DEPARTAMENTO NACIONAL DE ESTADISTICA
DANE

LIFE CONDITIONS INDICATORS OF COLOMBIA* –

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*This indicator is the result of the work of an inter-institutional group conformed by of the National Planning Department –DNP- and the National Department of Statistics - DANE. This paper summarizes the main aspects of this work titled "El Nuevo Indice de Condiciones de Vida".

THE LIFE CONDITIONS INDICATOR –ICV [1]

Background

Colombia, as many other countries, has been using two main indicators to measure poverty: unsatisfied basic need indicator and the poverty line.

The first, seeks to locate the lack of goods and services in households, that are considered basic or essentials for living in a determined place and time. This methodology was adapted from the Argentinean case.

Five indicators were defined to determine the number of households with unsatisfied basic needs:

- Inadequate dwelling: Towns where dwellings have floors composed of soil. Rural areas where the dwellings have soil floors or precarious building materials.
- Dwellings without basic services: Towns in which the dwellings have no aqueduct or sewer system. Rural areas where water is obtained from rivers, streams or rain water and there are no toilets.
- Household overcrowded: households where the number of individuals per bedroom is greater than three.
- No attendance to school: households with children between 7- 11 years of age that do not attend school.
- High economic dependence: Households where the head has a level of education lower than fourth grade and has more than three dependent individuals.

The researchers had knowledge of the implicit problems of an indicator of this nature. Some limitations were: subjectivity to choose some goods and services and the exclusion of others.

Three of the five variables chosen correspond to physical characteristics of the dwelling and access to public services which depend more on the infrastructure development that on the people's actual standard of life.

To qualify someone as being poor with only one unsatisfied basic need, independently if the other needs are satisfied, can lead to errors of inclusion or exclusion.

None of the variables are more important than the others: each one has the same priority.

This approach analyses only structural poverty but no non-conjunctural poverty.

It only measures the percentage of people with one or more needs unsatisfied, but does not take into account the level of poverty and the distribution among

[1] ICV it is the abbreviation in Spanish. In the paper we will use the Spanish abbreviation of the name utilised.

them. But, this approach also has strengths such as the ability, for the first time in Colombia, to calculate the poverty magnitude and to create poverty map.

Although it only includes five variables, they represent many other needs, which are highly correlated.

Because it is based on a population census, it allows to calculate the magnitude and evolution of poverty at both a local and a national level.

Poverty line is defined as the number of individuals or households that have an income below a minimum cut-off income or consumption. The cut-off is based on the ability to purchase a basket of commodities. It needs to be adjusted for different areas and regions within the country, because of tastes, prices and access to goods and services differ. Colombia has built a national poverty line, thirteen poverty lines for each one of the main cities, and another poverty line representing ten intermediate cities.

The first approach to the poverty line also has strengths and failures. It uses the income or consumption as a proxy to well being.

It allows to calculate the effect of the economic cycles in the household income and to calculate conjunctural poverty.

Though by itself it does not reflect that among poor people there are wide differences in income, some people are located just below the poverty line and others far below it; the income as a continuous variable allows calculating the distance between poor people and the poverty line, the poverty gap, and the degree of income inequality amongst them.

The disadvantages are: the difficulty in the collection of accurate income information, which is usually underestimated. Assumptions are necessary to convert household income or consumption data into measures of well-being, such as how to treat measurement errors and how to convert household data (size and composition) into data for individuals. Colombia uses the average adult to make this conversion.

The household data does not reveal inequality within the household, so it hides big differences in the income or consumption in the individual members especially between women and children.

The monetary income does not correspond to the real expenditure of consumption of the household members.

It assumes that households that are located above poverty line have no unsatisfied basic needs.

The Integrated Poverty Method (MIP)

MIP is based on the criteria that basic needs and poverty line analysis are complementary. It is the result of the crossover of both approaches and the junction and intersection of poor identified by the two indicators.

It is also the result of the simultaneous application of the Basics Needs approach and the poverty line indicator.

Just like the others, it has strengths and weakness.

One of the strengths is the combination of two complementary methods which allow the building of a poverty classification (typology).

It allows the identification of the structural poverty and the conjunctural poverty.

The information can be collected trough household surveys.

Some of the limitations are that it does not show the relationship between income and basic needs, and it does not measure income distribution or the poverty gap.

The Life Conditions Index- ICV

Conceptual framework

The ICV is considered an indicator of standards of living under the concept of Seen.[2]
It takes into account what an individual can be or do based on his conditions of life. It does not take into account the well-being of the rest. It looks for seeking the household capabilities and realizations through some value objects that allow us to asses the living standards.

The ICV can be considered a step forward in the understanding and measuring of poverty conditions. It integrates qualitative and quantitative variables. It allows integrating new characteristics as the human capital and social capital and it also allows evaluating politics in relations to equity and achievement criteria.

ICV combine variables of infrastructure and potential access to physical goods: dwelling characteristics and access to public services, changes in human capital, education and variables of social capital, household composition. The variables were selected from the Living Conditions Surveys, based on theories and previous experience of which ones are more related to living standards.

Each one of the variables was defined considering that its result could allow the classification of the contribution to the living standards.

[2] Amartya Sen. The Standard of Living. The Tanner Lectures, Cambridge University Press 1987.

The weight for the discrete or non-continuous variables as the dwelling characteristics or the attendance or not to school was calculated through the statistics process method of optimal scaling for describing ordinal data with cardinal models[3] This method ascribes numeric values to the categories of the variables maximizing the relation between variables and the goal trough the method of Principal Components. [4] The objective of this method is quantify the different categories in such a way that the value are assigned considering all the variables together and checking the results through statistical test.

The result of this methodology give different weight to the variables .The qualification of ICV increases with the living standard but contrary to other index it has not defined a priori ideal conditions.

As indicator of standard of life to seek the household capabilities and realizations must fulfill some attributes as monotonic, substitution and informative. The test proved that they are fulfilled.

Some of the advantages of this indicator are:
It gives a continuous measure of household which allows calculating not only the incidence but also the intensity and the reduction of living conditions.

The indicator was built in such a way that it can take values equal or bigger to zero and less than 100, thus it allows classifying the household according to its living standard. If it is closer to zero, the household has lower living standards, and the farther it is from zero, the better living standard it has.

The indicator has a high relation with permanent income of the household. Castaño has showed [5]empiric evidence between de high relation between per capita consumption and the ICV.

ICV is a multidimensional indicator; it includes new variables which go beyond measuring wealth.

ICV is a dynamic indicator that allows the introduction of new variables that have not yet been included in the indicator, such as environment, security, freedom, etc. These variables are important in Colombia because of the conflict we are facing.

It takes into account different levels of development and the differences between regions, cities and towns so it can be used for local planning.

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[3] Young, F. W. (1981), " Methods for Describing Ordinal Data with Cardinal Models", Journal of Mathematical Psychology, 12, 416-436

[4] Young,F:W,, Takane,Y.Y. de Leeuw,J. (1978), " The Principal Components of Mixed Measurement Level Multivariate Data: An Alternanting Least Squares Method with Optimal Scaling features." Psychometrika, 43, 279-281.
This process has been integrated to SAS calling PRINQUAL

[5] Elkin Castaño . Indicadores aproximados de recursos para la focalización de programas sociales: dos metodologías y una evidencia empírica. Misión Social, DNP, Universidad del Rosario, 2000.

It searches for a better identification of the poorer people among poor classes so that the problems of exclusion and inclusion can be reduced.

It allows prioritizing in order to do a better distribution of the resources. Each one of the components of the index can be used to distribute resources to one sector.

It allows different divisions among the population in order to characterize and analyze their evolution.

The ICV for urban areas

Variables

The source for the calculation of the indicator was the Living Conditions Surveys of 1997. The objective of this survey is to collect information about the living condition of households in areas such as health, education, work and access to goods and services.

The criteria used to choose the variables was:
- To have the higher relation with the conditions of life in the above mentioned area.
- To have more power to differentiate between poor and non-poor.
The variables can be included in the next Population Census because it is the only source of information at municipal (local) level.

The variables selected for the indicator for urban areas are:
- Geographic region: this variable tries to explain differences in standards of life depending on different levels of development in each Colombian region. These are: Atlántica, Antioquia, Bogotá, Central, Oriental, Orinoquía, Pacífica, San Andrés and Valle.
- Size of the municipal capital: This has relation with the urbanization level and the market development of goods and services.
- Socio-economic strata: To seek differences related to the environmental location, which can be indicative of the conditions of life of their residents.
- Characteristics of housing and services: The well-being of the household is related to the quality of the dwelling and the access to public services. These include: fuel used for cooking, type of human waste disposal and exclusivity or not in their utilization, means by which to get water and continuity or not of the service, garbage collecting service, telephone services, floor material, crowding and number of households per dwelling.

- Human capital: Among the variables related to the accumulation of human potential measured through the education of the household head and the

access to education of the others members were included: education level of head and the spouse, lack of attendance to primary school of the children between 5-11 years of age, lack of attendance to secondary school of the children between 12-17 years of age and number of illiterates.

Demographic characteristics of the household:

The standard of life of the household is related to the age of its members. For this the following variables were included: age of the head, sex of the head and to presence or absence of a spouse, number of children under six years of age, presence of permanently incapacitated people.

Goods:

It was found that the tenancy of durable goods has influence in the quality of life of the households: Some of them are complementary to the production work of the household, another to the relax activities and another to contribute to modify the physical environment. The variables included are: refrigerator, washing machine, service of TV by cable, color TV, heater, oven and air conditioner.

Scoring estimation

Because most of the variables are qualitative it was necessary to use the PRINQUAL process from the SAS package for converting them to quantitative variables. The results are shown in the attachment 1.

To weight of variables in the indicator

In order to calculate the weight that each of the variables has in the indicator for urban areas, the Principal Components analysis on the transformed variables was used. The weight of the first component is the weight of each one of the variables in the indicator.

The weights of each of the variables are:

VARIABLES	WEIGTH
Number of durable goods	0.358589
Floor material	0.329606
Strata	0.323411
Telephone service	0.322610
Head schooling	0.289337
Kind and exclusivity of waste disposal	0.282327
Household crowding	0.258436
Head of the municipal capital	0.253161
Schooling of the spouse	0.240586
Geographic region	0.229750
Fuel for cooking	0.195871
Water sources and continuity of the service	0.179596

Number of household per dwelling	0.153587
Garbage collecting service	0.127419
Lack of attendance to primary school (5-11 years)	0.085344
Number of illiterates	0.081622
Lack of attendance to secondary school (12-17 years)	0.076589
Age of the head	0.073448
Number of children under six years of age	0.069977
Gender of the head and presence of a spouse	0.041073
Presence of incapacitated individuals	0.018765

The variables of higher weight are: number of durable goods, floor material, strata and telephone service, all of them with a weight greater than 0.3. The variables with less weight are: gender of the head and the presence of incapacitated individuals.

Calculating the indicators

The process to calculate the index is:

The standardization of the variables subtracting the mean and dividing by the standard deviation. By such a way that each variable results with a mean of zero and a variance of 1. Then each standardized variable has its scale changed so that the minimum value is 0 and the maximum, 100. Finally, they are multiplied by their corresponding weight.

The index for each household is obtained as the sum of the final score of each category.

The indicator for the rural areas

To calculate the index for the rural areas the same methodology was used.
The variables selected were:

Dwelling location
The following variables are included: Geographic region, size of the municipal capital and type of population density.

Characteristics and service of the dwelling
Predominant floor and building materials, fuel for cooking, type and exclusivity of waste disposal, water sources and continuity of service, garbage collecting services, telephone services and electricity services.

Human capital
Schooling of the household head, schooling of the spouse, lack of attendance to primary school of children between 5-11 years of age, lack of attendance to secondary school of children between 12-17 years of age and number of illiterates.

Demographic characteristics of household
Household crowding, age of the head, number of children under six years of age, presence of permanently incapacitated individuals.

Presence of durables goods

Refrigerator, washing machine, heaters, oven and air conditioning.

The results are shown in the following table:

VARIABLES	WEIGHT
Type and exclusivity of waste disposal	0.320744
Fuel for cooking	0.319627
Number of durable goods	0.307363
Floor material	0.303227
Garbage collecting service	0.269622
Water sources and continuity of service	0.256310
Building materials	0.253977
Schooling of household head	0.247832
Type of population density	0.242393
Electricity service	0.235328
Schooling of the spouse	0.218064
Telephone service	0.200454
Region	0.197251
Size of the municipal capital	0.171177
Household crowding	0.139030
Lack of attendance to primary school (5-11 years)	0.128373
Lack of attendance to secondary school (12-17 years)	0.114909
Number of illiterates	0.102822
Number of children under six years of age	0.086851
Age of the household head	0.070250
Presence of permanently incapacitated individuals	0.045679

The variables of higher weight are: Type and exclusivity of the waste disposal, fuel for cooking, number of durable goods and floor material. As in the urban areas the variable of permanently incapacitated individuals is the lesser weight.

The following are some of the results of applying the different methodology to measure poverty based on the Living Conditions Survey of 2003:

Note:
I am sending the paper I will present in the workshop on poverty statistics in Latin America. I will send the corresponding annexes for this paper tomorrow.

This is the principal part of the paper. I will complete it tomorrow with some figures related to Colombia.

I would greatly appreciate if you could set aside hotel reservations. I will arrive in Rio de Janeiro on Monday 10th May at 7:00 am.