.29). This pro-rich structure is reflected in the concentration index of Table 4.40 (32.6). In terms proportional to consumption, state subsidies for technical education particularly benefit quintiles 3 and 4.

## **4.5. UNIVERSITY EDUCATION**

Higher education occupies an important place in the educational budget of Nicaragua: 28.4% of expenditure on education is devoted to national universities. State universities are attended by one third of university students, whereas the rest attend private universities.

According to information from the EMNV, 13.5% of 21 year old Nicaraguans attend universities (Table 4.30). In fact, the maximum rate of attendance is reached at that age (Graph 4.5). Practically no extremely poor youth attend any university. University education is almost completely inaccessible to young people from quintiles 1 and 2. The rate of attendance has recently increased to more than 20% in quintile 5. Table 4.30 indicates that universities are mostly concentrated in the Managua region. The participation of the indigenous population in higher education is substantially lower than the rest of the population.

Numerous reasons were invoked in the survey for not attending university, and do not vary significantly by poverty level or geographic area. These include a preference to not continue studies, employment (more frequent in rural areas), and economic problems (mentioned with somewhat more frequency in urban areas) (Table 4.32). Almost 40% of those who do not attend university indicate that they would not attend a university under any circumstance (Table 4.33). Some 30% indicated they would be attracted to university studies by a scholarship, 13% by a program for adults and 7% by better schedules.

Unlike other countries in the region, only 33% of those attending universities use public universities (Table 4.34). Youth from the intermediate quintiles of the distribution of

consumption are somewhat more strongly represented in state universities. The presence of private universities is more relevant in Managua and the Central region than in the rest of the country. Lower income individuals benefit more from private subsidized universities.

Table 4.35 confirms the presumption derived from the previous analysis: state expenditures on university education are clearly concentrated on the wealthier strata of the population. Expenditure in this area has a marked pro-rich slant (Graphs 4.2 and 4.4). The resulting concentration curve is always below the Lorenz curve, indicating a clearly regressive expenditure on universities. The subsidies to private university education have a pro-rich slant similar to that of state universities. In fact, the difference in the concentration indices of both programs is not statistically significant (see Table 4.40).

The pro-rich character of higher education, common in all incidence studies in Latin America, does not imply the need to revise the public spending decisions for that sector. The decision to provide a public service responds to a multiplicity of reasons: distributional equity is only one of them. This analysis suggests that a redistributive logic would argue in favor of rethinking or redefining the allocations made to the education sector. Nonetheless, there are other valid reasons for assigning such an important portion of the budget to a service that almost only benefits the strata with better living conditions.

The immediate reasons for the pro-rich structure of university education are clear when we examine the breakdown in Table 4.36. The “attendance effect” almost entirely explains the difference between current incidence and the incidence that would exist in a perfectly equal situation. In the case of Nicaragua, and in contrast with other countries, there is an additional effect that comes from the lower relative use of state universities by university students with fewer resources.

This fact implies a lower focalization of expenditure on universities than in Honduras (Table 4.37). However, this slant is reversed by the presence of two other factors: a higher concentration of the population of young Nicaraguans in the lower and middle strata (in relation to the situation in Honduras), and a substantially more uniform rate of access to universities as compared to our neighboring country. Aggregate expenditure on university education in Nicaragua is somewhat more focalized than in Honduras.

#### 4.6 GENERAL EVALUATION AND AGGREGATE INCIDENCE

The incidence results of this section are presented in Table 4.38.<sup>17</sup> The poorest quintile of Nicaraguan society consumes only 6.3% of total national consumption. That same quintile obtains a benefit, according to estimates of this study, of 17.9% of the total SPE spending on education, and 24.5% of the total PRS spending on education. In the case of the SPE, those percentages increase as more affluent strata are taken into consideration, whereas in the case of the PRS the percentages are constant in the first 2 quintiles and then drop significantly (Graphs 4.7 and 4.8). Social expenditure on education is therefore slightly pro-rich, though progressive: its concentration curve is between the Lorenz curve and the diagonal (Graph 4.9). On the other hand, in the case of PRS expenditure on education, the curve is above the diagonal, indicating a pro-poor and progressive expenditure. The concentration index, however, is small: only -15, a relatively low value, considering that it is the distribution of PRS spending alone.

A typical person from the first quintile obtains a benefit equivalent to about C\$ 644 per year, as a consequence of public social expenditure on education. That benefit represents 20.5% of the person's total consumption. On the other hand, a typical person from quintile 5 obtains a benefit of C\$ 847, which represents 3.6% of that person's consumption. The contrast is more marked when it comes to PRS spending on education, which does not include spending at the university level. In this case, a typical person from the first quintile receives C\$ 606 (19.3% of the person's consumption), whereas a typical person from the wealthiest quintile receives C\$243 (only 1% of the person's consumption).

On average, an extremely poor person obtains a benefit of C\$ 637 per year from social expenditure on education (Graph 4.39). The value for a non-poor person is somewhat higher (C\$ 772). If the analysis is restricted to PRS expenditures, an extremely poor person obtains a benefit that equals C\$ 602, a moderately poor person C\$ 600, and a non-poor person C\$ 403.

Table 4.40 provides the concentration and progressivity indices for all of the programs analyzed. The program most concentrated on the poor turns out to be the one concerned with Adult Education, followed by the general public primary education program (Graph 4.11). At the other extreme, subsidies to private education and the public university program turn out to be those with the greatest pro-rich character. Column (ii) of Table

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<sup>17</sup> Added to the expenditures analyzed in this section are central level activities of the MECD, teacher training and special education, which, due to lack of information, are assigned to the total MECD expenditure. On the other hand, the heading "common projects" includes mostly capital distribution for different educational programs. Yearly information on the assignment of these expenditures by program is available, which is used to assign total spending on "common projects".

4.41 indicates that these programs are regressive: the distribution of their benefits is even more concentrated among the wealthier strata than the distribution of consumption itself.

The final two columns of Table 4.41 indicate the redistributive impact of each program, measured as the effect on the Gini coefficient for inequality, assuming that the program is financed by proportional taxes. The program with the greatest redistributive impact is primary education. It has much greater impact than any other educational program, given its budgetary weight and its marked pro-poor bias (Graph 4.12).

The similarity in the degree of concentration of public expenditure on education in Nicaragua and Honduras is remarkable (Table 4.42). This aggregate result is the consequence of the greater pro-poor slant of the large programs in Nicaragua (primary, secondary, adults), compensated by a group of highly focalized programs in Honduras (Proheco, Pralebah, Educatodos). The definition of PRS expenditure differs between countries, since it is the result of a measure of consensus not delineated by clear rules. According to the definitions adopted in Nicaragua and Honduras, PRS expenditure in Nicaragua happens to be somewhat more pro-poor than that of its neighbor.

## **5. HEALTH**

The health of a given population is one of the main pillars of a strategy to achieve permanent reductions of poverty and reach stable avenues of development. Nicaragua makes a significant economic effort to move forward with various activities related to preventive health care, and the promotion and provision of health care services.

Table 5.1 provides some synthetic indicators for the health sector in Nicaragua, and comparisons with neighboring Honduras. Block 1 indicates the similitude between the levels of health, measured by life expectancy or the infant mortality rate. There are some differences in the sources used to obtain these results. Block 2 reports that in Nicaragua a somewhat higher portion of its gross domestic product is assigned to the sector, which is the result of a higher private expenditure on health, since per capita public expenditure on health is similar in both Central American countries. Finally, block 3 clearly indicates that Nicaragua possesses a smaller allotment of human resources—medical as well as in nursing and dentistry.

Graph 5.1 indicates that, according to information provided by WHO, per capita resources allocated to health activities in Nicaragua are low compared to other Central American and Caribbean countries. Statistics for life expectancy are comparable to those of other poor countries in Central America.

Nicaragua's Health System is made up of the Ministry of Health (MINSa), the Nicaraguan Social Security Institute (INSS), the private sector, medical services provided

by the Ministry of the Interior and the Army, and institutions which train human resources for the sector. The Ministry of Health is responsible for coordinating, organizing, controlling, regulating, ordering and overseeing actions having to do with health, as well as formulating policies, plans, programs and projects which are needed to respond to the health problems of the Nicaraguan population (General Health Law, Art. 7). Though an important part of expenditure on health corresponds to the INSS (C\$888 million in 2005), this system's shared payment component makes an interpretation of its results on an incidence analysis ambiguous. In this section, INSS expenditure on health is not taken into account, and is analyzed separately in Appendix B.

MINSAs offers medical services through a network of facilities composed of health posts, health centers and hospitals. In 2005 MINSAs had 1,025 health centers and health posts, and 34 hospitals. The INSS also offers medical services through social security facilities. Health care services are completed by 60 hospitals and clinics administered by the private sector, NGOs and other institutions.

Nicaragua's National Health Plan recognizes significant pending challenges, in particular in relation to maternal and infant mortality, the high rates of fertility and birth, chronic infantile malnutrition, high rates of morbidity of endemic diseases (malaria, TB, dengue and AIDS), the high incidence of work-related accidents, the prevalence of mental illnesses, the high prevalence of handicapped people, the rate of mortality and injuries caused by violence, the mortality and morbidity occasioned by chronic ailments, and mortality due to cancer. To solve these problems the government has defined the objective of improving the quality and access to health care, and strengthening inter-sectorial actions related to the promotion, prevention and protection of families and communities<sup>18</sup> in its policy for the coming years (National Health Plan, 2004-2015).

In the course of 2005, C\$2.75 billion were assigned to health programs from public social expenditures, whereas C\$2.165 billion were allocated from PRS spending (Table 5.2). From SPE, this amount is assigned mainly to prevention activities (9.3%) and public health care (63.4%). The rest of the resources are assigned to central level activities and common projects (23.8%), environmental health services (0.1%) and other expenditures (3.3%).

## **5.1. HEALTH SERVICES: PROMOTION, PREVENTION, EDUCATION AND COMMUNICATION**

There are two central types of actions related to preventive health care: public information activities and vaccination campaigns.

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<sup>18</sup> The Plan also proposes the objectives of improving MINSAs's institutionalization, and health care reforms that seek better performance and a new service model.

## Public Information Campaigns

The MINSA carries out various educational campaigns about topics related to health, nutrition, environmental health and outreach. The 2005 EMNV included questions related to the coverage of these campaigns. Table 5.3 indicates that 68% of all Nicaraguans received some information from a public outreach campaign about health-related topics. This proportion relates positively to consumption levels. Whereas the percentage of coverage among individuals from quintile 1 is 58.9%, it is 70.4% for quintile 3 and rises to 73.1% for quintile 5. The differences according to poverty levels are similar: the coverage of such campaigns among the extremely poor is 58%, while among non-extremely poor individuals it rises to 64.9% and then to 72.6% among non-poor individuals. There are also significant differences according to place of residence, particularly between urban areas (78.8%) and rural areas (54.4%), and between Managua (78.5%) and the rest of the regions. When the coverage of these campaigns is evaluated according to ethnicity, we find greater coverage among the indigenous (75.5%) than among the non-indigenous population (67.8%).

Column (i) of Table 5.4 provides the distribution of beneficiaries for these activities, indicating a slightly pro-rich slant. This slight slant is confirmed by a positive and low concentration index of 4.73 (first column of Table 5.5), and a concentration curve below, but close to, the line of perfect equality (Graph 5.2.a).

## Vaccination campaigns

One of the main justifications for state intervention in the health sector arises from the existence of negative externalities that generate transmissible diseases. Thus, governments frequently organize vaccination campaigns aimed at protecting the population from the main diseases. Nicaragua is no exception, since immunization actions have a clearly defined strategy and a sufficient budgetary relevance.

In the 2005 EMNV it is possible to identify children under 6 years of age, both those who have already been vaccinated, as well as those who were vaccinated during the course of 2005. Column (i) of Table 5.6 presents the proportion of children under 6 years in the total population. The values of that column suggest that there are a greater number of children among lower-income households, households in rural areas and in particular in the Atlantic region. While in those cases the proportion of children is around 16% of the entire population, this proportion is closer to 10% for the rest of the population. It must be pointed out that in the case of highest income households, this proportion is reduced even more to only 8.7% (quintile 5 households). This aspect of the distribution of the population that is the target of this program implies *a priori* a pro-poor slant.

The next columns of Table 5.6 offer two rates of coverage: the first refers to the overall coverage rate (percentage of young children vaccinated), whereas the second indicates the proportion of children vaccinated during 2005, and consequently is relevant for evaluating the performance of vaccination campaigns at a specific moment in time. The coverage rate averages 95%, with disparities between regions and population groups, though minimum coverage levels are always higher than 90%. Naturally, as the socioeconomic level of a child improves, the rate of coverage also rises. So, whereas for quintile 1 the vaccination coverage rate is 92.4%, among individuals of quintiles 4 and 5 the rate is close to 97%. The greater disparities are manifested between areas of residence. While coverage in Managua is complete, the percentage of vaccinated children under 6 years is 94% in the Pacific and Central regions, and 92.3% in the Atlantic region.

Column (iii) of Table 5.6 indicates that 11% of the child population was vaccinated in 2005. The coverage rate among the poor is 1.5% lower than among the non-poor (10.5 and 12, respectively). It is interesting to note that the overall regional disparities referred to seem to be reversed in the coverage of actions undertaken in 2005. In that year, the main coverage occurred in rural areas (12.5%), which is higher than the rate in urban areas (9.9%). It is also notable that efforts seem to have been guided by a desire to compensate for previous disparities in the coverage rates between areas. Thus, the greatest coverage now appears in the Atlantic region (12.8%), followed by the Central region (12.0%) and the Pacific region (11.9%). Finally, coverage in Managua was 7.8%.

The indicators presented so far have a weakness: both evaluate whether each child has had at least one contact with vaccination campaigns, but not whether he/she completed the entire schedule of vaccinations. Table 5.7 extends the analysis to the number of doses received by a child. On average, children up to 6 years of age have received 3.9 doses, which suggests that an important number of children are not receiving complete coverage from the vaccination plan. Throughout 2005, each immunized child received 1.6 doses (column ii). It is interesting to note that this value is not lower for the poor in rural areas.<sup>19</sup>

The similar rates of coverage combined with a greater concentration of children in the poorer strata imply a moderate pro-poor slant of public expenditures on vaccination programs (Table 5.4). Whereas children from quintile 1 receive 25.9% of the doses, that proportion descends as consumption levels rise until reaching 13.4% among the most affluent quintile. The pro-poor character of this program is reflected in Graph 5.2, and in the negative value of the concentration index (-12.74). The incidence results found for Nicaragua are very similar to those found by Gasparini *et al* (2005) in the case of Honduras (Table 5.8).

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<sup>19</sup> The difference is not significant from a statistical point of view.

## **Total health promotion, prevention, education and communication**

The program incidence exercise is presented in columns (iii) to (ix) of Table 5.4. Given the absence of complete information, a uniform allocation of the budget to sub-programs is assumed. The first four quintiles receive practically 20% each, with small deviations, and quintile 5 receives 17.7% (column (iii)). The per capita benefits of expenditure from this program are around C\$50 per person for quintiles 1 to 4, and C\$ 44.3 for the 5<sup>th</sup> quintile. Consequently, the health promotion and prevention program is slightly pro-poor (see Table 5.5 and Graph 5.2). The concentration index is negative, but only slightly different from zero (-1.5).

## **5.2. PUBLIC HEALTH CARE SERVICES**

The public health care system offers various services to the population. The 2005 EMNV allows us to identify the services rendered to children due to diarrhea, the medical consultations received by the general population due to illness, and the checkups made in relation to recent childbirth. Unfortunately, it is not possible to identify the assignment of resources to each of these activities from the available budgetary information.

### **Diarrhea**

Diarrhea is one of the main problems associated with the poor of quality of potable water. This illness affects 1 out of every 4 Nicaraguan children under 6 years of age, according to responses given in the EMNV. In general terms, diarrhea tends to affect all population groups in a very similar manner (column (ii) of Table 5.9). The main differences are found when considering the place of residence: there is a higher prevalence among individuals in rural areas (27.3%) than among those in urban areas (24.0%). There are also notable disparities between different areas of the country (22.8% in the Central region compared to 33.3% in the Atlantic region). When ethnicity is considered, we find that diarrhea incidence among indigenous children is 76% higher than the rate among the non-indigenous.

Among children affected by diarrhea, 7 out of 10 received some type of medical consultation during 2005. The children from poorer families tend to visit a doctor less frequently about this health problem. In the last column of Table 5.9, we find the relevance of public health service use: 54.6% of children receive health care in public institutions. The proportion of children receiving attention in public health centers, health posts or public hospitals tends to diminish noticeably as the standard of living improves. Thus, whereas almost all children with diarrhea visit a public health facility, only 38.2% of those from the highest economic groups do so. A similar situation is found in relation to poverty levels.

If the information presented in this table is analyzed in a comprehensive manner, it becomes clear that the Atlantic region—where the proportion of children is higher—is more affected by the presence of diarrhea than the other regions. There is also an inverse relationship between well-being and the use of public health facilities. In this sense it would seem that public infrastructure might be compensating for some inequalities in health originating in socioeconomic conditions.

Table 5.10 offers information about both opportunity costs (in terms of time) and monetary costs related to receiving medical services for cases of diarrhea. It appears clear that the main costs, in transportation time (35.5 minutes on average) are borne by individuals with a higher incidence of the sickness. The reverse occurs when the analysis is centered on the monetary costs of care: in all cases, the costs of transportation, consultations and medicines rise as the family's level of well-being rises.

Column (vi) of Table 5.10 reports that on average, each household spends C\$159.9 per child on account of diarrhea. Clearly, the distribution of this private expenditure is highly concentrated among individuals with more resources residing in urban areas. Among different regions of the country, there are no large differences between Managua, the Central region and the Pacific region (C\$175), but the case is different in the Atlantic region (C\$129.8).

Table 5.11 presents the incidence results found when considering the realization of at least one consultation made in a public health facility for reasons of diarrhea. Each of the first three quintiles utilizes just over 25% of the total benefits of public expenditure for attending to this health problem. This proportion is reduced significantly for quintile 4, 15% and quintile 5, 8.6%. The pro-poor character of these services can be appreciated in the concentration curve (section (a) of Graph 5.3), as well as in the high negative value of the concentration index (Table 5.12).

In order to understand some of the facts that underlie this result, Table 5.13 provides the results of some aggregate breakdowns. The first row reflects the distribution of the population targeted by the program—children up to 6 years of age—slanted toward the lower quintiles. The next row shows that the proportion of these children who visit some type of medical facility for reasons of diarrhea increases with higher levels of family well-being. Finally, the third row indicates that among lower-income households, the proportion of medical consultations related to diarrhea made in public health facilities is higher. The next two rows show an estimated incidence and the difference that would occur in the case of totally equal spending allocations. The final block of Table 5.13 quantifies the reasons for the difference between those two incidence structures. For example, in quintile 1, for which the estimated incidence surpasses the equitable allocation by 6.3 points, this difference would be 5.6 points solely based on the distribution of children (potential users effect). A similar effect appears for the rate of public coverage. On the contrary, a lower rate of consultations would cause a -4.4 point

reduction of incidence on quintile 1 with respect to the equal distribution situation. To summarize, public expenditure on medical services related to cases of diarrhea is pro-poor due to the fact that there is a higher concentration of children in the poorer quintiles, and more intensive use of the public health facilities by those strata of the population.

### **Medical care**

In this section we analyze the distributional incidence of expenditure on public health care. This includes all outpatient and inpatient interventions at the primary, secondary and tertiary levels of care, along with psycho-physical rehabilitation. The identified beneficiaries of the public health care system are all persons who visit health personnel at public health centers: Department of Health public hospitals, and health centers and posts.

This assumption could be questioned if differences in the quality of care were to be considered. Nevertheless, since one of the main objectives of the National Health Plan is to improve the quality of health care and access to health services through definition of a Basic Package of Health Services (PBSS) and a Basic Extended Coverage Package with a comprehensive approach to health, it is possible that this issue will be less significant as implementation of the PBSS increases.

A second objection could be the simplification of the services received during consultations, when individuals also benefit from tests or inpatient stays. Unfortunately, the 2005 EMNV does not permit identification of the type of facility (public or private) in which the services are offered.

Table 5.14 presents the main indicators for the need for medical services, as well as their coverage (both the health care system and public facilities). Some 45.7% of individuals older than 6 years indicate having had some type of health problem during the past month. According to the survey, there are no great differences according to levels of consumption. The differences become noteworthy in terms of access to health services (column (ii)). Whereas for quintile 1 the proportion of individuals who visit a doctor when they are ill is 32.1%, this proportion rises to 44.1% for quintile 3 and to 52.5% for quintile 5. A similar situation arises when individuals are categorized according to poverty level. Those groups with lower consultation rates are also those who make more use of public infrastructure. Thus, while the rate of usage is 89.2% among individuals from the first quintile, this proportion is reduced to 38.8% among those belonging to quintiles with more resources. A similar situation is to be found when individuals are classified according to poverty levels.

The indigenous population has a higher rate of doctor visits, and these mostly depend upon the public sector: among the indigenous population, the rate of usage is 79%, compared to 62.7% among the rest of the population. Significant differences can also be

found between the regions, though the magnitude of these is somewhat less. Thus, the difference between individuals residing in rural vs. urban areas is 21.2 points, and is 31.3 points between the Atlantic region and Managua.

Table 5.15 offers information about the relevance of the “opportunity costs” and monetary costs that can be identified in the survey. The opportunity cost in terms of time is inversely related to economic condition. Thus, for example, an individual from quintile 1 takes 30 minutes more to reach the health care facility and has to wait about 10 minutes more than someone from quintile 5. Moreover, the differences between urban and rural areas are very significant. The greater costs related to transportation or waiting time among the indigenous population are noteworthy.

Table 5.11 presents the results of conducting an incidence exercise. The resulting structure presents certain proportionality, with a slight tendency toward favoring individuals from the middle groups, quintiles 2 and 3. The pro-poor slant of the expenditure on general medical care is very low: the concentration index is negative but has a low absolute value, -3.95 (Table 5.12). This result is very similar to the one for Honduras (-4) found by Gasparini *et al.* (2005).

As we have seen, there are differences in the perception of illness and the use of health care services in Nicaragua’s different regions. To analyze this point in greater depth, Table 5.16 breaks down the information even further. In the first three sections, the three basic components which determine the incidence results are shown for each of the regions: the target population (the population which indicates an illness), the rate of consultation, and the rate of consultation in public health facilities. As in the case of education, these variables are presented for quintiles of *national* consumption. As a result, in Managua there is a greater concentration of sick people in higher income quintiles due to the fact that the population in Managua (and therefore the population which reports being ill in that city) has a greater representation of the higher quintiles of the distribution of national consumption.

The fourth section of Table 5.16 offers the aggregate incidence result and its comparison with the results by regions. There it becomes clear that the program’s slight pro-poor character does not tend to be reproduced in all regions. In this sense the situation of the Central region or the Atlantic region contrasts with the results found for Managua.

The last section of the table presents a comparison of the results between Managua and the Atlantic region. The higher pro-poor bias of public health care in the Atlantic, as compared with Managua, is due firstly to the greater concentration of poor population in the Atlantic region. In the second place, it is due to a higher rate of medical consultations made by the poor in the Atlantic region, in comparison to the regional average.

## Childbirth

Another service provided by the public health care system identified in the EMNV is prenatal visits during pregnancy, and childbirth attention. The survey allows identification of women between the ages of 13 and 49 years who have given birth within the last 12 months, and whose last delivery took place in a public health facility.

Table 5.17 presents various indicators for the health system's coverage of prenatal checkups. Column (i) reports that the presence of women between 13 and 49 years increases with the socioeconomic level, either according to quintiles of consumption or poverty level, and is greater in urban areas, and in the Managua and Pacific regions. Of these women, 92.5% had some prenatal checkup during the course of their last pregnancy. Note that the proportion of women who undergo prenatal checkups increases with the level of consumption. Thus, while 84.9% of the women from quintile 1 have had some checkups, this proportion rises until it reaches 98.7% for women from quintile 5. This situation has its correlate in the results by poverty level. In any case, there is an approximate difference of 13 points between women from highest economic strata and those from lowest economic strata. These results are also reproduced regionally.

One of the main problems related to problems linked to childbirth is the capacity of the person conducting the checkup. In this sense, 99% of the women indicate that they had their last checkup with a doctor or a nurse. Although there are some disparities between consumption groups, this proportion is not lower than 97% at any level. It should be noted that there is significant descent in the rate of coverage in the Atlantic region, which drops to 94.2%.

As we have seen in previous cases, the public sector performs an essential role both in service provision and in compensating for differences in access. Thus, 80.8% of the women underwent prenatal checkups at public health facilities. This average hides significant differences: 96.2% of the women from quintile 1 had their checkups in these facilities, whereas this proportion drops to 54.9% for quintile 5. In regional terms, some significant differences are also seen. Thus, the noticeable successes in terms of pregnancy oversight have been supported by important state service provision in rural areas. The proportion of women in rural areas who receive checkups in public health facilities reaches 91%, compared to 73.1% in urban areas. In the regions, this percentage is over 85% in the Pacific and Atlantic regions and 90.5% in the Central region, in contrast to 61.3% in the Managua region.

The evaluation of this program is not limited to prenatal checkups, since an evaluation of aspects related to childbirth itself is also relevant. In Table 5.18, the corresponding indicators are presented. Column (i) reports that 81.3% of deliveries are attended by health care personnel. This indicator, of central relevance to the health of the child and mother, shows deep disparities. Among very low-income women, this proportion is

59.4% (quintile 1) or 56.1% (extremely poor) and ascends as the socioeconomic situation improves until it reaches 97% (quintile 5) or 92.7% (non-poor). Similar or greater differences may be found by place of residence. Thus, the proportion of deliveries attended by health care personnel for women residing in urban areas surpasses women residing in rural areas by almost 33 points. A more extreme situation can be observed when comparing the Managua (97.8%) and the Pacific regions (90.2%), with the Central (76.1%) or Atlantic (50.7%) regions.

The last two columns of Table 5.18 present the direct monetary costs incurred in the last childbirth. Almost half of the women have made some payment for the delivery, which was on average C\$297. These indicators are a reflection of the importance of public services for each group. Thus, both the proportion whose deliveries were attended by health care personnel, and the amounts paid for delivery services rise with the level of consumption. Whereas the proportion of women who pay increases from 31.1% for quintile 1 to 70.3% for quintile 5, the amounts paid for deliveries also increase from C\$199 to C\$577, respectively.

Table 5.11 suggests that public services related to childbirth mostly favor individuals from quintiles 1 (24.7%) and 2 (26.1%). These results have a correlation with the concentration curve (section c in Graph 5.3), which is above the line of perfect equality, and the negative concentration index of -15.82.

### **The total for public medical care**

In this section we add information concerning the previous sections in order to estimate the structure of incidence of the aggregate expenditure on health care. The main results are presented in Table 5.19. The benefits of expenditure increase from quintile 1 to 2, and then decrease in an unvarying manner. According to our estimates, a typical individual from quintile 1 benefits from the equivalent of C\$364, the product of state expenditures on health, while someone from quintile 2 or 3 receives about C\$400. In contrast, an individual from quintile 5 receives slightly more than half that amount (C\$245). This structure implies that the program has a pro-poor bias. On average, the SPE spending for this program represents 3.4% of the total national consumption. For a typical individual from quintile 1 these amounts are notably more significant, since he/she receives the equivalent of 11.2% of his/her personal consumption from SPE spending (12% from the PRS). This proportion drops significantly as consumption levels increase until reaching 1% (SPE) for quintile 5, indicating a clearly progressive structure.

### **5.3. AGGREGATE ANALYSIS OF HEALTH EXPENDITURES**

In this section we include an aggregate analysis of the total expenditure on health care. Added to the programs analyzed in the previous sections are a group of health promotion

programs, central level activities and smaller programs. Several of these programs offer services which in theory benefit the whole population equally. A typical example is the environmental health program. It is assumed additionally that expenditures on central level activities and on the rest of the unidentified smaller programs also benefit the entire Nicaraguan population equally.

Table 5.20 presents the distributional incidence exercise for the aggregate expenditure on health (SPE and PRS). The poorest quintile in Nicaragua benefits from 20.5% of the total SPE spending on health, and from 20.7% of the total PRS expenditure on health. In both cases these proportions remain relatively stable until reaching quintile 5, when they fall significantly (Graphs 5.4 and 5.5). In this way public social expenditure on health is slightly pro-poor: its concentration curve is slightly above the line of perfect equality (Graph 5.6). The fact that the confidence intervals for concentration indices (Table 5.21) do not include zero allows us to infer that it adequately reflects the general orientation of the respective expenditures.

On average, a person from the first quintile obtains annual benefits from the actions included in public social expenditure on health of an amount equivalent to C\$549. This amount represents 17.5% of consumption. At the other extreme, an individual from quintile 5 benefits from C\$ 428, which represents 1.8% of personal consumption. In the case of PRS expenditure, the values are somewhat lower though the patterns are similar.

When an individual's poverty level is considered, an extremely poor person benefits from an average of C\$548 annually from public social expenditures on health (Table 5.22). These values are somewhat lower in per capita terms in the case of a non-poor individual, and much lower as a percentage of consumption.

Table 5.23 indicates the concentration and progressivity indices for the sector. The program with the greatest redistributive impact is Public Health Care, principally because of the size of the budgetary allocation. It should be noted that the progressivity of SPE and PRS spending means they both have significant effects on the unequal distribution of consumption.

Finally in Table 5.24 we present a comparison with the results found in a previous study in Honduras. At the level of programs, we observe that the health care services are more pro-poor in Nicaragua than in Honduras. The incidence of SPE spending is more concentrated in Nicaragua, whereas the degree of concentration of PRS expenditure on health is similar.

## 6. HOUSING AND LOCAL PUBLIC SERVICES

The government of Nicaragua provides funds for the construction of homes and the legalization of property deeds. In this section we analyze the distributional incidence of these expenditures. Although C\$ 1.502 billion were allocated by the Ministry of the Economy for the housing function of SPE spending, a greater part of this expenditure is not used strictly for services related to private housing. In conformity with the MHCP classification, this function includes all expenditures for water and sanitation services, and investment in infrastructure in general. In this section only expenditures related to constructing houses and legalizing property titles are analyzed, which represented C\$ 294 million in 2005 (3.3%) of the total SPE spending studied in this document. Additionally, we characterize the incidence of some urban services related to housing: public lighting, garbage collection and street construction.

Section 1 of the 2005 EMNV allows the beneficiaries of several programs associated with the provision of public services and housing to be identified. In part C of this section, respondents were asked whether the members of the household were benefited by the building (improvement) of streets, alleys, etc., by the installation of public lighting, by having benefited from some housing program and having received the title deed to their property. At the same time it identifies the organization which carried out the project, differentiating between the public sector (government, ministry, FISE or municipal government) and the private sector (NGO, church, private company). It is important to note that these questions allow the beneficiaries of the *expansion* (or extension) of these programs (investment in public services) to be identified, and not just the families that were already benefiting from the provision of these services (coverage). Table 6.1 shows the distribution of the household beneficiaries of the new extensions of programs, such as public lighting, street building, and the legalization of property deeds and provision of housing programs. Some 4.5% of Nicaraguan households benefited from new investments in lighting, 12.5% from the building and improvement of streets, 0.9% from the granting of title deeds for their properties and 1.1% from the construction of new homes. The second column within each service indicates the percentage of families benefited by the investment in programs implemented by the public sector. Some 2.2% of households have benefited recently from the installation of public lighting by the government, 11.6% of the households have benefited from the building of streets, while 0.4% benefited from new housing programs from the government. While the participation of the government is very high in the building and improvement of streets, it drops considerably in the case of lighting and housing. In the case of lighting, while the extension of the service reached 4.5% of all households, only 2.2% indicated that they had benefited from service extensions by some government organization. In the case of housing programs this difference is greater. 1.1% of households have benefited from housing programs, whereas 0.4% has received them from the public sector.

Information is presented according to quintiles of consumption, by poverty level, by urban or rural area, and by region. Concentrating on the plans authorized by the public sector we find that 0.4% of households from the lowest quintile received public lighting; this percentage is 2.5% for the highest quintile, while the households from the fourth quintile benefited most from this kind of program (3.9%). When we analyze according to poverty level, 3.1% of the non-poor households indicated that they received public lighting. This percentage falls to 0.2% for the extremely poor and to 0.7% for the poor in general. A majority of the benefits from expanding public lighting services are concentrated in the Managua region. Only 1.2% of indigenous households receive these benefits.

Households of the higher quintiles seem to have benefited more than the two lower quintiles from public construction and improvement of streets. For the third, fourth and fifth quintiles these percentages are 10.1%, 16.4% and 17.7% respectively, whereas for the two lowest quintiles they are 2.5% and 5.2%. These differences are also observed when dividing the population in terms of their poverty level: the percentage of poor households which benefits from these programs is 4.6% and that of the non-poor 15.8%. Naturally, this kind of service is mainly urban: 18.6% of urban households benefit from these programs and only 1.8% of rural households. As for public lighting services, most of these investments were carried out in the Managua region, affecting 20.3% of the households in that region. On the other hand 11% of the households in the Pacific region also benefited from the construction or improvement of streets by the government. For the Central and Atlantic areas these percentages were 5.8% and 9.9%, respectively. When households are broken down by ethnicity, we find that 18.5% of indigenous households benefited from the construction or improvement of streets, versus 12.1% of non-indigenous households.

The plan to legalize property deeds benefited 0.8% of households. Households that were mostly benefited were those from quintile 4 (1.8% of the households received the deed to their property) and those least benefited were those from quintile 1 (only 0.1% received their deed). When divided according to poverty levels, the same pattern emerges: 1.2% of non-poor households received their property deeds while only 0.2% of poor households received theirs. On the other hand, 1.3% of urban households received their property deeds while this percentage was only 0.2% for rural households. 2.5% of Managua's households received these property deeds whereas this percentage oscillated between 0.2% and 0.4% for the rest of the regions. The indigenous population did not benefit from the legalization of property deeds.

Only 0.4% of the households indicated in the EMNV that they had benefited from governmental housing programs. Unlike the previous cases, we find similar proportions of beneficiaries among urban and rural households. As in the case of the legalization of

property deeds, the indigenous population did not benefit from government housing programs.

The EMNV asks individuals how they eliminate household wastes, which includes the option of public garbage collection. Table 6.2 presents the different ways that garbage is eliminated. We find that public garbage collection (column 1) is the most common method used to get rid of refuse: 42.5% of households use the services of garbage trucks. Whereas only 6% of households from the lowest quintile use this service, this percentage rises to 71.2% for the highest quintile. Naturally, the difference between the availability of this service in rural and urban areas is even more marked.

Table 6.3 shows the percentage of the population (broken down by consumption quintiles) that benefit from different programs. In the case of public lighting, 31.1% of every cordoba spent on this service benefits the highest quintile while only 2.8% benefits the lowest quintile. The most benefited population group is the fourth quintile. This same pattern is observed for street construction and garbage collection services. In the first case, 41.6% of every cordoba spent on this service is received by the highest quintile and 4.2% by the lowest quintile. For garbage collection, these percentages are 46.7% and 2.1%, respectively.

Table 6.4 presents the distributional incidence of expenditures on housing programs. The expenditure in 2005 was C\$ 188.4 million. The population from the fourth quintile benefited most (40.6% of the total): a typical person from this quintile receives an estimated implicit subsidy of C\$ 74.4 annually. The main results of the incidence exercise for plans to legalize property deeds are presented in Table 6.5. In this case the expenditure for the year 2005 is C\$ 105.9 million. Most beneficiaries of this expenditure are from the fourth quintile (47.7%). Expenditure increases from the first to the fourth quintile, and then falls for the highest quintile: per capita expenditure rises from C\$2.3 to C\$ 49.1 from the first to the fourth quintiles, and then drops to C\$30.1 for the fifth.

In order to comprehensibly analyze each program, Table 6.6 presents the concentration and progressivity indices for the various services, while Graphs 6.1 and 6.2 present the concentration curves. The concentration indices are all positive, indicating that the public services analyzed have a pro-rich slant. Despite this bias, the remaining services (except for garbage collection) are progressive, given that the distribution of their benefits is less concentrated among the wealthier strata than the distribution of consumption itself.

The concentration curve for housing programs is always found above the consumption concentration curve, indicating a pro-rich but progressive expenditure (Graph 6.2). The rest of the concentration curves for services cross the concentration curve for consumption, but the regressive or progressive character of expenditures on those programs cannot be clearly determined.

## 7. WATER AND SANITATION

An individual's well-being is strongly dependent upon access to certain essential services, among which are potable water and sanitation services. In Latin America, lack of access to these services is frequently considered an indicator of structural poverty. The population's health in general—and particularly the health of children—is strongly linked to the availability of these services. Some of their benefits include a reduction in the probability of contracting infectious and parasitic diseases.

In 1998, the Nicaraguan Water and Sewage Company (ENACAL) was created, which is responsible for the nation's water and sewage networks. In the same year the Nicaraguan Water and Sewage Institute (INAA) was created, which is the entity responsible for regulating ENACAL's activities. During the course of 2005, ENACAL spent C\$904.3 million on maintenance of the service provision network. Unfortunately, available information does not allow this expense to be broken down according to the type of network (water or sewage). In order to analyze the incidence of the expenditure on maintenance, the relative participation of each service was estimated.<sup>20</sup> The fee structure implemented to finance maintenance costs implies that in practice, subsidies are used interchangeably among the company's clients. In that year, subsidies totaled C\$ 212.1 million.

Approximately C\$ 400 million was invested in expanding the sector's infrastructure, financed mainly by international loans and donations. About 50% of this sum was assigned to investment in the sanitation area, a higher percentage than usual. The implementation of the sanitation project for Lake Managua (very high budget) explains why such a high percentage of investments are being allocated to the sanitation network.

Clearly, part of the benefits from spending on water and sanitation take the form of externalities. One such example is an increase in well-being linked to a lower probability of the propagation of epidemics. Due to the difficulty of estimating such benefits, they are ignored in this study as they are in much of this type of literature.

The coverage and distributional incidence of expenditures on water will now be examined, followed by an analysis of the same for sanitation.<sup>21</sup>

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<sup>20</sup> Specifically, it was assumed that 70% of the resources earmarked for maintaining sector infrastructure were used for the potable water network.

<sup>21</sup> The Matagalpa and Jinotega departments are not included in the statistics for this section due to the fact that ENACAL is not the entity responsible for the services being analyzed.

## 7.1. MAINTENANCE OF THE WATER NETWORK

The rate of coverage of the water network in Nicaragua is somewhat low in comparison to the average in Latin America (see SEDLAC, 2007). In particular, access to this service is less extensive than in Honduras (Table 7.1). Whereas only 66.5% of households in Nicaragua enjoy running water on the land where their house stands, this percentage reaches 80.1% in Honduras. Also, much greater heterogeneity is found between quintiles in Nicaragua. In this country, the gap between coverage rates for the first and the last quintiles surpasses 60 percentage points. While only 26.8% of the households from the first quintile have access to the service, that rate rises to 88.8% for the wealthiest quintile (which is still a relatively low value). In Honduras this gap is 36.7 percentage points. The differences with the neighboring country seem to be mainly due to rural households that possess running water on their land (but outside the house). When the urban areas of both countries are compared, the rates of coverage are similar, both within and outside of the dwelling (columns (i) and (ii) of Table 7.1). However, the differences between the rural areas of both countries cease to be significant when only the households that have running water inside the dwelling are considered.<sup>22</sup>

To assign the expenditure on maintenance of the network, only those households possessing potable water service on the land where their dwelling is located were considered as beneficiaries. The distribution of the number of hours that water service was available—as an indicator of the quality of service—was also taken into consideration.<sup>23</sup> The results obtained are presented in Table 7.2. As expected, the level of incidence increases as consumption levels rise. The first quintile receives only 5%. Spending rises continuously among the higher consumption quintiles, until reaching 40.1% for quintile 5. The poor receive only 22.3% of the amount spent. In addition, the indigenous population is strongly marginalized from this type of spending, receiving less than 1% of the same. Moreover, expenditure is strongly concentrated in regional terms: more than 80% of the expenditure is used in the Managua and Pacific regions.

In Table 7.3 the structure of incidence is analyzed in greater detail. Of the C\$ 633 million spent, the three poorer quintiles receive slightly more than C\$ 200 million. Almost double this amount is spent on the two highest quintiles (C\$ 414.6 million). This manifests itself in the per capita subsidy received by each quintile. Whereas an individual from the first quintile receives C\$ 30 per year, this amount increases to approximately C\$ 250 for the wealthiest quintile. When the expenditure received is compared as a percentage of income, no marked differences are observed between the quintiles.

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<sup>22</sup> In other words, the higher coverage rate in rural areas of Honduras is due to the fact that households receive the service outside of the dwelling (but on their parcel of land).

<sup>23</sup> The households that receive water service for only a few hours per week benefit less than those for which the service is permanently available.

In Table 7.4, we see that the high concentration of expenditure on the quintiles with higher consumption is due mainly to the fact that they utilize a greater number of houses (while the average size of their households is smaller) and a higher rate of coverage. In particular, the differences in terms of quality of service (frequency) are not quantitatively significant to explain the incidence structure of expenditure.

### **Subsidies to water consumption**

As mentioned earlier, the amount of subsidies (discounted service rates) in 2005 was C\$ 212.1 million. These subsidies were distributed among households whose consumption is lower than 20 m<sup>3</sup> of water per month (C\$ 102.4 million), households with fixed rates (C\$ 66.5 million), pensioners (C\$ 9.3 million) and marginal settlements that do not pay for the service (C\$ 33.8 million). Information provided by the EMNV allowed these subsidies to be assigned to each of their target population. In Table 7.5 we see that the incidence of each subsidy tends to increase by quintiles, though the pro-rich slant is less marked than spending on network maintenance. This result is expected to some extent, since a household must have access to the service in order to receive the subsidy, and this access is highly restricted within the poorer quintiles. Nevertheless, the focalization on specific groups (i.e. those consuming less water) tends to attenuate the concentration of subsidies.

## **7.2. EXPANSION OF THE WATER NETWORK**

The EMNV permits the households that benefited from potable water installation programs during the 2001-2005 period to be identified. The distribution of these programs was used to approximate the incidence of the investments made by ENACAL during 2005. In Table 7.2 we see that the benefits of this expenditure are concentrated mainly in quintile 4. The rest of the quintiles have similar levels of participation (between 16% and 18%). These results are to be expected in a country that has low service coverage rates for potable water among the more affluent quintiles. In Nicaragua, the percentage of households from the fourth quintile with running water within the house is less than 80%. In general, the placement of these homes makes the cost of extending the water network much less expensive than extending it to poorest households.

Furthermore, the same table indicates that there are no important differences in spending in rural and urban areas. When the different regions are compared, however, certain heterogeneousness is found. The Managua and Central regions are those most benefited by these investments. Together they receive more than 60% of the total amount. In ethnic terms, EMNV data suggests that the investments only benefit the non-indigenous population.

Table 7.6 reports that of the C\$ 200 million invested during 2005, the fourth quintile is the recipient of C\$ 64.3 million. The amount received by the rest of the quintiles is around C\$ 33 million. The benefit received is not very different between quintiles, except when extremes of the distribution are compared.

### **7.3 MAINTENANCE OF THE SANITATION NETWORK**

Table 7.7 characterizes the sanitary services available in different households. Only 21.4% have a toilet connected to the sewage network. The most common sanitary services are untreated latrines (33.4%), and latrines with treatment (26.4%). In addition, approximately 10.7% of households have no type of sanitary service whatsoever. As in the case of the potable water network, important heterogeneity is found according to levels of poverty. In particular, the extremely poor have practically no access to the sewage network (1% of the dwellings have this service). In addition, approximately one out of every four homes does not possess any kind of sanitary service and 44.1% only possess untreated latrines. A similar situation is found in rural areas and in the Atlantic region. Furthermore, significant differences are found when households are classified according to the ethnicity of the head of household. In indigenous households, the likelihood of having a toilet connected to the public sewage network is much lower (4.4% compared to 24.2% in non-indigenous households). In indigenous households, the use of untreated latrines is most common. Moreover, a substantially higher number of indigenous households lack any type of sanitary installation at all.

The expenditure on maintenance was assigned to dwellings that have sanitary facilities connected to the sewage network. Consistent with the statistics on coverage, we see in Table 7.2C that spending has a strong pro-rich slant. The first quintile receives less than 1% of the expenditure and, all together, the three poorest quintiles receive little over 15%. The maximum benefit is received by the most affluent quintile, totaling 58.3% of the expenditure. Moreover, expenditure is strongly concentrated in the Managua (65.5%) and the Pacific (25.4%) regions. The indigenous population receives an almost unperceivable proportion of this investment (0.7%).

From Table 7.8 it is evident that the two richest quintiles receive approximately C\$ 228 million of the C\$ 271.3 million spent. In the last section of the same table we see that the benefits also increase when expressed as a percentage of consumption.

The incidence structure of this expenditure is very similar to that of Honduras, though in Honduras the pro-rich bias is slightly more marked (Table 7.9). In both countries the differences in the coverage rates between quintiles are the key factor that helps explain

the distributional incidence of expenditure. However, the greater pro-rich slant observed in Nicaragua is due to a greater concentration of households in the wealthiest quintile.<sup>24</sup>

#### **7.4 EXPANSION OF THE SANITATION NETWORK**

The EMNV also allows us to identify those households that were benefited by sewage service installation programs between 2001 and the moment of the survey. The C\$ 200 million invested in the sanitation network were assigned on the basis of this information. These investments mainly benefited the two wealthiest quintiles (Table 7.2). These two quintiles together received almost 80% of the expenditure.<sup>25</sup> The reasons are similar to those mentioned in the case of investments in the potable water network. Moreover, the investments are strongly concentrated in the Managua and Pacific regions. The indigenous population only receives 1.1% of these investments.

In Table 7.10 we see that approximately C\$ 160 million of the C\$ 200 million invested are devoted to the fourth and fifth quintiles. Whereas the subsidy per inhabitant is C\$ 13.4 for the first three quintiles (on average), this amount reaches C\$ 85.7 for the richest quintile.

#### **7.5. FINANCING**

In the previous paragraphs, the distribution of the benefits of spending for this area was analyzed. However, unlike in the case of other sectors, a great portion of these benefits correspond to the payment of service fees. Fortunately, the EMNV reports the amount paid by households (net subsidies) to obtain access to potable water service.<sup>26</sup> In the fifth column of Table 7.2 we see that the strata that benefit most from sector expenditures are also those that bear greater responsibility for financing the expenditure. In particular, the contribution made is more concentrated than the benefits of expenditures on potable water services. Specifically, while the wealthiest quintile receives 40.1% of the expenditure on maintenance of the potable water network, more than 50% of the cost falls to this same quintile. The higher concentration of costs in these quintiles is presumably due to the interchangeable structure of subsidies. On the other hand, the Managua and Pacific regions contribute 86.4% of the financing for expenditures.

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<sup>24</sup> This is due to the relatively larger size of the poor households in this country. Whereas in Honduras the average size of families from the first quintile is approximately 30% larger than families from the richest quintile, in Nicaragua the difference is approximately 50%. This explains why houses are more concentrated among the wealthiest quintiles in Nicaragua (in other words, why there are so many more houses found in the most affluent quintiles)

<sup>25</sup> Gasparini *et al* (2005) find very similar results for Honduras. In that country, the pro-rich slant of these investments is slightly higher: 87% of the expenditures are assigned to the two highest consumption quintiles.

<sup>26</sup> The amount reported by households was adjusted to obtain a deficit compatible with ENACAL's. As mentioned earlier, sector investments are financed fundamentally by international loans and donations.

## 7.6. AGGREGATE INCIDENCE

Bearing in mind the amount of ENACAL's investments and deficit, the sector's net subsidy totaled C\$ 480 million. In Table 7.11 we analyze the results obtained. We see that the incidence structure is not linear. The first quintile receives C\$ 51 million, and the subsidy received tends to increase as levels of consumption increase, until reaching a maximum in the fourth quintile (C\$ 172 million) and then dropping considerably in the wealthiest quintile (Graph 7.2). This structure is the result of the interaction of several factors, including the fact that financing for spending on maintenance falls mainly to the richest quintile and, additionally, that the quintile mostly benefiting from sector investments (on average) is the fourth quintile.

In Table 7.13 the corresponding concentration indices are shown. We see that expenditure on maintenance of the sanitation network is strongly concentrated among the wealthier strata. The concentration index has a very high value (58.5). Investment in this network also shows a substantial pro-rich bias, though somewhat lower. The concentration index of this expenditure is 44.6. As we see in Graph 7.4, an analysis of the expenditure on water yields somewhat different conclusions. Although expenditure on maintenance of the network also has a pro-rich slant, it is much less concentrated than in the case of sanitation. The difference between the concentration indices is more than twenty points. In relation to investments for expanding sector infrastructure, the concentration index is not significantly different from zero, which suggests a homogeneous distribution of the investments among quintiles. In addition, the burden of financing weighs more heavily on the richer strata than the benefits of expenditure, with the exception of spending on maintenance of the sanitation network. Finally, the sector's net subsidy has a pro-rich character, though the slant is not very marked. Its concentration index is 13.9. This is also illustrated in Graph 7.5. The concentration curve of the net subsidy is generally located between the line of perfect equality and the Lorenz curve, indicating that it is both pro-rich and progressive.

In the second column of Table 7.14 we analyze this point in greater detail. The progressivity indices for each item are analyzed. We find that sanitation works (both maintenance and investment) are not only pro-rich but are also regressive. If they were financed with proportional taxes they would tend to increase the inequality of the distribution of consumption. However, a greater part of the expenditure is financed by means of fees that are paid by service users. In the same table we find that the progressivity index associated with service fees is positive, indicating that they are more concentrated than consumption in the richer quintiles.

## **8. SOCIAL ASSISTANCE**

The main objective of Social Assistance is to improve the well-being of the less protected groups of the population. As a consequence, this sector's programs tend to be focalized on the poorer strata of the population, which differentiates them from programs that theoretically have a more universal character (i.e. primary education).

One argument holds that part of the benefits of these programs actually improve the well-being of persons who do not directly benefit from said programs. It is usually argued that poverty reduction generates positive effects in terms of security and health, and that it generates benefits in well-being for those individuals who are affected by the deprivation suffered by other members of society. For practical reasons, such externalities are ignored in this study.

In the course 2005, C\$ 1.272 billion were earmarked for this SPE function, whereas PRS expenditure totaled C\$ 1.211 billion.<sup>27</sup> More than 90% of both types of expenditure correspond to the Emergency Social Investment Fund (FISE) and food programs. The FISE invests in the basic infrastructure of key sectors: education, health, water and sanitation, social protection, and community works and services. Among the main food programs are the Comprehensive Care Program for Nicaraguan Children, the Comprehensive School Nutrition Program, and other food assistance programs for areas affected by natural disasters.

From the previous paragraph we find that the services provided by this sector are highly diverse. They range from monetary or in kind transfers to the financing of soup kitchens for children, residential centers for the elderly, or training courses. This diversity is partly a reflection of this sector's high degree of fragmentation. Programs financed in this area are very numerous, as are their objectives. For example, during 2005 the Emergency Social Investment Fund financed 591 programs which include the installation of latrines, the replacement of primary school furniture and the construction of windmills, to mention a few. We will now examine the distributional impact of the main programs financed in this area.

### **8.1. EMERGENCY SOCIAL INVESTMENT FUND**

The Emergency Social Investment Fund (FISE) has been playing a fundamental role in improving Nicaraguan infrastructure since 1990. FISE finances various projects designed

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<sup>27</sup> The differences between the SPE and PRS expenditure are due to the fact that approximately C\$ 60 million from the Ministry of the Family budget were not included in the latter. Since more detailed information is not available about excluded programs, this amount was distributed among the different programs of the Ministry of the Family. In the case of FISE, the SPE and PRS expenditures are similar.

to maintain and extend the basic infrastructure of five sectors: education, health, water and sanitation, community works and services, and social protection.

The funds for social investment were started in several Central American countries mainly in the 1980s and 1990s to counteract inequalities generated by structural reforms initiated in those years. Originally, these functioned as short term emergency funds, designed to mitigate the effects of the crisis in the labor market. One of the main objectives of these funds was to develop micro-projects to employ the workers who were hurt most. Over the course of time, the social investment funds were concentrated more and more on financing and implementing long-term projects to improve basic infrastructure in the countries. In the same year in which the FISE was created in Nicaragua, the Honduran Social Investment Fund (FHIS) was started up in Honduras. The main differences and likenesses between the FISE and the FHIS are discussed later in this document.

The FISE finances numerous projects with limited budgets. Between 1991 and 2004 this fund invested US\$ 303 million in 15,061 projects, which means an average of approximately US\$ 20,000 per project.<sup>28</sup> During the course of 2005, some C\$829 million were devoted to financing 591 projects. We see in Table 8.1 that the greater amount of resources financed programs related to community works (37.5%), water and sanitation (2.8%) and education (21.4%). The areas of social protection and health only received, respectively, 2.7% and 10.7% of the Fund's resources. On the other hand, it is estimated that in the same year FISE services benefited more than 1,200,000 people and that its programs employed over 50,000 workers.

Some FISE components not only finance the extension of the basic community infrastructure, but also activities to repair and replace existing infrastructure. For these components, the distribution of projects between maintenance jobs and investment was close to the average for the 2000-2004 period (38.6%).<sup>29</sup> Unlike other surveys, the EMNV possesses a special module on participation in social programs, which permits the users of the new infrastructure in various sectors to be identified in an adequate manner. In particular, the beneficiaries of a range of investment programs financed by FISE, the government, ministries or municipal governments during the 2001-2005 period are identified. Below we examine the main services provided by different FISE components and the information provided by the EMNV to assign expenditure to each of these.

Table 8.2 presents the distribution of the projects by type of service provided for each FISE component. In the area of water and sanitation, we see that 66.6% of spending is used to finance projects improving access to water in rural areas. In general, these have to do with the construction of wells. The remaining 33.4% are works intended to maintain

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<sup>28</sup> CABAL (2005)

<sup>29</sup> CABAL (2005) based on data provided by the FISE investments portfolio.

and expand the potable water network in urban areas. No sewage projects are included in FISE's Implementation Summary (2005).<sup>30</sup> With respect to water programs, the benefits of each type of service can be identified in the EMNV with greater or lesser precision. Ideally, in order to assign expenditures on rural programs, those rural households that benefited from FISE's well construction projects during the course of 2005 should be identified. However, the EMNV only identifies rural households that obtain water mainly from public or private wells, independent of their date of construction or their source of financing. Much better information is available for assigning the spending of urban programs, since the survey indicates the users of new infrastructure. Expenditure devoted to expanding the network was assigned to the urban population that indicated it had benefited from programs that installed potable water service—financed by public entities—between 2001 and the moment the survey was conducted. In turn, expenditure on maintenance was assigned to all households that possess potable water pipes within the house.

In the educational sector, FISE finances projects that expand, build, replace and repair schools at different educational levels. Likewise, it provides required equipment and furniture. In the second section of Table 8.2 we find that 77.1% of the expenditure of this component benefited primary schools. This is followed, in order of importance, by secondary schools (18.3%) and preschools (3.5%). Special education schools receive the smallest percentage of expenditure (1.1%). Expenditure on maintenance at each educational level was assigned to children and adolescents who attend preschools or subsidized primary and secondary schools.<sup>31</sup> With respect to investment in this sector, the EMNV identifies the children who benefited from programs that constructed or improved schools and educational centers financed by the government between 2001 and 2005.

The community works and services component is mainly concerned with expanding, building, replacing and repairing the road infrastructure (rain drainage systems, water channels, streets, gutters, rural roads, bridges, etc.) and, on a smaller scale, offering community services (multi-use sports facilities, community centers, solid waste management, etc.) and the installation of electricity services in rural areas. Several of these investments are covered in the EMNV's special module for participation in social programs. The expenditure on road infrastructure, which involves approximately 90% of the budget of this component, was assigned to households that benefited from road or highway construction and/or improvement programs, or from programs for streets, alleys, drainage systems or water channels. In addition, expenditure on community services was assigned to the households that indicated they had benefited from programs to expand and repair sports or recreational infrastructure. And the beneficiaries of spending on rural

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<sup>30</sup> According to CABAL (2005) the financing of these projects ceased in 2000.

<sup>31</sup> Includes public and private subsidized facilities.

electrification projects were those that reported having benefited from electricity installation programs.

In the area of social protection, the FISE invests in infrastructure that supports productive activities and children's soup kitchens, and shelters or homes for minors, the elderly and the handicapped. Productive infrastructure projects are oriented mainly toward farm activities<sup>32</sup> and represent 48.4% of the expenditure on social protection programs. Due to the absence of more precise information, this expenditure was assigned to workers who carry out agricultural or primary activities. On the other hand, food security projects represent approximately 15% of the budget. The EMNV allows children who receive the services of children's soup kitchens to be identified. This expenditure was assigned to children who attend community soup kitchens, child development centers, or the soup kitchens of subsidized schools, according to the reported value of the food rations received. The rest of the social protection services (attention for the handicapped, homes for the elderly, etc.) cannot be identified in the survey.

In the area of health, 51.8% of the budget is devoted to latrine installation programs. The beneficiaries of these projects can be identified in the participation module for social programs. The rest of the projects are related to health care infrastructure (health posts and centers, hospitals, etc.). The amount spent on repairing and maintaining this infrastructure was assigned in conformity with the distribution of people who received health care in health posts, health centers or public hospitals during the month prior to the survey. Individuals who indicated that they had benefited from programs that either constructed or improved health centers and posts between 2001 and 2005 were considered users of the new sector infrastructure.

In Table 8.3 the incidence structure for each type of service is presented. The repair and extension of educational infrastructure are distributed in a very similar manner. Investment has a slightly stronger pro-poor slant, linked mainly to a greater participation of the second quintile in school construction and improvement programs. The poor receive 58.3% of the expenditure and 53.9% of spending to maintain facilities. It is important to stress that approximately 65% of the investment is made in rural areas of Nicaragua. Additionally, this expenditure particularly benefits the Central region of the country and, to a lesser extent, the Pacific region.

In the second section of Table 8.3 the distributional incidence of the health component is analyzed. Whereas the expenditure on hospital and health center infrastructure is distributed in a relatively homogeneous manner among the quintiles, the latrine installation programs mainly benefit the poorest strata, although 8.2% is filtered toward the wealthiest quintile. In particular, more than 40% of the expenditure on these

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<sup>32</sup> They finance small agro-industrial storage plants, ovens, community mills, chicken farms, etc.

programs is received by the moderately poor. Likewise, it should be stressed that 86% of the benefits of these programs are received by the rural population (basically in the Central region).

Programs related to constructing wells in rural areas have a substantial pro-poor slant. Nearly 85% of the expenditure benefits the three lowest quintiles, and approximately 70% benefits the poor. The Central and Pacific regions are the ones most favored by these efforts. Urban potable water programs, however, show a strong pro-rich bias. Only 15.1% of the expenditure on maintaining the water network is received by the poorest 60% of the population. At the same time, investment is strongly concentrated on the fourth quintile (39.9%). As mentioned previously, this can partly be explained by the relatively high percentage of households from this quintile that do not possess the service and, at the same time, because the cost of extending the potable water network is usually lower in less poor areas. Likewise, approximately 45% of these investments were carried out in Managua.

The incidence structure of the projects carried out as part of the community works and services component follows a similar logic as that mentioned in the previous paragraph. Investments in roads and highways, and especially in streets, drainage systems, alleys and water channels benefits the highest consumption quintiles in greater measure. In the case of the latter, 85% of the expenditure is concentrated on the non-poor, fundamentally in urban areas. In particular, more than 45% of the expenditure on these works is carried out in Managua. On the other hand, the incidence structure of investment in rural electrical installations is non linear, taking an inverted U shape. The highest percentage of the expenditure is absorbed by the third quintile (40.8%). A similar pattern is observed in relation to expenditures on sports installations, though the maximum subsidy is received by the fourth quintile.

Finally, the projects related to productive infrastructure and spending on soup kitchens have a decreasing incidence as consumption levels rise. In both cases, less than 10% of the expenditure is filtered toward the wealthiest quintile. The poor receive 68.8% of the production support projects and 62.3% of the expenditure on soup kitchens. Both types of projects benefit rural areas and the Central region to a greater extent.

Table 8.4 presents the results of incidence for each FISE component and for the total program. These results arise from the interaction between the incidence structure of each service and their budgetary relevance. In the first place, we see that more than 70% of the expenditure on education and health is absorbed by the three poorer quintiles. In the case of education programs, the larger number of works targeting primary schools would explain this result. The same is true in the area of health, with the high number of latrine installation programs (which have a clear pro-poor slant). Although the expenditure on the urban potable water network has marked pro-rich character, the greater budgetary weight of the rural programs more than compensates for the subsidy to urban programs

that increases with consumption levels. In the case of the social protection component, the three quintiles with lower consumption receive more than 80% of the expenditure. In contrast, the community works and services component benefits the non-poor population in greater measure, due fundamentally to the larger participation of road projects in the budget.

The total FISE expenditure has a slight pro-rich slant, which is explained basically by the high level of spending on the fund's community works and services component (37.5%). Whereas expenditure distribution is practically uniform among the quintiles, geographic distribution is more heterogeneous. The Central and Pacific regions are the most favored. They receive more than 60% of FISE investments. Moreover, we see that 52% of the FISE budget is assigned to rural areas. The indigenous population receives slightly more investment than the percentage it represents in the population. This is mainly the result of spending in the areas of health, and water and sanitation.

The concentration indices reported in Table 8.5 reflect the above-mentioned results. Clearly the social protection projects show the greatest pro-poor slant. The concentration index is negative and high in absolute terms (-27.3). The education and health programs show a considerably lower degree of focalization. The concentration index of these expenditures is around -13.5. The aggregate FISE expenditure is slightly pro-rich, practically neutral. The concentration index is statistically significant and low in absolute terms: just 3.0. This is illustrated in the concentration curves for expenditure (Graph 8.1).

Table 8.6 summarizes the results obtained. We see that the C\$ 819 million spent by FISE is divided in a relatively homogeneous way, though the subsidy received tends to increase slightly as levels of consumption rise. The first quintile received C\$ 153.8 million, while this amount increased to C\$ 178.4 million for the richest quintile. When the subsidy received is considered as a percentage of consumption, the picture is different. Whereas individuals from the first quintile receive a subsidy which is equivalent to 4.8% of their consumption, this percentage drops to 0.7% for individuals from the last quintile.

Finally, it is interesting to compare the FISE with the Honduran version of the same entity: the FHIS. As mentioned earlier, both funds were created in the same year and with similar objectives. The infrastructure works financed and the implementation strategies utilized do not differ markedly. The results obtained by Gasparini *et al* (2005) suggest that FHIS expenditure is more focalized on the poorer strata. The estimated concentration index has a value of -9.1. The difference could possibly be due to the fact that more information is available for estimating the distributional impact of the FISE. The survey used to analyze the FHIS (ENCOVI) did not allow a large portion of the services reported in the EMNV to be identified. In particular, the ENCOVI does not ask about investment in road infrastructure, an expenditure characterized by a strong pro-rich slant in Nicaragua. The comparability of the results is also affected by greater constraints

on availability of information for the FHIS projects, which made it necessary to apply stronger assumptions about the distribution of resources among different programs.

## **8.2. FOOD PROGRAMS**

Food insecurity constitutes one of the most pressing problems in Nicaragua. In urban areas, 22% of children from the lowest quintile suffer from chronic malnutrition.<sup>33</sup> Some of the main programs aimed at addressing the nutritional needs of the most vulnerable population are the Comprehensive Care Program for Nicaraguan Children, the Comprehensive School Nutrition Program, and other programs geared toward mitigating food emergencies in communities affected by disasters. The provision of food rations in children's school soup kitchens, food for work, and direct donations of food are the main benefits of these programs.

### **School and children's soup kitchens**

In addition to responding to children's food and nutritional needs, children's and school soup kitchens try to foster learning. Food rations given out in these soup kitchens are one of the main incentives used to reduce school dropouts. In addition, an adequate nutritional program improves children's ability to concentrate and allows a better assimilation of school lessons. Below we analyze the incidence of the main food support programs in the country.

### **Comprehensive Care Program for Nicaraguan Children**

The Comprehensive Care Program for Nicaraguan Children (PAININ) is the program with the greatest budgetary relevance within the Ministry of the Family (MIFAMILIA). During 2005, C\$ 165.5 million were spent on this program, which represents more than 40% of the ministry's entire budget.<sup>34</sup> This expenditure is used mostly to finance Community Child Care Centers (CICOs) where food rations are provided to preschool age children, together with health and educational services.

The EMNV allows identification of children under 7 years old who attend a CICO. Table 8.7 indicates that only 2.5% of children of that age group attend this type of facility. In particular, there are no important differences between poor and non-poor children (2.6% and 2.4%, respectively). In rural areas, the CICOs and children's soup kitchens seem to be more extensive. Whereas 1.8% of children in urban areas attend this type of soup kitchen, this percentage reaches 3.3% in rural areas. Furthermore, indigenous children are less likely to attend these centers, though the differences are not very marked. While

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<sup>33</sup> WHO (2006).

<sup>34</sup> This C\$ 165.5 million includes C\$ 3 million for the Comprehensive Assistance Program for Vulnerable Women and Children, since this program finances similar services as the PAININ.

1.6% of indigenous children attend CICOs, this percentage is around 2.6% for non-indigenous children.

In the same table we see that, on average, nearly 78% of children receive food supplements in those centers. These services are more common in urban areas (84.7% vs. 73.8% in rural areas). While only 65.5% of the children in rural CICOs receive food rations every day, this percentage reaches practically 80% in urban areas. A breakdown of the population by ethnic groups reveals no significant differences. The last section in the table indicates that the most popular food supplements are cereals (41.6%), lunches (41.4%) and breakfasts (23.7%).

In order to study the PAININ's distributional incidence, it was assumed that the benefits are distributed in a similar manner as the (reported) values of the food services delivered at the CICOs.<sup>35</sup> Table 8.8 indicates that this program had a non linear incidence structure. Whereas the first quintile receives 17% of the expenditure, the second quintile receives 26.4%. The benefits received then decrease in the remaining quintiles. In particular, the two richest quintiles receive a similar subsidy to that of the first quintile (about 17% of the expenditure.). On the other hand, the poor receive little more than 50% of the expenditure, and 56.3% of this is directed to rural areas. Non-indigenous children receive 96.2% of the subsidy. Likewise, an important heterogeneousness is found between the regions. In particular, practically half of the program's benefits are directed to the Central region.

As we see in Table 8.9, the non linear incidence structure results from the interaction of a group of factors. The relatively low subsidy received by the first quintile is due mainly to the lower average value of the food supplement received.<sup>36</sup> If there were no differences in this respect, the first quintile would actually receive approximately 27% of the expenditure. The second quintile receives the highest percentage of benefits due mainly to the fact that a high percentage of the program's target population is found in that quintile. At the same time, the rate of attendance at the CICOs and the value of the food supplements are higher than the average in the rest of the quintiles, strengthening the previous effect. In addition, "leakage" to the wealthiest quintile would increase approximately by 7 percentage points were it not for this quintile's low participation among potential program users.

### **Comprehensive School Nutrition Program**

The Comprehensive School Nutrition Program (PINE) provides food supplements (glass of milk, nutritional biscuits, etc.) to children of both sexes between 3 and 12 years of age

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<sup>35</sup> Except in the private non-subsidized CICOs.

<sup>36</sup> It is noteworthy that this effect captures also the differences in the probability of receiving food in the CICOs (the rations possess a null value for those children who do not receive them).

who attend schools and preschools. During 2005 the sum spent on this program was C\$ 93.5 million. This expenditure is partially financed with funds from the World Food Program.<sup>37</sup> The EMNV permits identification of the children within the mentioned age range who receive this kind of food supplement. Table 8.10 provides coverage statistics for children older than 6 years who attend primary schools.<sup>38</sup> On average, 74.2% of them receive some kind of food supplement at school. The coverage rate for this service is considerably higher for poor children and those living in rural areas. Likewise, only 56.8% of children in Managua received some kind of food supplement. Similar conclusions are obtained when comparing the frequency of the rations (during the week prior to the survey), though the differences are less marked. In particular, whereas 85% of the children who attend primary schools in rural areas receive food supplements every day, this percentage falls to 78.5 % in urban areas. Important differences are also observed in the composition of the food supplements. In particular, it is evident that the proportion of children who receive lunch or cereals at school is much higher in rural areas (the gap surpasses 25 percentage points).

This program's spending was assigned to children between 3 and 12 years of age who receive food supplements at school or preschool, in accordance with the reported value of the rations.<sup>39</sup> Table 8.11 indicates the clear pro-poor bias of this program. The two poorest quintiles receive a similar percentage of the expenditure (about 26%), but the amount received decreases beginning with the third quintile in a constant manner until reaching the highest consumption quintile, which receives 7.5% of the expenditure. The decreasing incidence structure is also manifested in the high subsidy received by poor children (60.7%). Important differences can also be observed in regional terms: rural areas receive approximately 64% of the benefits. Likewise, a greater part of the expenditure is focused in the Central and Pacific regions (37.8% and 33.6%, respectively). ). Indigenous children receive 8% of this expenditure.

Table 8.11 suggests that the pro-poor bias of the PINE program is due mainly to the concentration of the program's target population in the poorer quintiles. If this population were to be distributed in a homogeneous way, approximately 8 percentage points of the expenditure received by the two poorest quintiles would be shifted toward the greater consumption quintiles (principally to the richest quintile).

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<sup>37</sup> The program is also financed with Treasury resources, as well as funds from the Education for All Project, or EFA (source: World Bank), and the Support Program for the Educational Policy Sector (PAPSE), and others.

<sup>38</sup> Those attending private non-subsidized schools are not included.

<sup>39</sup> The same as in the case of the PAININ: food supplements distributed by non-subsidized facilities were not considered.

## **Food assistance programs for areas affected by natural disasters**

Nicaragua is one of the Central American nations that is most affected by natural disasters and this is evidenced by the existence of specific programs aimed at responding to food insecurity in the hardest hit areas. The World Food Program (WFP)<sup>40</sup> finances two programs of this kind in rural areas of Nicaragua: the Food Assistance Program for People Affected by Disasters and the Assistance Program for Rural Families in Areas Affected by Droughts and Floods. The program's joint budget totals C\$ 84.5 million, which are devoted mainly to financing food for work programs and the direct donation of food to inhabitants of rural areas. Due to a lack of more precise information, it was assumed that this sum is distributed in equal proportions among both services.

The EMNV allows the rural population which benefited from donations of food or food for work between the year 2001 and the moment of the survey to be identified. This information was utilized to assign the expenditure.<sup>41</sup> In Table 8.8 we see that the distribution of the benefits of these programs is very similar. Both programs have a strong pro-poor bias (somewhat more marked in the case of food donations). In both programs the incidence structure decreases as consumption levels increase (by quintile), with the maximum expenditure going to the first quintile (which receives about 35% of each expenditure) and the minimum to the highest consumption quintile (in both cases this quintile receives less than 4%). Likewise, the poor receive nearly 65% of the benefits, which are concentrated mainly in the Central region. The non-indigenous population receives around 97% of the expenditure for both programs. Although these programs are among the most focalized, the high degree of leakage toward the highest consumption quintiles is a fact to be noted.<sup>42</sup>

## **Aggregate incidence of the food programs**

In Table 8.12 we find the aggregate incidence of the food programs. These programs show an important pro-poor slant. Of the C\$ 343.5 million of the SPE expenditure devoted to them, about C\$250 million benefit the first three quintiles. Whereas the typical individual from the second quintile receives the greatest subsidy (C\$ 87 per year), the typical individual from the wealthiest quintile receives a more reduced subsidy (C\$ 36.6). The benefit expressed as a percentage of consumption falls constantly and drastically as more affluent quintiles are considered. The pro-poor character of the expenditure is

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<sup>40</sup> The WFP is the main food assistance organization of the United Nations system. In Nicaragua, it not only cooperates in financing several of the services mentioned in the preceding paragraphs, but it also participates in linking and financing the food assistance programs mentioned above.

<sup>41</sup> Programs financed by churches or the private sector were not considered.

<sup>42</sup> In particular, in comparison with Honduras, food for work programs are found to be less focalized. In that country almost 90% of the expenditure on these programs benefits the two poorest quintiles of the distribution of consumption.

confirmed in Table 8.15. The concentration index provides a value of  $-14.5$  and is statistically significant.

However, when analyzing the concentration indices of the food programs separately, certain heterogeneousness is observed. The WFP-financed food programs have the greatest degree of focalization among the poorer strata (the index rises to  $-29.7$ ), whereas the PINE occupies second place ( $-19.4$ ). In the case of the PAININ, the concentration index is not statistically different from zero, which suggests a neutral incidence structure. The concentration curves of expenditure offered in Graph 8.2 illustrate these results.

### **8.3. AGGREGATE INCIDENCE**

The social assistance programs analyzed so far represent over 80% of the total SPE and the PRS expenditure. However, there are numerous programs with small budgets that have not been analyzed. Some of these programs, for example the Program to Promote Responsible Paternity and Maternity (C\$ 6.7 million) or the Program to Support Poor Rural Families (C\$ 2 million) were assigned to their specific target populations. For the rest it was assumed that the distribution of benefits is similar to the aggregate of programs for which specific functions were assigned.

Table 8.13 presents the estimated incidence structure for total expenditure in this area. There are practically no differences between PRS and SPE spending. In both cases, the distribution of benefits is quite uniform among the different quintiles, showing a slight pro-poor slant (see Graphs 8.3 and 8.4). The maximum subsidy is received by the second quintile, and the minimum by the most affluent quintile. However, the difference between both subsidies (C\$ 33.6 million) is only equivalent to 2.6% of the SPE in this area. In Graph 8.5 we see that the concentration curve for expenditure is slightly above the curve of perfect equality.

The poor population receives somewhat less than 50% of the expenditure for social assistance (Table 8.14). These results are interesting since, taking into account the fact that these programs are specifically designed to attend to the needs of the neediest population groups, the leakage towards the more affluent quintiles is substantial. The uniform incidence structure is due mainly to the fact that the relative focalization of the food programs in the poorest quintiles is compensated by the slightly pro-rich slant of the FISE investments overall (of greater budgetary importance). In poor countries like Nicaragua, a significant proportion of the individuals who belong to intermediate consumption quintiles (or even to the wealthiest quintile) lack some kinds of basic infrastructure such as potable water service or road infrastructure. This is one of the reasons why FISE investments benefit all strata of the consumption distribution.

### **Box 1: Social Security**

Nicaragua's social security system is not highly developed. According to the data in the 2005 EMNV, only 13.5% of the entire population over 60 years of age report receiving benefits from the pension system (Table C.1). This protection covers elderly people who live in urban areas (19.9%) to a much greater extent than those living in rural areas (3.4%), probably due to the differing degrees of informality of activities in each area. The pension system's coverage increases with higher levels of consumption. Whereas almost 20% of persons over 60 years belonging to quintile 5 enjoy coverage, that percentage falls to 3.6% in quintile 1. When broken down by levels of poverty, we find that the coverage of non-poor retirees is double the coverage of the poor (16.7% versus 8.3%). However, there do not seem to be any important discrepancies in pension coverage based on ethnic origin. Lastly, there are notable differences in existing levels of coverage between regions, derived from differences in the degree of development and the main kinds of activities available in each of them. At one extreme, 22.7% of the population older than 60 years which resides in Managua is covered, while only 4.6% of the population of the same age group from the Atlantic region receives a retirement pension (Table C.2).

Unlike most of the social expenditure that is financed by general taxes, the financing of the social security system is linked to individual contributions, and is administered by an autonomous entity: the Nicaraguan Social Security Institute (INSS). Higher contributions made during one's employable life leads to the right to more generous pensions. For this reason, a complete analysis of the impact of the social security system must evaluate the distributional incidence of its financing source. This *box* offers only one side of the expenditure-income equation of Nicaragua's social security system. Table C.3 indicates that 40% of the retirement benefits pertain to the highest quintile, whereas only 4% are allocated to the poorest quintile. The impact in proportion to consumption is highest for quintile 3 (3.3% of total consumption) and lowest in quintile 1 (1.3%). The concentration index for expenditures on pensions (37.1) reinforces the evidence that it is a pro-rich expenditure. However, it is important to stress once more that the final incidence of the social security system depends on the distributional impact of the financing structure

However, when the subsidy is expressed as a percentage of consumption, the differences are more marked between poor and non-poor. Whereas on average an extremely poor person receives a subsidy equivalent to 8.6% of his/her consumption, this amount drops to 1.6% for a non-poor individual (Table 8.14).

Table 8.15 presents the concentration and progressivity indices for each expenditure analyzed. The most focalized programs are the food transfer programs financed by the WFP, and the FISE social protection module. In third place we find the PINE, but with a considerably lower degree of concentration. On the other hand, the FISE's community

works and services module is clearly more concentrated on the wealthier strata in the distribution of consumption. This is illustrated in Graph 8.7. However, in the second column of Table 8.15 we note that all the progressivity indices are positive. Under the suppositions of proportional financing, all these programs tend to improve the distribution of income. In column (iv) of the same table the distributional impact of each program is reported. We see that the FISE water and sanitation and education components have the greatest equalizing impact. The moderate focalization of these programs (especially that of the potable water and sanitation projects), is compensated by their budgetary relevance, converting them into the programs of greatest redistributive impact. They are followed in order of importance by the PAININ and the WFP. This last one, despite being the most focalized program, has a very limited budget which limits its redistributive impact. A similar analysis can explain why the FISE's social protection component occupies last place in this ranking. Graph 8.8 illustrates the ordering of the programs, according to their redistributive impact.

## **9. RURAL DEVELOPMENT AND ROAD INFRASTRUCTURE**

In Nicaragua there are a multiplicity of projects and programs focusing on the rural development and the promotion of farming and forestry activities. These include “Prorural,” the program promoting the production of basic grains, the clusters program (*polos de desarrollo*), the rural roads program, the national “pound per pound” program, and several development programs focused in specific geographic areas. The services provided are also varied, including technical assistance, loans, the provision of agricultural inputs and equipment at reduced or subsidized prices, infrastructure for assistance to production, institutional strengthening, training, and agricultural and forestry health.

Program financing comes from different sources, in many cases a combination of local and external funding, and is handled by different government institutions, including: the Agricultural and Forestry Ministry (MAGFOR), the Rural Development Institute (IDR), the Nicaraguan Agricultural Technology Institute (INTA), the National Forestry Institute (INAFOR) and the Nicaraguan Foundation on Agricultural and Forestry Technological Development (FUNICA). Furthermore, the Ministry of Transport and Infrastructure (MTI) impacts on rural development through the repair and construction of rural roads, while the FISE (analyzed in the previous section) does the same in relation to rural electrification and the maintenance of rural roads.

Interest shown by both the government of Nicaragua and international donors and organizations in the development of rural programs is in part based on the greater relative poverty of such areas, with a particular focus on the population dedicated to farming activities. In this sense, the numbers that characterize the rural population are eloquent (Table 9.1). In 2005, 44% of Nicaragua's entire population resided in rural areas. Poverty

indices in these areas for that year greatly surpassed those of urban areas: 67.9% of the rural population was poor, as opposed to 29.1% in urban areas, and 26.9% of the extreme poor lived in rural versus 5.4% urban areas.

The data contained in Table 9.1 also justifies the interest in programs specifically related to farming activities. Farming activities agglutinate an eminently poor population: 68.8% of the whole population that carries out agricultural activities is poor, a number which rises to 71.2% among the rural population.

The 2005 EMNV allows us to identify the rural population that is dedicated to agricultural production, livestock production and/or forestry activities. Additionally, it is possible to identify the households and individuals who, since 2001, have benefited from constructing and improving rural roads, from agricultural projects and cattle ranching projects, and those which in the last 12 months received technical assistance on their farms or loans for farming activities.<sup>43</sup>

Table 9.2 characterizes the general rural population, as well as that devoted to agriculture, livestock production and forestry activities. The proportion of rural population decreases as levels of consumption rise, representing nearly 78% of the population in the first quintile and only 13.4% in the highest consumption quintile. The population is concentrated mostly in rural areas in the Atlantic and Central regions, where more than 60% live in the countryside. In contrast, Managua registers a much lower proportion of rural population (9.5%).

We see in this table that practically the entire the rural population carries out some kind of agricultural activity, whether for family consumption or for commerce. We also find that the rural population devoted to these activities decreases slightly as consumption levels rise, and that these numbers are lower in Managua than in the rest of the regions and somewhat higher for the indigenous population than among the non-indigenous. The proportion of the rural population devoted to livestock and forestry activities, on the other hand, is 36.1% and 10.6%, respectively. These activities have greater weight among the non-poor population than among the poor, and also in the Central and Atlantic regions, particularly the latter. In these activities—unlike in the case of agricultural activities—there is a considerable difference between the indigenous and non-indigenous participation. The indigenous population participates more actively in forestry activities (17.8% versus 10.1% for the remaining population) and participates less in livestock production (only 8.1% as opposed to 36.5%).

The coverage rate for agricultural and livestock projects, for rural roads and technical assistance is tabulated in Table 9.3 by quintiles of per capita household consumption, by

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<sup>43</sup> Only three households in the sample report having received loans from the government for farming purposes. In general these are granted through private banks, cooperatives or other financial intermediaries. For this reason, this kind of intervention was not specifically analyzed.

poverty levels, by region, and by ethnicity. Some 18% of the rural population has received the benefits of programs that construct or improve rural roads, the coverage in quintile 5 (29%) being considerably higher than in the first quintile (13.1%), and also higher for the non-poor (21.9%) than for those living in poverty (16.2%). Managua has the greatest level of coverage (30.5%), while the rest of the regions have rates that oscillate between 14.9% and 19.2%. The coverage rates of agricultural and farming projects are lower: 3.4% and 0.3%, respectively. The coverage of livestock projects, as well as rural road projects, is higher in the last quintile and for the non-poor, and is much higher in Managua than in the rest of the regions. Coverage of the indigenous population is almost null, probably due to the small rural indigenous population involved in livestock activities. Unlike the other two programs, the rate of coverage of agricultural projects is lower for the last quintile than for the rest. However, in this case the non-poor population is also covered to a greater extent than the poor population. A comparison among regions shows that the coverage of agricultural programs is higher in the Central region. Finally, the rate of coverage for technical assistance is 4.8%, and a further breakdown of data shows greater coverage in Managua, in quintile 4, and among the non-indigenous population.

Additionally, a coverage rate for each region was obtained, broken down by poverty level (Table 9.4). With the exception of rural roads in the Managua region and agricultural projects in the Atlantic region, all rural development programs have greater coverage among the non-poor than among the poor, based on the information provided by the 2005 EMNV.

The per quintile incidence of agricultural and livestock production programs, rural road programs and technical assistance programs depends on the rural population in each quintile (potential beneficiaries) and on the rate of coverage for each quintile. Table 9.5 reflects the results of a breakdown of the incidence of each type of program, in relation to these two effects. The distribution of the rural population per quintile appears in the first line and indicates a higher concentration in the lower consumption quintiles. The second line indicates the rate of coverage for each specific program. The difference between the estimated incidence for each program (line 3) and the perfectly equal distribution of expenditure among quintiles is reported in the fourth row. The final block explains that difference when the results are broken down according to the potential user effect and the coverage effect.

In the case of agricultural projects, we find the greater difference is registered in the first quintile and the lowest one in quintile 5. The first quintile has a higher incidence than the equal distribution, due exclusively to the fact that it contains a higher proportion of the target population, with the effect of the coverage rate being negative: if the percentage of rural population did not differ between the quintiles, the participation of quintile 1 in the expenditure on rural development would be lower than equal distribution by 0.6 points,

for a lower relative coverage in that quintile. In the last quintile, the negative effect of both factors is added (potential user, -10.2, and rate of coverage, -7) to produce a difference of -17.3 with respect to an equal structure.

Cattle ranching projects have a highly regressive structure, in which the last quintile receives a greater incidence than the equal, at the expense of the lower consumption quintiles where there is a low incidence. The scarcity of coverage in quintiles 1, 2 and 3 more than compensates for their higher concentrations of rural population, and the opposite occurs in quintile 5. Consider again quintiles 1 and 5 in the analysis of rural roads. For quintile 1, the estimated incidence is 5.7 points higher than the equal. If the rate of coverage did not differ by quintiles, then the participation of quintile 1 in the expenditure on rural roads would be much higher than equal distribution (14.2). This important “potential user” effect is counteracted, however, by the lower rate of coverage in that quintile. In this sense, note that if the distribution of the rural population were uniform among quintiles, the participation of quintile 1 would be 8.5 points lower than 20%. At the other end of the distribution, although the rate of coverage in the most affluent quintile is much higher, its rural population is lower, giving as a result an added effect of -10.3 points.

Lastly, technical assistance has a higher than equal incidence in quintiles 1, 3 and 4. This is caused by different factors, according to the quintile: in the first quintile the result is attributed exclusively to its higher total population, while it is only attributed, on the contrary, to a greater rate of coverage in fourth quintile. In the third quintile, the positive effects of both “potential users” and higher “coverage” are linked.

In 2005, expenditure assigned to rural development activities was C\$ 1.477 billion cordobas, distributed among MAGFOR (within whose structure other organizations such as INTA and INAFOR are found), the MTI and the IDR. Of that amount, C\$ 1.365 billion (92.4%) correspond to poverty-related expenditures, which shows the relevance of this kind of program in improving the situation of the less favored segments of the population.

As mentioned, the programs offered by these organizations are varied, as are their zones of intervention and services provided. For this reason, the assignment criterion varied according to the specific program analyzed. The programs which were implemented throughout the entire country or which offered externalities, such as those providing general agricultural health or technological research services, were assigned to the whole of the rural population or to that portion of the population devoted to the specific type of activity (agriculture, cattle, forestry). Those with a specific zone of intervention, on the other hand, were assigned to the rural population of the same area (municipality or

department), either in general or to the one that indicated having received a specific type of program, depending on the case.<sup>44</sup>

Table 9.6 presents an analysis of the distributional incidence of expenditure on rural development. Columns (i), (ii) and (iii) show the proportion of expenditure that benefits each quintile, in the form of each organization's rural development programs. We do not find unvarying behavior in the distribution of expenditure among quintiles for any of the organizations. Both in the case of MAGFOR and IDR programs, the combined expenditure mostly benefits the first quintile. On the other hand, MTI expenditures on rural roads mostly benefit the second consumption quintile. In all cases, the first two quintiles receive more than 45% of total expenditure.

Column (iv) presents the distribution of the aggregate expenditure on rural development among quintiles. In this case we do observe an unvarying reduction in the proportion of expenditure as we move to the highest consumption quintiles. The proportion received by the first three quintiles is relatively homogeneous, and then falls significantly for the fourth quintile and again for the fifth. Graph 9.1 illustrates the distribution of consumption and of spending on rural development among different quintiles, while Graph 9.2 does the same for percentiles, showing a decreasing pattern from the second decile onward.

Columns (v) and (vi) reflect the total expenditure on rural development received by each quintile, in absolute and per capita terms, respectively, reflecting the decreasing and unvarying structure just mentioned. Finally, column (vii) presents the expenditure per quintile on rural development programs in relation to the quintile's consumption. Expenditure on rural development is clearly progressive, that is, it decreases as a proportion of consumption as the level of consumption rises.

One detail of the expenditure structure (by quintiles) of the main programs of the various organizations is highlighted in Table 9.7. The programs were selected according to the magnitude of their expenditure. The technical assistance programs (which group together the activities of the INTA and the Farming Technology Project, or PTA), INAFOR, the Rural Development Initiative for Nicaragua and FONDEAGRO account for 65% of the MAGFOR's total expenditure on rural development. At the same time, the rural productive reactivation programs (PRPR), the rural roads program (PCR) and the program to promote basic grain production (KR-2) account for 70% of the IDR's expenditure on rural development.

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<sup>44</sup> Additionally, in the case of programs for which information about the number of beneficiaries was available, an effort was made to approximate the survey results to the greatest extent possible.

With the exception of the MAGFOR's technical assistance and the rural roads programs, all the remaining programs concentrate their expenditure on the first consumption quintile.

Beginning with the last column of each of the sections which make up Table 9.7, we see that the expenditure of each organization is progressive, replicating this behavior at the aggregate level.

With respect to the expenditure structure of rural development according to poverty levels, Table 9.8 reveals that more than half of the expenditure (56%) targets the poor population (see Graph 9.3). This percentage breaks down into 38% of the overall expenditure received by individuals who fall above the extreme poverty line, and 18% by the indigent population. Expenditure on rural development earmarked for the poor represents 7.8% of their consumption, almost 5 times the percentage for the non-poor (1.6%).

Graph 9.4 shows the degree of concentration of aggregate rural expenditure, and by organization (the aggregate and the main programs). The concentration curve of aggregate expenditure is above the Lorenz consumption curve and also above the diagonal, clearly indicating progressive and pro-poor expenditure. The same occurs for expenditures by the MAGFOR and the IDR. However, although expenditure continues to be progressive in the case of the MTI, its concentration curve lies below the diagonal for the first quintile. The main programs of both the MAGFOR and the IDR appear to be globally progressive and pro-poor, except for the rural roads program. This indicates, as expected, a similar behavior to that of the MTI.

The indices of concentration, progressivity and redistributive impact of the rural development programs are presented in Table 9.9. In line with the previous results, the concentration indices indicate pro-poor expenditure for all of the programs and organizations considered, but to a lesser degree in the case of rural roads programs. In particular, aggregate expenditure on rural development presents a concentration index of -13.2.<sup>45</sup> The progressivity indices, meanwhile, indicate the same in all cases. Finally, despite the fact that they do not have high degrees of progressivity, the rural productive reactivation programs, technical assistance programs and rural roads programs provide the greatest redistributive impact, a fact which is associated with their higher levels of expenditure.

### **Regional differences**

One of the principal expenditures on rural development is assigned to rural roads. This has different impact in the different regions of the country. Table 9.10 presents the

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<sup>45</sup> The negative values of the concentration indices are confirmed by their confidence intervals.

distribution of the rural population and coverage of the rural roads programs by regions and by per capita consumption quintiles, together with an estimate of the regional incidence by quintiles. Likewise, the last block compares the incidence of this kind of program in the Pacific and Atlantic regions.

In the Central and Atlantic regions, approximately 70% of the rural population pertains to the two first consumption quintiles, in particular the first, whereas the Pacific population is concentrated in the three first quintiles in a somewhat more homogeneous form. With respect to incidence, whereas the aggregate expenditure on rural roads nationwide appears to be relatively pro-poor, this is only verified at the regional level in the Central region, while the incidence in the rest of the regions shows a dissimilar behavior. In general, there is a significant incidence in the second quintile in all of the regions.

When comparing the focalization of the rural roads program between the Pacific and the Atlantic, we see that the incidence is higher in the latter region in quintile 1, and lower in quintile 5. A greater focalization of the rural roads programs in the Atlantic is due entirely to a higher concentration of the rural population in that region, and the poorest strata in terms of consumption.

### **Comparison with Honduras**

On the basis of the study conducted by Gasparini et al (2005), the incidence of rural development expenditures in Nicaraguan can be compared with that of Honduras.<sup>46</sup> The main aspects of this comparison appear in Table 9.1, which reports PRS expenditures on rural development for both countries in the first block, and the respective indices of concentration in the second block. It seems that the distribution of the benefits of rural development programs is more focalized on the poor in Honduras than in Nicaragua.

## **10. AGGREGATE RESULTS**

This section synthesizes the main results from the previous sections, and reports the incidence of aggregate public social expenditure and Poverty Reduction Strategy expenditure in Nicaragua.<sup>47</sup> Table 10.1 and Graphs 10.1 and 10.2 summarize the main results of the study. Public expenditures on social services benefit the different strata of the population of Nicaragua approximately equally. The participation of all quintiles in assignment of the SPE is around 20%. Given this finding, it may be concluded that public social expenditure in Nicaragua is not pro-poor. In fact, the participation of the lowest income quintile is slightly lower than that of the rest (18.8%). The approximately uniform

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<sup>46</sup> It is important to note that in the strictest sense, it may not be possible to compare the results of both studies since the methodologies used for assigning expenditure differed based on the availability of information from the surveys and differences in the structure of expenditures.

<sup>47</sup> As discussed in sections 3 and 7, expenditure on water and sanitation in the analysis of the aggregate incidence of social expenditure is ignored, since it has a different financing structure.

distribution of social expenditure arises from the compensation between programs centered on the poor (education and basic health, several components of the FISE, food programs), and others concentrated on the highest consumption strata (universities, secondary education, subsidies to private education). These results are very similar to those found in the case of Honduras (Gasparini *et al*, 2005).

An average Nicaraguan receives an implicit subsidy of C\$ 1,558 per year as a result of the public provision of services included in the SPE. This amount does not differ fundamentally by socioeconomic stratum. On the other hand, the functional composition of this amount differs by quintiles. Compared with more affluent individuals, state transfers to education are less important to those in the poorest quintile (44% vs. 55%). However, the relative relevance of the implicit subsidies of SPE spending on health and social welfare are higher.

Although aggregate expenditure is not pro-poor, its distribution is much less concentrated among the rich than the distribution of consumption. For this reason, the SPE in Nicaragua is progressive. State spending on social services as a proportion of per capita consumption falls as the levels of per capita consumption increase. (Graph 10.4)

The poor constitute 46.2% of the Nicaraguan population. Their participation in the SPE is somewhat lower: 44.8% (Table 10.2). Compared with the non-poor, they receive a higher implicit subsidy for social assistance and health, and a lower one for education and housing (Graph 10.6). Though the benefits received in terms of the SPE are slightly higher for the non-poor, the impact as a percentage of consumption is clearly greater on the poor (Graph 10.7).

Expenditure related to the Poverty Reduction Strategy is substantially more focalized than the SPE. Table 10.3 indicates that of the total PRS expenditure, some 22.5% is assigned to the first quintile. This percentage rises marginally between quintiles 1 and 2 and then falls as levels of affluence rise. However, the higher (non-poor) quintiles do not benefit less from PRS expenditure. Quintiles 4 and 5 together receive more than 30% of PRS expenditure, which constitutes a value of more than C\$ 2.4 billion, or the equivalent of more than C\$ 1,000 annually per person.

PRS expenditure decreases as levels of consumption go up, though the reduction is not sudden (Graphs 10.1 and 10.2). Naturally, PRS expenditure as a proportion of consumption becomes substantially more relevant for the lower strata of the distribution (Graph 10.4).

Despite the fact that PRS expenditure is, in principle, focalized almost exclusively on the poor, 47% of this spending benefits people who are considered non-poor (Table 10.4 and Graph 10.5). The non-poor receive important benefits from the PRS expenditures in education, health and even social assistance.

Graph 10.8 shows the concentration curves for expenditures. The curve corresponding to SPE is hardly distinguishable from the diagonal, or the perfect equality line, indicating an absence of either a pro-poor or pro-rich slant. On the other hand, the curve for PRS expenditure is clearly above that line, indicating an average expenditure focalized on the poor.

Table 10.5 presents indicators of concentration, progressivity and redistributive impact. Estimates of the concentration index for total SPE (1.1) indicate a very slight pro-rich bias, almost neutral. This value is the result of spending on education and housing that has a pro-rich character, and expenditure on health and social assistance that has a pro-poor character (Graph 10.10). Since the concentration index for consumption (better known as the Gini coefficient) is positive and high (40.1), social expenditure is progressive: all the values of column (ii) in Table 10.5 are significantly higher than zero.

Social spending is progressive, and therefore reduces inequality. What is the impact of this “equalizing” impact? The last column of Table 10.5 indicates the change in the Gini coefficient as a consequence of social spending. The redistributive impact is computed as the product of the size of spending in proportion to consumption, and the degree of progressivity, measured through the Kakwani progressivity index found in the table’s second column.<sup>48</sup> Aggregate public social spending implies a drop of 6 points in the Gini coefficient for the distribution of per capita consumption. In other words, while the Gini prior to SPE is 40.1, the Gini after spending (and assuming proportional taxation) would be close to 34. Eighty-three percent of this redistributive impact comes from expenditures in education and health.

In the lower portion, Table 10.5 reports the redistributive impact of PRS spending. Expenditures in these programs imply a 7.3 point drop in the Gini coefficient for the distribution of per capita consumption. Thirty-seven percent of this impact comes from education programs. This is followed in order of importance by health programs (26.8%), rural development (19.1%) and social assistance (13.5%).

The classification of programs by sector hides some important differences. Within the area of education, for instance, spending on elementary education is pro-poor, while expenditures on university education have a pro-rich bias. Table 10.6 indicates the concentration indices for a wide range of social programs being implemented in Nicaragua. These indices, illustrated in Graph 10.12, indicate the average degree of focalization of each item. The programs most focused on the poor (among the programs analyzed) are the adult and public primary education programs, several food programs (WFP and PINE), and some FISE components. Rural development programs also have a

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<sup>48</sup> This is known as the Reynolds-Smolensky index. See Lambert (1993).

high degree of focalization, since they are geographically located in areas with high levels of poverty.

Within the group of programs considered, at least half have a pro-rich slant (positive concentration index). Of these, only the higher education programs and subsidies to private education are regressive.

As explained previously, the redistributive impact of a program depends not only upon its degree of focalization, but also on its budgetary relevance. The final two columns of Table 10.6 and Graph 10.13 present estimates of the redistributive impact of the main social programs. The Public Health Care and Primary Education programs have the greatest equalizing redistributive impact. The primary education program in particular is not only very much focalized on the poor, but is also important in budgetary terms. The public hospital program is not very focalized but is important in budgetary terms. The rural development programs of the IDR, MTI and MAGFOR follow in relevance as far as their redistributive impact. At the other extreme, the public university program is the main “dis-equalizing” program in terms of its redistributive impact.

### **Aggregate fiscal incidence and simulations**

A complete study of social spending requires a distributional analysis of the sources of financing for spending, and of possible inefficiency in their management. Although both aspects are beyond the scope of this study, some simple simulations were conducted to measure their potential impact on the results. Table 10.7 summarizes the results for SPE and PRS spending. The Kakwani progressivity index for social sector spending is 39. If the financing of these expenditures were neutral—in other words if taxation were proportional to consumption—then SPE would make the Gini for the distribution of per capita consumption drop from 40.1 to 34. It is possible that the Nicaraguan tax system is relatively close to neutrality in distributional terms. State financing for public spending is supported by three types of taxes: Sales Tax or Value Added Tax, Excise Taxes, and Tax on Income and other assets. Sales tax is usually considered regressive. However, this regressivity is significantly attenuated by using consumption as a proxy for individual well being (in place of regular income), and when we also consider a series of tax deductions on essential consumer goods. In addition, property taxes and especially taxes on income and assets add progressivity to the system. Table 10.7 considers two alternative scenarios to proportional taxation: one of slightly progressive taxes (a Kakwani index of 10, similar to that found by Gasparini, Artana, Castro-Leal and Montenegro, 2006) and the other of slightly regressive taxation (Kakwani index of -10). Although the magnitudes would vary, SPE would be equalizing in both scenarios. In the more pessimistic scenario of regressive taxation, SPE would imply a drop in the Gini of more than 4.5 percentage points.

Some funds never actually get utilized by the programs they are assigned to. These funds that are not used for their originally allocated purpose represent a sort of “leak” in the public benefit structure. Because of limited information, little is known about how many of these “leaks” are associated with corruption. It is particularly difficult to estimate their amount and who—at least who in terms of their location in the consumption scale—benefits from such leaks. In Table 10.7, two situations are simulated. In the first, the distribution of leakage is similar to the distribution of consumption, while in the second we assume that the beneficiaries of leaks are only found in quintile 5. Simulations of leakages of 10%, 20% and 50% are assumed for both scenarios. Under the first hypothesis (distribution of leakage similar to consumption), assuming inefficiencies of 10% and proportional taxation, the Gini after social sector spending would be 34.6, which would imply a drop of 5.4 points in relation to the original Gini, rather than 6.1 points without leakage. The most extreme case presented in the table would be 50% leakage that only benefits the 5<sup>th</sup> quintile. If this were the case, the redistributive impact of social sector spending would be almost null. Ultimately, this would mean that society is making an enormous effort to finance social spending, without any distributional impact.

Table 10.8 contains some very simple simulations of the potential redistributive impact of specific political changes. Political decisions should result from considering a large variety of economic, social and ethical issues, and from a realistic appraisal of a series of limitations or constraints. Table 10.8 contributes to the political debate by estimating the redistributive impact of certain measures. The table is only intended to be illustrative, and prudence should be used in its interpretation. For example, it should be kept in mind that the relative difficulty in achieving the goals of the seven simulations could be very different.

We begin with a 36.5 Gini coefficient for the distribution of household per capita consumption (after social spending, assuming proportional taxation and 20% inefficiency). If the Nicaraguan tax system were to become progressive (with a Kakwani index of 10), a 1.6 point reduction of the Gini could be expected. If leakages could be eliminated, the Gini could decrease from 36.5 to 34, in other words an important 2.5 point drop in the Gini. If public spending were to increase by 10% with a marginal incidence similar to the average incidence calculated in this study, the Gini would drop 3.1 points. This effect should be weighed against the potential negative impact that a tax increase would have on the level of economic activity (and therefore on poverty and possibly inequality).

Points 4-6 simulate situations with more focalized spending in education, health, and social assistance. In all cases, and in order to facilitate the exercise, we assumed that spending was entirely focused on quintiles 1-3, limiting spending assignments to the most disadvantaged 60% of the population. The total focalization of spending in education on these strata would imply a 1 point drop in the Gini. In the case of health, the reduction

would be 1.8 points. The impact of a greater focalization of SPE social assistance programs would be somewhat less (0.9 points), although it would be significant in quantitative terms given that these are theoretically focalized programs (unlike education or health, which are generally universal). Total focalization of social spending would have a considerable distributional impact (a 3.7 point reduction of the Gini in the case of SPE and 3.5 points in the case of PRS spending).

## **11. FINAL REMARKS**

Both Nicaraguan society and the international community are engaged in efforts to finance a broad range of public programs whose intention is improving the standard of living of Nicaraguans, particularly the most impoverished. This study helps to evaluate the coverage of these programs, and their degree of focalization. In particular, micro data from the recent 2005 Living Standards Measurement Study (EMNV) was used to identify the direct beneficiaries of public programs pertaining to Public Social Expenditures (SPE), and of those programs linked to the Poverty Reduction Strategy (PRS).

This study concludes that the SPE of Nicaragua does not have a pro-poor bias. The different economic strata of Nicaraguan society essentially benefit uniformly from public spending programs. This is the consequence of the coexistence of programs that have very varied focalization. While the benefits of some programs are focused on the poorest strata, others, in contrast, benefit the non-poor to a greater extent. This study provides estimates of the degree to which each program is focalized.

One of the main roles of policymakers is to allocate a limited budget amongst a multitude of options. These assignments should be guided by economic efficiency and distributional equity. This study provides a series of results that can assist rational and informed decision-making about the budgetary assignments to different programs. In the debate on social spending, knowing who benefits from this spending is fundamental. The study provides estimates of the direct impact of the main social programs being implemented in Nicaragua today.

The different sections of the study offer a detailed characterization of the coverage and incidence of an extensive group of public services. From this analysis spring several priority areas where efforts should be concentrated. Nicaragua, for example, still has a long way to go to expand preschool education coverage. Only 30% of poor Nicaraguan children receive education at an early age. The arguments invoked by the parents for not sending their children to preschool (a perception of their not needing it and the lack of nearby educational center) can be faced directly by the government, through campaigns to make them aware of the relevance of preschool education and/or the creation of more preschool facilities. Although Nicaragua has advanced in the direction of full primary school enrollment, there is still a significant deficit. One of every four children from households whose consumption level is below the extreme poverty line does not attend a

primary school. Unlike other countries in the region, where the frontier of progress toward educational development is in the mid to high levels, progress toward closing the gaps with respect to universal primary education enrollment is still needed in Nicaragua. Since the gap is substantially more severe among the poorer strata of the country, a successful policy in this sense will imply not only an increase in the economy's aggregate productive capacities, but a shift toward more equal opportunities and more equal incomes.

Among children who do not attend primary school, the main reason cited in the EMNV which justifies their non attendance is economic difficulties (Table 4.10), in particular in the case of poor families. The long distance from the school and a lack of interest constitute two other pertinent reasons behind the non attendance. Both the state and civil society have a fundamental role to play in alleviating the impact of these difficulties. Both actions on the side of demand (subsidizing access to education and making the population aware of the importance of schooling) and on the side of supply (facilitating geographic access to schools) seem to be necessary to reach the goal of full school enrollment in Nicaragua.

For low income youth in Nicaragua, access to secondary education is difficult (only 30% of poor 15 year olds attend) and access to a university is almost impossible (1%). These difficulties make public expenditure on these educational services highly pro-rich at present. This, however, does not imply that new investments in the sector need to have that bias, necessarily. This is exemplified by the case of secondary education, where the increase in coverage since 1993 has had a more intensive effect on the poor. Whereas the total average expenditure on secondary education continues to be pro-rich, at the margin it has been pro-poor. Naturally, in addition to being a non equitable situation, the small presence of poor youth in the intermediate/secondary and higher educational system is inefficient. Nicaragua is wasting valuable human capital by not being able to encourage a larger percentage of its low income youth to continue studying.

The study underlines the importance of public expenditures to compensate for some inequalities in health originating from socioeconomic conditions. For poor families, the treatment of common childhood illnesses such as diarrhea, or adequate medical care for childbirth, are provided almost exclusively by public health centers. For example, 96.2% of the women from quintile 1 had their prenatal checkups at public health facilities. In Nicaragua, the outstanding progress made in relation to prenatal visits is upheld by an important state provision of health services in rural areas, which must be encouraged and reinforced.

In Nicaragua a significant proportion of individuals from the intermediate consumption quintiles (or even the most affluent quintiles) lack some kind of basic infrastructure, such as potable water, sanitation or road infrastructure. For this reason, investments in infrastructure often do not have a pro-poor character. The very poor families, in general

situated in more isolated and difficult access areas, must wait until investments cover more accessible areas first. This point is particularly relevant for the FISE. Although the majority of its components are focalized on the neediest, some of its investments in infrastructure do not have a pro-poor character.

Another related point arises when considering the regional structure of Nicaragua. The Managua region is substantially less poor than the rest of the country, in particular in relation to the Central and Atlantic regions. Many social programs have an important impact on vast sectors of the population in Managua which, even by Latin American standards, is considered poor. However, in the Nicaraguan context these sectors are not considered the neediest, so that the subsidies they receive are not evaluated as clearly pro-poor.

In spite of the fact that rural development programs are often not focalized on the poor population of a geographic area, they are mostly carried out in areas where the majority of the population is poor. This simple geographic focalization seems to be sufficient to give rural development programs a strong pro-poor character. This result implies that if other more sophisticated means for orienting the focalization of a program are very costly to implement, a simple geographic focalization can generate reasonable results.

The study includes some simple simulations of the potential redistributive impact of certain policy changes. Any given political decision must be the result of considering a great variety of economic, social and ethical arguments, and a realistic evaluation of the set of restrictions. The study provides estimates of the redistributive impact of certain measures—such as increased taxation progressivity, a reduction of inefficiency, an elevation of social expenditure, and increased focalization in the education, health and social assistance sectors—to current economic policy debates.

One of this study's main findings is a low level of focalization in many social programs. In fact, aggregate SPE is not pro-poor, and PRS spending has a relatively low level of focalization. Almost 47% of PRS-related expenditures benefit people who are not considered poor. The evidence in this study indicates that there is sufficient margin for significantly increasing the degree to which social spending is focalized, whether through budgetary allocations to more focalized programs, or reassigning the budget of specific program areas to poorer beneficiaries, or through extending the network of social programs—currently limited by the low coverage of numerous programs—to lower income sectors.

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## **APPENDIX A: IMPLEMENTATION OF SOCIAL EXPENDITURE**

A relevant aspect of expenditure is determining which institution has the greatest presence in developing given activities. Table A.1 presents this information, but it is limited to institutions that make some type of effort related to public social expenditure, in accordance with MHCP classifications. Thus, 65.6% of the education expenditure is implemented by the Ministry of Education, while the remainder is almost entirely implemented by the universities (31.9%). The additional 2.4% is implemented by MIFAMILIA and the Ministry of Labor. In the health sector, 94.3% of the expenditure is implemented by the Ministry of Health and the remaining amount by FISE and MIFAMILIA. The expenditure for housing is mainly implemented through decentralized entities (89.1%), among which are transfers to the municipalities (64.2%), the Urban and Rural Housing Institute (14.1%), and the FISE (12.2%). In the remaining functions of social services and recreational services, the implementation of expenditure is also concentrated among decentralized entities.

In the last column of Table A.1 the distribution of the entire public social expenditure is shown. Clearly, the two main ministries are Health (29.2%) and Education (28.4%). More than a third of expenditure is assigned to these decentralized entities. Of the remaining institutions, the more significant one is the Ministry of the Family, which implements 4.2% of the global expenditure.

Table A.2 offers the same information for the PRS expenditure. The only case in which there are differences with social expenditure is education, due to the fact that the expenditure on universities is not included in Poverty Strategy expenditures. The Ministry of Education implements 89.8% of the PRS expenditure in this area. Also, due to the fact that the implementation of Economic Services is included in the Poverty Reduction expenditure, the Ministries associated with this function also take part in this group. Some 45.6% of this function is carried out by the Ministry of Transport and Infrastructure and 27.2% through decentralized entities. The other institutions which implement this expenditures include the Agriculture and Forestry Ministry (12.2%), the Ministry for the Environment and Natural Resources (8.6%) and the Commerce and Industry Ministry (6.3%).

## ANNEX B: INSS EXPENDITURE ON HEALTH

An important financier of health care services is the INSS. This institute offers medical coverage to its members and their families. Given that benefits are linked to individual contributions to the system, an analysis was not included with the rest of the health sector. For a complete distributional analysis of the INSS, we would need to analyze the sources of financing in detail, which is beyond the scope of this study.

According to the 2005 EMNV, only 11% of the population is insured by the INSS. During 2005, the INSS devoted C\$ 888 millions to medical services.

Table B.1 indicates that a greater part of INSS benefits associated with medical treatment for diarrhea among children under 6 years of age are concentrated in quintiles 4 and 5 (45.1% and 29.3% respectively), which mostly responds to the shared payment character of the INSS system. Given this distribution, it is not unusual that the concentration index should adopt a positive and high value (32.1) (see Table B.2). A similar phenomenon occurs for general medical services offered by the INSS.

Some 11.1% of the population receives medical consultations at a social security establishment. Table B.3 reports that the proportion rises as consumption levels rise, with almost no participation amongst the extreme poor (0.5%), and very low participation among the moderately poor (5.5%). There are noticeable differences between regions. Whereas the coverage in urban areas reaches 16.3%, it is only 3.3% in rural areas. When coverage is analyzed according to region, a greater disparity appears. Thus, whereas coverage in Managua reaches 24.3% and in the Pacific region 9.9%, it is only 3 or 4% in the remaining regions.

The remaining columns of Table B.3 reflect the costs incurred for each individual at the moment they receive medical care from an INSS facility. On average, an individual must wait 54 minutes to receive a medical consultation, a value that is similar to public health care facilities. With respect to out of pocket expenditures, the main difference is due to the fact that individuals who attend a social security clinic do not spend anything on consultations. Although the average expenditure on medicines does not appear to be substantially different, expenditures on public transport are double the amount spent by those attending public hospitals.

In Table B.1 we see the incidence distribution of services for general medical attention, which is largely concentrated in quintiles 4 (34.7%) and 5 (39.6%), whereas this value is only 1.3% for quintile 1. When considering these results it is not unusual to discover that the concentration index of these activities is considerable and positive (43.37).

Column (iii) of Table B.1 shows the incidence structure for INSS's aggregate expenditure on health. Note that according to our estimates, quintiles 4 and 5 received C\$661.5 millions of the C\$887.9 millions that the INSS allocated to health in 2005. In per capita

terms, the average individual from one of those quintiles receives between C\$ 313 and C\$332, whereas a typical individual from quintile 1 receives only C\$10. The concentration index for the INSS's medical activities is high and positive, reflecting the pro-rich character of the program. This high concentration of incidence makes these amounts clearly regressive in relation to consumption. For a typical individual from quintile 1, the amounts received are equal to 0.3% of his/her consumption, whereas this proportion is around 1.5% for individuals from quintiles 2, 3 or 5 and for 2.9% for someone from quintile 4. Although this information is important for evaluating the INSS, once more we emphasize that a complete analysis of the distributional impact of the INSS expenditure requires a detailed study of contributions to that system.

**Table 3.1: Public social expenditure and PRS spending by area- Nicaragua, 2005**

MHCP Classification				
Function	Social expenditure		PRS expenditure	
	C\$ (millions)	%	C\$ (millions)	%
Total	9107	100.0	9816	100.0
Education	3858	42.4	2702	27.5
Health	2821	31.0	2235	22.8
Social Services	824	9.1	568	5.8
Housing	1502	16.5	1381	14.1
Sports and Culture	102	1.1	1	0.0
Financial Services			2929	29.8

Source: Author's calculations based on MHCP data.

**Table 3.2: Public social expenditure by area - Nicaragua, 2005**

Classification used for this study		
	Millions C\$	%
<b>Total SPE</b>	<b>8,012</b>	<b>100.0</b>
<b>Education</b>	<b>3,696</b>	<b>46.1</b>
Preschool	36	0.4
Primary	1,421	17.7
Intermediate and technical	315	3.9
Adults and special programs	133	1.7
MECD activities and projects	740	9.2
Universities	1,051	13.1
<b>Health</b>	<b>2,750</b>	<b>34.3</b>
Promotion and prevention	256	3.2
Public health care	1,745	21.8
Central level activities, others	750	9.4
<b>Housing</b>	<b>294</b>	<b>3.7</b>
Housing programs	188	2.4
Legalizing property deeds	106	1.3
<b>Social assistance</b>	<b>1,272</b>	<b>15.9</b>
FISE	819	10.2
Food programs	344	4.3
Others	109	1.4

Source: Author's calculations based on data from the MHCP and other Nicaraguan government institutions and programs

**Table 3.3: PRS spending by area and large-scale programs - Nicaragua, 2005**

Classification used for this study		
	Millions C\$	%
<b>Total PRS</b>	<b>7,576</b>	<b>100.0</b>
<b>Education</b>	<b>2,540</b>	<b>33.5</b>
Preschool	36	0.5
Primary	1,421	18.8
Intermediate and technical	315	4.2
Adults and special programs	116	1.5
MECD central activities	629	8.3
MECD teacher training	23	0.3
<b>Health</b>	<b>2,165</b>	<b>28.6</b>
Promotion and prevention	128	1.7
Public health care	1,857	24.5
Central activities and others	181	2.4
<b>Housing</b>	<b>294</b>	<b>3.9</b>
Housing programs	188	2.5
Legalizing property deeds	106	1.4
<b>Social assistance</b>	<b>1,211</b>	<b>16.0</b>
FISE	819	10.8
Food programs	298	3.9
Others	94	1.2
<b>Rural development</b>	<b>1,365</b>	<b>18.0</b>
MAGFOR	270	3.6
IDR	520	6.9
MTI	575	7.6

Source: Author's calculations based on data from the MHCP and other Nicaraguan government institutions and programs

**Table 3.4: Public social expenditure and PRS spending by area- Nicaragua, 2005**

Classification used for this study				
Function	Social expenditure		PRS expenditure	
	C\$ (millions)	%	C\$ (millions)	%
Total	8012	100.0	7576	100.0
Education	3696	46.1	2540	33.5
Health	2750	34.3	2165	28.6
Housing	294	3.7	294	3.9
Social assist.	1272	15.9	1211	16.0
Rural development			1365	18.0

Source: Author's calculations based on MHCP data and on other institutions and programs of Nicaragua's government.

**Table 3.5: Average consumption and consumption structure by quintiles**

	Average consump.	Total consump. (%)
1	262	6.3
2	434	10.4
3	618	14.8
4	914	21.8
5	1980	46.8
Average	839	100.0

Source: Author's calculations based on 2005 EMNV data.

**Table 3.6: Inequality indices Distribution of household per capita consumption**

Share decile 1	2.5
Share decile 10	31.3
Decile 10/1	12.3
Percentile 90/10	5.8
Gini coefficient	0.403
Theil index	0.298
Variation coefficient	0.973
Atkinson (e=0.5)	0.132
Atkinson (e=1)	0.237
Atkinson (e=2)	0.391
Entropy (c=0)	0.270
Entropy (c=2)	0.473

Source: Author's calculations based on 2005 EMNV data.

**Table 3.7: Population structure by poverty levels**

	F		Poor	Non-poor	Total
	Extreme poor	Moderate poor			
<i>Percentage in each group</i>					
National	14.8	31.3	46.2	53.9	100.0
Rural	26.7	41.1	67.8	32.2	100.0
Urban	5.4	23.6	29.0	71.0	100.0
Managua	3.1	16.0	19.1	80.9	100.0
Pacific	10.1	35.3	45.4	54.6	100.0
Central	24.4	36.0	60.5	39.5	100.0
Atlantic	23.3	38.9	62.2	37.8	100.0
<i>Geographical distribution</i>					
Rural	79.6	58.0	64.9	26.4	44.2
Urban	20.4	42.0	35.1	73.6	55.8
Total	100.0	100.0	100.0	100.0	100.0
Managua	5.2	12.5	10.1	36.8	24.5
Pacific	20.0	33.1	28.9	29.8	29.4
Central	52.9	37.0	42.1	23.6	32.1
Atlantic	22.0	17.4	18.9	9.8	14.0
Total	100.0	100.0	100.0	100.0	100.0

Source: Author's calculations based on 2005 EMNV data.

**Table 4.1: Education - Educational structure**

General title	Specific title	International classification for education	Duration / Levels	Cohort / Ideal age	Institution in charge		
Basic and Middle education	Prescholar education	Initial Education	4 years	0-4 years	MIFAMILIA		
		Prescholar	2 years	5-6 years	MECD		
	Primary education (compulsory)	Primary education	1er level	7 years			
			2do level	8 years			
			3er level	9 years			
			4to level	10 years			
			5to level	11 years			
	High school education	Middle education	6to level	12years			
			1er year	13 years			
			2do year	14 years			
			3er year	15 years			
4to year			16 years				
Higher education	Graduate program	3rd cycle	5to year	17 years	MECD		
			1st cycle	2 a 3 years		Variable	
			Non Degree program	1st and 2nd cycle		4 a 6 years	18-23
			Masters and Doctorates	Variable		Variable	
					CNU		

Source: MECD.

**Table 4.2: Education - Public social expenditure and PRS spending Millions of cordobas**

<i>Social Public Spendings (SPS)</i>	Millions C\$	%
<b>Total</b>	<b>3,696</b>	<b>100</b>
Preschool education	36	1.0
Primary education	1,421	38.4
Middle education	250	6.8
Adults	109	2.9
Special programs	25	0.7
MECD central activities	153	4.2
MECD projects	564	15.3
MECD teachers training	23	0.6
Technical education	65	1.8
Universities	1,051	28.4

<i>PRS</i>	Millions C\$	%
<b>Total</b>	<b>2,540</b>	<b>100.0</b>
Preschool education	36	1.4
Primary education	1,421	55.9
Middle education	250	9.9
Adults	92	3.6
Special programs	25	1.0
MECD activities and shared projects	629	24.8
MECD teachers training	23	0.9
Technical education	65	2.5

Source: Author's calculations based on Nicaragua's government data.

**Table 4.3: Preschool education Attendance rate (%)**

Age	[0-3]	[4-6]	4	5	6
Total	6.0	38.1	34.9	53.4	25.8
Quintiles					
1	4.1	25.4	19.4	34.4	21.1
2	4.5	34.5	26.5	53.8	24.6
3	6.3	38.7	29.5	52.5	32.9
4	7.9	47.4	44.8	69.0	27.9
5	8.9	56.8	64.8	79.0	23.6
Extreme poor	3.5	22.6	17.8	28.9	20.8
Moderate poor	4.9	34.9	27.1	50.9	25.9
Poor	4.4	30.3	23.8	42.7	23.9
Non-poor	7.9	47.6	47.5	67.0	28.1
Rural	5.0	34.0	29.4	45.1	27.1
Urban	6.8	42.1	39.3	62.2	24.4
Managua	7.7	45.8	44.6	68.5	22.1
Pacific	5.9	39.4	33.9	56.2	27.6
Central	5.4	37.1	32.4	50.6	27.4
Atlantic	4.7	29.5	26.6	38.9	23.3
Observations	3220	2712	872	917	923
Expanded observations	421175	344767	116115	115603	113049

Source: Author's calculations based on 2005 EMNV data.

**Table 4.4: Preschool education Reasons for non-attendance**

Number of observations

	Total [4,6]	Pr.Poor		Poor	Non-poor	Rural	Urban
		Extreme	non-extreme				
1. Because of age	476	124	197	321	155	281	195
2. Doesen't need it	83	37	23	60	23	44	39
3. Too far from home	305	123	117	240	65	283	22
4. No one can take him/her	11	3	6	9	2	6	5
5. Family problems	19	5	7	12	7	10	9
6. Economic problems	218	92	88	180	38	141	77
7. Others	130	32	53	85	45	89	41
Observations	1242	416	491	907	335	854	388

Source: Author's calculations based on 2005 EMNV data.

**Table 4.5: Preschool education Characterization**

public %	hours	% receiving public food supplies	Subs. amount public food supplies	% provided to school in work	Time to get to school
82.0	3.5	61.0	82.1	17.2	12.2
97.7	3.2	74.1	99.8	17.2	12.8
93.5	3.3	73.5	102.9	13.2	9.8
93.6	3.5	70.8	91.2	13.7	14.3
74.1	3.7	49.9	71.6	16.8	10.1
53.5	3.9	38.7	49.4	25.2	13.1
96.7	3.1	76.2	96.3	13.9	11.6
95.8	3.3	72.7	102.9	16.0	11.3
96.1	3.3	73.7	101.0	15.5	11.3
71.3	3.7	51.2	67.7	18.5	12.5
97.5	3.3	78.6	106.9	19.5	14.8
69.8	3.7	47.1	61.7	15.3	9.8
59.8	3.9	34.3	35.5	13.4	11.5
82.8	3.5	73.9	89.0	16.2	9.9
92.5	3.3	63.5	96.8	23.2	14.0
95.3	3.3	77.4	111.4	11.2	12.3
977	1178	982	958	982	1177
130312	156625	131501	126595	131501	156196

Source: Author's calculations based on 2005 EMNV data.

**Table 4.6: Preschool education Distributional incidence**

	Structure % (i)	Spending		
		total C\$ M (ii)	per inhabitant C\$ (iii)	as % of consumption (iv)
1	21.1	7.6	7.4	0.23
2	22.1	7.9	7.7	0.15
3	23.2	8.3	8.1	0.11
4	20.6	7.4	7.2	0.07
5	13.0	4.7	4.5	0.02
Total	100.0	35.8	7.0	0.07

Source: Author's calculations based on 2005 EMNV data.

**Table 4.7: Preschool education Breakdown of distributional incidence results**

	1	2	3	4	5	Total
Children [4-6] (% of total)	27.1	21.9	19.9	17.9	13.2	100.0
Preschool attendance rate	25.4	34.5	38.7	47.4	56.8	38.1
Public attendance rate	97.7	93.5	93.6	74.1	53.5	82.0
Estimated incidence	21.5	22.6	23.0	20.1	12.8	100.0
Difference	1.5	2.6	3.0	0.1	-7.2	0.0
<b>Effects</b>						
1. Potential user	6.4	2.0	0.1	-1.9	-6.5	0.0
2. Attendance	-8.5	-2.2	0.2	4.1	6.3	0.0
3. Public	3.5	2.7	2.8	-2.0	-6.9	0.0

Source: Author's calculations based on 2005 EMNV data.

**Table 4.8: Primary education Attendance rates**

Age	7	8	9	10	11	12	13	14	15	[7-11]
Total	82.5	91.3	90.1	91.8	87.8	64.8	45.3	27.8	16.2	88.7
<b>Quintiles</b>										
1	65.6	81.9	81.7	82.0	84.2	72.2	60.1	39.6	20.9	79.1
2	80.1	89.2	88.9	91.5	88.1	77.2	54.6	39.5	21.9	87.6
3	90.6	94.0	94.5	96.8	92.8	65.7	50.4	25.4	17.4	93.8
4	94.3	97.7	93.8	96.8	87.3	59.3	31.1	15.7	11.9	94.1
5	94.1	99.9	97.9	98.9	87.0	38.5	20.6	9.8	4.3	95.1
<b>Extreme poor</b>										
Moderate poor	62.2	79.9	79.6	79.5	82.4	68.3	60.3	38.8	20.6	76.5
Poor	82.2	89.8	90.1	91.6	89.6	76.3	54.1	38.3	20.6	88.7
Non poor	75.0	86.7	86.2	87.3	87.3	73.5	56.2	38.5	20.6	84.5
<b>Rural</b>										
Urban	93.2	96.8	94.7	97.5	88.4	56.2	32.9	15.9	11.5	94.2
<b>Managua</b>										
Pacific	76.3	87.8	87.0	89.2	88.3	75.5	55.9	37.5	21.3	85.9
Central	88.7	95.0	93.4	94.6	87.3	54.9	33.6	18.4	11.9	91.8
Atlantic	89.0	97.9	91.4	94.3	85.9	53.0	30.3	16.9	11.2	91.6
Observations	92.1	95.1	93.5	93.3	88.7	61.4	45.1	22.9	10.4	92.5
Expanded observations	77.3	88.9	90.2	92.0	90.2	70.4	45.9	31.0	17.5	87.9
	72.6	82.3	83.6	86.2	83.2	78.1	61.5	41.9	31.5	81.5
Observations	977	1002	985	1086	1012	1143	1035	1009	1048	5062
Expanded observations	125900	123055	125635	139644	134008	154613	132866	133343	136166	648242

Source: Author's calculations based on 2005 EMNV data.

**Table 4.9: Primary education School system**

Non-autonomous public sch.	70.8
Autonomous school	18.8
Community school	1.6
Private school with subsidy	2.6
Private sch. without subsidy	6.0
Other	0.3
<b>Total</b>	<b>100.0</b>

Source: Author's calculations based on 2005 EMNV data.

**Table 4.10: Primary education Reasons for non-attendance (children between 7-11 years of age)**

Number of observations

	Total [7,11]	Pr Poor		Poor	Non Poor	Rural	Urban
		extreme	non extreme				
1. Because of age	0	0	0	0	0	0	0
2. Not interested	57	20	31	51	6	36	21
3. Finished studies	0	0	0	0	0	0	0
4. Domestic job	5	1	3	4	1	5	0
5. Rural work/labor	15	5	9	14	1	15	0
6. Class full	15	5	8	13	2	7	8
7. Grade level not provided	1	1	0	1	0	1	0
8. School far from home	105	55	39	94	11	105	0
9. No teachers to attend	13	7	4	11	2	13	0
10. Too unsafe	32	12	15	27	5	32	0
11. Pregnancy	0	0	0	0	0	0	0
12. Children's care	2	2	0	2	0	2	0
13. Family problems	44	15	16	31	13	25	19
14. Economic problems	236	132	84	216	20	167	69
15. Others	73	27	30	57	16	50	23
	598	282	239	521	77	458	140

Source: Author's calculations based on 2005 EMNV data.

**Table 4.11: Primary education (children between 7-11 years of age) Reasons for non-attendance and reasons for returning to school**

Number of observations

	Food program	Grants	School mat offered	Adults program	Credits	Nursery	Better timetable	More security	Finished studies	No case	Other	Total [7,11]
1. Because of age	0	0	0	0	0	0	0	0	0	0	0	0
2. Not interested	0	2	3	1	0	0	0	0	0	47	4	57
3. Finished studies	0	0	0	0	0	0	0	0	0	0	0	0
4. Domestic job	0	0	0	0	0	0	1	0	0	2	2	5
5. Rural work/labor	0	3	1	4	0	0	2	0	0	5	0	15
6. Class full	0	0	2	0	0	0	1	0	0	0	12	15
7. Grade level not provided	0	0	0	0	0	0	0	0	0	1	0	1
8. School far from home	0	1	2	0	0	0	3	3	0	2	92	103
9. No teachers to attend	0	0	0	0	0	0	0	0	0	0	13	13
10. Too unsafe	0	1	0	0	0	0	2	7	0	1	21	32
11. Pregnancy	0	0	0	0	0	0	0	0	0	0	0	0
12. Children's care	0	0	0	0	0	1	0	0	0	1	0	2
13. Family problems	1	9	12	3	0	3	1	3	0	3	9	44
14. Economical problems	2	120	95	5	1	1	0	2	0	2	7	235
15. Other	0	1	1	1	0	0	0	3	0	19	48	73
Observations	3	137	116	14	1	5	10	18	0	83	208	

Source: Author's calculations based on 2005 EMNV data.

**Table 4.12: Primary education Characterization**

	Public %	Private % with subsidy	% in autonomous schools	% in communal establishments	% in multi-grade classes	% receiving public food sup.	Cost subsidy public food sup	% receiving public school materials	Number of absences	% of those repeating	% provided to school in work	Quality evaluation 0-5	Time to get to school	% public transport
Total	91.4	30.1	18.8	1.6	34.2	68.0	90.4	7.0	1.0	11.1	9.2	1.9	14.9	2.4
Quintiles														
1	99.8	0.0	13.4	2.5	54.8	77.7	101.9	9.4	0.8	13.7	10.0	1.9	18.4	0.5
2	99.2	86.2	12.7	1.7	39.9	79.2	103.8	6.6	0.9	12.1	9.3	1.9	15.1	0.8
3	95.9	34.8	25.2	1.3	30.8	71.1	95.8	7.3	1.1	10.8	11.2	1.8	13.8	1.7
4	85.7	31.1	23.4	1.3	16.6	57.3	79.9	5.4	1.2	8.8	6.7	1.9	12.9	5.0
5	57.1	26.8	23.5	0.4	12.2	34.9	41.7	4.4	1.2	7.1	7.0	2.1	12.1	7.3
Extreme poor	99.8	0.0	13.5	1.7	58.9	76.4	100.4	9.0	0.9	14.2	10.6	1.8	18.6	0.4
Moderate poor	98.7	51.4	15.0	2.2	39.0	79.0	102.6	7.4	0.9	12.5	9.9	1.9	15.2	0.8
Poor	99.1	47.1	14.5	2.1	45.4	78.2	101.9	7.9	0.9	13.0	10.2	1.9	16.3	0.6
Non-poor	81.8	29.0	24.1	1.0	20.2	55.4	74.9	5.8	1.2	8.6	7.9	1.9	13.2	4.7
Rural	99.1	65.7	12.4	2.7	60.7	82.1	107.2	9.7	1.0	12.5	11.8	1.8	18.8	1.8
Urban	82.9	28.0	25.8	0.4	5.1	52.6	68.5	4.0	1.1	9.5	6.3	1.9	10.6	3.2
Managua	80.0	23.0	36.1	0.3	8.9	46.6	35.8	6.1	1.6	11.5	7.4	1.9	11.3	3.5
Pacific	90.9	27.9	19.9	0.3	21.9	77.6	94.7	3.0	0.8	10.5	11.3	1.8	12.9	3.5
Central	96.2	48.8	12.4	1.8	51.6	70.3	101.5	10.4	0.9	11.4	8.9	1.9	18.1	1.7
Atlantic	94.7	42.5	11.2	4.5	46.2	71.1	111.9	7.7	1.0	11.0	8.2	1.8	15.6	1.0
Observations	6833	444	6846	6846	6846	6842	5369	6846	6679	6846	6846	6822	6846	6846
Expanded observations	873867	75241	875887	875887	875887	874974	671394	875887	854104	875887	875887	872956	875887	875887

Source: Author's calculations based on 2005 EMNV data.

**Table 4.13: Public primary education Distributional incidence**

	Structure %	Spending		
		total C\$ M	per inhabitant C\$	as % of consumption
	(i)	(ii)	(iii)	(iv)
1	26.8	373.1	362.8	11.5
2	26.1	363.0	353.0	6.8
3	22.8	317.1	308.3	4.2
4	17.3	240.7	234.1	2.1
5	7.1	98.2	95.5	0.4
Average	100.0	1392.1	270.7	2.7

Source: Author's calculations based on 2005 EMNV data.

**Table 4.14: Public primary education Breakdown of distributional incidence results**

	1	2	3	4	5	Total
Children [7-12] (% of total)	26.2	22.8	21.1	18.3	11.8	100.0
Primary sch attendance rate	79.1	87.6	93.8	94.1	95.1	88.7
Public school attendance rate	99.8	98.9	94.9	84.8	55.1	90.0
Estimated incidence	25.9	24.7	23.5	18.3	7.7	100.0
Difference	5.9	4.7	3.5	-1.7	-12.3	0.0
Effects						
1. Potential user	5.8	2.5	0.8	-2.0	-7.0	0.0
2. Attendance	-2.7	-0.4	1.1	1.1	0.9	0.0
3. Public	2.8	2.5	1.6	-0.8	-6.1	0.0

Source: Author's calculations based on 2005 EMNV data.

**Table 4.15: Distributional incidence****A. Adult Education**

	Structure %	Spending		
		total C\$ M	per inhabitant C\$	as % of consumption
	(i)	(ii)	(iii)	(iv)
1	39.0	42.3	41.2	0.65
2	25.0	27.2	26.4	0.25
3	17.3	18.8	18.3	0.12
4	13.6	14.8	14.4	0.07
5	5.1	5.5	5.3	0.01
<b>Average</b>	<b>100.0</b>	<b>108.6</b>	<b>21.1</b>	<b>0.10</b>

**B. Private with subsidy**

	Structure %	Spending		
		total C\$ M	per inhabitant C\$	as % of consumption
	(i)	(ii)	(iii)	(iv)
1	0.0	0.0	0.0	0.00
2	6.2	1.8	1.7	0.03
3	12.0	3.4	3.3	0.04
4	31.7	9.0	8.8	0.08
5	50.1	14.2	13.8	0.06
<b>Average</b>	<b>100.0</b>	<b>28.4</b>	<b>5.5</b>	<b>0.06</b>

Source: Author's calculations based on 2005 EMNV data.

**Table 4.16: Regional Breakdown of distributional incidence results Public primary education**

	1	2	3	4	5	Total
<i>Children's distribution</i>						
Managua	6.8	13.3	25.9	30.2	23.8	100.0
Pacific	20.4	23.6	25.5	20.4	10.2	100.0
Central	37.3	23.9	17.1	12.9	8.7	100.0
Atlantic	34.0	29.7	16.7	12.6	7.0	100.0
Nicaragua	26.2	22.8	21.1	18.3	11.8	100.0
<i>Attendance rate</i>						
Managua	79.5	79.6	92.4	92.7	95.4	91.6
Pacific	86.5	91.9	96.1	94.6	92.9	92.5
Central	78.5	91.0	92.7	96.5	97.2	87.9
Atlantic	70.2	80.6	93.0	91.6	94.1	81.5
Nicaragua	79.1	87.6	93.8	94.1	95.1	88.7
<i>Public attendance rate</i>						
Managua	100.0	100.0	88.2	81.0	47.7	78.1
Pacific	99.2	98.3	96.3	79.1	49.5	88.9
Central	100.0	99.4	97.6	94.8	68.8	95.7
Atlantic	100.0	98.5	97.7	88.2	60.3	94.2
Nicaragua	99.8	98.9	94.9	84.8	55.1	90.0
<i>Estimated incidence</i>						
Managua	7.7	14.9	29.9	32.1	15.4	100.0
Pacific	21.2	25.9	28.7	18.5	5.7	100.0
Central	34.9	25.7	18.4	14.0	7.0	100.0
Atlantic	31.1	30.7	19.8	13.3	5.2	100.0
Nicaragua	25.9	24.7	23.5	18.3	7.7	100.0
<i>Comparison Managua-Atlantic</i>						
	1	2	3	4	5	Total
<i>Estimated incidence</i>						
Atlantic	31.1	30.7	19.8	13.3	5.2	100.0
Managua	7.7	14.9	29.9	32.1	15.4	100.0
Difference	23.4	15.7	-10.1	-18.8	-10.2	
<i>Effects</i>						
1. Potential user	26.2	16.4	-11.6	-19.1	-11.8	
2. Attendance	-1.8	0.9	0.7	0.2	0.0	
3. Public	-0.9	-1.6	0.7	0.2	1.6	

Source: Author's calculations based on 2005 EMNV data.

**Table 4.17: Breakdown of distributional incidence - results Nicaragua-Honduras comparison Public primary education**

	1	2	3	4	5	Total
<i>Children's distribution</i>						
Nicaragua	26.2	22.8	21.1	18.3	11.8	100.0
Honduras	24.4	22.1	21.7	17.1	14.8	100.0
Difference	1.8	0.7	-0.6	1.1	-3.0	
<i>Attendance rate</i>						
Nicaragua	79.1	87.6	93.8	94.1	95.1	88.7
Honduras	87.3	91.8	93.2	94.2	91.4	91.4
Difference	-8.2	-4.2	0.6	-0.1	3.8	-2.6
<i>Public attendance rate</i>						
Nicaragua	99.8	98.9	94.9	84.8	55.1	90.0
Honduras	99.9	99.5	97.9	93.9	65.7	93.7
Difference	-0.1	-0.5	-2.9	-9.1	-10.6	-3.8
<i>Estimated incidence</i>						
Nicaragua	25.9	24.7	23.5	18.3	7.7	100.0
Honduras	25.0	23.6	23.2	17.8	10.4	100.0
Difference	0.9	1.1	0.2	0.5	-2.7	
<i>Effects</i>						
1. Potential user	1.5	0.5	-0.9	1.0	-2.1	
2. Attendance	-1.7	-0.4	0.9	0.5	0.6	
3. Public	1.1	0.9	0.3	-1.1	-1.2	

Source: Author's calculations based on 2005 EMNV data.

**Table 4.18: Breakdown of distributional incidence results Nicaragua, 1993-2005 Public primary education**

	1	2	3	4	5	Total
<i>Children's distribution</i>						
1993	25.1	22.6	17.7	18.8	15.8	100.0
2005	26.2	22.8	21.1	18.3	11.8	100.0
Difference	1.0	0.2	3.4	-0.6	-4.0	
<i>Attendance rate</i>						
1993	56.6	72.3	82.7	90.1	91.3	76.5
2005	79.1	87.6	93.8	94.1	95.1	91.4
Difference	22.5	15.3	11.1	4.0	3.9	14.8
<i>Public attendance rate</i>						
1993	99.5	96.5	96.0	83.5	70.9	89.3
2005	99.8	98.9	94.9	84.8	55.1	93.7
Difference	0.3	2.4	-1.1	1.3	-15.8	4.5
<i>Estimated incidence</i>						
1993	20.7	23.1	20.5	20.7	15.0	100.0
2005	25.9	24.7	23.5	18.3	7.7	100.0
Difference	5.1	1.6	3.0	-2.5	-7.2	
<i>Effects</i>						
1. Potential user	0.6	-0.1	3.6	-0.8	-3.3	
2. Attendance	4.0	0.6	-0.9	-2.4	-1.4	
3. Public	0.5	1.1	0.2	0.7	-2.5	

Source: Author's calculations based on 1993 and 2005 EMNV data.

**Table 4.19: High school education Attendance rates**

Age	12	13	14	15	16	17	18	19	20	[13-15]	[16-18]
Total	24.7	39.2	49.1	49.7	49.5	39.0	24.0	18.2	11.8	46.0	37.6
Quintiles											
1	8.1	11.6	17.6	23.0	19.7	14.9	9.5	16.5	5.3	17.4	15.3
2	10.1	24.2	33.0	38.5	26.9	30.1	19.4	13.0	11.1	31.9	25.6
3	26.2	39.9	59.7	47.0	62.2	53.6	30.3	16.5	13.7	48.7	48.6
4	36.2	60.7	71.3	67.8	71.8	51.8	28.9	25.7	16.7	66.6	50.1
5	57.8	74.3	80.5	85.7	84.0	53.0	29.9	19.3	11.7	80.1	53.7
Extreme poor	10.6	10.9	18.0	19.9	22.9	11.7	8.1	14.4	5.5	16.1	15.0
Moderate poor	10.8	26.5	33.8	38.6	30.6	34.0	20.1	15.2	11.6	33.0	28.5
Poor	10.7	21.3	28.7	32.8	28.0	26.7	16.6	14.9	9.4	27.6	24.1
Non-poor	38.7	59.5	71.7	67.6	73.0	52.0	29.8	20.6	13.6	66.3	50.6
Rural	10.7	22.4	31.6	32.5	30.7	23.2	17.9	13.9	9.0	28.6	24.2
Urban	37.7	57.6	66.1	64.3	67.1	52.6	28.9	21.3	13.6	62.8	49.2
Managua	41.6	63.8	72.1	63.8	74.8	62.6	25.0	23.7	12.4	66.6	66.6
Pacific	29.2	42.6	53.8	61.9	54.6	41.1	21.6	18.6	10.6	53.0	53.0
Central	16.7	33.5	42.0	37.4	37.6	28.1	27.1	12.7	10.6	37.7	37.7
Atlantic	6.7	16.3	29.7	33.2	32.5	24.0	20.3	17.6	16.4	26.4	26.4
Observations	1143	1035	1009	1048	916	834	806	763	783	3092	2556
Expanded observations	154613	132866	133343	136166	124296	114869	120681	115977	116112	402375	359846

Source: Author's calculations based on 2005 EMNV data.

**Table 4.20: High school education School system**

Non-autonomous public sch.	30.4
Autonomous school	45.8
Community school	0.0
Private sch. with subsidy	9.3
Private sch. without subsidy	14.3
Other	0.1
<b>Total</b>	<b>100.0</b>

Source: Author's calculations based on 2005 EMNV data.

**Table 4.21: High school education Reasons for non-attendance (13-18 years of age)**

Number of observations

	[13,18]	Pr Poor				Area	
		Extreme	Not extreme	Poor	Non-poor	Rural	Urban
1. Because of age	9	4	2	6	3	7	2
2. Not interested	502	132	210	342	160	343	159
3. Finished studies	3	2	0	2	1	2	1
4. Domestic job	116	43	46	89	27	86	30
5. Rural work/labor	456	163	186	349	107	346	110
6. Class full	7	2	3	5	2	4	3
7. Grade level not provided	50	8	26	34	16	49	1
8. School far from home	84	33	33	66	18	84	0
9. No teachers to attend	4	1	1	2	2	4	0
10. Too unsafe	13	4	6	10	3	12	1
11. Pregnancy	59	14	22	36	23	38	21
12. Children's care	84	24	37	61	23	48	36
13. Family problems	80	18	33	51	29	53	27
14. Economic problems	577	171	272	443	134	374	203
15. Other	101	27	34	61	40	65	36
<b>Total</b>	<b>2145</b>	<b>646</b>	<b>911</b>	<b>1557</b>	<b>588</b>	<b>1515</b>	<b>630</b>

Source: Author's calculations based on 2005 EMNV data.

**Table 4.22: High school education - Reasons for non-attendance and reasons for returning to school (13-18 years of age)**

Number of observations

	Food program	Grants	Sch. Mat. offered	Adults program	Credits	Nursery	Better timetable	Better security	Finished studies	No case	Other	Total [13.18]
1. Because of age	0	2	0	5	0	0	0	0	0	2	0	9
2. Not interested	1	20	5	12	1	1	5	1	0	449	8	503
3. Finished studies	0	0	0	1	0	0	0	0	1	1	0	3
4. Domestic job	0	23	6	27	1	3	11	0	0	44	1	116
5. Rural work/labor	0	94	15	99	1	0	62	0	1	180	2	454
6. Class full	0	1	0	1	0	0	1	0	0	0	4	7
7. Grade level not provided	0	1	0	19	2	0	2	2	0	1	23	50
8. School far from home	0	9	1	13	0	0	2	2	0	4	53	84
9. No teachers to attend	0	0	0	0	0	0	0	0	0	0	4	4
10. Too unsafe	0	1	0	0	0	0	1	4	0	0	7	13
11. Pregnancy	0	10	0	6	0	14	2	0	0	22	5	59
12. Children's care	0	12	1	11	0	25	7	0	0	24	4	84
13. Family problems	0	26	6	11	2	1	4	5	0	15	10	80
14. Economical problems	0	461	64	24	7	1	2	0	0	15	3	577
15. Other	0	5	1	11	0	0	1	0	0	41	42	101
Observations	1	665	99	240	14	45	100	14	2	798	166	

Source: Author's calculations based on 2005 EMNV data.

**Table 4.23: High school education Characterization**

	Public %	Private % with subsidy	% in autonomous schools	Number of absences	% of those repeating	% contribution to school in work	Quality evaluation [0-5]	Time to get to school	% public transport
Total	76.3	39.4	45.8	0.7	6.0	2.5	2.0	23.4	24.1
Quintiles									
1	92.8	82.2	49.1	0.6	6.7	1.8	1.9	34.5	16.9
2	90.2	68.3	47.3	0.6	6.6	2.4	2.0	30.4	21.5
3	85.5	47.4	48.5	0.4	5.9	2.7	1.9	24.1	18.6
4	75.0	35.6	48.3	0.9	6.4	1.4	1.9	20.7	26.5
5	56.0	33.1	38.9	0.8	5.2	3.9	2.1	17.5	30.4
Extreme poor	94.5	86.6	50.8	0.7	5.2	0.2	1.9	35.0	13.3
Moderate poor	89.7	62.3	46.1	0.5	6.2	2.6	1.9	29.1	19.8
Poor	90.7	65.3	47.0	0.5	6.0	2.1	1.9	30.4	18.5
Non-poor	69.9	35.8	45.2	0.8	6.0	2.7	2.0	20.2	26.6
Rural	88.8	63.7	47.2	0.5	4.7	3.0	1.9	41.5	33.4
Urban	71.1	35.4	45.2	0.8	6.6	2.3	2.0	15.7	20.2
Managua	71.2	33.0	50.8	1.0	7.8	3.2	1.9	18.3	31.7
Pacific	77.4	31.0	44.3	0.6	5.4	2.3	2.0	21.3	23.0
Central	80.7	60.5	45.6	0.6	5.3	2.3	2.0	28.2	21.5
Atlantic	76.3	40.5	35.9	0.5	4.8	1.9	1.9	31.8	12.2
Observations	2862	623	2867	2772	2867	2866	2857	2866	2867
Expanded observations	435450	103008	436060	419622	436060	436044	434735	435884	436060

Source: Author's calculations based on 2005 EMNV data.

Table 4.24: High school education Distributional incidence

	Structure %	Spending		
		total C\$ M	per inhabitant C\$	as % of consumption
	(i)	(ii)	(iii)	(iv)
1	10.7	26.2	25.5	0.8
2	18.4	45.1	43.8	0.8
3	25.6	62.8	61.0	0.8
4	26.2	64.3	62.5	0.6
5	19.2	47.0	45.7	0.2
<b>Average</b>	<b>100.0</b>	<b>245.4</b>	<b>47.7</b>	<b>0.5</b>

Source: Author's calculations based on 2005 EMNV data.

**Table 4.25: High school education Breakdown of distributional incidence results**

	1	2	3	4	5	Total
Youth [13-17] (% of total)	22.3	23.6	20.0	18.1	15.9	100.0
High school attendance rate	17.4	30.7	52.3	65.0	75.7	45.5
Public school attendance rate	92.3	89.4	87.1	73.4	56.7	76.3
Estimated incidence	10.4	18.6	26.3	25.0	19.7	100.0
Difference	-9.6	-1.4	6.3	5.0	-0.3	0.0
<b>Effects</b>						
1. Potencial user	1.8	3.4	0.5	-1.6	-4.0	0.0
2. Attendance	-13.9	-7.3	3.3	7.9	10.1	0.0
3. Public	2.4	2.5	2.5	-1.2	-6.2	0.0

Source: Author's calculations based on 2005 EMNV data.

**Table 4.26: Regional breakdown of distributional incidence results High school education**

	1	2	3	4	5	Total
<i>Distribution of youth</i>						
Managua	7.2	11.3	21.5	26.2	33.9	100.0
Pacific	15.0	27.6	23.8	20.4	13.2	100.0
Central	34.2	24.0	16.7	13.7	11.5	100.0
Atlantic	29.9	30.3	18.1	13.4	8.3	100.0
Nicaragua	22.3	23.6	20.0	18.1	15.9	100.0
<i>Attendance rate</i>						
Managua	33.1	33.0	63.8	75.3	77.1	67.4
Pacific	22.3	35.6	58.2	67.6	79.5	51.3
Central	13.6	29.7	45.0	58.3	76.0	36.0
Atlantic	10.1	22.6	34.4	47.0	56.0	27.1
Nicaragua	17.4	30.7	52.3	65.0	75.7	45.5
<i>Public attendance rate</i>						
Managua	100.0	78.5	87.2	66.7	59.2	70.6
Pacific	91.5	93.5	91.3	71.4	49.0	77.7
Central	90.5	89.2	82.7	85.6	61.4	80.5
Atlantic	87.1	86.0	80.5	74.2	54.0	76.6
Nicaragua	92.3	89.4	87.1	73.4	56.7	76.3
<i>Estimated incidence</i>						
Managua	5.2	6.4	26.0	28.7	33.7	100.0
Pacific	7.7	23.0	31.7	24.7	12.9	100.0
Central	14.6	21.9	21.4	23.6	18.5	100.0
Atlantic	12.7	28.3	24.2	22.6	12.2	100.0
Nicaragua	10.4	18.6	26.3	25.0	19.7	100.0
<i>Comparison Managua-Atlantic</i>						
	1	2	3	4	5	Total
<i>Estimated incidence</i>						
Atlantic	12.7	28.3	24.2	22.6	12.2	100.0
Managua	5.2	6.4	26.0	28.7	33.7	100.0
Difference	7.5	22.0	-1.9	-6.1	-21.6	
<i>Effects</i>						
1. Potencial user	15.4	17.3	1.8	-10.4	-24.1	
2. Attendance	-6.6	3.0	-1.9	1.3	4.2	
3. Public	-1.4	1.6	-1.6	3.1	-1.7	

**Table 4.27: Breakdown of distributional incidence results Nicaragua-Honduras  
Comparison High school education**

	1	2	3	4	5	Total
<i>Distribution of youth</i>						
Nicaragua	22.3	23.6	20.0	18.1	15.9	100.0
Honduras	20.2	21.2	19.1	20.3	19.2	100.0
Difference	2.1	2.4	0.9	-2.2	-3.2	
<i>Attendance rate</i>						
Nicaragua	17.4	30.7	52.3	65.0	75.7	45.5
Honduras	7.2	21.2	38.8	61.3	78.0	41.3
Difference	10.2	9.5	13.5	3.7	-2.2	4.1
<i>Public attendance rate</i>						
Nicaragua	92.3	89.4	87.1	73.4	56.7	76.3
Honduras	77.8	82.7	84.3	80.9	53.0	71.4
Difference	14.5	6.7	2.8	-7.5	3.7	4.9
<i>Estimated incidence</i>						
Nicaragua	10.4	18.6	26.3	25.0	19.7	100.0
Honduras	3.9	12.8	21.5	34.6	27.2	100.0
Difference	6.5	5.9	4.8	-9.7	-7.5	
<i>Effects</i>						
1. Potential user	0.9	2.3	2.1	-2.1	-3.3	
1. Attendance	4.5	2.7	2.4	-4.2	-5.4	
1. Public	1.0	0.9	0.3	-3.4	1.2	

Source: Author's calculations based on 2005 EMNV data.

**Table 4.28: Breakdown of distributional incidence results Nicaragua, 1993-2005  
High school education**

	1	2	3	4	5	Total
<i>Distribution of youth</i>						
1993	21.6	21.0	21.2	18.7	17.5	100.0
2005	22.3	23.6	20.0	18.1	15.9	100.0
Difference	0.8	2.5	-1.2	-0.5	-1.5	
<i>Attendance rate</i>						
1993	3.7	12.6	19.9	38.2	47.0	23.0
2005	17.4	30.7	52.3	65.0	75.7	45.5
Difference	13.7	18.1	32.4	26.8	28.7	22.4
<i>Public attendance rate</i>						
1993	99.1	63.7	74.6	75.5	62.3	70.1
2005	92.3	89.4	87.1	73.4	56.7	76.3
Difference	-6.7	25.7	12.6	-2.1	-5.6	6.2
<i>Estimated incidence</i>						
1993	4.9	10.4	19.5	33.4	31.7	100.0
2005	10.4	18.6	26.3	25.0	19.7	100.0
Difference	5.5	8.2	6.8	-8.5	-12.0	
<i>Effects</i>						
1. Potential user	0.5	2.0	-0.8	0.0	-1.6	
2. Attendance	6.0	2.1	5.0	-6.3	-6.8	
3. Public	-0.9	4.1	2.5	-2.2	-3.5	

Source: Author's calculations based on 2005 EMNV data.

**Table 4.29: Technical Education Distributional incidence**

	Structure %	Spending		
		total C\$ Mill.	per inhabitant C\$	as % of consump.
	(i)	(ii)	(iii)	(iv)
1	4.5	2.9	2.9	0.1
2	8.6	5.6	5.4	0.1
3	19.5	12.7	12.3	0.2
4	30.4	19.7	19.2	0.2
5	36.9	23.9	23.2	0.1
<b>Average</b>	<b>100.0</b>	<b>64.7</b>	<b>12.6</b>	<b>0.1</b>

Source: Author's calculations based on 2005 EMNV data.

**Table 4.30: University education Attendance rates**

Age	18	19	20	21	22	23	24	25	[19-25]
Total	10.8	12.8	12.3	13.5	9.3	10.7	8.0	5.5	10.5
Quintiles									
1	0.0	0.2	0.5	2.5	0.5	0.0	0.9	1.7	0.9
2	1.6	0.6	2.5	0.1	3.8	3.0	1.4	0.0	1.7
3	3.8	6.9	7.4	10.0	5.6	5.8	1.8	7.0	6.4
4	13.9	15.7	14.9	15.8	11.4	13.8	4.0	3.9	11.8
5	33.6	37.7	35.9	37.6	24.8	27.5	26.5	12.5	29.2
Extreme poor	0.0	0.0	0.6	1.0	0.0	0.0	1.4	1.4	0.6
Moderate poor	1.8	1.3	2.4	2.4	3.7	2.2	1.0	0.7	2.0
Poor	1.3	0.9	1.8	1.9	2.7	1.6	1.1	0.9	1.6
Non-poor	18.2	21.9	20.5	21.8	14.4	17.0	13.1	9.1	17.2
Rural	3.0	5.5	4.5	4.8	3.7	3.3	1.9	4.6	4.1
Urban	17.0	18.3	17.4	19.2	12.8	14.8	12.2	6.2	14.8
Managua	17.7	19.7	14.2	18.0	9.9	14.3	12.2	7.2	14.1
Pacific	13.8	10.4	17.1	17.2	9.9	8.4	9.1	5.6	11.3
Central	5.8	13.4	8.9	9.4	9.4	13.1	4.5	5.3	9.2
Atlantic	1.8	2.6	3.3	3.5	5.4	3.2	4.9	2.3	3.6
Observations	806	763	783	691	726	733	665	613	4974
Expanded observations	120681	115977	116112	107493	106786	110800	104221	84362	745751

Source: Author's calculations based on 2005 EMNV data.

**Table 4.31: University education**

Non-autonomous public sch.	0.4
Autonomous school	32.8
Private school with subsidy	18.1
Private school without subsidy	48.7
<b>Total</b>	<b>100.0</b>

Source: Author's calculations based on 2005 EMNV data.

**Table 4.32: University education Reasons for non-attendance (19-25 years of age)**

Number of observations

	[19,25]	P <sub>t</sub> Poor				Area	
		extreme	non-extreme	Poor	Non-poor	Rural	Urban
1. Because of age	14	5	6	11	3	10	4
2. Not interested	531	100	221	321	210	318	213
3. Finished studies	42	1	1	2	40	8	34
4. Household duties	175	40	66	106	69	114	61
5. Rural work/labor	939	209	345	554	385	525	414
6. Class full	6	1	1	2	4	2	4
7. Grade level not provided	35	6	17	23	12	32	3
8. School far from home	34	13	14	27	7	32	2
9. No teachers to attend	3	0	2	2	1	3	0
10. Too unsafe	5	3	1	4	1	5	0
11. Pregnancy	60	6	24	30	30	25	35
12. Child's care	258	53	102	155	103	131	127
13. Family problems	56	8	16	24	32	17	39
14. Economic problems	587	99	227	326	261	266	321
15. Other	71	7	20	27	44	30	41
<b>Total</b>	<b>2816</b>	<b>551</b>	<b>1063</b>	<b>1614</b>	<b>1202</b>	<b>1518</b>	<b>1298</b>

Source: Author's calculations based on 2005 EMNV data.

**Table 4.33: University education (19-25 years of age) - Reasons for non-attendance and reasons for returning to university**

Number of observations

	Food program	Grants	Sch. Mat. offered	Adults program	Credits	Nursery	Better timetable	More security	Finished studies	No case	Other	Total [18,23]
1. Because of age	0	1	0	11	0	0	0	0	0	2	0	14
2. Not interested	0	22	0	16	2	3	2	1	0	483	4	533
3. Finished studies	0	2	0	0	1	0	0	0	33	6	0	42
4. Household duties	0	29	2	40	1	10	18	0	1	72	2	175
5. Rural work/labor	0	209	16	191	3	6	155	3	3	340	11	937
6. Class full	0	2	0	1	0	0	0	1	0	0	2	6
7. Grade level not provided	0	3	0	14	0	0	1	0	0	2	15	35
8. School far from home	0	5	1	12	0	0	0	0	0	0	16	34
9. No teachers to attend	0	0	0	2	0	0	0	0	0	0	1	3
10. Too unsafe	0	2	0	1	0	0	0	1	0	0	1	5
11. Pregnancy	0	16	0	6	2	13	4	0	0	9	10	60
12. Child's care	0	44	3	32	1	55	13	1	1	104	4	258
13. Family problems	0	28	1	2	2	4	5	0	0	11	3	56
14. Economical problems	0	479	26	34	10	1	4	1	0	24	9	588
15. Other	0	6	0	5	1	0	2	0	1	29	27	71
<b>Observations</b>	<b>0</b>	<b>848</b>	<b>49</b>	<b>367</b>	<b>23</b>	<b>92</b>	<b>204</b>	<b>8</b>	<b>39</b>	<b>1082</b>	<b>105</b>	<b>2817</b>

Source: Author's calculations based on 2005 EMNV data.

**Table 4.34: University education Characterization**

	Public %	Private % with subsidy	Quality evaluation [0-5]	Time to get to school	% public transp.
Total	33.2	27.1	2.3	47.2	82.3
Quintiles					
1	32.7	65.2	2.1	48.1	69.5
2	38.1	65.9	2.4	49.5	85.0
3	42.8	24.4	2.2	55.7	89.9
4	37.1	27.2	2.3	55.1	78.6
5	30.0	25.0	2.3	43.1	82.3
Extreme poor	42.5	26.0	2.0	29.4	57.5
Moderate poor	37.4	61.6	2.3	50.6	83.5
Poor	37.9	58.4	2.3	48.6	80.9
Non-poor	32.9	25.3	2.3	47.1	82.4
Rural	35.9	27.1	2.3	66.5	87.6
Urban	32.7	27.1	2.3	44.0	81.4
Managua	28.1	24.4	2.2	38.9	87.2
Pacific	38.5	21.3	2.3	49.0	82.6
Central	32.0	37.7	2.3	60.6	77.0
Atlantic	49.8	40.0	2.2	42.7	61.6
Observations	705	470	703	695	698
Expanded observations	127476	85188	126921	126038	126317

Source: Author's calculations based on 2005 EMNV data.

**Table 4.35: University education Distributional incidence**

	Structure (i)	Spending (ii)	Spending p/c (iv)	% consump. (vi)
1	1.1	11.1	10.8	0.3
2	4.0	41.6	40.4	0.8
3	14.0	146.9	142.8	1.9
4	23.1	242.4	235.7	2.2
5	57.9	608.7	591.8	2.5
Average	100.0	1050.6	204.3	2.0

Source: Author's calculations based on 2005 EMNV data.

**Table 4.36: University education Breakdown of distributional incidence results**

	1	2	3	4	5	Total
Youth [18-25] (% of total)	17.9	19.4	22.0	20.2	20.5	100.0
University attendance rate	0.6	1.9	6.6	14.2	33.0	11.6
Public attendance rate	21.1	31.5	42.4	36.4	28.0	31.9
Estimated incidence	0.6	3.2	16.6	28.4	51.2	100.0
Difference	-19.4	-16.8	-3.4	8.4	31.2	0.0
1. Potential user	-1.0	-0.4	1.6	-0.2	0.0	0.0
2. Attendance	-14.8	-16.2	-10.3	5.4	36.0	0.0
3. Public	-3.4	-0.2	5.4	3.1	-4.8	0.0

Source: Author's calculations based on 2005 EMNV data.

**Table 4.37: Breakdown of distributional incidence results - Nicaragua-Honduras comparison**

University education

	1	2	3	4	5	Total
<i>Distribution of youth</i>						
Nicaragua	17.9	19.4	22.0	20.2	20.5	100.0
Honduras	16.1	18.1	20.5	22.4	22.9	100.0
Difference	1.7	1.3	1.6	-2.2	-2.4	
<i>Attendance rate</i>						
Nicaragua	0.6	1.9	6.6	14.2	33.0	11.6
Honduras	0.0	0.5	1.7	4.8	25.8	7.7
Difference	0.6	1.4	4.9	9.4	7.2	3.9
<i>Public attendance rate</i>						
Nicaragua	21.1	31.5	42.4	36.4	28.0	31.9
Honduras	100.0	100.0	85.6	97.3	74.4	79.1
Difference	-78.9	-68.5	-43.2	-60.9	-46.4	-47.1
<i>Estimated incidence</i>						
Nicaragua	0.6	3.2	16.6	28.4	51.2	100.0
Honduras	0.0	1.7	5.0	18.0	75.3	100.0
Difference	0.6	1.5	11.6	10.3	-24.1	
<i>Effects</i>						
1. Potential user	0.1	0.4	1.5	-0.4	-1.6	
2. Attendance	0.8	1.6	7.5	11.4	-21.3	
3. Public	-0.2	-0.5	2.5	-0.6	-1.1	

Source: Author's calculations based on 2005 EMNV data.

**Table 4.38: Education Incidence by quintiles**

	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5	Total
<i>Structure (%)</i>						
Consumption	6.3	10.4	14.8	21.8	46.8	100.0
Education - SPE	17.9	18.6	20.0	19.9	23.6	100.0
Education - PRS	24.5	24.4	22.6	18.7	9.8	100.0
<i>Spending (millions of cordobas)</i>						
Education - SPE	662	688	740	735	871	3696
Education - PRS	623	620	573	474	249	2540
<i>Spending per inhabitant (cordobas)</i>						
Education - SPE	644	669	720	714	847	719
Education - PRS	606	602	557	461	243	494
<i>Spending as % of consumption</i>						
Education - SPE	20.5	12.8	9.7	6.5	3.6	7.2
Education - PRS	19.3	11.6	7.5	4.2	1.0	4.9

Source: Author's calculations based on 2005 EMNV data.

**Table 4.39: Education - Incidence by poverty levels**

	Poor		Total poor	Non-poor	Total
	extreme	moderate			
<i>Structure (%)</i>					
Consumption	4.3	16.3	20.6	79.4	100.0
Education - SPE	13.1	29.0	42.2	57.8	100.0
Education - PRS	18.1	38.0	56.1	43.9	100.0
<i>Spending (millions of cordobas)</i>					
Education - SPE	486	1073	1559	2137	3696
Education - PRS	459	966	1425	1115	2540
<i>Spending per inhabitant (cordobas)</i>					
Education - SPE	637	666	657	772	719
Education - PRS	602	600	600	403	494
<i>Spending as % of consumption</i>					
Education - SPE	22.0	12.8	14.7	5.2	7.2
Education - PRS	20.7	11.5	13.4	2.7	4.9

Source: Author's calculations based on 2005 EMNV data.

**Table 4.40: Concentration indices - Confidence intervals**

	Index	stand. deviat.	var. coeff.	Confidence interval 95%	
				Lower limit	Upper limit
Preschool	-7.7	1.0	-0.13	-9.3	-4.7
Public primary school	-20.1	0.4	-0.02	-20.9	-19.5
Private subsidized primary school	51.0	1.9	0.04	47.2	53.9
Public high school	10.0	0.7	0.07	8.8	11.2
Private subsidized high school	35.6	2.0	0.06	31.6	38.9
Adults	-32.5	2.0	-0.06	-37.4	-29.7
Technical education	32.6	6.1	0.19	19.7	44.3
Public universities	56.8	1.4	0.03	53.9	59.3
Private subsidized superior educ	57.0	2.2	0.04	52.6	61.5

**Table 4.41: Education Concentration and progressivity indices and redistributive impact**

	Concentration	Progressivity	Spending	Redistribution
	rate (i)	rate (ii)	(Consumption %) (iii)	impact (iv)
Consumption	40.1	-		
Preschool	-7.7	47.7	0.1	0.03
Public primary school	-20.1	60.2	2.7	1.62
Private subsidized primary school	51.0	-10.9	0.1	-0.01
Public high school	10.0	30.0	0.5	0.14
Private subsidized high school	35.6	4.5	0.0	0.00
Adults	-32.5	72.6	0.2	0.15
Technical education	32.6	7.5	0.1	0.01
Public universities	56.8	-16.7	1.9	-0.32
Private subsidized superior educ.	57.0	-16.9	0.1	-0.02
Total SPE	5.4	34.7	7.2	2.48
Total PRS	-15.0	55.0	4.9	2.71

Source: Author's calculations based on 2005 EMNV data.

**Table 4.42: Education Comparison with Honduras***Structure in percentage terms*

	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5	Total
<i>Nicaragua</i>						
Consumption	6.3	10.4	14.8	21.8	46.8	100.0
Education - SPE	17.9	18.6	20.0	19.9	23.6	100.0
Education - PRS	24.5	24.4	22.6	18.7	9.8	100.0
<i>Honduras</i>						
Consumption	4.7	8.5	13.8	21.9	51.1	100.0
Education - SPE	17.9	18.6	18.5	20.9	24.0	100.0
Education - PRS	21.8	22.0	21.4	21.0	13.9	100.0

*Concentration rates*

	Nicaragua	Honduras
Consumption	40.1	45.9
Preschool	-7.7	-8.3
Primary	-20.1	-17.1
High school	10.0	29.0
Adults	-32.5	-22.8
Universities	56.8	70.2
Total SPE	5.4	6.5
Total PRS	-15.0	-7.0

Source: Author's calculations based in *Gasparini et al.* (2005).**Table 5.1: Health sector indicators Nicaragua**

	Nicaragua	Honduras
<b>1. Health condition</b>		
Life expectancy years (men)	67	65
Life expectancy years (women)	71	70
Infant mortality rate for every 1000 live births	31	31
<b>2. Health spending</b>		
Total health spending as % of GDP	7.7	7.1
Spending per capita in US\$	208	184
Public spending per capita in US\$	101	104
<b>3. Human resources availability</b>		
Number of physicians	2,045	3,676
Physicians for every 1000 inhab	0.374	0.569
Nurses	5,862	8,333
Nurses for every 1000 inhab	1.072	1.291
Dentists	243	1,371
Dentists for every 1000 inhab	0.044	0.212

Source: Author's calculations based on *World Health Statistics 2006* and *The World Health Report 2006 Edition*.

**Table 5.2: Public spending program distribution in health sector Nicaragua, 2005**

<b>Public Social Expenditure</b>		
	millions C\$	%
Total	2,750	100.0
Promotion, prevention, education and health information	256	9.3
Public health care services	1,745	63.4
Environmental health services	3	0.1
Central level and shared activities	656	23.8
Other	91	3.3

<b>PRS</b>		
	millions C\$	%
Total	2,165	100.0
Promotion, prevention, education and health information	128	5.9
Health care services	1,857	85.8
Environmental health services	3	0.1
Central level and shared activities	113	5.2
Other	65	3.0

Source: Author's calculations based on information provided by the MHCP and INSS.

**Table 5.3: Information campaigns Coverage rate**

Percentage of persons whose families receive health information

	%
<b>Total</b>	<b>68.0</b>
Quintiles	
1	58.9
2	64.3
3	70.4
4	73.5
5	73.1
Extreme poor	58.0
Non extreme poor	64.9
Poor	62.7
Non poor	72.6
Rural	54.4
Urban	78.8
Managua	78.5
Pacific	71.1
Central	63.6
Atlantic	53.5
Indigenous groups	75.5
Other	67.8
Observations	36550

Source: Author's calculations based on 2005 EMNV data.

**Table 5.4: Promotion, prevention, education and health information services Incidence**

	Information campaigns	Vaccinations	Prevention services	Spending		Spending per inhab.		% of consump.	
	(i)	(ii)	(iii)	PSE (iv)	PRS (v)	PSE (vi)	PRS (vii)	PSE (viii)	PRS (ix)
1	17.4	25.9	19.9	51.0	25.5	49.7	24.9	1.6	0.8
2	19.0	22.3	20.3	52.1	26.0	50.8	25.4	1.0	0.5
3	20.7	20.9	21.5	55.0	27.5	53.6	26.8	0.7	0.4
4	21.6	17.5	20.5	52.6	26.3	51.3	25.6	0.5	0.2
5	21.3	13.4	17.7	45.4	22.7	44.3	22.1	0.2	0.1
Average	100.0	100.0	100.0	256.0	128.0	49.9	25.0	0.5	0.2

Source: Author's calculations based on 2005 EMNV data.

**Table 5.5: Promotion, prevention, education and health information services Concentration rate**

	Information campaigns	Vaccinat.	Prevention services
Index	4.73	-12.74	-1.50
standard error	0.26	1.74	0.40
var. coeff	0.06	-0.14	-0.27
confidence interval			
Lower limit	4.20	-9.96	-2.32
Upper limit	5.23	-16.95	-0.78

Source: Author's calculations based on 2005 EMNV data.

**Table 5.6: Vaccinations - Coverage rate**

	Proportion of children under 6 years of age (i)	Proportion of children vaccinated (ii)	Proportion of children vaccinated in 2005 (iii)
<b>Total</b>	<b>12.7</b>	<b>94.9</b>	<b>11.1</b>
Quintiles of consump.			
1	16.4	92.4	10.7
2	14.3	95.2	9.9
3	12.6	94.8	13.4
4	11.6	96.9	12.5
5	8.7	96.9	9.0
Extreme poor	16.4	94.3	10.7
Non extreme poor	14.6	92.9	10.3
Poor	15.2	93.4	10.5
Non poor	10.6	96.7	12.0
Rural	11.0	92.5	12.5
Urban	10.1	97.0	9.9
Managua	11.9	100.0	7.8
Pacific	11.8	94.5	11.9
Central	12.7	94.0	12.0
Atlantic	16.3	92.3	12.8
Observations	5013	1727	488

Source: Author's calculations based on 2005 EMNV data.

**Table 5.7: Vaccinations - Vaccination program coverage**

	Vaccination program fulfillment (i)	Number of doses received in 2005 (ii)
<b>Total</b>	<b>3.9</b>	<b>1.6</b>
Quintiles of consump.		
1	3.4	1.6
2	3.8	1.8
3	4.0	1.4
4	2.9	1.3
5	6.0	1.9
Extreme poor	3.7	1.7
Non extreme poor	3.5	1.7
Poor	3.6	1.7
Non poor	4.2	1.5
Rural	3.4	1.6
Urban	4.3	1.5
Managua	5.2	1.7
Pacific	3.5	1.5
Central	2.8	1.7
Atlantic	4.6	1.4
Observations	4943	487

Source: Author's calculations based on 2005 EMNV data.

**Table 5.8: Vaccinations Comparison of distributional incidence with Honduras**

Quintiles	Nicaragua %	Honduras %
1	25.9	26.5
2	22.3	22.1
3	20.9	21.6
4	17.5	17.7
5	13.4	12.0
<b>Average</b>	<b>100.00</b>	<b>100.00</b>

Source: Author's calculations based on 2005 EMNV and *Gasparini et al* (2005)

**Table 5.9: Diarrheic diseases - Public incidence and coverage**

	Proportion of children under 6 years of age (i)	Proportion of children with diarrheic disease (ii)	Proportion of children having consulted a physician (iii)	Number of consultations (iv)	Health care in public facilities (v)
<b>Total</b>	<b>12.7</b>	<b>25.6</b>	<b>70.8</b>	<b>1.0</b>	<b>54.6</b>
Quintiles of consump.					
1	16.4	25.7	58.8	0.8	55.9
2	14.3	24.6	74.7	1.0	63.6
3	12.6	27.7	69.5	1.0	62.5
4	11.6	26.3	76.5	1.1	43.9
5	8.7	23.1	84.1	1.4	38.2
Extreme poor	16.4	26.5	56.8	0.7	54.4
Non extreme poor	14.6	25.1	72.9	1.0	64.4
Poor	15.2	25.6	67.0	0.9	60.8
Non poor	10.6	25.6	75.6	1.1	46.9
Rural	11.0	27.3	63.9	0.9	55.2
Urban	10.1	24.0	78.0	1.2	54.0
Managua	11.9	25.6	81.0	1.3	49.1
Pacific	11.8	23.8	75.2	1.1	53.7
Central	12.7	22.8	67.6	0.8	60.7
Atlantic	16.3	33.3	60.5	0.9	53.4
Indigenous groups	18.2	42.9	70.5	1.0	66.8
Other	12.5	24.4	71.3	1.0	53.3
Observations	5013	1300	809	1300	720

Source: Author's calculations based on 2005 EMNV data.

**Table 5.10: Diarrheic diseases Opportunity and monetary costs for receiving health care**

	Minutes taken to get to health center	Transport. expenses	Time spent waiting	Consultation expenses	Medicine expenses	Total expenses for diarrhea treatment
	(i)	(ii)	(iii)	(iv)	(v)	(vi)
<b>Total</b>	<b>35.5</b>	<b>10.0</b>	<b>57.8</b>	<b>52.7</b>	<b>97.1</b>	<b>159.9</b>
Quintiles of consump.						
1	49.7	4.3	56.1	23.3	33.1	60.7
2	33.2	7.0	56.1	17.6	57.9	82.6
3	35.7	6.1	67.2	15.2	94.0	115.3
4	26.6	18.3	54.0	92.1	124.2	234.6
5	29.7	17.6	55.1	94.5	187.1	299.2
Extreme poor	52.3	2.4	57.9	11.2	32.5	46.1
Non extreme poor	35.0	6.9	59.6	20.6	67.6	95.1
Poor	40.3	5.5	59.1	18.7	56.6	80.8
Non poor	30.3	14.9	56.5	79.6	128.5	222.9
Rural	55.1	10.3	56.5	40.6	82.5	133.5
Urban	19.3	9.8	59.0	59.3	107.9	177.0
Managua	22.3	17.3	62.0	36.1	117.9	171.3
Pacific	26.8	7.5	54.7	69.5	98.0	175.0
Central	53.9	7.6	60.8	79.7	88.2	175.6
Atlantic	39.6	7.2	52.6	38.0	84.5	129.8
Observations	877	249	877	139	599	599

Source: Author's calculations based on 2005 EMNV data.

**Table 5.11: Public health care services Incidence**

	Public health care for diarrhea cases	Health public services	Births at public health centers
	%	%	%
1	26.7	19.2	24.7
2	25.2	22.2	26.1
3	24.6	22.8	19.8
4	15.0	20.2	20.3
5	8.6	15.6	9.1
Average	100.0	100.0	100.0

Source: Author's calculations based on 2005 EMNV data.

**Table 5.12: Public health care services**

	# consul. for diarrhea	Health services	Births	Public health care
Index	-20.33	-3.95	-15.82	-7.46
standard error	1.21	0.63	1.06	0.57
var. coeff.	-0.06	-0.16	-0.07	-0.08
Confidence interval				
Lower limit	-17.82	-2.71	-18.39	-8.61
Upper limit	-22.31	-5.15	-13.57	-6.42

Source: Author's calculations based on 2005 EMNV data.

**Table 5.13: Diarrheic diseases Breakdown**

	1	2	3	4	5	Total
Children [0-6] (% of total)	25.9	22.5	19.8	18.2	13.6	100.0
Consultation rate	58.8	74.7	69.5	76.5	84.1	70.8
Public consultation rate	92.4	83.7	88.5	55.0	48.3	76.1
Estimated incidence	26.3	26.3	22.8	14.3	10.3	100.0
Difference	6.3	6.3	2.8	-5.7	-9.7	0.0
Effects						
1. Potential user	5.6	2.4	-0.5	-1.7	-5.8	0.0
2. Consultation	-4.4	1.2	-0.5	1.2	2.5	0.0
3. Public	5.0	2.7	3.7	-5.1	-6.3	0.0

Source: Author's calculations based on 2005 EMNV data.

**Table 5.14: Public health general services Need and coverage**

	Proportion of persons needing health care (i)	Proportion of persons receiving medical consult (ii)	Number of consultations (iii)	Consultations in public health centers (iv)
<b>Total</b>	<b>45.7</b>	<b>43.5</b>	<b>0.6</b>	<b>63.7</b>
Quintiles of consump.				
1	44.7	32.1	0.4	89.2
2	44.7	40.8	0.6	81.7
3	46.8	44.1	0.6	72.5
4	47.3	47.0	0.7	55.2
5	45.0	52.5	0.9	38.8
Extreme poor	43.9	31.9	0.4	89.6
Non extreme poor	45.3	39.2	0.5	82.1
Poor	44.8	36.9	0.5	84.1
Non poor	46.4	48.7	0.7	52.1
Rural	47.8	38.8	0.5	76.5
Urban	44.0	47.4	0.7	55.3
Managua	44.5	46.1	0.7	45.1
Pacific	43.1	46.6	0.7	64.6
Central	47.7	41.7	0.6	74.5
Atlantic	48.8	37.2	0.5	76.4
Indigenous groups	48.1	45.0	0.7	79.0
Other	45.7	43.5	0.6	62.7
Observations	15716	6498	7004	5146

Source: Author's calculations based on 2005 EMNV data.

**Table 5.15: Public health general services Opportunity and monetary costs for receiving health care**

	Minutes to get to health center	Transport. Expenses	Time spent waiting	Consultation expenses	Medicine expenses	Total consultation expenses
	(i)	(ii)	(iii)	(iv)	(v)	(vi)
<b>Total</b>	<b>43.9</b>	<b>15.8</b>	<b>58.4</b>	<b>242.2</b>	<b>117.2</b>	<b>375.2</b>
Quintiles of consump.						
1	65.3	7.8	62.4	23.0	35.5	66.2
2	46.6	9.5	65.7	704.6	56.8	771.0
3	43.2	14.3	60.5	55.6	87.2	157.1
4	38.4	17.4	55.1	404.4	125.3	547.2
5	35.9	24.4	52.5	124.3	251.7	400.4
Extreme poor	64.0	5.0	60.2	20.5	31.4	56.9
Non extreme poor	48.5	10.3	65.6	484.9	58.1	553.4
Poor	52.7	8.9	64.2	391.8	50.5	451.2
Non poor	38.8	19.8	55.1	201.3	165.6	386.7
Rural	73.0	19.0	62.7	479.8	87.8	586.6
Urban	24.5	13.7	55.5	103.8	141.3	258.7
Managua	29.8	13.0	62.2	80.7	151.4	245.1
Pacific	29.2	10.9	55.3	364.0	108.1	482.9
Central	58.0	15.5	62.1	148.1	106.6	270.1
Atlantic	74.4	35.2	47.3	648.1	106.6	789.9
Indigenous groups	74.1	47.9	47.3	97.3	124.9	270.2
Other	42.5	14.5	58.8	256.8	117.9	389.3
Observations	7091	2481	7094	1552	11612	11612

Source: Author's calculations based on 2005 EMNV data.

**Table 5.16: Public health general services Regional breakdown**

	1	2	3	4	5	Total
<i>Distribution of disease perception</i>						
Managua	2.0	7.9	20.4	30.5	39.2	100.0
Pacific	13.5	21.3	24.8	22.9	17.4	100.0
Central	31.4	22.1	17.9	15.2	13.5	100.0
Atlantic	29.3	28.8	18.9	13.9	9.1	100.0
Nicaragua	19.1	19.5	20.6	20.8	20.1	100.0
<i>Consultation rate</i>						
Managua	22.1	43.3	42.3	47.4	48.8	46.1
Pacific	33.8	43.9	47.5	48.9	55.6	46.6
Central	33.9	39.7	43.1	45.4	57.2	41.7
Atlantic	27.1	37.4	40.9	43.4	51.7	37.2
Nicaragua	32.1	40.8	44.1	47.0	52.5	43.5
<i>Public consultation rate</i>						
Managua	63.4	68.2	67.4	40.7	34.9	45.5
Pacific	90.7	77.9	71.0	56.5	39.5	64.3
Central	90.1	87.5	75.7	66.9	46.2	74.9
Atlantic	90.0	84.0	77.3	69.2	47.6	76.9
Nicaragua	89.8	81.7	72.3	54.5	39.7	64.6
<i>Estimated incidence</i>						
Managua	1.3	11.1	27.7	28.1	31.8	100.0
Pacific	13.9	24.3	28.0	21.1	12.7	100.0
Central	30.7	24.5	18.7	14.7	11.4	100.0
Atlantic	25.0	31.7	20.8	14.7	7.9	100.0
Nicaragua	19.6	23.1	23.4	19.0	14.9	100.0
<i>Comparison Managua-Atlantic</i>						
	1	2	3	4	5	Total
<i>Estimated incidence</i>						
Atlantic	25.0	31.7	20.8	14.7	7.9	100.0
Managua	1.3	11.1	27.7	28.1	31.8	100.0
Difference	23.6	20.6	-6.8	-13.4	-24.0	
<i>Effects</i>						
1. Potential user	20.1	25.1	-2.7	-16.9	-25.5	
2. Consultation	2.6	-2.7	-0.2	-1.3	1.7	
3. Public	0.9	-1.7	-3.9	4.8	-0.1	

Source: Author's calculations based on 2005 EMNV data.

**Table 5.17: Births Coverage of prenatal care**

	Proportion of fertile women	Proportion of women receiving prenatal checkups	Proportion of women receiving prenatal checkups with health care pers.	Proportion of women receiving prenatal checkups at public health centers
	(i)	(ii)	(iii)	(iv)
<b>Total</b>	<b>28.5</b>	<b>92.5</b>	<b>99.0</b>	<b>80.8</b>
Quintiles of consump.				
1	24.4	84.9	97.8	96.2
2	27.3	91.3	99.0	91.4
3	28.4	93.3	98.8	84.5
4	29.8	96.9	99.5	71.3
5	32.6	98.7	100.0	54.9
Extreme poor	24.7	83.8	97.1	95.9
Non extreme poor	26.8	90.9	99.0	91.2
Poor	26.1	88.6	98.4	92.7
Non poor	30.5	96.6	99.6	69.1
Rural	25.7	88.0	97.8	91.0
Urban	30.7	96.1	99.9	73.1
Managua	30.7	96.2	100.0	61.3
Pacific	29.4	95.7	99.7	84.6
Central	27.1	91.6	99.7	90.5
Atlantic	25.6	83.0	94.2	86.3
Observations	36550	3171	2872	2871

Source: Author's calculations based on 2005 EMNV data.

**Table 5.18: Births Coverage**

	Proportion of women w/ delivery attended by health personnel	Proportion of women paying for delivery services	Amount of childbirth expenses
	(i)	(iv)	(v)
<b>Total</b>	<b>81.3</b>	<b>49.6</b>	<b>297.1</b>
Quintiles of consump.			
1	59.4	34.1	199.3
2	78.2	44.4	181.3
3	86.2	50.1	245.4
4	93.2	59.0	271.5
5	97.0	70.3	577.0
Extreme poor	56.1	31.8	220.4
Non extreme poor	77.7	43.7	191.3
Poor	70.6	39.8	198.9
Non poor	92.7	60.5	369.0
Rural	63.2	45.5	248.9
Urban	96.0	53.4	334.4
Managua	97.8	63.5	248.8
Pacific	90.2	47.0	310.8
Central	76.1	46.7	330.8
Atlantic	50.7	42.3	293.9
Observations	3170	1160	525

**Table 5.19: Public health care aggregate Incidence**

	Structure %	Spending		Spending per inhab.		% of consump.	
		SPE	PRS	SPE	PRS	SPE	PRS
		(i)	(ii)	(iii)	(iv)	(v)	(vi)
1	20.8	363.6	386.9	354.7	377.3	11.2	12.0
2	23.1	402.5	428.2	392.6	417.6	7.5	8.0
3	22.7	396.5	421.9	386.8	411.5	5.2	5.5
4	19.4	337.8	359.4	329.5	350.5	3.0	3.2
5	14.0	244.6	260.3	238.6	253.8	1.0	1.1
Average	100.0	1745.1	1856.5	340.4	362.2	3.4	3.6

Source: Author's calculations based on 2005 EMNV data.

**Table 5.20: Health Incidence by quintiles**

	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5	Total
<i>Structure (%)</i>						
Consumption	6.3	10.4	14.8	21.8	46.8	100.0
Health - SPE	20.5	22.0	21.9	19.6	16.0	100.0
Health - PRS	20.7	22.6	22.4	19.5	14.7	100.0
<i>Spending (millions of cordobas)</i>						
Health - SPE	564	604	601	540	440	2750
Health - PRS	448	490	485	422	319	2165
<i>Spending per inhab. (cordobas)</i>						
Health - SPE	549	588	585	525	428	535
Health - PRS	436	477	472	410	310	421
<i>Spending as % of consump.</i>						
Health - SPE	17.5	11.3	7.9	4.8	1.8	5.3
Health - PRS	13.9	9.2	6.4	3.8	1.3	4.2

Source: Author's calculations based on 2005 EMNV data.

**Table 5.21: Health Concentration indices by program and for total spending  
Confidence intervals**

	Index	difference	var. coeff.	Confidence interval 95%	
				Low limit	Upper limit
Prevention	-1.5	0.4	-0.3	-2.3	-0.8
Public health care	-7.5	0.6	-0.1	-8.6	-6.4
Total PSE	-5.0	1.0	-0.2	-8.4	-4.0
Total PRS	-6.7	1.5	-0.2	-9.5	-3.5

Source: Author's calculations based on 2005 EMNV data.

**Table 5.22: Health Incidence by poverty level**

	Poor		Total poor	Non poor	Total
	extreme	moderate			
<i>Structure (%)</i>					
Consump.	4.3	16.3	20.6	79.4	100.0
Health - SPE	15.2	33.9	49.1	50.9	100.0
Health - PRS	15.3	34.9	50.2	49.8	100.0
<i>Spending (millions of cordobas)</i>					
Health - SPE	418	934	1351	1399	2750
Health - PRS	331	755	1087	1078	2165
<i>Spending per inhab. (cordobas)</i>					
Health - SPE	548	580	569	505	535
Health - PRS	435	469	458	389	421
<i>Spending as % of consump.</i>					
Health - SPE	18.9	11.1	12.7	3.4	5.3
Health - PRS	15.0	9.0	10.2	2.6	4.2

Source: Author's calculations based on 2005 EMNV data.

**Table 5.23: Health Concentration and progressivity indices, and redistributive**

	Concentration index (i)	Progressivity index (ii)	PSE (% consump.) (iii)	Redistributive impact (iv)
Consump.	40.1	-		
Prevention	-1.5	41.6	0.5	0.21
Public health care	-7.5	47.5	3.4	1.61
Total SPE	-5.0	45.1	5.3	2.40
Total PRS	-6.7	46.8	4.2	1.96

Source: Author's calculations based on 2005 EMNV data.

**Table 5.24: Health Comparison with Honduras**

<i>Structure in percentage terms</i>						
	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5	Total
<i>Nicaragua</i>						
Consump.	6.3	10.4	14.8	21.8	46.8	100.0
Health - SPE	20.5	22.0	21.9	19.6	16.0	100.0
Health - PRS	20.7	22.6	22.4	19.5	14.7	100.0
<i>Honduras</i>						
Consump.	4.7	8.5	13.8	21.9	51.1	100.0
Health - SPE	19.3	21.2	22.7	20.7	16.1	100.0
Health - PRS	20.7	22.1	23.3	19.8	14.1	100.0
<i>Concentration indices</i>						
	Nicaragua	Honduras				
Consump.	40.1	45.9				
Hospital health care	-7.5	0.3				
Total SPE	-5.0	-3.0				
Total PRS	-6.7	-6.6				

Source: Author's calculations based on 2005 EMNV data and Gasparini et al. (2005).

**Table 6.1: Social programs: public services and housing - Characterization (percentages)**

	Lighting		Street construction		Housing		
	Total	Pub.Sect.	Total	Pub. Sect.	Prop. Deeds	Programs	
					Total	Total	Pub. Sect.
Total	4.5	2.2	12.5	11.6	0.9	1.1	0.4
Quintiles							
1	0.6	0.4	2.9	2.5	0.2	2.0	0.3
2	1.9	1.0	5.9	5.2	0.5	1.5	0.5
3	5.2	2.5	10.4	10.1	1.0	0.8	0.4
4	7.8	3.9	17.5	16.4	1.9	1.1	0.8
5	5.2	2.5	19.1	17.7	0.9	0.4	0.2
Extreme poor	0.5	0.2	2.3	1.7	0.2	2.2	0.5
Moderate poor	2.4	0.9	6.3	5.7	0.3	1.3	0.3
Poor	1.8	0.7	5.2	4.6	0.3	1.5	0.4
Non poor	6.1	3.1	16.8	15.8	1.3	0.8	0.5
Rural	0.9	0.5	2.2	1.8	0.2	1.5	0.4
Urban	7.1	3.4	19.8	18.6	1.4	0.7	0.5
Managua	10.0	4.8	21.3	20.3	2.7	0.2	0.2
Pacific	3.8	1.6	11.4	11.0	0.2	0.6	0.2
Central	1.6	1.0	6.7	5.8	0.4	2.5	0.9
Atlantic	2.2	1.5	11.3	9.9	0.4	0.4	0.3
Indigenous groups	3.1	1.2	19.5	18.1	0.0	0.5	0.0
Others	4.4	2.2	12.1	11.3	1.0	1.1	0.4
Observations	6861	6861	6861	6861	6861	6861	6861
Expanded observations	984721	984721	984721	984721	984721	984721	984721

Source: Author's calculations based on 2005 EMNV data.

**Table 6.2: Domestic garbage collection - Characterization (percentages)**

	Garbage recollection								
	1	2	3	4	5	6	7	8	9
Total	42.5	0.5	30.7	4.7	19.3	0.7	1.0	0.7	0.0
Quintiles									
1	6.0	0.0	43.0	6.3	42.0	1.6	0.0	1.1	0.0
2	22.7	0.2	40.5	4.9	29.3	1.1	0.5	0.8	0.1
3	35.6	0.4	36.7	6.3	18.4	0.8	0.7	1.2	0.0
4	51.7	0.8	27.8	4.3	13.0	0.5	1.4	0.4	0.0
5	71.2	0.6	16.3	3.0	6.8	0.1	1.7	0.2	0.1
Extreme poor	4.9	0.0	42.6	6.3	43.9	1.3	0.0	1.1	0.0
Moderate poor	22.5	0.1	40.7	5.1	29.1	1.3	0.3	1.0	0.0
Poor	17.5	0.1	41.2	5.4	33.3	1.3	0.2	1.0	0.0
Non poor	57.2	0.7	24.4	4.3	11.1	0.4	1.5	0.5	0.1
Rural	1.3	0.2	50.0	7.9	37.8	1.3	0.0	1.5	0.0
Urban	71.9	0.7	16.8	2.5	6.1	0.3	1.7	0.1	0.1
Managua	75.6	0.5	14.8	2.4	4.7	0.0	2.0	0.0	0.0
Pacific	41.2	0.6	42.3	4.8	9.2	0.5	1.0	0.3	0.1
Central	28.7	0.3	29.2	5.8	33.3	1.0	0.2	1.5	0.0
Atlantic	11.7	0.5	39.7	6.6	37.7	2.0	0.8	0.9	0.2
Indigenous groups	18.6	0.6	48.4	6.7	20.2	4.3	1.1	0.1	0.0
Other	44.0	0.5	29.5	4.6	19.1	0.5	1.0	0.7	0.1
Observations	2116	39	2442	380	1706	67	53	49	9
Expanded observations	418038	4451	301928	46578	190111	6929	9875	6397	414

1.Garbage recollection truck, 2.Garbage container, 3.They burn it, 4.They bury it, 5.They throw it to waste land, etc., 6.They throw it to a river, lake, etc., 7.They pay to have it removed, 8.They produce organic fertilizer, 9. Other

Source: Author's calculations based on 2005 EMNV data.

**Table 6.3: Structure of incidence. Public services**

	Lighting		Street construction		Garbage collection	
	%	Incidence	%	Incidence	%	Incidence
1	0.1	2.8	0.1	4.2	0.8	2.1
2	0.2	7.5	0.2	8.0	3.7	9.0
3	0.5	21.7	0.5	15.4	6.6	16.1
4	0.8	36.9	1.1	30.8	10.6	26.1
5	0.7	31.1	1.4	41.6	19.3	46.7
Average	0.4	100.0	0.6	100.0	8.2	100.0

Source: Author's calculations based on 2005 EMNV data.

**Table 6.4: Housing programs incidence**

Housing programs	Structure %	Spending \$M	Spending \$ per inhab.	% of consump.
1	11.14	21.0	20.4	0.6
2	18.92	35.6	34.7	0.7
3	18.19	34.3	33.3	0.4
4	40.64	76.6	74.4	0.7
5	11.10	20.9	20.3	0.1
Average	100.0	188.4	36.6	0.4

Source: Author's calculations based on 2005 EMNV data.

**Table 6.5: Legalizing property deeds incidence**

Legalizing property	Structure %	Spending \$M	Spending \$ per inhab.	% of consump.
1	2.3	2.4	2.3	0.1
2	6.3	6.7	6.5	0.1
3	14.5	15.4	15.0	0.2
4	47.7	50.5	49.1	0.4
5	29.2	31.0	30.1	0.1
Average	100.0	105.9	20.6	0.2

Source: Author's calculations based on 2005 EMNV data.

**Table 6.6: Progressivity indices**

	Concentration index (i)	Progressivity index (ii)	Spending (% consump.) (iii)	Redistributional impact (iv)
Consumption	40.1			
Garbage collection	44.8	-4.7		
Public lighting	36.4	3.7		
Street construction	39.0	1.1		
Legalizing property deeds	38.7	1.4	0.2	0.00
Housing programs	8.8	31.3	0.4	0.11

Source: Author's calculations based on 2005 EMNV data.

**Table 7.1: Water - Characterization of water service**

	Nicaragua		Honduras	
	Potable water	Pot. water inside house	Potable water	Pot. water inside house
	(i)	(ii)	(i)	(ii)
<b>Total</b>	66.5	34.3	80.1	33.7
<b>Quintiles</b>				
1	26.8	4.5	58.1	5.4
2	48.8	14.1	66.8	9.3
3	60.7	24.8	81.3	23.6
4	77.6	37.2	88.5	39.3
5	88.0	61.4	94.8	70.7
<b>Poverty</b>				
Extreme poor	25.3	4.8	58.9	5.4
Moderate poor	47.3	14.1	72.4	14.2
Non poor	79.4	45.9	90.7	51.8
<b>Area</b>				
Rural	28.5	6.3	65.8	15.4
Urban	89.1	50.8	93.8	51.3
<b>Regions</b>				
Managua	96.1	57.3		
Pacific	67.8	28.8		
Central	50.0	25.3		
Atlantic	24.4	11.4		

Source: Author's calculations based on 2005 EMNV data.

**Table 7.2: Water and sanitation - Distributional incidence**

	Maintenance		Investment		Cost
	Water	Sanitation	Water	Sanitation	
<b>Quintiles</b>					
1	5.0	0.8	17.4	0.0	2.2
2	12.5	4.4	16.0	15.3	8.2
3	17.0	10.8	17.6	5.4	13.3
4	25.4	25.7	32.2	35.2	23.5
5	40.1	58.3	16.8	44.1	52.9
Total	100.0	100.0	100.0	100.0	100.0
<b>Poverty</b>					
Extreme poor	3.4	0.2	11.6	0.0	1.5
Moderate poor	18.9	7.3	30.5	15.3	12.4
Poor	22.3	7.5	42.1	15.3	13.9
Non poor	77.7	92.5	57.9	84.7	86.1
Total	100.0	100.0	100.0	100.0	100.0
<b>Area</b>					
Rural	13.7	0.4	50.8	0.0	9.3
Urban	86.3	99.6	49.2	100.0	90.7
Total	100.0	100.0	100.0	100.0	100.0
<b>Ethnic group</b>					
Indigenous	0.8	0.7	0.0	1.1	1.2
Other	99.2	99.3	100.0	98.9	98.8
Total	100.0	100.0	100.0	100.0	100.0
<b>Regions</b>					
Managua	43.9	65.5	33.9	31.3	49.7
Pacific	37.9	25.4	15.9	58.1	36.7
Central	14.2	8.3	27.4	10.6	11.2
Atlantic	4.1	0.7	22.8	0.0	2.4
Total	100.0	100.0	100.0	100.0	100.0

Source: Author's calculations based on 2005 EMNV data.

**Table 7.3; Maintenance of the water network - Distributional incidence**

	Structure (%)	Spending	Spending per inhab.	Consumption %
	(i)	(ii)	(iv)	(vi)
1	5.0	31.7	30.8	1.0
2	12.5	79.0	76.8	1.5
3	17.0	107.8	104.8	1.4
4	25.4	160.6	156.1	1.4
5	40.1	254.0	246.9	1.1
Average	100.0	633.0	123.1	1.2

Source: Author's calculations based on 2005 EMNV data.

**Table 7.4: Maintenance of the water network - Analysis of incidence**

	1	2	3	4	5	Total
Households (%)	12.2	15.9	19.6	22.5	29.8	100.0
Coverage rate	26.8	48.7	60.7	77.3	87.0	66.2
Hours per week	134.3	142.3	126.2	128.3	136.1	132.9
Estimated incidence	5.0	12.5	17.0	25.4	40.1	100.0
Difference	-15.0	-7.5	-3.0	5.4	20.1	0.0
Effects						
1. Potential user	-5.9	-4.5	-1.3	1.5	10.1	0.0
2. Coverage	-9.2	-4.1	-0.7	4.7	9.3	0.0
3. Frequency	0.1	1.1	-1.0	-0.8	0.7	0.0

Source: Author's calculations based on 2005 EMNV data.

**Table 7.5: Subsidy to water service fee - Distributional incidence**

	-20 m3	Fixed rate	Retirees	Exempt	Total
<b>Quintiles</b>					
1	7.0	8.0	2.1	3.9	6.6
2	14.2	15.4	8.2	12.4	14.0
3	20.4	22.4	15.9	19.8	20.7
4	28.0	27.1	23.3	34.9	28.6
5	30.5	27.1	50.5	29.0	30.1
Total	100.0	100.0	100.0	100.0	100.0
<b>Poverty</b>					
Extreme poor	4.8	5.6	0.4	2.8	4.5
Moderate poor	21.1	24.5	16.9	16.9	21.3
Poor	26.0	30.0	17.3	19.7	25.9
Non poor	74.0	70.0	82.7	80.3	74.1
Total	100.0	100.0	100.0	100.0	100.0
<b>Area</b>					
Rural	13.8	27.8	2.3	10.9	17.2
Urban	86.2	72.2	97.7	89.1	82.8
Total	100.0	100.0	100.0	100.0	100.0
<b>Regions</b>					
Managua	41.8	47.0	53.7	68.7	48.2
Pacific	37.1	30.3	37.9	19.2	32.1
Central	17.1	12.4	8.1	8.0	13.8
Atlantic	4.0	10.3	0.2	4.1	5.8
Total	100.0	100.0	100.0	100.0	100.0

Source: Author's calculations based on 2005 EMNV data.

**Table 7.6: Extension of the sanitation network - Distributional incidence**

	Structure (%) (i)	Spending (ii)	Spending per inhab. (iv)	Consump. % (vi)
1	17.4	34.9	33.9	1.1
2	16.0	31.9	31.0	0.6
3	17.6	35.3	34.3	0.5
4	32.2	64.3	62.5	0.6
5	16.8	33.6	32.7	0.1
<b>Average</b>	<b>100.0</b>	<b>200.0</b>	<b>38.9</b>	<b>0.4</b>

Source: Author's calculations based on 2005 EMNV data.

**Table 7.7: Sanitation - Characterization**

	Total	Extreme poor	Moderate poor	Poor	Non poor	Rural	Urban	Indigen.	Other	Region			
										Managua	Pacific	Central	Atlantic
Sanitary services in household													
- Untreated latrines	33.4	44.1	39.2	40.6	29.1	41.8	27.4	45.8	33.2	26.3	32.2	36.2	43.9
- Latrines with treatment	26.5	28.8	33.6	32.2	23.2	34.0	21.2	21.2	25.1	12.1	34.7	32.2	22.9
- Toilet connected to sewage network	21.4	1.0	6.5	4.9	31.0	0.2	36.5	4.4	24.2	48.6	16.7	11.4	1.1
- Toilet connected to cesspool or septic tank	8.0	0.0	3.1	2.3	11.3	2.6	11.8	9.1	8.6	10.5	9.2	5.4	6.3
- Toilet that empties into river or ravine	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.1
- None	10.7	26.1	17.6	20.0	5.2	21.4	3.1	19.5	8.9	2.6	7.3	14.6	25.7

Source: Author's calculations based on 2005 EMNV data.

**Table 7.8: Maintenance of the sanitation network - Distributional incidence**

	Structure (%) (i)	Spending (ii)	Spending per inhab. (iv)	Consump. % (vi)
1	0.8	2.2	2.1	0.1
2	4.4	11.9	11.6	0.2
3	10.8	29.3	28.5	0.4
4	25.7	69.6	67.7	0.6
5	58.3	158.3	153.9	0.7
<b>Average</b>	<b>100.0</b>	<b>271.3</b>	<b>52.8</b>	<b>0.5</b>

Source: Author's calculations based on 2005 EMNV data.

**Table 7.9: Maintenance of the sanitation network - Analysis of incidence**

	Nicaragua						Honduras					
	1	2	3	4	5	Total	1	2	3	4	5	Total
Pot. Pop. (% of households)	12.2	15.9	19.6	22.5	29.8	100.0	15.4	18.2	19.0	21.8	25.6	100.0
Sanitation coverage rate	1.5	6.3	12.6	26.0	44.6	22.8	2.1	7.8	21.9	41.0	67.1	32.0
Estimated incidence	0.8	4.4	10.8	25.7	58.3	100.0	1.0	4.5	13.0	27.9	53.6	100.0
Difference	-19.2	-15.6	-9.2	5.7	38.3	0.0	-19.0	-15.5	-7.0	7.9	33.6	0.0
Effects												
1. Pot. Pop.	-4.3	-3.3	-1.7	-0.2	9.6	0.0	-2.6	-1.5	-1.8	0.2	5.6	0.0
2. Coverage	-14.9	-12.3	-7.5	5.9	28.8	0.0	-16.5	-14.1	-5.2	7.7	28.0	0.0

Source: Author's calculations based on 2005 EMNV data.

**Table 7.10: Extension of the sanitation network - Distributional incidence**

	Structure (%) (i)	Spending (ii)	Spending per inhab. (iv)	Consump. % (vi)
1	0.0	0.0	0.0	0.0
2	15.3	30.6	29.7	0.6
3	5.4	10.9	10.6	0.1
4	35.2	70.4	68.4	0.6
5	44.1	88.2	85.7	0.4
<b>Average</b>	<b>100.0</b>	<b>200.0</b>	<b>38.9</b>	<b>0.4</b>

Source: Author's calculations based on 2005 EMNV data.

**Table 7.11: Water and sanitation - Incidence by quintiles**

	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5	Total
<i>Structure (%)</i>						
Consumption	6.3	10.4	14.8	21.8	46.8	100.0
Potable water and sanitation	10.5	17.9	15.4	35.7	20.4	100.0
<i>Spending (millions of cordobas)</i>						
Potable water and sanitation	51	86	74	172	98	480
<i>Spending per inhabitant (cordobas)</i>						
Potable water and sanitation	49	84	72	167	95	93
<i>Spending as % of consumption</i>						
Potable water and sanitation	1.6	1.6	1.0	1.5	0.4	0.9

Source: Author's calculations based on 2005 EMNV data.

**Table 7.12: Water and sanitation - Incidence by poverty level**

	Poor		Total poor	Non poor	Total
	Extreme	Moderate			
<i>Structure (%)</i>					
Consumption	4.3	16.3	20.6	79.4	100.0
Potable water and sanitation	7.0	26.7	33.7	66.3	100.0
<i>Spending (millions of cordobas)</i>					
Potable water and sanitation	34	128	162	318	480
<i>Spending per inhabitant ( cordobas)</i>					
Potable water and sanitation	44	79	68	115	93
<i>Spending as % of consumption</i>					
Potable water and sanitation	1.5	1.5	1.5	0.8	0.9

Source: Author's calculations based on 2005 EMNV data.

**Table 7.13: Water and sanitation - Concentration indices**

	Index	Stand. Dev.	Var. Coeff.	Confidence interval 95%	
				Lower limit	Upper limit
<b>Maintenance</b>					
Water	35.3	0.5	0.01	34.2	36.4
Sanitation	58.5	0.7	0.01	56.7	59.9
<b>Expanding the network</b>					
Water	4.9	3.9	0.80	-2.1	13.6
Sanitation	44.6	4.9	0.11	33.3	52.1
Financing (maint.)	50.2	0.69	0.01	49.1	51.9
<b>Total</b>	<b>13.9</b>	<b>3.6</b>	<b>0.26</b>	<b>7.8</b>	<b>20.3</b>

Source: Author's calculations based on 2005 EMNV data.

**Table 7.14: Water and sanitation - Concentration and progressivity indices and redistributive impact**

	Concentration	Progressivity	Spending	Redistributive
	index (i)	index (ii)	(consumption %) (iii)	impact (iv)
Consumption	40.1	-		
<b>Maintenance</b>				
Water	35.3	4.8	1.2	0.06
Sanitation	58.5	-18.4	0.5	-0.10
<b>Expanding the network</b>				
Water	4.9	35.1	0.4	0.14
Sanitation	44.6	-4.5	0.4	-0.02
<b>Financing (maint.)</b>	<b>50.2</b>	<b>10.2</b>	<b>1.6</b>	<b>0.16</b>
<b>Total</b>	<b>13.9</b>	<b>26.1</b>	<b>0.9</b>	<b>0.24</b>

Source: Author's calculations based on 2005 EMNV data.

**Table 8.1: Emergency Social Investment Fund (FISE) - Components**

<b>SECTOR</b>	<b>Projects</b>	<b>% of budget</b>	<b>Beneficiaries</b>	<b>Jobs</b>
WATER AND SANITATION	140	27.8	140,791	16,746
EDUCATION	155	21.4	79,743	11,874
COMMUNITY WORKS	193	37.5	844,365	16,386
SOCIAL PROTECTION	36	2.7	22,902	1,792
HEALTH	67	10.7	132,747	4,382
<b>TOTAL</b>	<b>591</b>	<b>100.00</b>	<b>1,220,548</b>	<b>51,180</b>

Source: Author's calculations based on FISE's implementation summary 2001-2006.

**Table 8.2: Emergency Social Investment Fund (FISE) - Main services by components**

<b>SECTOR</b>	<b>Level</b>	<b>Projects</b>		<b>Spending (% of budget)</b>	
		<b>Projects</b>	<b>Spending (% of budget)</b>	<b>Projects</b>	<b>Spending (% of budget)</b>
WATER AND SANITATION	Potable water rural areas	127	66.6		
	Potable water urban areas	13	33.4		
EDUCATION	Special education	3	1.1		
	Preschool education	7	3.5		
	Primary education	133	77.1		
	Secondary education	12	18.3		
COMMUNITY WORKS AND SERVICES	Electricity rural areas	9	1.9		
	Municipal strenghtening	.	.		
	Municipal infrastructure	1	2.9		
	Road infrastructure	147	89.1		
	Reforestation and soil conservation	1	0.1		
	Community services	23	6.0		
SOCIAL PROTECTION	Food and community support	5	14.6		
	Services for the disabled	1	4.2		
	Services for minors	1	8.8		
	Production support infrastruc.	16	48.4		
	Housing	13	24.0		
HEALTH	Primary health care	17	20.0		
	Secondary health care	6	28.2		
	Latrine construction	44	51.8		

Source: Author's calculations based on FISE's implementation summary 2001-2006.

**Table 8.3: Emergency Social Investment Fund (FISE) - Distributional incidence, main services**

	EDUCATION		HEALTH			WATER AND SANITATION		
	Maintenance	Investment	Latrine constr.	Maint.care	Inv. health care	Rural water	Maint. urb. water	Inv. urb. water
<b>Quintiles</b>								
1	22.9	23.8	29.4	19.2	20.1	36.9	0.8	5.5
2	23.9	27.8	25.8	22.2	18.1	26.4	4.2	11.6
3	22.8	22.7	23.7	22.8	23.9	21.1	10.1	17.1
4	19.4	14.6	12.9	20.2	20.2	10.7	20.3	39.9
5	11.0	11.1	8.2	15.6	17.7	5.0	64.6	25.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
<b>Poverty</b>								
Extreme poor	16.7	16.8	21.6	13.8	14.8	27.3	0.6	3.0
Moderate poor	37.2	41.5	41.9	34.2	31.0	42.6	6.7	20.7
Poor	53.9	58.3	63.5	47.9	45.8	69.9	7.3	23.7
Non poor	46.1	41.7	36.5	52.1	54.2	30.1	92.7	76.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
<b>Area</b>								
Rural	51.2	64.5	86.0	47.8	45.1	100.0	0.0	0.0
Urban	48.8	35.5	14.0	52.2	54.9	0.0	100.0	100.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
<b>Regions</b>								
Managua	19.2	11.3	5.8	19.6	18.6	1.8	46.7	44.4
Pacific	28.9	30.7	12.5	29.3	33.2	41.2	28.6	9.4
Central	35.1	37.3	57.8	36.8	29.3	35.3	22.5	35.2
Atlantic	16.7	20.7	23.9	14.3	18.8	21.7	2.2	11.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Author's calculations based on 2005 EMNV data.

**Table 8.3: Emergency Social Investment Fund (FISE) - Distributional incidence, main services (continuation)**

	COMMUNITY WORKS AND SERVICES				SOCIAL PROTECTION	
	Roads/hwys	Streets, drainage	Electricity	Sports facilities	Inst. support prod.	Soup kitchens
<b>Quintiles</b>						
1	13.4	3.1	17.8	10.6	35.1	26.9
2	19.0	7.8	21.5	8.4	26.5	27.9
3	19.1	16.7	40.8	24.1	19.1	22.4
4	22.4	30.2	12.4	30.5	11.9	15.9
5	26.1	42.3	7.4	26.4	7.3	6.8
Total	100.0	100.0	100.0	100.0	100.0	100.0
<b>Poverty</b>						
Extreme poor	8.6	1.6	11.0	9.3	26.4	19.0
Moderate poor	30.3	13.4	37.6	16.1	42.4	43.4
Poor	38.9	15.0	48.6	25.4	68.8	62.3
Non poor	61.1	85.0	51.4	74.6	31.2	37.7
Total	100.0	100.0	100.0	100.0	100.0	100.0
<b>Area</b>						
Rural	53.8	6.8	100.0	39.0	85.6	65.2
Urban	46.2	93.2	0.0	61.0	14.4	34.8
Total	100.0	100.0	100.0	100.0	100.0	100.0
<b>Regions</b>						
Managua	21.8	45.3	0.0	58.1	3.9	7.0
Pacific	27.6	28.1	40.9	18.9	25.0	33.6
Central	36.4	15.9	45.7	13.1	48.4	37.6
Atlantic	14.2	10.7	13.4	9.9	22.7	21.7
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: Author's calculations based on 2005 EMNV data.

**Table 8.4: Emergency Social Investment Fund (FISE) - Distributional incidence by component**

	EDUCATION	HEALTH	WATER AND SANITATION	COMM. WORKS AND SERVICES	SOCIAL PROTECTION	FISE
<b>Quintiles</b>						
1	23.3	24.7	25.4	8.6	33.2	18.8
2	25.4	23.3	20.0	13.2	26.9	19.2
3	22.8	23.5	18.3	18.7	19.9	20.0
4	17.6	16.4	16.5	26.3	12.8	20.3
5	11.0	12.1	19.9	33.2	7.2	21.8
Total	100.0	100.0	100.0	100.0	100.0	100.0
<b>Poor</b>						
Extreme poor	16.7	18.0	18.7	5.5	24.7	13.4
Moderate poor	38.9	37.6	32.4	21.8	42.6	30.7
Poor	55.6	55.6	51.1	27.3	67.3	44.1
Non poor	44.4	44.4	48.9	72.7	32.7	55.9
Total	100.0	100.0	100.0	100.0	100.0	100.0
<b>Area</b>						
Rural	56.3	67.1	66.6	32.2	80.9	52.0
Urban	43.7	32.9	33.4	67.8	19.1	48.0
Total	100.0	100.0	100.0	100.0	100.0	100.0
<b>Ethnic group</b>						
Indigenous	5.6	8.3	8.3	4.2	6.7	6.2
Other	94.4	91.7	91.7	95.8	93.3	93.8
Total	100.0	100.0	100.0	100.0	100.0	100.0
<b>Regions</b>						
Managua	16.1	12.3	16.5	34.4	4.6	22.3
Pacific	29.6	21.3	34.5	27.6	27.0	29.3
Central	36.0	46.3	32.6	25.7	45.9	32.6
Atlantic	18.3	20.1	16.4	12.3	22.5	15.8
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: Author's calculations based on 2005 EMNV data.

**Table 8.5: Emergency Social Investment Fund (FISE) - Concentration indices**

	Index	Stand. Dev.	Var. Coeff.	Confidence interval 95%	
				Lower limit	Upper limit
1. Education	-13.7	0.5	-0.04	-14.6	-12.4
2. Health	-13.2	0.8	-0.06	-14.9	-11.6
3. Water and sanitation	-5.7	1.1	-0.20	-8.0	-3.7
4. Community works and services	25.6	0.8	0.03	24.3	27.0
5. Social protection	-27.3	0.4	-0.02	-28.2	-26.3
FISE	3.0	0.5	0.16	2.01	3.9

Source: Author's calculations based on 2005 EMNV data.

**Table 8.6: Emergency Social Investment Fund (FISE) - Distributional incidence**

	Structure (%)	Spending	Spending per inhab.	% of consump.
	(i)	(ii)	(iv)	(vi)
1	18.8	153.8	149.6	4.8
2	19.2	156.9	152.5	2.9
3	20.0	164.0	159.5	2.2
4	20.3	166.1	161.5	1.5
5	21.8	178.4	173.5	0.7
Average	100.0	819.3	159.3	1.6

Source: Author's calculations based on 2005 EMNV data.

**Table 8.7: Comprehensive Care Program for Nicaraguan Children (PAININ)  
Characterization**

	Total	Extreme poor	Moderate poor	Poor	Non poor	Rural	Urban	Indigen.	Other	Region			
										Managua	Pacific	Central	Atlantic
<b>Registered or enrolled in:</b>													
- Children's soup kitchen / CICO	2.5	2.3	2.9	2.6	2.4	3.3	1.8	1.6	2.6	1.6	1.0	4.2	2.8
- CDI / child care center	0.6	0.0	0.8	0.5	0.8	0.3	1.0	1.6	0.6	1.1	0.5	0.5	0.5
- Preschool	19.0	11.4	16.3	14.6	24.3	16.7	21.1	23.5	18.7	23.8	19.7	17.5	14.6
- School	8.3	6.5	6.7	6.6	10.4	7.1	9.4	8.3	8.4	8.9	9.3	8.0	6.7
- None of these	69.6	79.9	73.3	75.6	62.1	72.6	66.7	65.0	69.7	64.7	69.4	69.8	75.3
<b>Received food? (CICOs)</b>													
	77.9	79.1	74.0	75.5	81.2	73.8	84.7	85.6	77.9	89.3	82.9	84.2	50.5
<b>Frequency (last week)</b>													
- Every day	71.9	68.4	73.5	71.9	71.8	66.5	79.5	73.0	71.6	78.9	69.6	67.1	86.6
- Some days	26.3	31.6	26.5	28.1	24.1	30.4	20.5	27.0	26.5	21.1	30.4	29.8	13.4
- None	1.8	0.0	0.0	0.0	4.1	3.1	0.0	0.0	1.9	0.0	0.0	3.1	0.0
<b>Received:</b>													
- Milk	17.5	8.5	11.3	10.4	27.2	14.9	21.9	21.9	17.8	51.8	25.9	11.6	5.2
- Nutritional biscuit	4.7	7.3	8.0	7.8	0.6	4.4	5.4	16.8	4.1	0.0	19.2	2.2	6.8
- Cereal	41.6	45.7	37.2	39.7	44.2	47.9	31.3	17.5	42.9	33.0	58.1	47.1	23.5
- Soy and derivatives	13.4	8.9	9.5	9.3	19.1	14.6	11.5	29.6	13.1	45.0	15.4	6.7	8.6
- Breakfast	23.7	16.0	38.6	31.8	12.8	20.7	28.8	16.6	24.7	0.0	35.4	31.4	13.0
- Lunch	41.4	33.3	35.0	34.5	50.9	40.1	43.7	54.5	40.6	77.3	51.6	34.4	30.1
- Other	7.3	26.2	0.0	7.9	6.5	7.6	6.9	3.7	7.7	0.0	0.0	13.3	0.5

Source: Author's calculations based on 2005 EMNV data.

**Table 8.8: Main food programs  
Distributional incidence**

	PAININ	PINE	WFP			Total
			Food donat.	Food for work	Tot. WFP	
<b>Quintiles</b>						
1	17.0	26.0	33.2	35.5	34.4	23.7
2	26.4	26.9	25.0	24.2	24.6	26.1
3	22.9	23.0	24.7	19.4	22.0	22.7
4	17.1	16.7	13.6	17.0	15.3	16.5
5	16.6	7.5	3.5	3.8	3.7	11.0
Total	100.0	100.0	100.0	100.0	100.0	100.0
<b>Poverty</b>						
Extreme poor	13.0	18.0	25.9	26.5	26.2	17.6
Moderate poor	38.7	42.8	39.9	37.5	38.7	39.8
Poor	51.7	60.7	65.8	64.0	64.9	57.4
Non poor	48.3	39.3	34.2	36.0	35.1	42.6
Total	100.0	100.0	100.0	100.0	100.0	100.0
<b>Area</b>						
Rural	57.6	63.7	100.0	100.0	100.0	69.5
Urban	42.4	36.3	0.0	0.0	0.0	30.5
Total	100.0	100.0	100.0	100.0	100.0	100.0
<b>Ethnic group</b>						
Indigenous	3.8	8.0	3.1	2.3	2.7	4.7
Other	96.2	92.0	96.9	97.7	97.3	95.3
Total	100.0	100.0	100.0	100.0	100.0	100.0
<b>Regions</b>						
Managua	21.6	7.7	2.2	16.1	9.1	14.8
Pacific	15.8	33.6	29.2	15.3	22.2	22.2
Central	49.6	37.8	68.6	53.1	60.8	49.1
Atlantic	13.0	20.9	0.0	15.6	7.8	13.9
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: Author's calculations based on 2005 EMNV data.

**Table 8.9: Comprehensive Care Program for Nicaraguan Children (PAININ)  
Incidence analysis**

	1	2	3	4	5	Total
Children under age 6 (% of total)	26.1	22.4	19.9	18.2	13.3	100.0
Attendance rate in CICOs	2.7	2.7	2.6	2.2	2.1	2.5
Average value of food	50.2	90.5	92.4	87.5	122.7	82.7
Estimated incidence	17.0	26.4	22.9	17.1	16.6	100.0
Difference	-3.0	6.4	2.9	-2.9	-3.4	0.0
Effects						
1. Potential user	5.2	3.0	0.3	-1.4	-7.1	0.0
2. Attendance	1.6	2.1	1.0	-1.8	-2.8	0.0
3. Value	-9.9	1.3	1.6	0.4	6.6	0.0

Source: Author's calculations based on 2005 EMNV data.

**Table 8.10: Comprehensive School Nutrition Program (PINE)  
Characterization**

	Total	Extreme poor	Moderate poor	Poor	Non poor	Rural	Urban	Region			
								Managua	Pacific	Central	Atlantic
Received food?	74.2	77.3	80.8	79.7	66.9	83.9	62.8	56.8	84.4	73.8	76.7
Frequency (last week)											
- Every day	82.5	87.3	81.6	83.4	81.0	85.0	78.5	74.1	83.5	84.7	82.4
- Some days	16.6	12.6	17.0	15.6	18.1	14.2	20.4	24.4	15.7	14.8	16.1
- None	0.9	0.1	1.4	1.0	0.8	0.8	1.1	1.5	0.8	0.5	1.5
Received:											
- Milk	12.9	6.9	10.1	9.1	17.4	7.2	18.8	35.5	10.1	4.1	9.0
- Nutritional biscuit	3.7	0.7	5.1	3.7	3.7	2.0	5.4	9.3	5.0	0.5	1.4
- Cereal	37.4	49.5	44.8	46.3	27.0	51.7	22.7	4.1	52.0	44.7	37.2
- Soy and derivatives	1.9	3.1	1.8	2.2	1.4	2.9	0.8	0.3	0.5	1.3	7.3
- Breakfast	21.4	28.0	24.4	25.6	16.5	28.6	13.9	5.9	24.6	28.9	18.5
- Lunch	37.3	45.2	46.6	46.1	27.0	50.4	23.8	7.5	46.2	40.8	50.8
- Other	1.5	2.4	1.2	1.5	1.4	1.7	1.2	1.0	1.1	1.6	2.2

Source: Author's calculations based on 2005 EMNV data.

**Table 8.11: Comprehensive School Nutrition Program (PINE)  
Incidence analysis**

	1	2	3	4	5	Total
Children ages 3 - 12 attending preschool or school*	24.7	23.9	22.7	19.2	9.5	100.0
Receive food	78.4	80.1	75.7	65.7	59.5	74.0
Average value of food	101.5	106.1	101.2	99.9	99.8	102.2
Estimated incidence	26.0	26.9	23.0	16.7	7.5	100.0
Difference	6.0	6.9	3.0	-3.3	-12.5	0.0
Effects						
1. Potential user	4.5	3.8	2.4	-1.1	-9.6	0.0
2. Coverage	1.6	2.2	0.8	-1.9	-2.6	0.0
3. Value	-0.1	0.9	-0.2	-0.4	-0.3	0.0

Source: Author's calculations based on 2005 EMNV data.

**Table 8.12: Food programs - Distributional incidence**

	Structure %	Spending		Spending per inhab.		% of consump.	
		(i)	(ii)	(iii)	(iv)	(v)	(vi)
1	23.7	81.4	70.6	79.2	68.6	1.7	1.5
2	26.1	89.6	77.7	87.1	75.5	1.0	0.9
3	22.7	78.1	67.7	75.9	65.8	0.5	0.5
4	16.5	56.8	49.2	55.2	47.9	0.3	0.2
5	11.0	37.6	32.6	36.6	31.7	0.1	0.1
<b>Average</b>	<b>100.0</b>	<b>343.5</b>	<b>297.8</b>	<b>66.8</b>	<b>57.9</b>	<b>0.3</b>	<b>0.3</b>

Source: Author's calculations based on 2005 EMNV data.

**Table 8.13: Social assistance  
Incidence by quintiles**

	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5	Total
<i>Structure (%)</i>						
Consumption	6.3	10.4	14.8	21.8	46.8	100.0
Social assistance - SPE	20.3	21.2	20.8	19.2	18.6	100.0
Social assistance - PRS	20.1	21.0	20.7	19.3	18.9	100.0
<i>Spending (millions of cordobas)</i>						
Social assistance - SPE	258	270	264	244	236	1272
Social assistance - PRS	244	255	251	233	229	1211
<i>Spending per inhabitant (cordobas)</i>						
Social assistance - SPE	251	262	257	237	230	247
Social assistance - PRS	237	248	244	227	222	236
<i>Spending as % of consumption</i>						
Social assistance - SPE	8.0	5.0	3.5	2.2	1.0	2.5
Social assistance - PRS	7.5	4.8	3.3	2.1	0.9	2.3

Source: Author's calculations based on 2005 EMNV data.

**Table 8.14: Social assistance  
Incidence by poverty level**

	Poor		Poor total	Non poor	Total
	extreme	moderate			
<i>Structure (%)</i>					
Consumption	4.3	16.3	20.6	79.4	100.0
Social assistance - SPE	14.9	33.2	48.0	52.0	100.0
Social assistance - PRS	14.8	32.9	47.7	52.3	100.0
<i>Spending (millions of cordobas)</i>					
Social assistance - SPE	189	422	611	661	1272
Social assistance - PRS	179	399	577	634	1211
<i>Spending per inhabitant (cordobas)</i>					
Social assistance - SPE	248	262	257	239	247
Social assistance - PRS	235	247	243	229	236
<i>Spending as % of consumption</i>					
Social assistance - SPE	8.6	5.0	5.8	1.6	2.5
Social assistance - PRS	8.1	4.7	5.4	1.5	2.3

Source: Author's calculations based on 2005 EMNV data.

**Table 8.15: Social assistance  
Concentration and progressivity indices and redistributive impact**

	Concentration index (i)	Progressivity index (ii)	Spending (Consump. %) (iii)	Redistributive impact (iv)
Consumption	40.1	-		
<b>FISE component</b>				
1. Education	-15.1	55.2	0.3	0.19
2. Health	-15.9	56.0	0.2	0.10
3. Water and sanitation	-25.2	65.3	0.4	0.29
4. Community works and service:	24.1	16.0	0.6	0.09
5. Social assistance	-27.2	67.3	0.0	0.03
<b>Food programs</b>				
PAININ	-3.9	44.0	0.3	0.14
PINE	-19.4	59.5	0.2	0.11
WFP	-29.7	69.8	0.2	0.11
<b>Other programs</b>	-3.7	43.8		
Total SPE	-2.5	42.5	2.5	1.05
Total PRS	-1.9	42.0	2.3	0.99

Source: Author's calculations based on 2005 EMNV data.

**Table 9.1: Population distribution by poverty level, area of residency and productive sector**

	All sectors			Primary sector		
	Total	Rural	Urban	Total	Rural	Urban
Poor	46.0	67.6	28.9	68.8	71.2	54.4
Extreme poor	14.8	26.6	5.4	26.4	28.3	14.8
Moderate poor	31.2	41.0	23.5	42.4	42.9	39.6
Non poor	54.0	32.4	71.1	31.2	28.8	45.7
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: Author's calculations based on 2005 EMNV data.

**Table 9.2: Characterization of general rural population and type of activity (percentages)**

	Rural population	Population: agric. prod.	Population: livestock prod.	Population: forest prod.
<b>Total</b>	44.2	96.6	36.1	10.6
<b>Quintiles</b>				
1	77.9	98.7	30.7	10.4
2	57.7	96.7	39.0	10.1
3	44.0	95.1	38.9	11.0
4	27.4	92.6	41.7	12.5
5	13.4	93.8	33.9	9.9
<b>Poverty</b>				
Extreme	79.6	98.6	29.2	10.6
Moderate	58.0	97.0	38.2	10.3
Non poor	26.4	94.0	39.0	11.1
Poor	64.9	97.6	34.7	10.4
Non poor	26.4	94.0	39.0	11.1
<b>Region</b>				
Managua	9.5	86.5	22.7	6.6
Pacific	42.2	96.3	26.2	6.9
Central	61.8	97.6	35.7	10.3
Atlantic	68.6	96.3	52.8	17.1
<b>Expanded obs.</b>	5,126,347	1,644,031	2,261,470	2,262,688

Source: Author's calculations based on 2005 EMNV data.

**Table 9.3: Rural development  
Coverage rate (%)**

	Rural roads*	Agricultural projects*	Livestock projects*	Technical assistance**
<b>Total</b>	18.0	3.4	0.3	4.8
<b>Quintiles</b>				
1	13.1	3.3	0.2	3.3
2	19.2	2.8	0.0	2.1
3	19.3	4.0	0.3	7.4
4	22.5	5.0	0.4	12.7
5	29.0	1.5	2.6	4.1
<b>Poverty</b>				
Extreme	11.3	3.5	0.2	2.8
Moderate	19.3	2.9	0.0	3.1
Non poor	21.9	4.0	0.8	9.5
Poor	16.2	3.1	0.1	3.0
Non poor	21.9	4.0	0.8	9.5
<b>Region</b>				
Managua	30.5	1.8	2.9	14.0
Pacific	16.2	1.8	0.0	4.4
Central	19.2	5.3	0.4	6.1
Atlantic	14.9	2.1	0.0	1.4
<b>Ethnic groups</b>				
Indigenous groups	19.2	6.9	0.0	3.9
Other	18.2	3.5	0.4	5.3
<b>Expanded obs.</b>	2,264,923	2,264,923	2,264,923	1,662,467

Source: Author's calculations based on 2005 EMNV data.

\* Programs provided by Government/Ministry/FISE or local governments. Rural population.

\*\* Cost free. Rural population with UPA.

**Table 9.4: Rural development  
Coverage rate by regions (%)**

	<b>Managua</b>				<b>Pacific</b>			
	Rural roads	Agricultural projects	Livestock projects	Technical assistance	Rural roads	Agricultural projects	Livestock projects	Technical assistance
Total	30.5	1.8	2.9	14.0	16.2	1.8	0.0	4.4
Poor	33.3	0.0	0.0	0.0	14.6	1.3	0.0	3.5
Non poor	29.2	2.7	4.4	25.4	18.4	2.4	0.0	6.1
	<b>Central</b>				<b>Atlantic</b>			
	Rural roads	Agricultural projects	Livestock projects	Technical assistance	Rural roads	Agricultural projects	Livestock projects	Technical assistance
Total	19.2	5.3	0.4	6.1	14.9	2.1	0.0	1.4
Poor	18.4	4.6	0.2	4.4	11.3	2.3	0.0	0.4
Non poor	21.6	7.3	0.9	11.4	25.4	1.5	0.0	4.8

**Table 9.5: Breakdown of distributional incidence**

Agricultural programs						
	1	2	3	4	5	Total
Rural population	35.4	26.2	20.0	12.4	6.0	100.0
Agricultural program coverage rate	3.3	2.8	4.0	5.0	1.5	3.4
Estimated incidence	34.2	21.4	23.6	18.1	2.7	100.0
Difference	14.2	1.4	3.6	-1.9	-17.3	0.0
Effects						
Potential user	14.9	5.4	-0.3	-9.7	-10.2	0.0
Coverage	-0.6	-4.0	3.9	7.8	-7.0	0.0
Livestock programs						
	1	2	3	4	5	Total
Rural population	35.4	26.2	20.0	12.4	6.0	100.0
Agricultural program coverage rate	0.2	0.0	0.3	0.4	2.6	0.3
Estimated incidence	19.7	0.0	18.1	15.0	47.2	100.0
Difference	-0.3	-20.0	-1.9	-5.0	27.2	0.0
Effects						
1. Potential user	14.9	3.1	4.7	-2.1	-20.7	0.0
2. Coverage	-15.2	-23.1	-6.6	-2.9	47.9	0.0
Rural roads						
	1	2	3	4	5	Total
Rural population	35.4	26.2	20.0	12.4	6.0	100.0
Rural roads coverage rate	13.1	19.2	19.3	22.5	29.0	18.0
Estimated incidence	25.7	27.8	21.4	15.5	9.7	100.0
Difference	5.7	7.8	1.4	-4.5	-10.3	0.0
Effects						
1. Potential user	14.2	7.7	1.3	-7.0	-16.2	0.0
2. Coverage	-8.5	0.1	0.1	2.5	5.9	0.0
Technical assistance						
	1	2	3	4	5	Total
Rural population	35.4	26.2	20.0	12.4	6.0	100.0
Technical assistance coverage rate	3.3	2.1	7.4	12.7	4.1	4.8
Estimated incidence	23.1	11.2	29.5	31.4	4.9	100.0
Difference	3.1	-8.8	9.5	11.4	-15.1	0.0
Effects						
1. Potential user	13.7	5.1	2.2	-9.6	-11.4	0.0
2. Coverage	-10.6	-13.9	7.2	21.0	-3.7	0.0

Source: Author's calculations based on 2005 EMNV data.

**Table 9.6: Rural development  
Spending incidence**

	MTI Programs %	MAGFOR Programs %	IDR Programs %	Total %	Spending		
					total C\$ M (v)	per inhab. C\$ (vi)	as % of consump. (vii)
1	19.5	30.1	25.6	23.8	324.6	315.6	10.0
2	26.2	21.6	23.1	23.9	326.5	317.5	6.1
3	21.7	22.9	23.3	22.6	309.2	300.6	4.1
4	17.2	18.2	17.4	17.7	240.9	234.3	2.1
5	15.4	7.3	10.6	12.0	163.8	159.3	0.7
Average	100.0	100.0	100.0	100.0	1365.1	265.5	2.6

Source: Author's calculations based on 2005 EMNV data.

**Table 9.7: Rural development  
Spending incidence: details by institution**

MAGFOR						Spending		
Programs	Tech. assistance INTA+PTA	INAFOR	Rural development initiative	Fondeagro	Total MAGFOR	total C\$ M	per inhab. C\$	as % of consump.
	% (i)	% (ii)	% (iii)	% (iv)	% (v)	(vi)	(vii)	(viii)
1	25.8	27.7	35.4	39.7	30.1	81.4	79.1	2.5
2	17.1	22.4	26.2	19.0	21.6	58.2	56.6	1.1
3	26.3	20.9	20.0	22.9	22.9	61.9	60.2	0.8
4	24.1	17.4	12.4	15.1	18.2	49.1	47.8	0.4
5	6.7	11.6	6.0	3.3	7.3	19.7	19.1	0.1
Average	100.0	100.0	100.0	100.0	100.0	270.3	52.6	0.5

IDR					Spending		
Programs	Basic grains KR-II	Rural roads PCR	Rural reactivation PRPR	Total IDR	total C\$ M	per inhabitant C\$	as % of consump.
	% (i)	% (ii)	% (iii)	% (iv)	(v)	(vi)	(vii)
1	28.2	19.5	24.5	25.6	133.3	129.6	4.1
2	20.0	26.2	23.4	23.1	120.3	117.0	2.2
3	25.6	21.7	22.7	23.3	121.0	117.6	1.6
4	20.4	17.2	19.4	17.4	90.3	87.8	0.8
5	5.8	15.4	10.1	10.6	55.3	53.7	0.2
Average	100.0	100.0	100.0	100.0	520.1	101.1	1.0

MTI				
Programs	Total MTI %	Spending		
		total C\$ M	per inhabitant C\$	as % of consump.
	(i)	(ii)	(iii)	(iv)
1	19.5	112.0	108.9	3.5
2	26.2	150.3	146.2	2.8
3	21.7	124.9	121.5	1.6
4	17.2	98.9	96.1	0.9
5	15.4	88.6	86.1	0.4
Average	100.0	574.7	111.8	1.1

Source: Author's calculations based on 2005 EMNV data.

**Table 9.8: Rural development  
Distribution by poverty level**

	Poor		Total poor	Non poor	Total
	Moderate poor				
<i>Structure (%)</i>					
Consump.	4.3	16.3	20.6	79.4	100.0
Rural development	17.5	37.9	55.5	44.5	100.0
<i>Spending (millions of cordobas)</i>					
Rural development	239	518	757	608	1365
<i>Spending per inhab. (cordobas)</i>					
Rural development	314	322	319	220	265
<i>Spending as % of consump.</i>					
Rural development	10.8	6.2	7.1	1.5	2.6

Source: Author's calculations based on 2005 EMNV data.

**Table 9.9: Rural development Indices**

Programs	Concentration indices (i)	Progressivity indices (ii)	Spending (consump. %) (iii)	Redistributional impact (iv)
Consumption	40.1			
Technical assistance (INTA+PTA)	-11.7	51.8	0.3	0.13
INAFOR	-14.7	54.7	0.1	0.04
Nicaraguan rural development initiative	-29.8	69.9	0.1	0.05
Fondeagro	-34.0	74.1	0.1	0.04
<b>Total MAGFOR</b>	-19.9	60.0	0.7	0.42
Promotion of basic grain production (KR-2)	-19.2	59.3	0.1	0.09
Rural roads (PCR)	-7.3	47.4	0.2	0.10
Rural productive reactivation (PRPR)	-14.4	54.5	0.3	0.19
<b>Total IDR</b>	-15.3	55.4	1.0	0.56
<b>Total MTI</b>	-7.3	47.4	1.2	0.55
<b>Rural development</b>	-13.2	53.3	2.9	1.53

Source: Author's calculations based on 2005 EMNV data.

**Table 9.10: Rural development: rural roads  
Breakdown of regional distributional incidence results**

	1	2	3	4	5	Total
<i>Rural population distribution</i>						
Pacific	25.1	25.4	26.1	15.6	7.9	100.0
Central	43.3	25.8	16.1	10.6	4.3	100.0
Atlantic	38.0	30.2	18.9	9.2	3.8	100.0
Nicaragua	35.4	26.2	20.0	12.4	6.0	100.0
<i>Rural roads coverage</i>						
Pacific	9.3	18.0	16.6	18.5	26.2	16.2
Central	16.3	20.9	22.2	22.9	18.1	19.2
Atlantic	7.6	14.0	20.1	31.9	29.2	15.0
Nicaragua	13.1	19.2	19.3	22.5	29.0	18.0
<i>Estimated incidence</i>						
Pacific	14.4	28.2	26.8	17.8	12.7	100.0
Central	36.7	28.0	18.6	12.6	4.0	100.0
Atlantic	19.3	28.3	25.5	19.6	7.4	100.0
Nicaragua	25.7	27.9	21.3	15.4	9.7	100.0
<i>Atlantic-Pacific comparison</i>						
	1	2	3	4	5	Total
<i>Estimated incidence</i>						
Atlantic	19.3	28.3	25.5	19.6	7.4	100.0
Pacific	14.4	28.2	26.8	17.8	12.7	100.0
Difference	4.9	0.0	-1.3	1.7	-5.3	
<i>Effects</i>						
1. Potential user	9.1	8.5	-4.6	-7.3	-5.7	
2. Coverage	-4.2	-8.5	3.3	9.0	0.4	

Source: Author's calculations based on 2005 EMNV data.

**Table 9.11: Rural development  
Comparison with Honduras**

<i>Structure in percentages</i>						
	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5	Total
<i>Nicaragua</i>						
Consumption	6.3	10.4	14.8	21.8	46.8	100.0
Rural development	23.8	23.9	22.6	17.7	12.0	100.0
<i>Honduras</i>						
Consumption	4.7	8.5	13.8	21.9	51.1	100.0
Rural development	34.2	27.1	19.2	12.6	6.9	100.0

<i>Concentration indices</i>		
	Nicaragua	Honduras
Consumption	40.1	45.9
Rural development	-12.6	-28.5

Source: Author's calculations based in 2005 EMNV data and Gasparini et al. (2005)

**Table 10.1: Public social expenditure by quintiles**

	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5	Total
<b>Structure (%)</b>						
Consumption	6.3	10.4	14.8	21.8	46.8	100.0
Social Public Expenditure	18.8	20.0	20.7	20.5	20.0	100.0
Education	17.9	18.6	20.0	19.9	23.6	100.0
Health	20.5	22.0	21.9	19.6	16.0	100.0
Housing	7.9	14.4	16.9	43.2	17.6	100.0
Social assistance	20.3	21.2	20.8	19.2	18.6	100.0
<b>Spending (millions of cordobas)</b>						
Social Public Expenditure	1508	1604	1656	1646	1599	8012
Education	662	688	740	735	871	3696
Health	564	604	601	540	440	2750
Housing	23	42	50	127	52	294
Social assistance	258	270	264	244	236	1272
<b>Spending per inhabitant (cordobas)</b>						
Social Public Expenditure	1466	1560	1610	1600	1555	1558
Education	644	669	720	714	847	719
Health	549	588	585	525	428	535
Housing	23	41	48	124	50	57
Social assistance	251	262	257	237	230	247
<b>Spending as % of consumption</b>						
Social Public Expenditure	46.6	30.0	21.7	14.6	6.6	15.5
Education	20.5	12.8	9.7	6.5	3.6	7.2
Health	17.5	11.3	7.9	4.8	1.8	5.3
Housing	0.7	0.8	0.7	1.1	0.2	0.6
Social assistance	8.0	5.0	3.5	2.2	1.0	2.5

Source: Author's calculations based on 2005 EMNV data.

**Table 10.2: Public social expenditure by poverty level**

	Poor		Poor total	Non-poor	Total
	extreme	non-extreme			
<b>Structure (%)</b>					
Consumption	4.3	16.3	20.6	79.4	100.0
Social Public Expenditure	13.9	30.9	44.8	55.2	100.0
Education	13.1	29.0	42.2	57.8	100.0
Health	15.2	33.9	49.1	50.9	100.0
Housing	7.8	15.0	22.8	77.2	100.0
Social assistance	14.9	33.2	48.0	52.0	100.0
<b>Spending (millions of cordobas)</b>					
Social Public Expenditure	1116	2472	3588	4424	8012
Education	486	1073	1559	2137	3696
Health	418	934	1351	1399	2750
Housing	23	44	67	227	294
Social assistance	189	422	611	661	1272
<b>Spending per inhabitant (cordobas)</b>					
Social Public Expenditure	1463	1535	1512	1598	1558
Education	637	666	657	772	719
Health	548	580	569	505	535
Housing	30	27	28	82	57
Social assistance	248	262	257	239	247
<b>Spending as % of consumption</b>					
Social Public Expenditure	50.4	29.4	33.8	10.8	15.5
Education	22.0	12.8	14.7	5.2	7.2
Health	18.9	11.1	12.7	3.4	5.3
Housing	1.0	0.5	0.6	0.6	0.6
Social assistance	8.6	5.0	5.8	1.6	2.5
Population	0.76	1.61	2.37	2.77	5.1
Consumption	2213	8399	10612	41021	51633

Source: Author's calculations based on 2005 EMNV data.

**Table 10.3: PRS public spending by quintiles**

	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5	Total
<b>Structure (%)</b>						
Consumption	6.3	10.4	14.8	21.8	46.8	100.0
Spending PRS	22.5	23.2	22.2	18.8	13.2	100.0
Education	24.5	24.4	22.6	18.7	9.8	100.0
Health	20.7	22.6	22.4	19.5	14.7	100.0
Housing	22.3	22.4	21.7	19.1	14.5	100.0
Social assistance	20.1	21.0	20.7	19.3	18.9	100.0
Rural development	23.8	23.9	22.6	17.7	12.0	100.0
<b>Spending (millions of cordobas)</b>						
Spending PRS	1706	1757	1683	1427	1004	7576
Education	623	620	573	474	249	2540
Health	448	490	485	422	319	2165
Housing	66	66	64	56	43	294
Social assistance	244	255	251	233	229	1211
Rural development	325	327	309	241	164	1365
<b>Spending per inhabitant (cordobas)</b>						
Spending PRS	1659	1708	1636	1387	976	1473
Education	606	602	557	461	243	494
Health	436	477	472	410	310	421
Housing	64	64	62	55	42	57
Social assistance	237	248	244	227	222	236
Rural development	316	318	301	234	159	265
<b>Spending as % of consumption</b>						
Social Public Expenditure	52.7	32.8	22.1	12.7	4.1	14.7
Education	19.3	11.6	7.5	4.2	1.0	4.9
Health	13.9	9.2	6.4	3.8	1.3	4.2
Housing	2.0	1.2	0.8	0.5	0.2	0.6
Social assistance	7.5	4.8	3.3	2.1	0.9	2.3
Rural development	10.0	6.1	4.1	2.1	0.7	2.6

Source: Author's calculations based on 2005 EMNV data.

**Table 10.4: PRS public spending by poverty level**

	Poor		Poor total	Non-poor	Total
	extreme	non-extreme			
<b>Structure (%)</b>					
Consumption	4.3	16.3	20.6	79.4	100.0
Spending PRS	16.6	36.2	52.8	47.2	100.0
Education	18.1	38.0	56.1	43.9	100.0
Health	15.3	34.9	50.2	49.8	100.0
Housing	16.4	35.0	51.4	48.6	100.0
Social assistance	14.8	32.9	47.7	52.3	100.0
Rural development	17.5	37.9	55.5	44.5	100.0
<b>Spending (millions of cordobas)</b>					
Spending PRS	1257	2741	3997	3578	7576
Education	459	966	1425	1115	2540
Health	331	755	1087	1078	2165
Housing	48	103	151	143	294
Social assistance	179	399	577	634	1211
Rural development	239	518	757	608	1365
<b>Spending per inhabitant (cordobas)</b>					
Spending PRS	1648	1702	1684	1292	1473
Education	602	600	600	403	494
Health	435	469	458	389	421
Housing	63	64	64	52	57
Social assistance	235	247	243	229	236
Rural development	314	322	319	220	265
<b>Spending as % of consumption</b>					
Social Public Expenditure	56.8	32.6	37.7	8.7	14.7
Education	20.7	11.5	13.4	2.7	4.9
Health	15.0	9.0	10.2	2.6	4.2
Housing	2.2	1.2	1.4	0.3	0.6
Social assistance	8.1	4.7	5.4	1.5	2.3
Rural development	10.8	6.2	7.1	1.5	2.6

Source: Author's calculations based on 2005 EMNV data.

**Table 10.5: Concentration and progressivity indices and redistributive impact**

Spending by areas

	Concentration rate (i)	Progression rate (ii)	Spending (% consumption) (iii)	Redistributive impact (iv)
Consumption	40.1	-	-	-
Total SPE	1.1	39.0	15.5	6.1
Education	5.4	34.7	7.2	2.5
Health	-5.0	45.1	5.3	2.4
Housing	19.2	20.8	0.6	0.1
Social assistance	-2.4	42.5	2.5	1.0
Total PRS	-9.8	49.9	14.7	7.3
Education	-15.0	55.0	4.9	2.7
Health	-6.7	46.8	4.2	2.0
Housing	19.2	20.8	0.6	0.1
Social assistance	-2.0	42.0	2.3	1.0
Rural development	-12.7	52.8	2.6	1.4

Source: Author's calculations based on 2005 EMNV data.

**Table 10.6: Concentration and progressivity indices and redistributive impact**

By programs

	Concentration	Progressivity	Spending (% consumption)		Redistributive impact	
	rate (i)	rate (ii)	SPE (iii)	PRS (iv)	SPE (v)	PRS (vi)
Consumption	40.1	-	-	-		
Education						
Preschool	-7.7	47.7	0.1	0.1	0.03	0.03
Public primary school	-20.1	60.2	2.7	2.7	1.62	1.62
Subsidized pub. prim. sch.	51.0	-10.9	0.1	0.1	-0.01	-0.01
Public high school	10.0	30.0	0.5	0.5	0.14	0.14
Subsidized public high sch	35.6	4.5	0.0	0.0	0.00	0.00
Adults	-32.5	72.6	0.2	0.2	0.15	0.13
Technical education	32.6	7.5	0.1	0.1	0.01	0.01
Public universities	56.8	-16.7	1.9		-0.32	0.00
Subsidized priv. higher ed.	57.0	-16.9	0.1		-0.02	0.00
Health						
Prevention	-1.5	41.6	0.5	0.2	0.21	0.10
Public Medical Care	-7.5	47.5	3.4	3.6	1.61	1.71
Housing						
Legalizing property deeds	38.7	1.4	0.2	0.2	0.00	0.00
Housing programs	8.8	31.3	0.4	0.4	0.11	0.11
Social assistance						
FISE - Education	-13.7	53.8	0.3	0.3	0.18	0.18
FISE - Health	-13.2	53.3	0.2	0.2	0.09	0.09
FISE - Water and sanitatio	-5.7	45.8	0.4	0.4	0.20	0.20
FISE - Community works	25.6	14.4	0.6	0.6	0.09	0.09
FISE - Social protection	-27.3	67.3	0.0	0.0	0.03	0.03
PAININ	-3.9	44.0	0.3	0.3	0.14	0.12
PINE	-19.4	59.5	0.2	0.2	0.11	0.09
WFP	-29.7	69.8	0.2	0.1	0.11	0.10
Rural development						
MAGFOR	-19.9	60.0		0.5		0.31
IDR	-15.3	55.4		1.0		0.56
MTI	-7.3	47.4		1.1		0.53
Total SPE	1.1	39.0	15.5		6.05	
Total PRS	-9.8	49.9		14.7		7.32

Source: Author's calculations based on 2005 EMNV data.

**Table 10.7: Impact of social expenditures on distributional inequality**

SPE		
	Value	Difference
Pre-SPE Gini for consumption	40.1	
Progressivity indices (Kakwani)		
Social Public Expenditures	39.0	
Proportional taxes	0.0	
Progressive taxes	10.0	
Regressive taxes	-10.0	
SPE in social/consumption sectors	15.517	
Post-SPE Gini for consumption		
1. financed with proportional taxes	34.0	-6.1
2. financed with progressive taxes	32.5	-7.6
3. financed with regressive taxes	35.6	-4.5
Post-SPE Gini for consumption (proportional taxes)		
Leakage hypothesis 1		
1. 10% leakage	34.6	-5.4
2. 20% leakage	35.2	-4.8
3. 50% leakage	37.1	-3.0
Leakage hypothesis 2		
1. 10% leakage	35.2	-4.8
2. 20% leakage	36.5	-3.6
3. 50% leakage	40.2	0.1
PRS		
	Value	Difference
Pre- PRS spending Gini for consumption	40.1	
Progressivity indices (Kakwani)		
PRS spending	49.9	
Proportional taxes	0.0	
Progressive taxes	10.0	
Regressive taxes	-10.0	
PRS spending/consumption	14.7	
Gini for consumption post-PRS spending		
1. financed with proportional taxes	32.8	-7.3
2. financed with progressive taxes	31.3	-8.8
3. Financed with regressive taxes	34.2	-5.9
Post-PRS spending Gini for consumption (proportional taxes)		
Leakage hypothesis 1		
1. 10% leakage	33.5	-6.6
2. 20% leakage	34.2	-5.9
3. 50% leakage	36.4	-3.7
Leakage hypothesis 2		
1. 10% leakage	34.1	-6.0
2. 20% leakage	35.4	-4.7
3. 50% leakage	39.3	-0.7

Source: Author's calculations based on 2005 EMNV data.

**Table 10.8: Impact of social expenditures on distributional inequality  
Alternative scenarios**

SPE		
	Gini	Variation
Gini pre - tax	40.1	
Gini post - fiscal (with proportional taxes and inefficiency 2 of 20%)	36.5	-3.6
<i>Simulations</i>		
1. Progressive taxes	34.9	-1.6
2. Without inefficiency	34.0	-2.5
3. 10% higher spending	33.4	-3.1
4. Focalized education spending	35.5	-1.0
5. Focalized medical care spending	34.7	-1.8
6. Focalized social assistance spending	35.6	-0.9
7. Focalized social spending	32.7	-3.7
PRS		
	Gini	Variation
Gini pre - fiscal	40.1	
Gini post - fiscal (with proportional taxes and inefficiency 2 of 20%)	35.4	-4.7
<i>Simulations</i>		
1. Progressive taxes	33.9	-1.5
2. Without inefficiency	34.0	-1.4
3. 10% higher spending	32.0	-3.4
4. Focalized education spending	34.1	-1.3
5. Focalized medical care spending	34.0	-1.4
6. Focalized social assistance spending	34.5	-0.9
7. Focalized social spending	31.9	-3.5

Source: Author's calculations based on 2005 EMNV data.

**Table A1: Public social expenditure by area and location -MHCP classification  
Nicaragua, 2005**

Institution	Education		Health		Socials Services		Housing		Recreational Services		Total	
	C\$ (millions)	%	C\$ (millions)	%	C\$ (millions)	%	C\$ (millions)	%	C\$ (millions)	%	C\$ (millions)	%
<b>TOTAL</b>	<b>3,857.9</b>	<b>100.0</b>	<b>2820.8</b>	<b>100.0</b>	<b>824.2</b>	<b>100.0</b>	<b>1502.5</b>	<b>100.0</b>	<b>101.7</b>	<b>100.0</b>	<b>9107.1</b>	<b>100.0</b>
Presidency of the Republic			6.3	0.2	46.6	5.7			13.3	13.0	66.2	0.7
Ministry of Government			25.7	0.9							25.7	0.3
Ministry of Defense					1.0	0.1	9.9	0.7			9.9	0.1
Ministry of the Treasury and Public Credit											1.0	0.0
Ministry of Commerce, Industry and Trade							0.9	0.1			0.9	0.0
Ministry of Education, Culture and Sports	2,532.4	65.6							51.2	50.3	2583.6	28.4
Ministry of Health			2659.6	94.3							2659.6	29.2
Ministry of Labor	42.2	1.1			34.3	4.2	10.0	0.7			86.6	1.0
Ministry of Family Services	50.9	1.3	57.5	2.0	275.4	33.4					383.8	4.2
Decentralized institutions and others	1,232.4	31.9	71.6	2.5	466.9	56.7	1339.2	89.1	37.3	36.6	3147.4	34.6
Attorney General of the Republic							3.1	0.2			3.1	0.0
Nicaraguan Institute for Municipal Improvement							139.4	9.3			139.4	1.5

Source: Author's calculations based on MHCP data.

**Table A.2: Public spending to support poverty reduction, by area and location -MHCP classification  
Nicaragua, 2005**

Institution	Education		Health		Social Services		Housing		Recreational Services		Economic Services		Total	
	C\$ (millions)	%	C\$ (millions)	%	C\$ (millions)	%	C\$ (millions)	%	C\$ (millions)	%	C\$ (millions)	%	C\$ (millions)	%
<b>TOTAL</b>	<b>2,701.9</b>	<b>100.0</b>	<b>2235.3</b>	<b>100.0</b>	<b>567.8</b>	<b>100.0</b>	<b>1381.4</b>	<b>100.0</b>	<b>0.9</b>	<b>100.0</b>	<b>2928.6</b>	<b>100.0</b>	<b>9815.9</b>	<b>100.0</b>
Presidency of the Republic			6.3	0.3	38.5	6.8							44.8	0.5
Ministry of Defense							2.8	0.2					2.8	0.0
Ministry of Commerce, Industry and Trade							0.9	0.1			183.56	6.3	184.4	1.9
Ministry of Education, Culture and Sports	2,427.3	89.8							0.9	100.0			2428.3	24.7
Agriculture and Forestry Ministry											357.68	12.2	357.7	3.6
Ministry of Transportation and Infrastructure											1,336.56	45.6	1336.6	13.6
Ministry of Health			2099.8	93.9									2099.8	21.4
Ministry of Labor	42.2	1.6					10.0	0.7					52.3	0.5
Ministry of the Environment and Natural Resources											253.23	8.6	253.2	2.6
Ministry of Family Services	50.9	1.9	57.5	2.6	215.1	37.9							323.6	3.3
Decentralized institutions and others	181.4	6.7	71.6	3.2	314.2	55.3	1279.9	92.7			797.61	27.2	2644.7	26.9
Nicaraguan Institute for Municipal Improvement							87.8	6.4					87.8	0.9

Source: Author's calculations based on MHCP data.

**Table B.1: Health care at social security facilities  
Incidence**

	Health care for cases of diarrhea (INSS)	Health services (INSS)	Health care (INSS)	Spending	Spending per inhabitant	consump. %
	% (i)	% (ii)	% (iii)	(iv)	(v)	(vi)
1	0.0	1.3	1.2	10.2	10.0	0.3
2	17.7	9.7	10.4	92.3	90.0	1.7
3	7.8	14.7	14.0	123.9	120.9	1.6
4	45.1	34.7	36.2	321.1	313.1	2.9
5	29.3	39.6	38.3	340.4	332.0	1.4
Average	100.0	100.0	100.0	887.9	173.2	1.7

Source: Author's calculations based on 2005 EMNV data.

**Table B.2: Health care at social security facilities  
Concentration indices**

	Health care for diarrhea	Health services	Births (delivery)	Health care INSS
Index	32.1	43.37	53.29	42.39
Standard error	3.06	1.05	1.62	1.02
Var. coef.	0.10	0.02	0.03	0.02
Confidence interval				
Lower limit	26.29	40.77	49.04	39.86
Upper limit	37.89	45.48	56.17	44.50

Source: Author's calculations based on 2005 EMNV data.

**Table B.3: Health care at social security facilities  
Opportunity and monetary costs for receiving health care**

	Medical consult at social security facilities	Spending on public transp.	Waiting time	Spending on medicines	Total consultation spending
	(i)	(ii)	(iii)	(v)	(v)
<b>Total</b>	<b>11.1</b>	<b>20.9</b>	<b>54.0</b>	<b>87.9</b>	<b>108.8</b>
Quintiles of consumption					
1	1.0	33.5	41.5	24.6	58.1
2	6.3	19.2	47.1	42.0	61.2
3	8.2	17.8	72.0	67.8	85.6
4	16.6	18.7	46.7	93.4	112.1
5	17.2	24.0	55.8	198.1	222.1
Extreme poor					
Non extreme poor	0.6	58.5	68.8	21.8	80.3
Poor	5.5	21.6	44.6	43.5	65.1
Non Poor	4.2	23.1	45.5	36.9	60.0
	15.1	20.6	55.3	126.6	147.2
Rural					
Urban	3.3	38.5	84.9	65.9	104.4
	16.3	18.6	49.9	106.0	124.6
Region					
Managua	24.3	18.4	54.2	106.0	124.3
Pacific	9.9	18.0	39.1	85.0	103.0
Central	3.8	20.6	89.2	80.6	101.2
Atlantic	3.0	92.5	48.9	80.0	172.5
Observations	7198	487	487	15335	15335
Expanded frecuencies	1068595	119098	119098	2156369	2156369

Source: Author's calculations based on 2005 EMNV data.

**Table C.1: Retirement pensions - Coverage rate**

Total		Poverty		Area		Region		Ethnic groups	
1	3.6	Extreme	1.6	Rural	3.4	Managua	22.7	Indigen. gr	11.8
2	6.0	Moderate	10.9	Urban	19.9	Pacific	16.3	Others	13.9
3	16.2	Non poor	16.7			Central	6.8		
4	16.2	Poor	9.3			Atlantic	4.6		
5	19.8	Non poor	16.7						

Source: Author's calculations based on 2005 EMNV data.

**Table C.2: Retirement pensions - Coverage rate by regions and poverty level**

	<b>Managua</b>	<b>Pacific</b>	<b>Central</b>	<b>Atlantic</b>
Total	22.7	16.3	6.8	4.6
Poor	7.0	16.0	4.7	2.1
Non poor	25.1	16.5	8.9	7.5

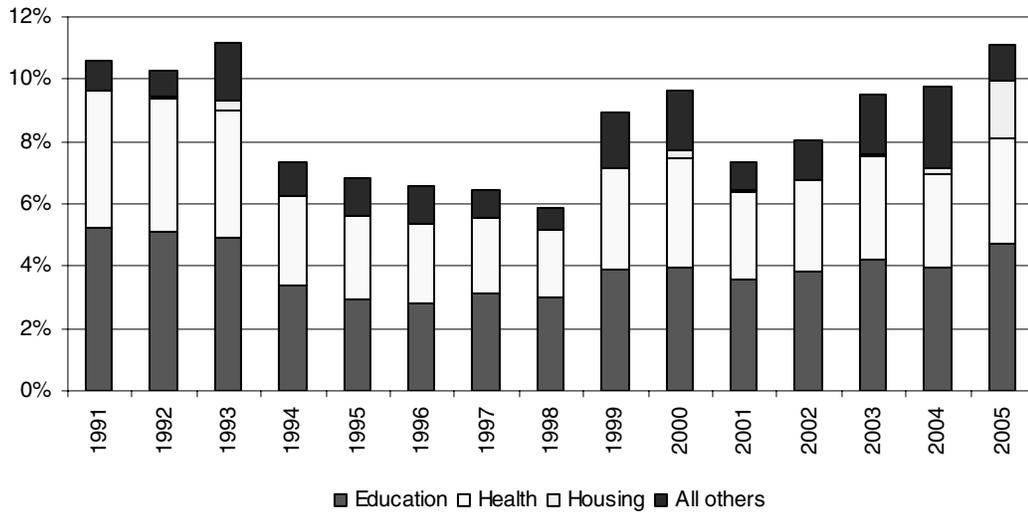
Source: Author's calculations based on 2005 EMNV data.

**Table C.3: Retirement pensions Spending incidence**

	Structure %	Spending		
		total C\$ M	per inhabitant C\$	as % of consump
	(i)	(ii)	(iii)	(iv)
1	4.0	42.5	41.5	1.3
2	7.5	79.3	77.4	1.5
3	23.6	250.5	244.3	3.3
4	25.0	266.1	259.5	2.4
5	39.9	424.6	414.1	1.8
Average	100.0	1063.0	207.4	2.1

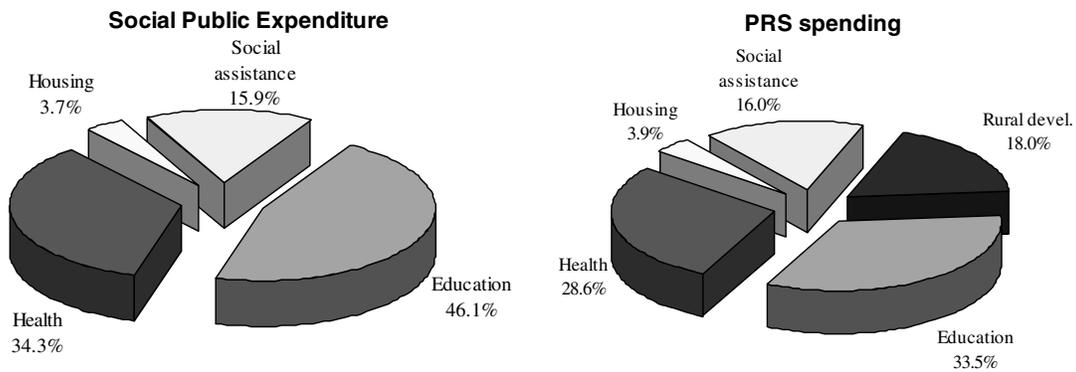
Source: Author's calculations based on 2005 EMNV data.

**Graph 3.1: Evolution of public social expenditure (as percentage of GDP)  
Nicaragua 1991-2005  
MHCP classification**



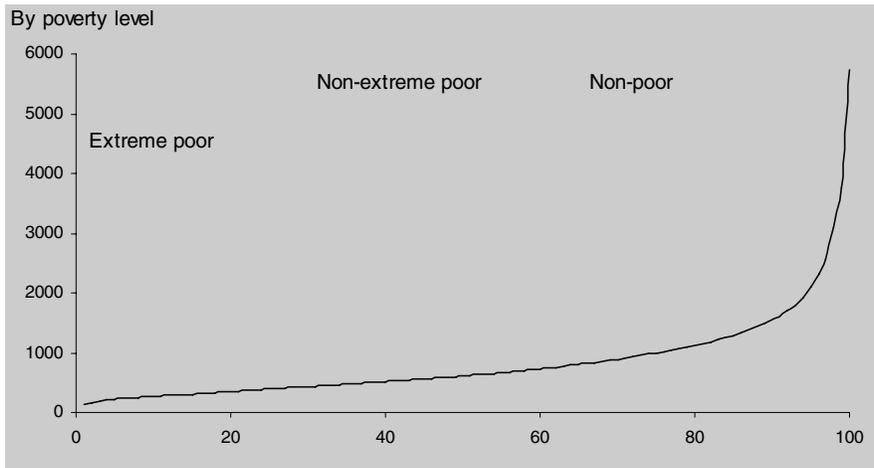
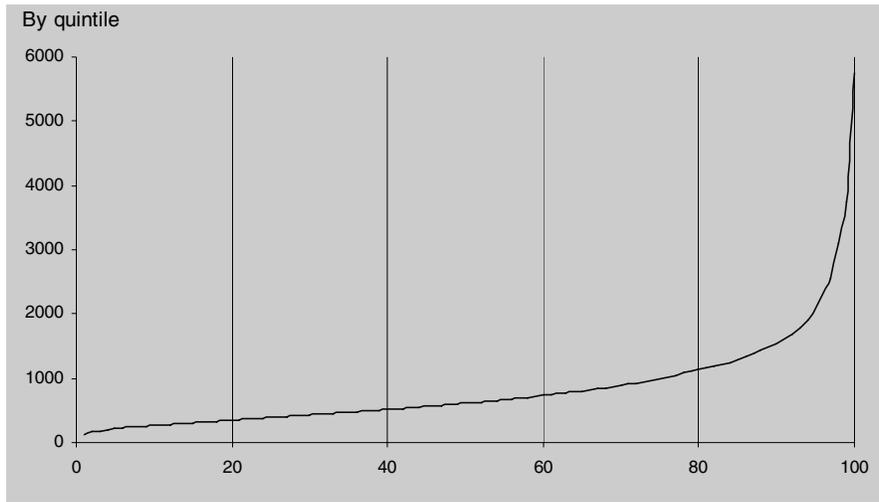
Source: Author's calculations based on MHCP data.

**Graph 3.2: Public social expenditure and PRS spending by areas  
Classification used for this study**



Source: Author's calculations based on MHCP data.

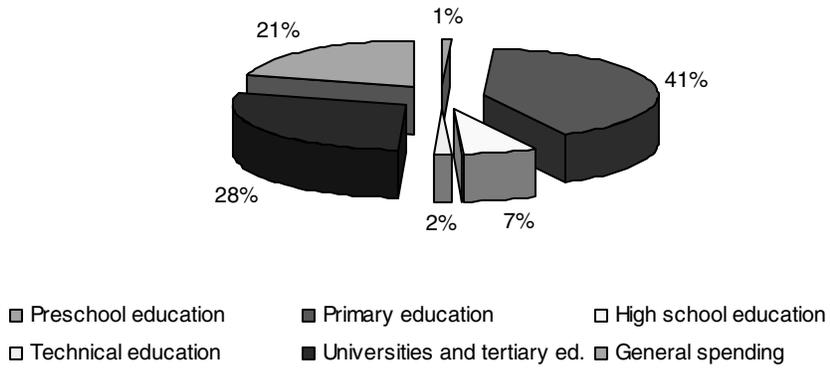
**Graph 3.3 - Per capita consumption by percentiles (Pen curve)**



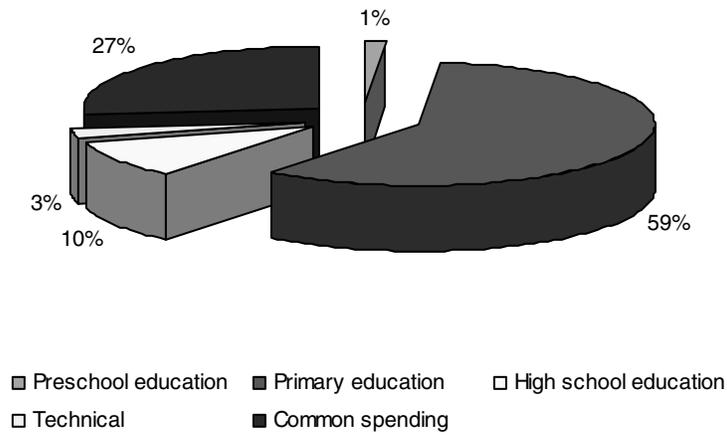
Source: Author's calculations based on 2005 EMNV data.

**Graph 4.1 - Participation of each education level in education spending**

**SPE spending in education**



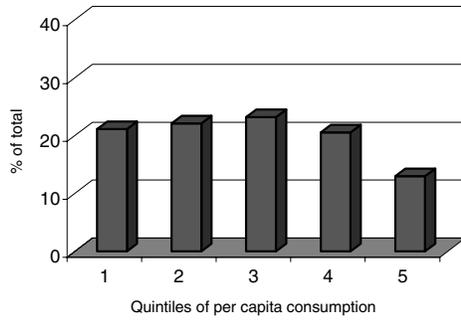
**PRS spending in education**



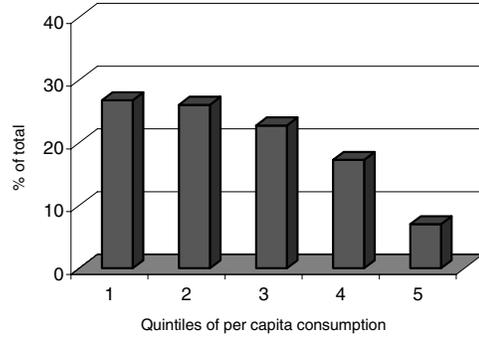
Source: Author's calculations based on government data.

**Graph 4.2 - Education spending - Participation by quintiles**

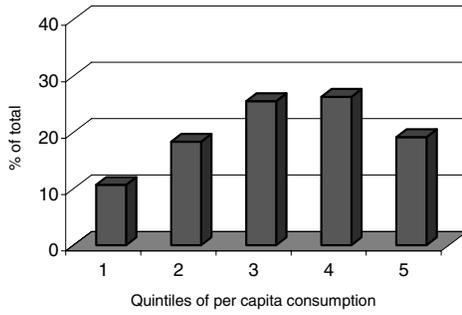
Prescholar



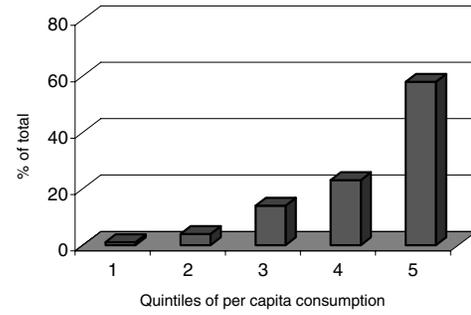
Primary



Middle



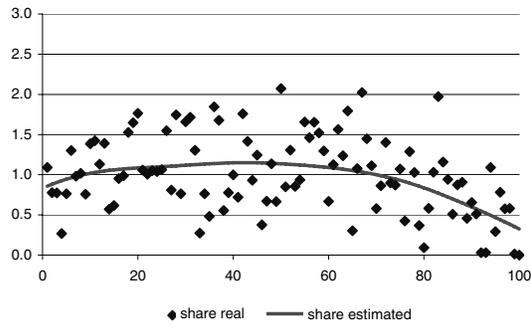
University



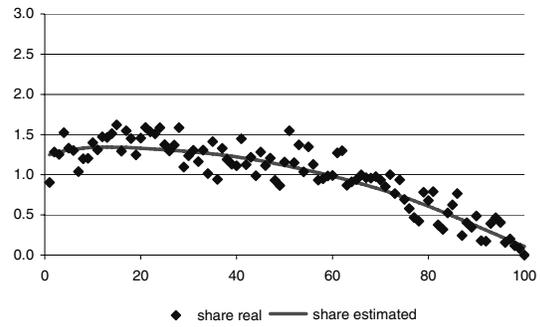
Source: Author's calculations based on 2005 EMNV data.

### Graph 4.3 - Education spending Participation by percentiles

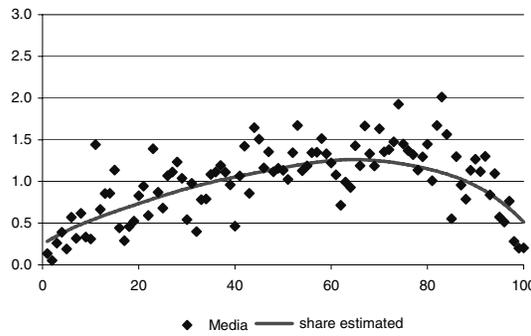
Preschool



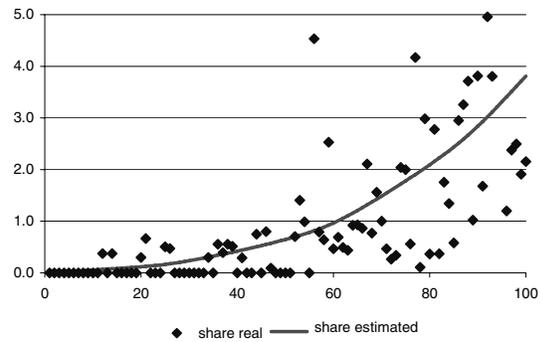
Primary



Middle



University

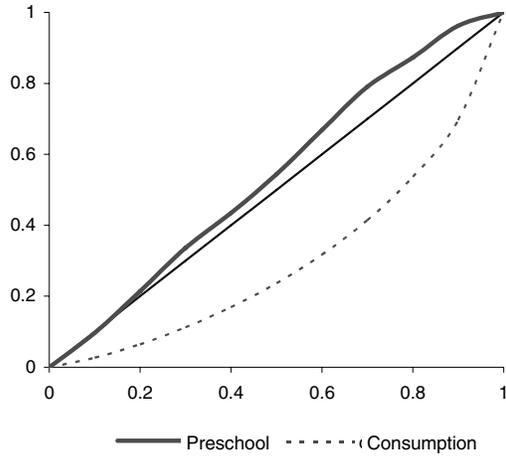


Source: Author's calculations based on 2005 EMNV data.

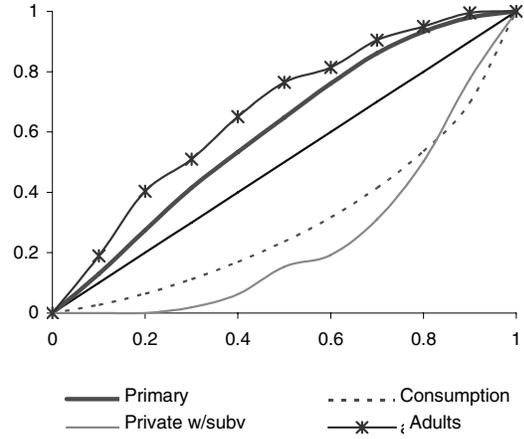
Note: The continuous line demonstrates a non-parametric estimate of participation (lowess estimate)

### Graph 4.4 - Education Concentration curves

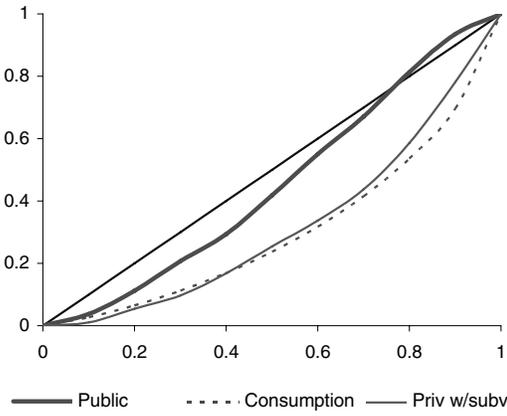
Preschool



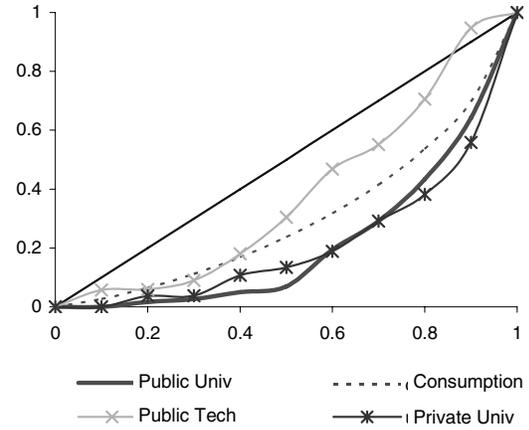
Primary



Middle



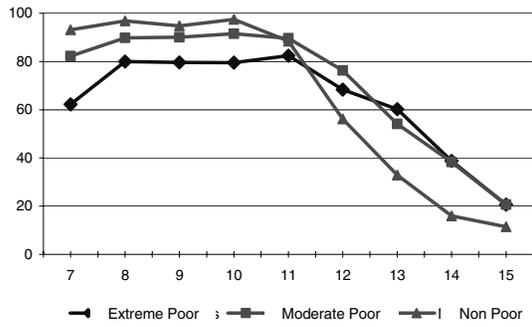
Higher education



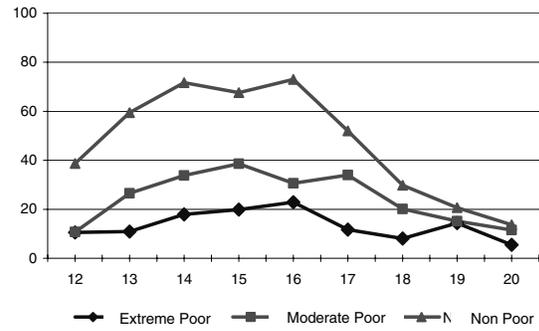
Source: Author's calculations based on 2005 EMNV data.

**Graph 4.5 - Education Attendance rates**

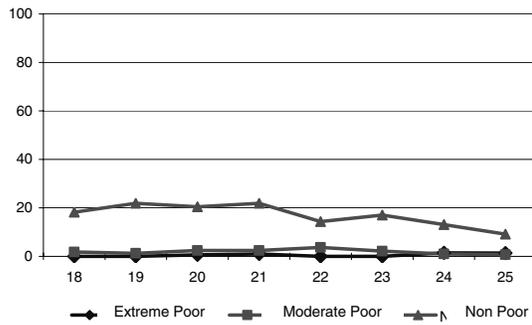
Primary



Middle

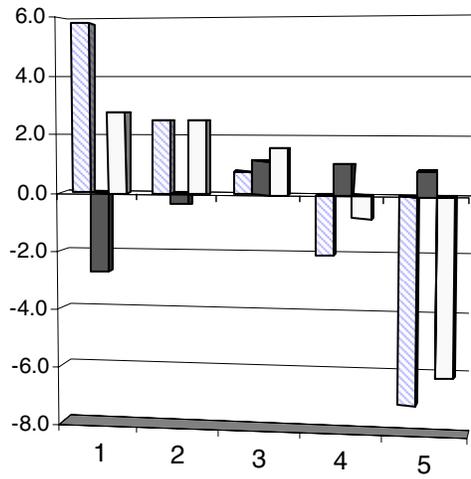


University



Source: Author's calculations based on 2005 EMNV data.

**Graph 4.6 - Primary education**  
**Breakdown of distributional incidence results**  
**Potential user, attendance and public effects**

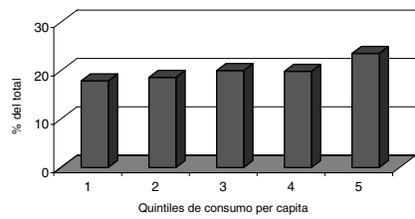


□ 1. Potencial user ■ 2. Attendance □ 3. Public

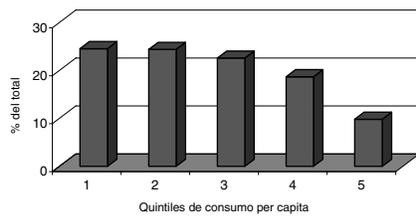
Source: Author's calculations based on 2005 EMNV data.

**Graph 4.7 - Spending for education**  
**Participation by quintiles**

GPS

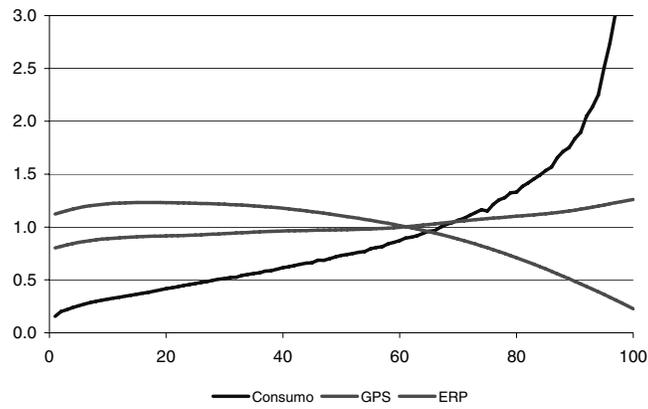


ERP



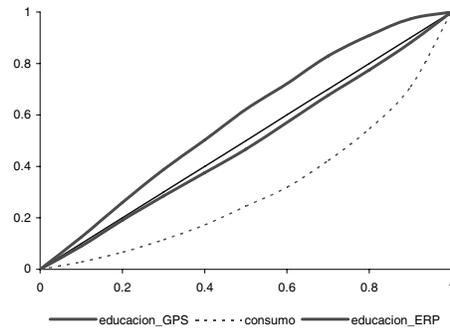
Source: Author's calculations based on 2005 EMNV data.

**Graph 4.8 - Spending for education  
Participation by quintiles**



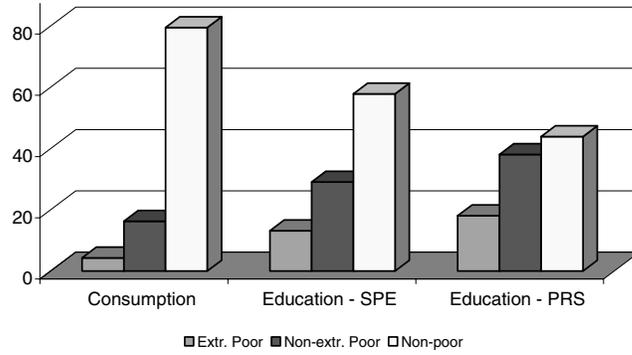
Source: Author's calculations based on 2005 EMNV data.  
Note: Lines demonstrate a non-parametric estimation of participations (*lowess estimation*).

**Graph 4.9 - Spending for education  
Concentration curves**



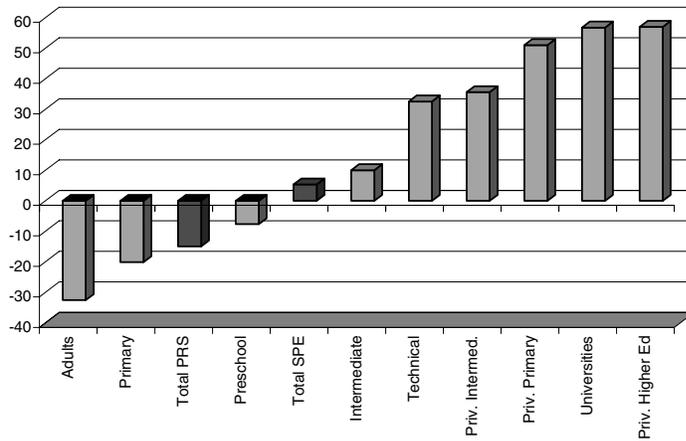
Source: Author's calculations based on 2005 EMNV data.

**Graph 4.10 - Consumption and spending for education  
Group participation by poverty level**



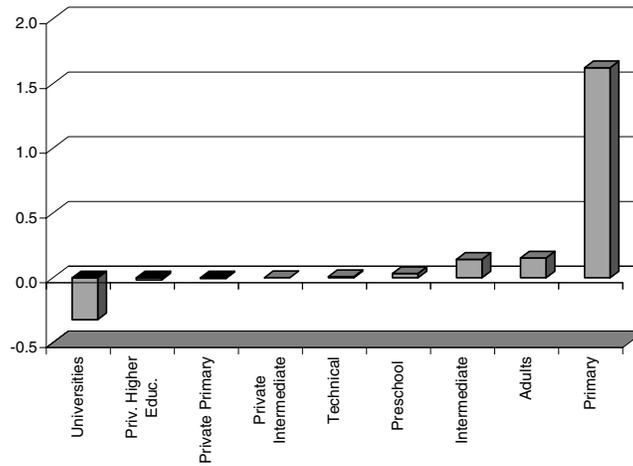
Source: Author's calculations based on 2005 EMNV data.

**Graph 4.11 - Education  
Concentration indices**



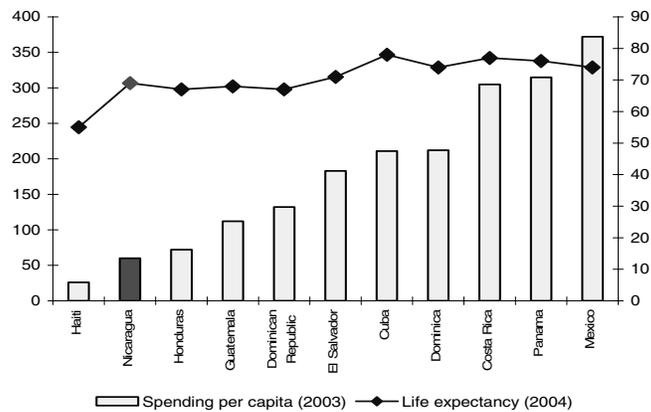
Source: Author's calculations based on 2005 EMNV data.

**Graph 4.12 - Education  
Redistributional impact indices**



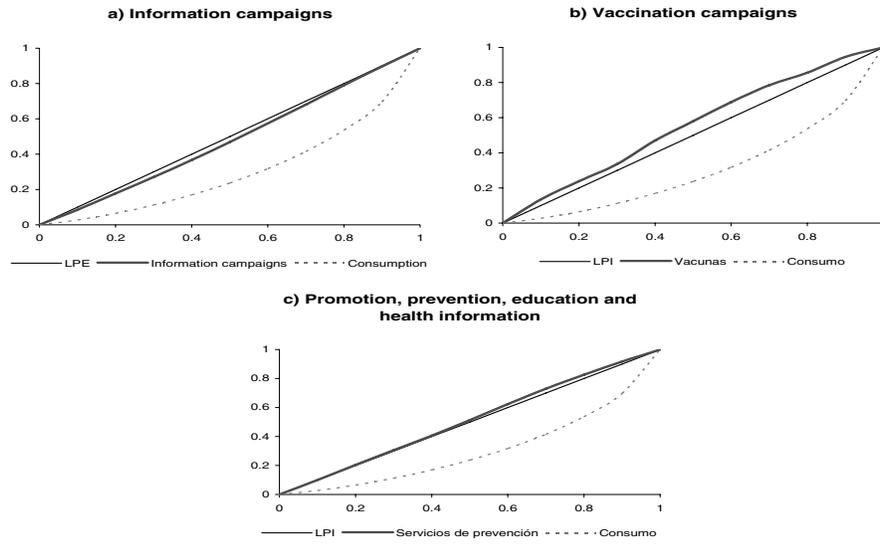
Source: Author's calculations based on 2005 EMNV data.

**Graph 5.1 - Per capita spending for health care (PPP) and life expectancy  
International comparison**



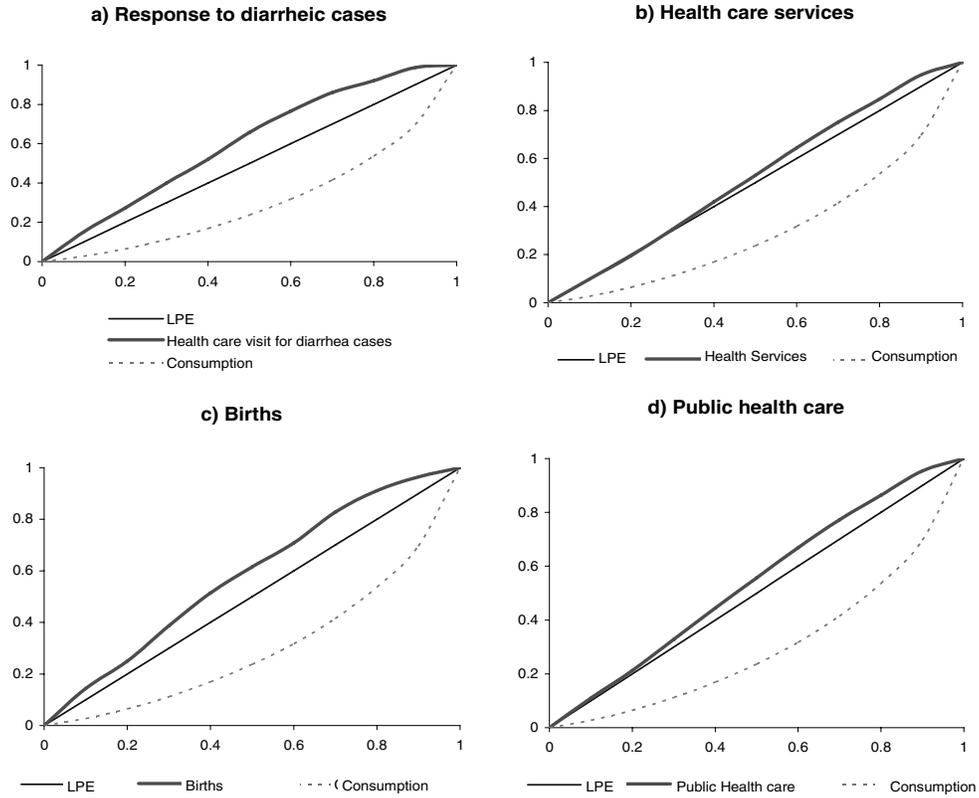
Source: Author's calculations based on WHO data.

## Graph 5.2 - Promotion, education and health information services Concentration curves



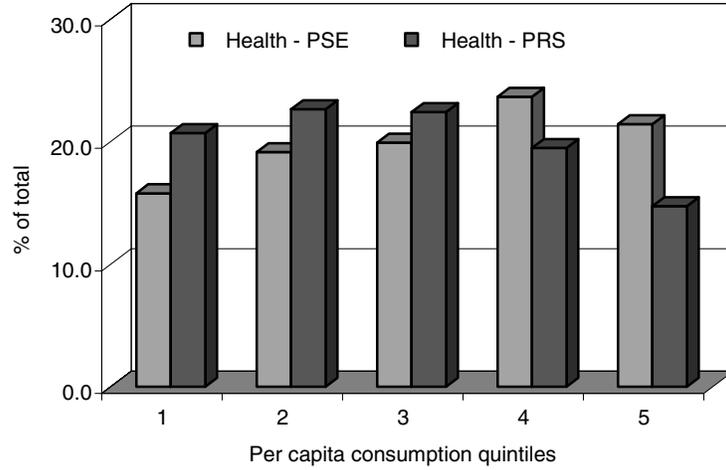
Source: Author's calculations based on 2005 EMNV data.

## Graph 5.3 - Public health care Concentration curves



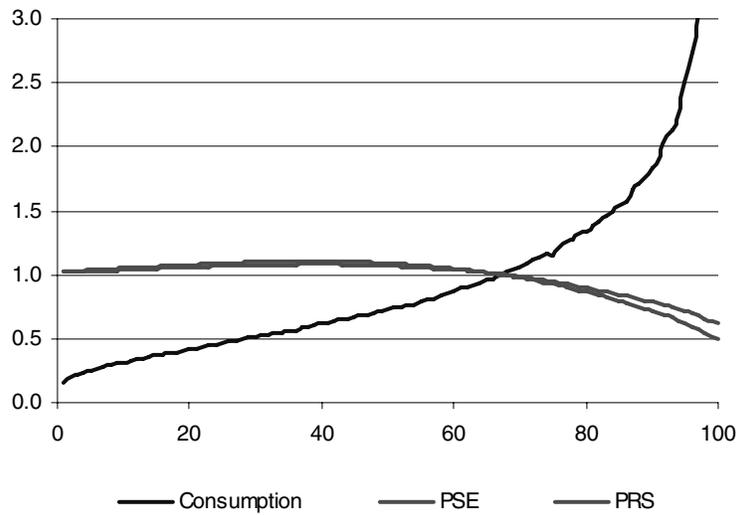
Source: Author's calculations based on 2005 EMNV data.

**Graph 5.4 - Health spending  
Participation by quintiles**



Source: Author's calculations based on 2005 EMNV data.

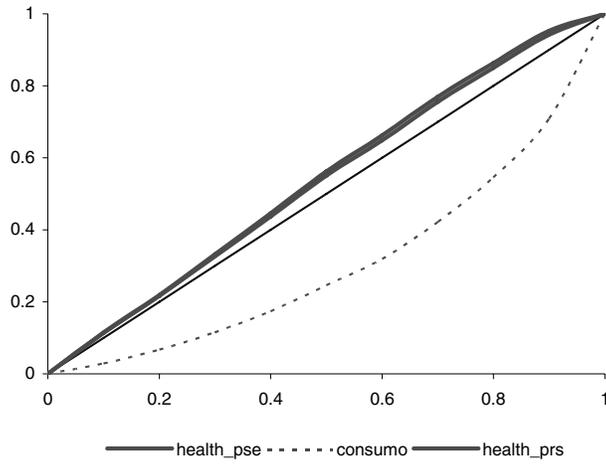
**Graph 5.5 - Health spending  
Participation by percentiles**



Source: Author's calculations based on 2005 EMNV data.

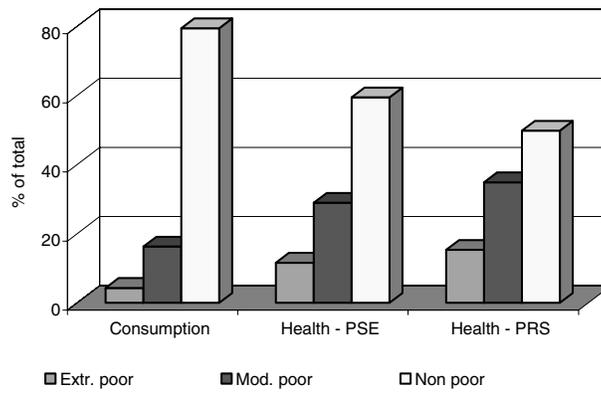
Note: Lines demonstrate a non-parametric estimate of participation (*lowess estimate*).

**Graph 5.6 - Health spending  
Concentration curves**



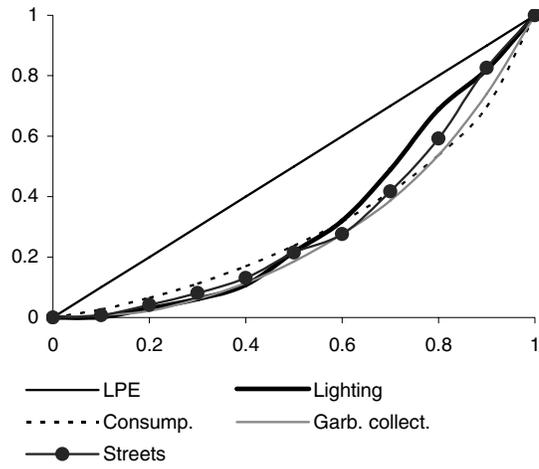
Source: Author's calculations based on 2005 EMNV data.

**Graph 5.7 - Consumption and health spending  
Group participation by poverty level**



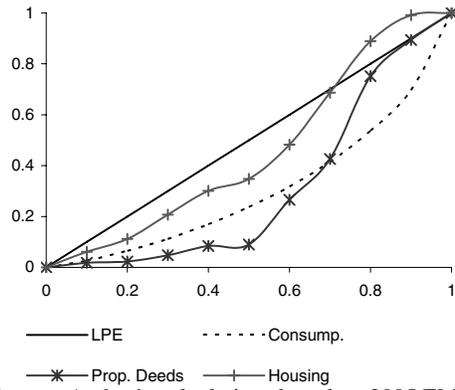
Source: Author's calculations based on 2005 EMNV data.

**Graph 6.1 - Public services  
Concentration curves**



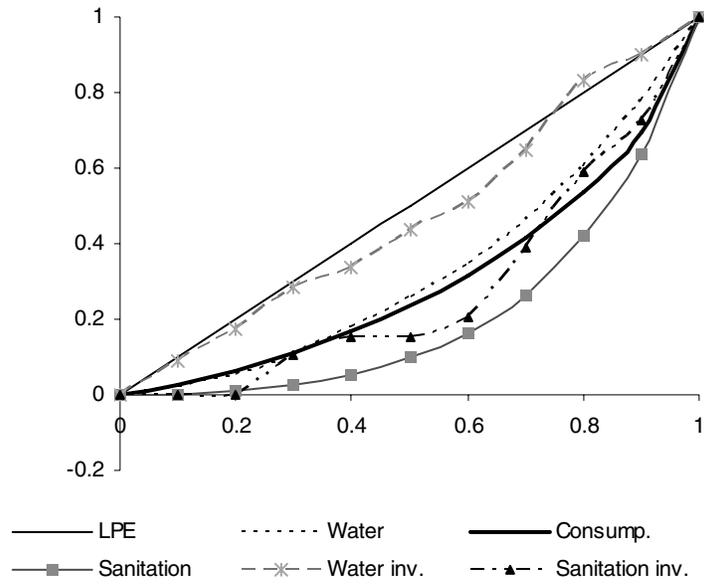
Source: Author's calculations based on 2005 EMNV data.

**Graph 6.2 - Housing programs  
Concentration curves**



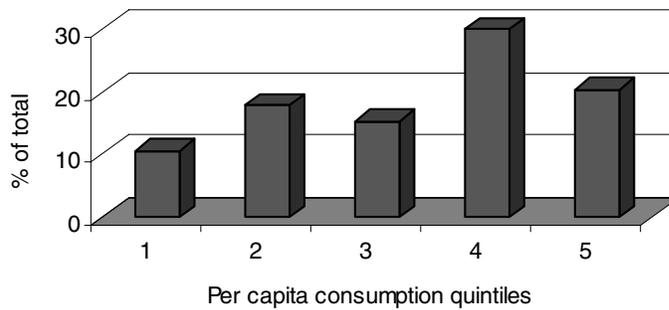
Source: Author's calculations based on 2005 EMNV data.

**Graph 7.1 - Water and sanitation  
Concentration curves**



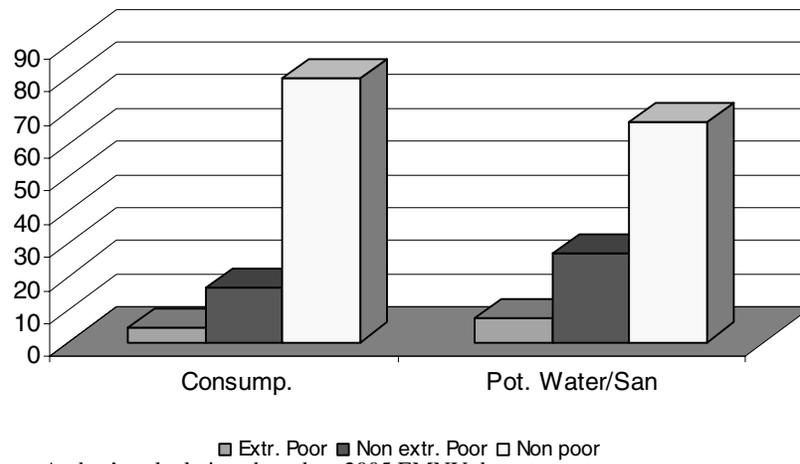
Source: Author's calculations based on 2005 EMNV data.

**Graph 7.2 - Water and sanitation  
Participation by quintiles**



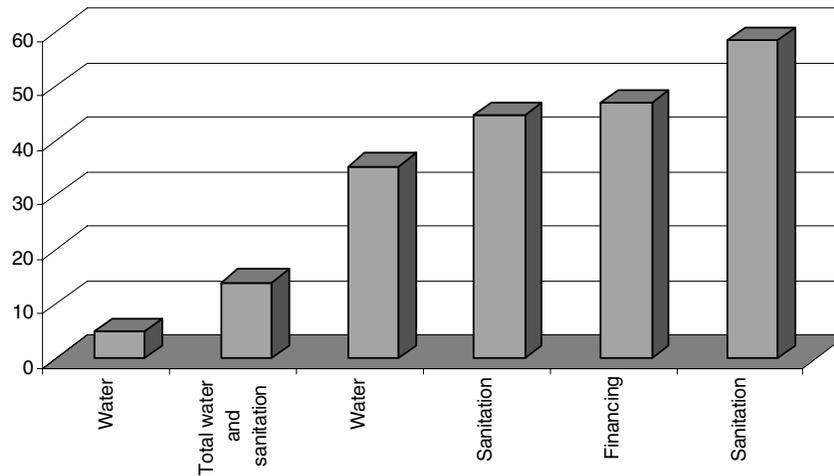
Source: Author's calculations based on 2005 EMNV data.

**Graph 7.3 - Consumption and water/sanitation spending  
Group participation by poverty level**



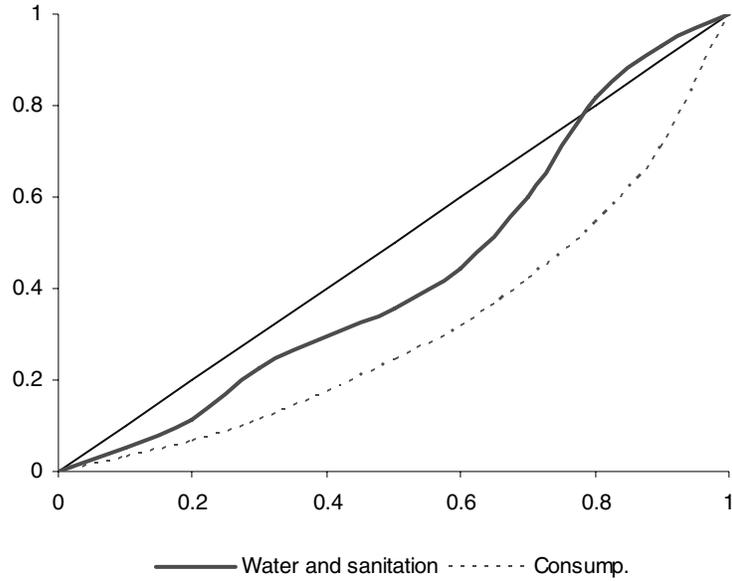
Source: Author's calculations based on 2005 EMNV data.

**Graph 7.4 - Water and sanitation  
Concentration indices**



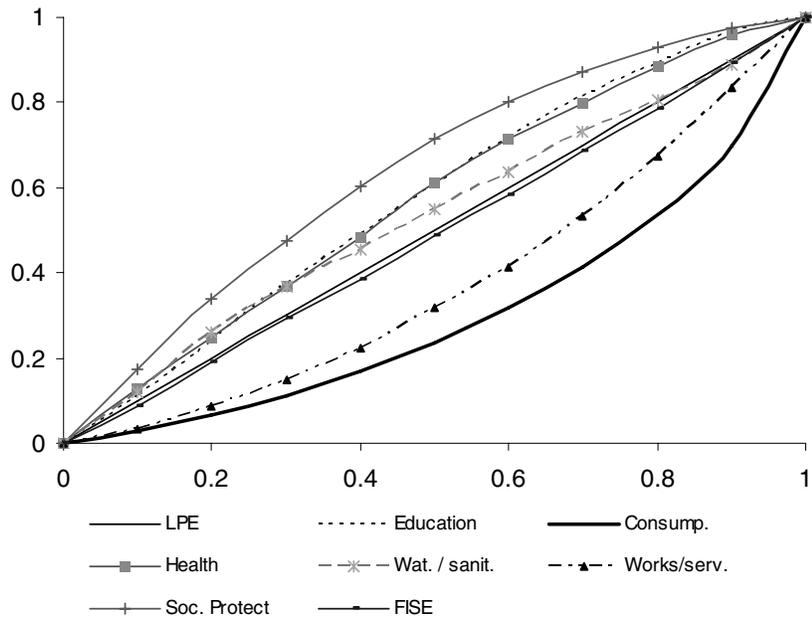
Source: Author's calculations based on 2005 EMNV data.

**Graph 7.5 - Water and sanitation  
Concentration curves**



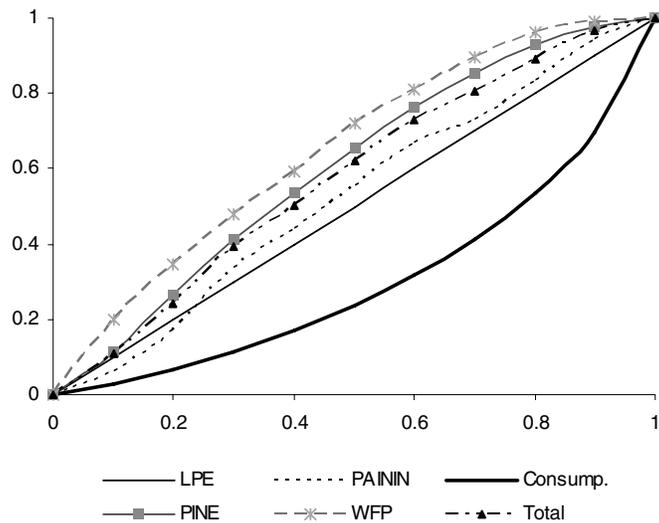
Source: Author's calculations based on 2005 EMNV data.

**Graph 8.1 - Emergency Social Investment Fund (FISE)  
Concentration curves**



Source: Author's calculations based on 2005 EMNV data.

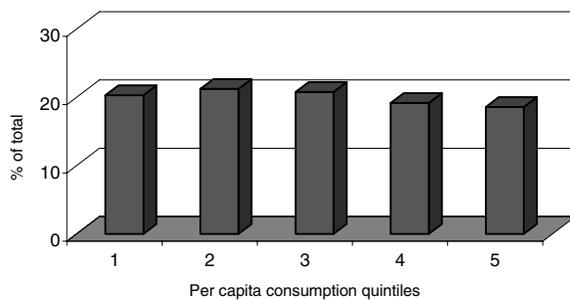
**Graph 8.2 - Food programs  
Concentration curves**



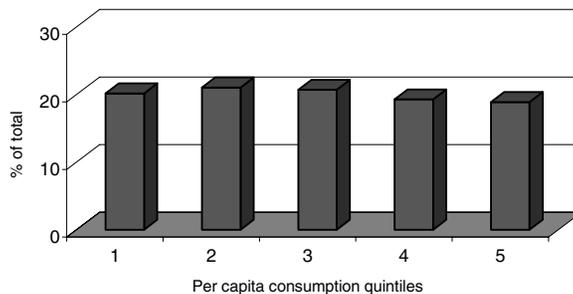
Source: Author's calculations based on 2005 EMNV data.

**Graph 8.3 - Social assistance  
Participation by quintiles**

SPE

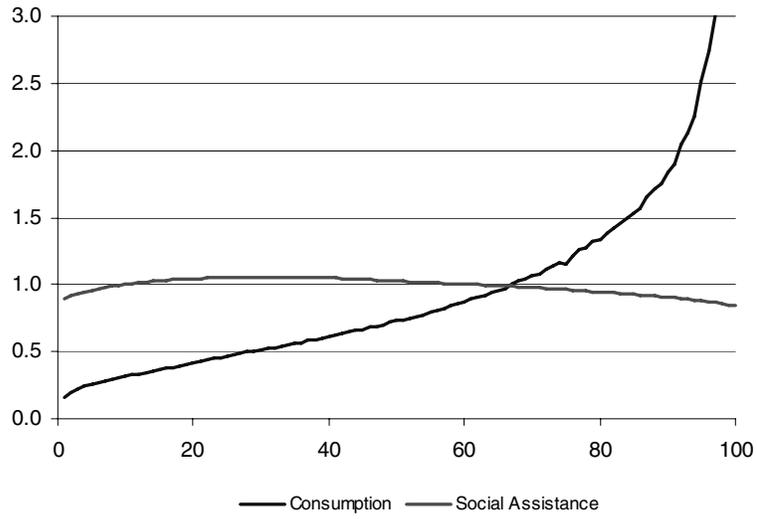


PRS



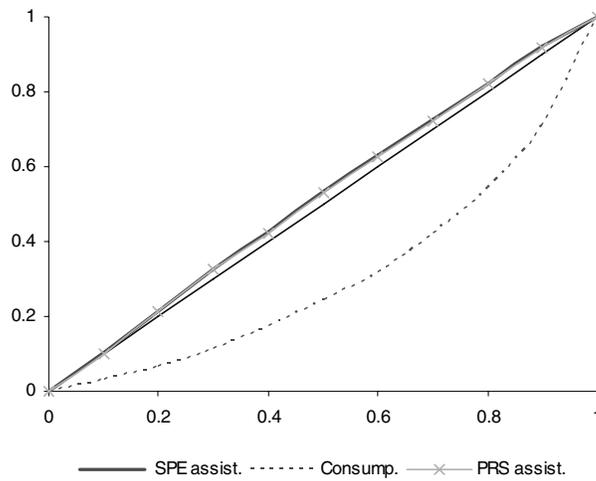
Source: Author's calculations based on 2005 EMNV data.

**Graph 8.4 - Social assistance  
Participation by percentiles**



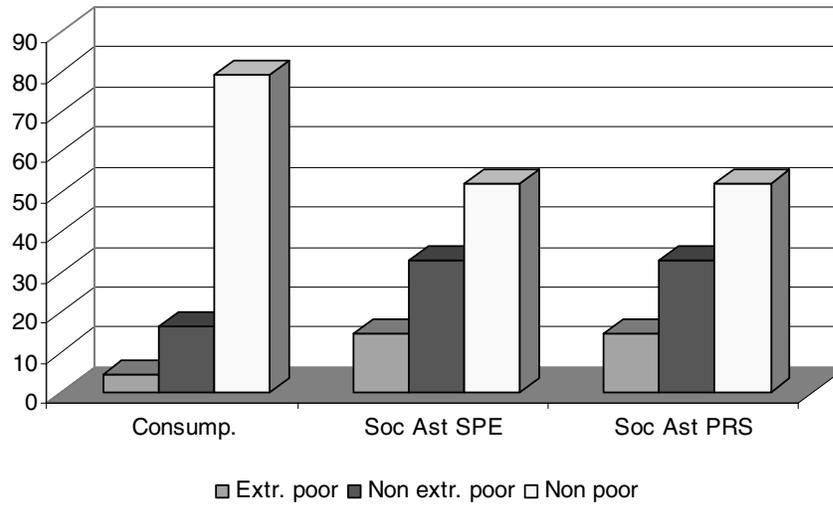
Source: Author's calculations based on 2005 EMNV data.  
 Note: Lines demonstrate a non-parametric estimate of participation (*lowess estimate*).

**Graph 8.5 - Social assistance  
Concentration curves**



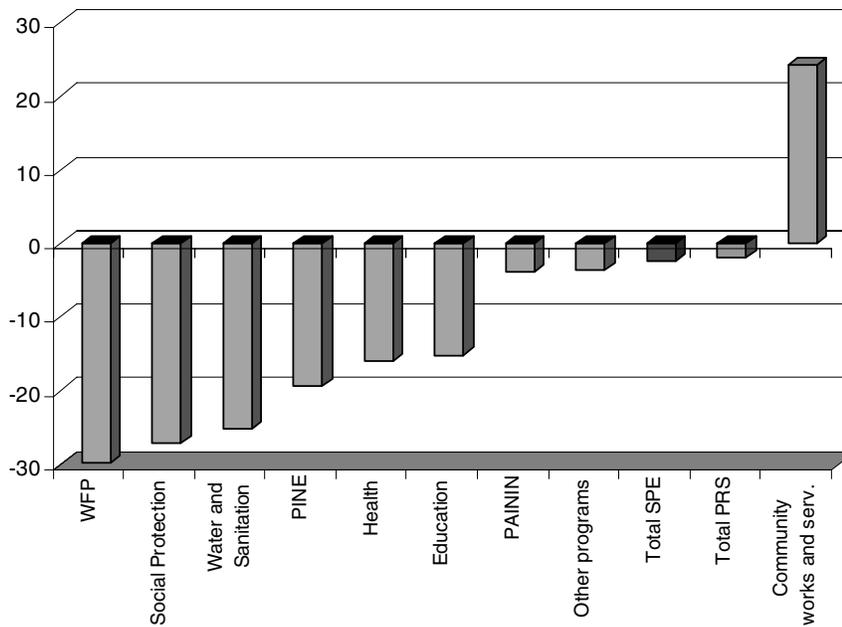
Source: Author's calculations based on 2005 EMNV data.

**Graph 8.6 - Consumption and social assistance spending  
Group participation by poverty level**



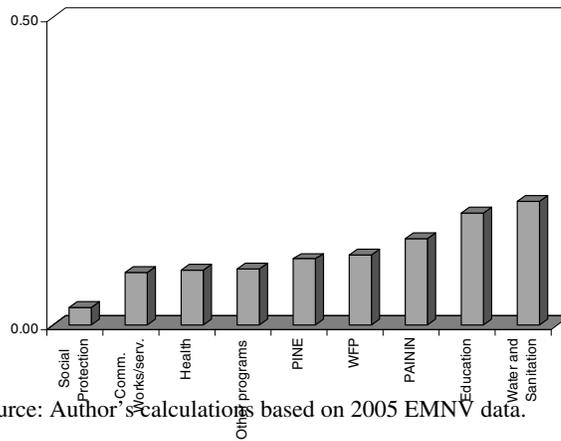
Source: Author's calculations based on 2005 EMNV data.

**Graph 8.7 - Social assistance  
Concentration indices**

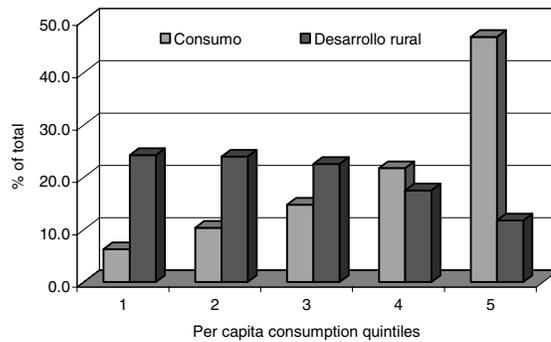


Source: Author's calculations based on 2005 EMNV data.

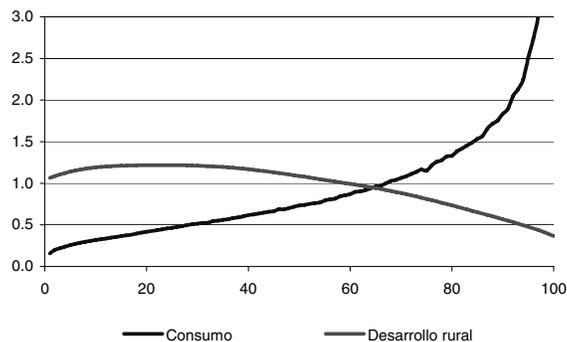
**Graph 8.8 - Social assistance  
Redistributive impact indices**



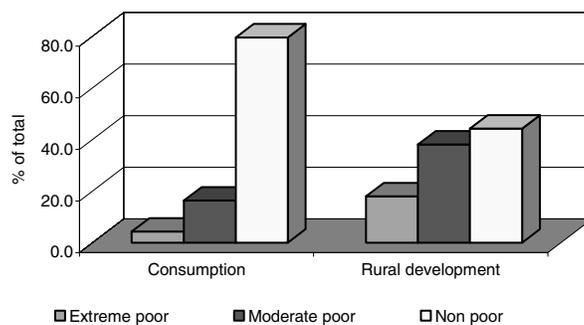
**Graph 9.1 - Consumption and spending for rural development  
Participation by quintiles**



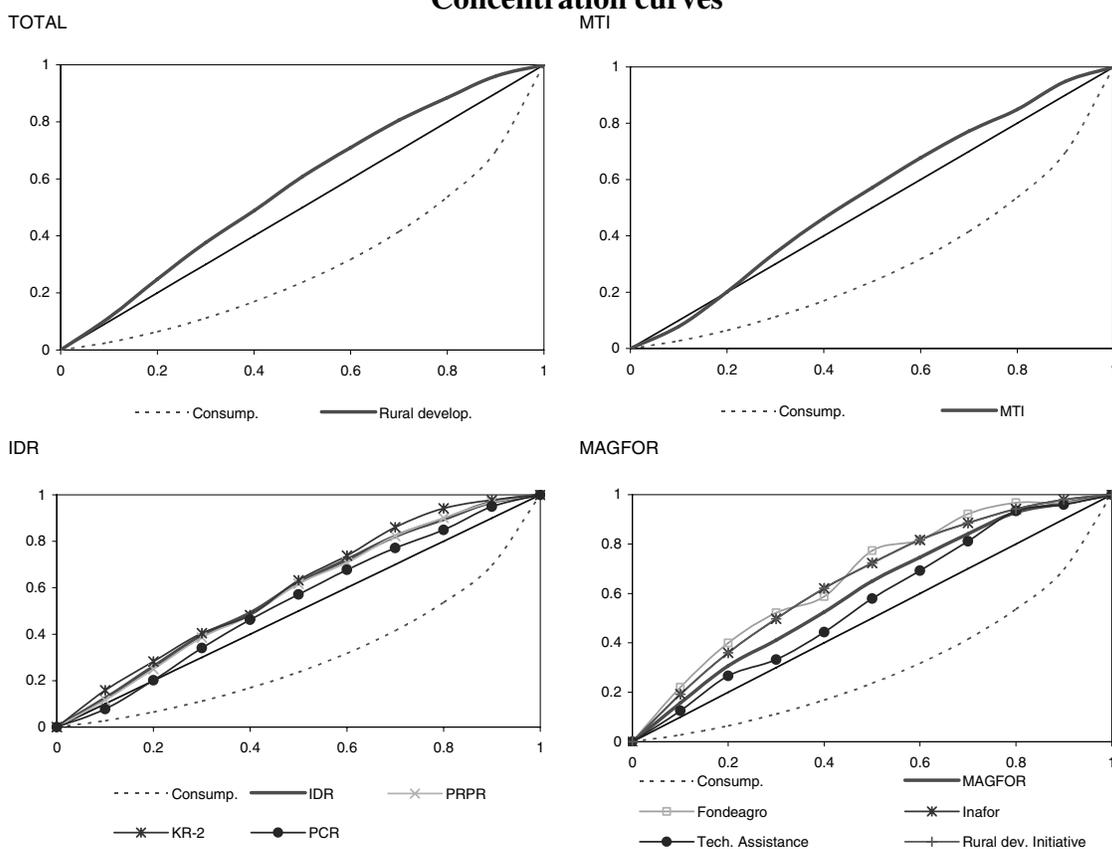
**Graph 9.2 - Consumption and spending for rural development  
Participation by percentiles**



**Graph 9.3 - Consumption and spending for rural development  
Participation by poverty level**

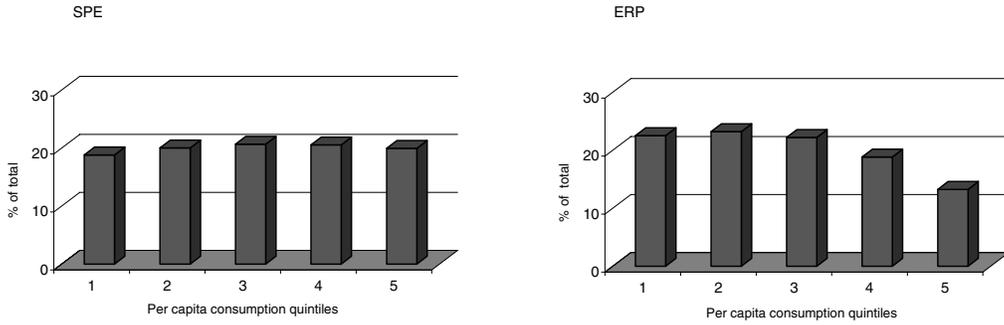


**Graph 9.4 - Rural development  
Concentration curves**



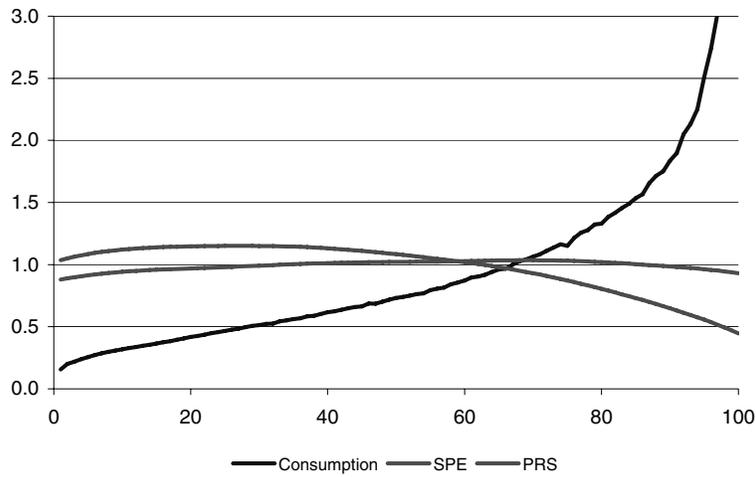
Source: Author's calculations based on 2005 EMNV data.

**Graph 10.1 - Social spending  
Participation by quintiles**



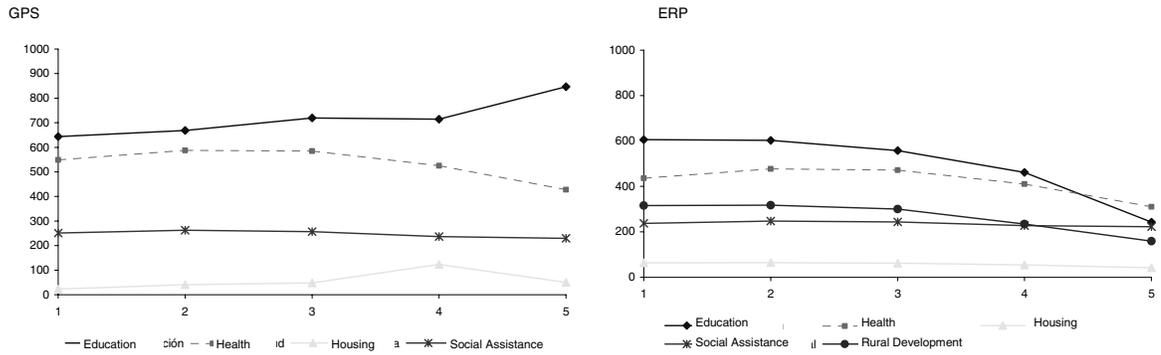
Source: Author's calculations based on 2005 EMNV data.

**Graph 10.2 - Social spending  
Participation by percentiles**



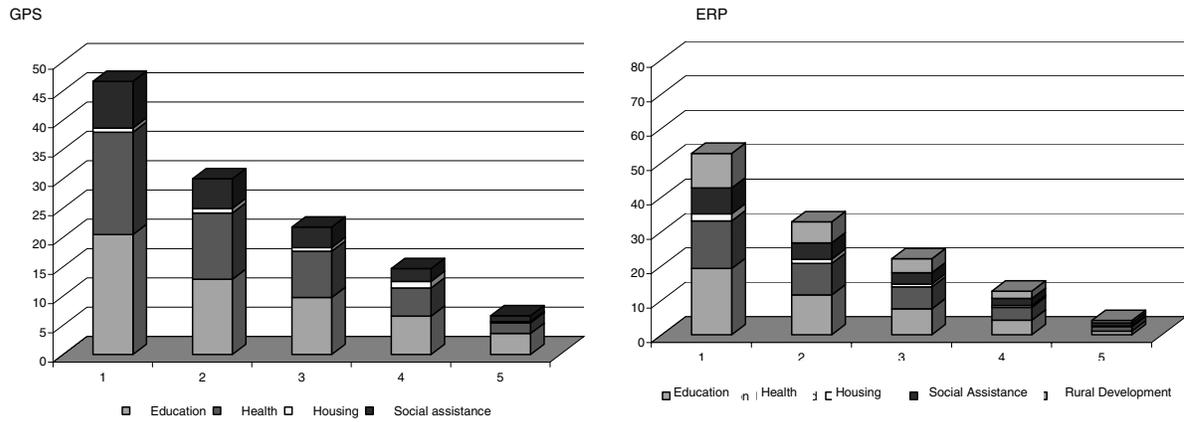
Source: Author's calculations based on 2005 EMNV data.

**Graph 10.3- Areas of social spending**  
**Spending per inhabitant (C\$ per year)**



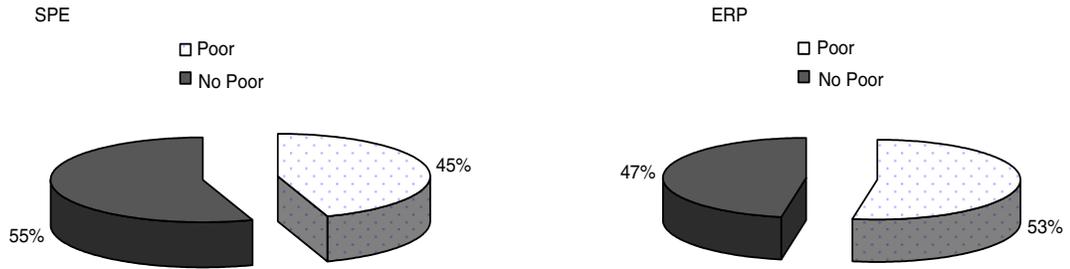
Source: Author's calculations based on 2005 EMNV data.

**Graph 10.4 - Areas of social spending**  
**Spending as percentage of total consumption**



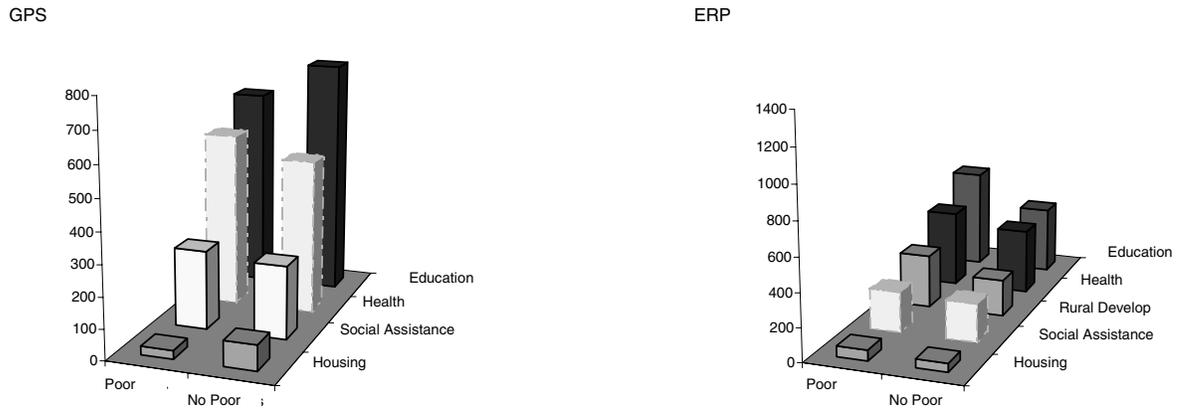
Source: Author's calculations based on 2005 EMNV data.

**Graph 10.5 - Assignment of social spending by poverty level**



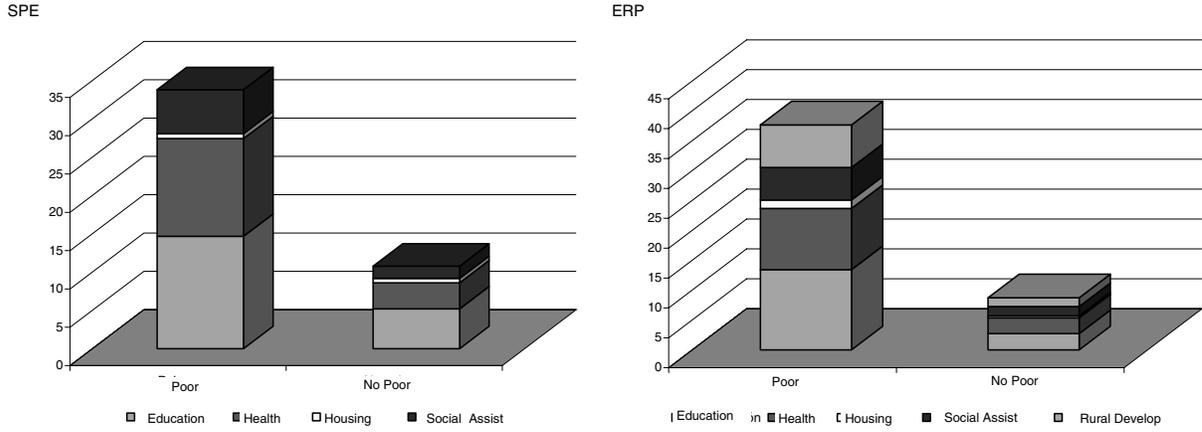
Source: Author's calculations based on 2005 EMNV data.

**Graph 10.6 - Areas of social spending by poverty level**  
Spending per inhabitant (C\$ per year)



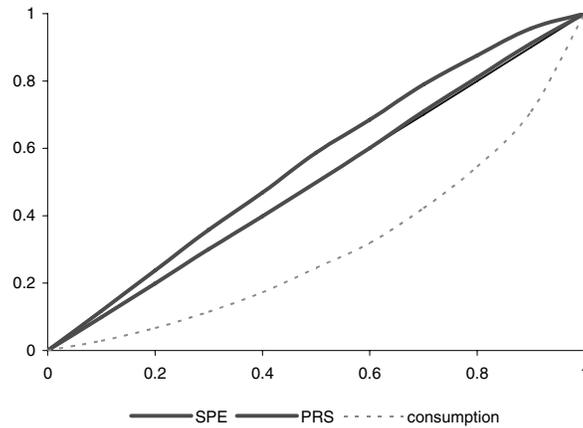
Source: Author's calculations based on 2005 EMNV data.

**Graph 10.7 - Areas of social spending by poverty level**  
**Spending as percentage of consumption**



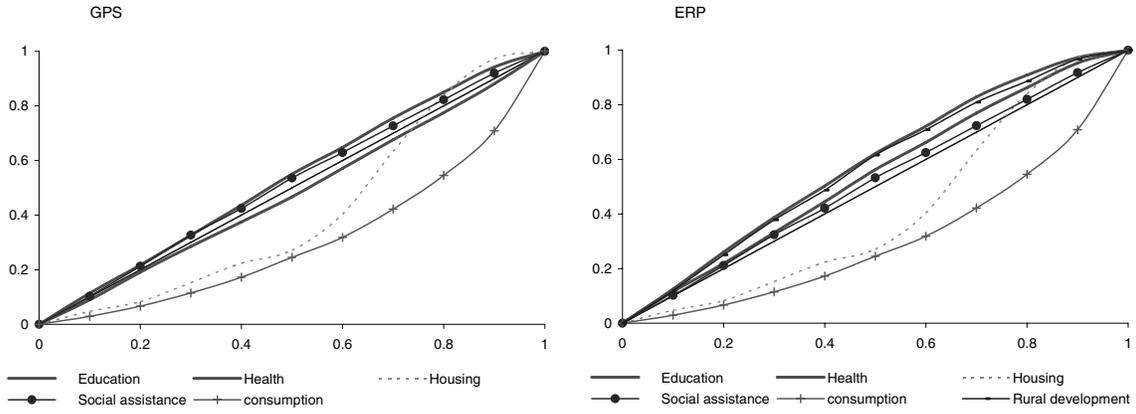
Source: Author's calculations based on 2005 EMNV data.

**Graph 10.8 - Social spending**  
**Concentration curves**



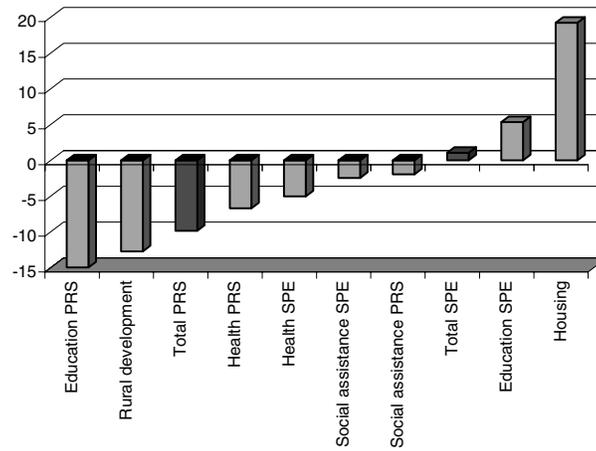
Source: Author's calculations based on 2005 EMNV data.

**Graph 10.9 - Areas of social spending  
Concentration curves**



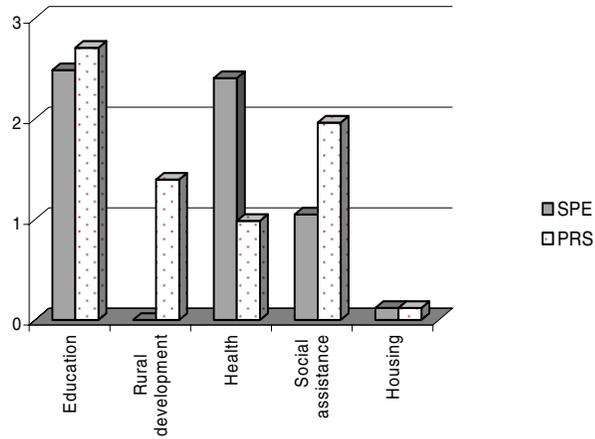
Source: Author's calculations based on 2005 EMNV data.

**Graph 10.10 - Areas of social spending  
Concentration indices**



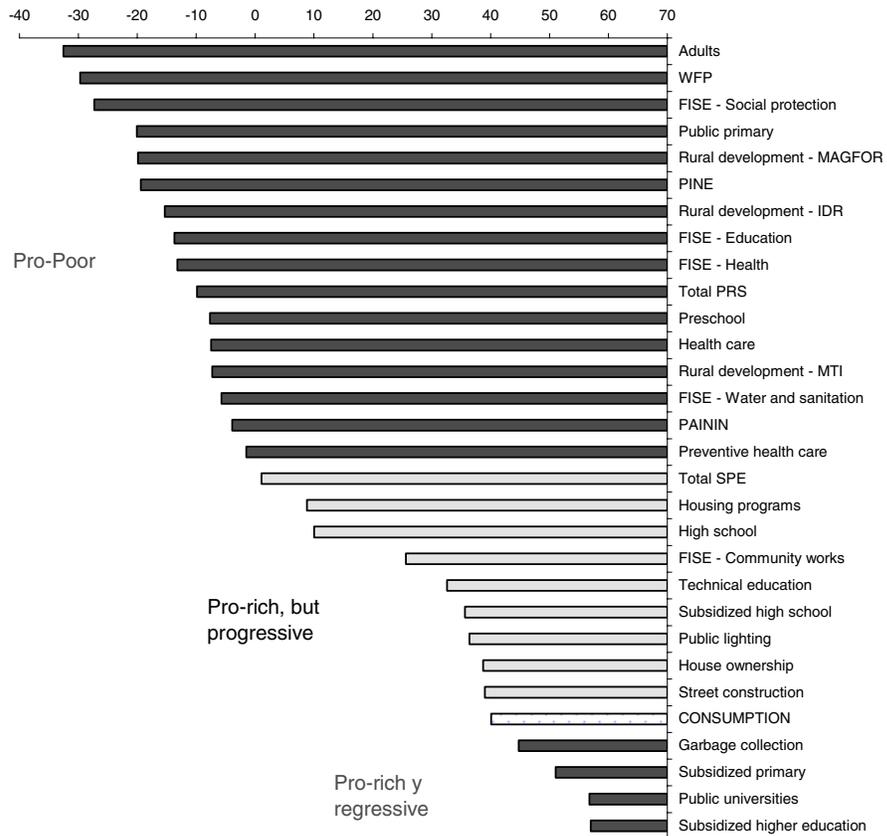
Source: Author's calculations based on 2005 EMNV data.

**Graph 10.11 - Areas of social spending  
Kakwani progressivity indices**



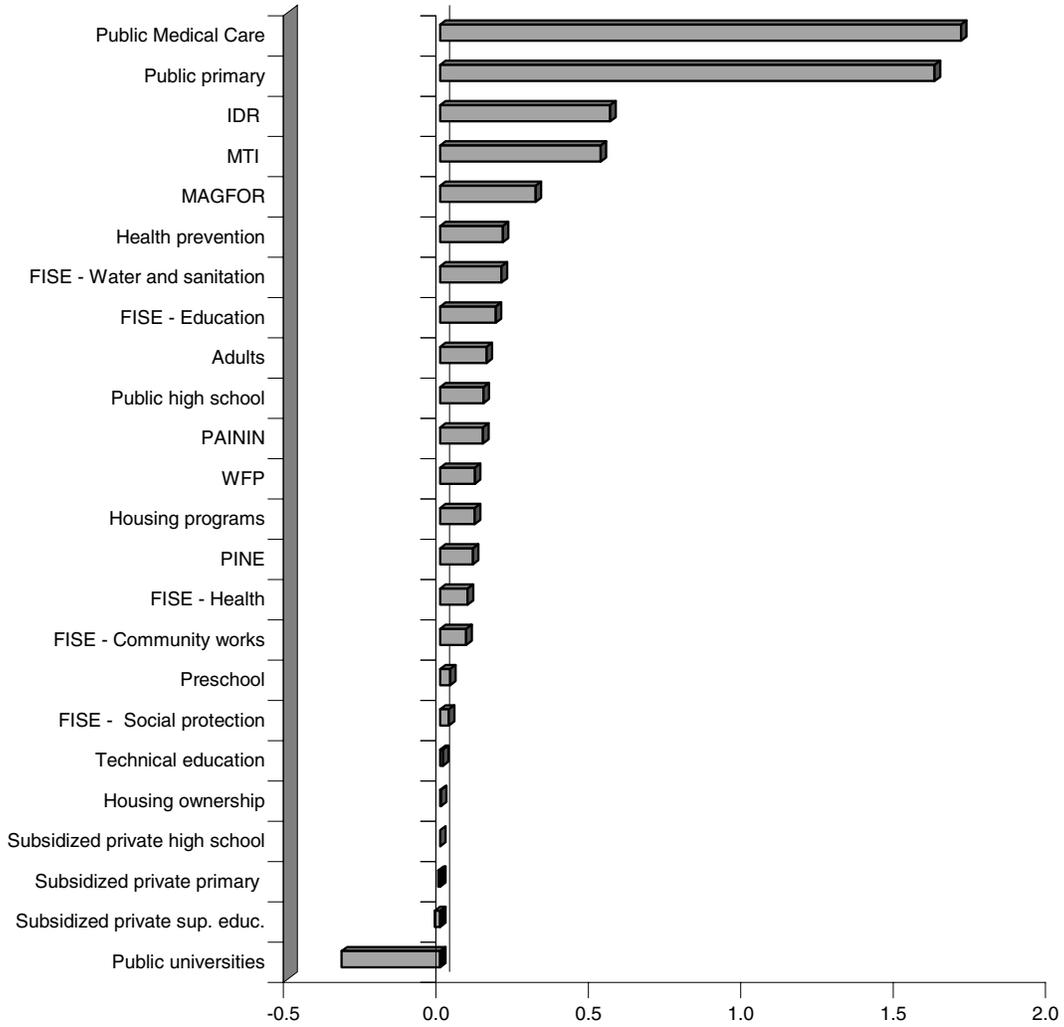
Source: Author's calculations based on 2005 EMNV data.

**Graph 10.12 - Social programs  
Concentration indices**



Source: Author's calculations based on 2005 EMNV data.

**Graph 10.13 -Social programs  
Redistributional impact indicator**



Source: Author's calculations based on 2005 EMNV data.