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Food Security and Basic Human Needs in Brazil

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ABSTRACT:

Food Security (FS) is an indispensable policy-orientation principle to the fulfillment of the human rights to feeding, thus, it is much more than guaranteeing adequate nutrition under the merely biologic point of view. This comprehension comes from the understanding that food is one of the satisfiers of the Basic Human Needs (BHN), which will result in essential conditions to the rights of all to have a meaningful live. Therefore, the paper traces a picture of FS, as well as its relations with the BHN and other socio-economic indicators, in Brazil. This study is based on one of the methods recommended by FAO for the evaluation of FS, utilized in the Food Security Supplement of the National Annual Survey of Household in Sample (PNAD) produced in Brazil for 2004 an innovative experience on quality of life. Both of them performed the database used in the study.

Key-words: Food Security; Poverty; Hunger; Social inequality.

1. Introduction

The aim of the present study is to present an analysis of the food security of the Brazilian population. The paper examines the relationships among food security and various social, economic and demographic indicators.

This study is based on one of the methods recommended by FAO goes for the evaluation of Food Security (FS) - the Food Security and Hunger Perception Method, which combines objective and subjective indicators associated with individual feeding conditions. The National Household Sample Survey for 2004 (PNAD[1] 2004) incorporated Food Security Supplement (FS Supplement), an innovative experience on quality of life measure. (PNAD 2004, 2007). Both of them performed the database used in the present study.

[1] Pesquisa Nacional por amostra de Domicílios (PNAD) is produced by the Brazilian Institute of Geograpy and Statistic (Instituto Brasileiro de Geografia e Estatística – IBGE).

Using data from the PNAD for 2004, multivariate analyses (weighted logistic regressions) were done to estimate the contributions of potential explanatory factors to the food insecurity.

The probability of food insecure was determined by a regression analysis using the potential explanatory variables. The tables presents estimated Adjusted odds ratio (OR) and Confidence Interval of 95% (CI 95%) of those logistic regressions. The adjusted odds ratio of the variable compared to its reference with controlling for other variables.

1.1 Basic Human Needs

Measure levels of social welfare involves not only quantify spending on consumption or the availability of income dedicated to the satisfaction of consumption. Thus, United Nations Economic Commission for Latin America and the Caribbean (CEPAL-Feres and Mancero, 2001) recommends studies aimed at identifying the Unmet Basic Needs (UBNs) in society, thus mapping, another focus of poverty, since it is beyond the issue of lack of monetary resources.

Lustosa (2001) highlights how as great advantage in using the method of UBNs, the use of several social indicators, could be an alternative way of mapping poverty and build up thus an important tool to aid the implementation of public policies and monitoring of social and demographic changes occurring in Brazilian society. That is, is another focus on the issue, which shows in a visible, the presence/absence of the State in providing necessary services to its population. Here the use of such indicators is aimed at comparing the results of Food Security / Food Insecurity (FS/FI) with those who represent factors leading to social vulnerability.

In this paper there was an exercise in adaptation of the methodology by Lustosa (2001), with the material of the Expert Group ... (2006, p.104-115), and with the work of CEPAL-Feres and Mancero (2001), trying them compatible with the information received and made by the PNAD 2004. It seems interesting to explore the relationship between the information available in the material said, composing the UBNs, and data from FS/FI (FS and the three types of FI: Mild FI, Moderate FI and Severe FI), also collected by the 2004 PNAD.

It is important to register that not all representatives of various dimensions deal with UBNs were portrayed here, since many of them are not part of the questionnaire collected by the PNAD. The dimensions presented in this study are:

- Household, Sanitary Services and Access to the Information (UBN-H) – it defines the requirements (goods and services) essential for housing, so that it provides a condition of a healthy life for their inhabitants. This dimension is also intended to identify the conditions of access to sanitation services of the poor population and poor access to information (through the lack of TV and radio in the household), as justification for deprivation of social inclusion;

- Children and Adolescents Education and Living Conditions (UBN-E) – it defines the minimum requirements for the educational background of the Brazilian population in 2004, trying to capture the gaps. Failures that can compromise the children's learning process, disrupting their educational development and accelerating their entry into the labor market. Although in most cases be the only way out, with low skills (professional qualification), the labor market becomes attractive by paying low wages and creating a vicious circle; and

- Capacity of Subsistence (UBN-S) – it presents the aspects that make the reference person of the household, and consequently its other residents more vulnerable to the social context in which they live. They are minimum requirements of education and guiding influence of household members, which must be attributed to the household reference person's capacity.

The Table 1 shows a presentation of the three dimensions of UBNs and their respective items used in this study.

Table 1 - The Three Dimensions of the Basic Human Needs

Item	Household, Sanitary Services and Access to the Information (UBN-H)	Children and Adolescents Education and Living Conditions (UBN-E)	Capacity of Subsistence (UBN-S)
1	Non Durable or inadequate material in household construction - whose predominant building material is mud uncoated, or reused wood, or straw or other material not durable, or cover with reused wood, or with straw or other non durable material;	Household existence of at least one child between 7 and 14 years old who don´t frequent school or daycare center;	Male person of reference has never frequented school or has at most three years of study;
2	Lack of adequate sanitary facilities; or having Bathroom / Sanitarium (toilet) shared with another household;	Household existence of some adolescent / adult (of 10 years or more) illiterate;	Female person of reference has never frequented school or has at most three years of study;
3	Inappropriate water supply; household without canalization of water for at least a room;	Household existence of at least one child among 7 and 14 years old who has never frequented school or daycare center;	Person of reference has at most 3 years completed of study, and 4 or more residents by one resident who is working.
4	Overpopulation, high density of residents for home, existence of more than 3 people for bedroom (excluding bathrooms and kitchen) ;	Household existence of at least of one child between 7 and 14 years old who is occupied in the job market.	--------
5	Non garbage collected. The garbage is burnt or buried on the property, or played in a vacant lot, a lake or sea or other place;	--------	--------
6	Absence of electricity in the household;	--------	--------
7	Absence of refrigerator in the household;	--------	--------
8	Lack of access to the information in the household. Absence of radio and TV in the household.	--------	--------

Only to compose the work about UBN was made a cut in the use of data on household level, based on only the Permanent Private Households[2] (PPHs).

1.2 Database

The PNAD (National Household Sample Survey) is a household survey in sample, of multiple purposes, with annual periodicity, having been the same conceived and implanted since 1967 by the Brazilian Institute of Geography and Statistic (IBGE), seeking the production of basic information for the study and planning of the national socioeconomic development. The results of PNAD relative to the general characteristics of the population, migration, education, labor, families, households and income, with the complete geographic coverage of all the Federative Units. (PNAD 2004, 2007, p.13-16).

PNAD for 2004 had as reference the month of September (more specifically the last week of September) of this year, however, the questions regarding Food Security supplement referred to the previous period of until 3 months before the date of the interview. The collection of PNAD 2004 happened among the last week of September to the end of December of 2004. The used methodology in the reception of Food Security data was conceived under the perspective of the respondents' perception about the requirements of the questionnaires, and they referred to the feelings lived by the residents of the interviewed households by the researchers.

That method is based on the development of a scale of direct measure of the Food Security (FS) and Hunger of the United States Department of Agriculture (USDA). The adjustments made in the method for implantation in Brazil have become necessary and they have resulted in the creation of the Brazilian Scale of Alimentary Insecurity (EBIA[3]), tends his qualitative and quantitative validation executed by the research coordinators' decisions between 2003 and 2004. (UNICAMP, 2004; PNAD 2004, 2007, p.22-24). The questions that consisted of the Food Security Supplement (FS Supplement) of PNAD 2004 are asked a single time to only one respondent of the household and they refer to the state of all their residents' Food Security (FS).

The method classified FS into three severity levels:

- Psychological dimension of Food Insecurity – concerns that the food ends before there is money to buy more food;
- Qualitative dimension of Food Insecurity – restriction of the food quality – replacement of cheap products and food without quantitative reduction; and
- Quantitative dimension of Food Insecurity – restriction on the availability of food, the worse situation is when children are suffering from lack of food.

[2] The PNAD collects information the PNAD collects information about living people in Permanent Private Households (PPHs), Improvised Private Households (IPHs) and the existing residential units in Collective Households (CHs – Hotels, Hostels, Pensions etc.). PNAD only collects information about sanitary services, access to information and living conditions of the Permanent Private Households (PPHs). Because of this, this paper only focuses on the study of people who live in PPHs. (PPHs – 99,831%; IPHs – 0,096%; and CHs – 0,073%).

[3] Escala Brasileira de Insegurança Alimentar (EBIA).

The methodology of that scale classifies the residents of the Household in according with four categories: Food Security (FS), Mild Food Insecurity, Moderate Food Insecurity and Severe Food Insecurity. The punctuation score attributed to the households correspond to the total of affirmative answers to the 15 questions of EBIA, obeying the existence situation or not of at least one 18 years-old smaller resident.

The Table 2 shows The Brazilian Scale of Food Insecurity (EBIA) with the classification of households with at least one resident under 18 years old and with only residents over 18 years old.

Table 2 - The Brazilian Scale of Food Insecurity (EBIA)

Categories of FS or FI	Score of Household Punctuation
Classification of Households with at least one resident under 18 years old	
Food security	0
Mild Food insecurity	From 1 to 5
Moderate Food insecurity	From 6 to 10
Severe Food insecurity	From 11 to 15
Classification of Households with only residents over 18 years old	
Food security	0
Mild Food insecurity	From 1 to 3
Moderate Food insecurity	From 4 to 6
Severe Food insecurity	From 7 to 9

It is also important to remind that PNAD for 2004 researched 399,354 people residents in 139,157 households units (PNAD 2004, 2007, p.13-16). After the use of the calculated weights, the expanded data corresponded to 182,060,108 residents in 51,840,004 households with accomplished interviews and about 56 million families.

2. Prevalence of Food Security / Food Insecurity and Unmet Basic Needs

Using data from the 2004 PNAD, weighted cross-tabulations were done to estimate the proportion of brazilians (adults and children) who lived in Food Security (FS) or Food Insecurity (FI) households. The Table 1 shows the total of households, families and inhabitants by the Food Security Situation of Households.

Table 3 shows the total of households, families and households' inhabitants by the Food Security / Food Insecurity situation (FS, Mild FI, Moderate FI and Severe FI) of the three types of households [Permanent Private Households (PPH), Improvised Private Households (IPH) and the existing residential units in Collective Households (CHs – Hotels, Hostels, Pensions etc.)].

Table 3 - Total of Households, Families and Inhabitants by the Food Security Situation of Households Brazil - 2004

Households, Families and Inhabitants by FS Situation	Households		Families		Inhabitants	
	Value	%	Value	%	Value	%
Total.....	**51 840 004**	**100.000**	**56 078 995**	**100.000**	**182 060 108**	**100.000**
Food Security (FS).....	33 788 653	65.179	35 912 958	64.040	109 726 116	60.269
Food Insecurity (FI).....	18 027 875	34.776	20 141 637	35.917	72 259 500	39.690
Mild FI.....	8 311 701	16.033	9 250 751	16.496	32 710 717	17.967
Moderate FI.....	6 365 018	12.278	7 135 843	12.725	25 619 452	14.072
Severe FI.....	3 351 156	6.464	3 755 043	6.696	13 929 331	7.651
Without Declaration of FS..	23 476	0.045	24 400	0.044	74 492	0.041

According to Table 3, about 39.7% of brazilians were in FI in 2004, which means about 72 million people. This population were living in about 34,8% of total Brazilian households, which means about 18 million of Brazilian households.

The worst stage of FI, the Severe FI reached about 7.7% of residents (about 14 million people) who lived in about 6.5% of total Brazilian households, which means about 3 million of households. On the other hand, the light stage of FI, the Mild FI reached about 18% of total brazilians (about 33 million people) were living in about 16% of the households in 2004, which means about 8 million of households.

According to Food Security, in 2004 only about 60.3% of brazilians were living in a complete stage of FS, which means 110 million of residents who were living in about 34 million households (about 65.2% of total Brazilian households).

The Table 4 shows the Permanent Private Households (disregarding the other types of households), by Food Security Situation and Food Insecurity Type, according to the occurrence of Unmet Basic Needs (UBN) Dimension in Brazil for 2004. For using the UBN a cut was necessary, only being considered for the present study the Permanent Private Households (PPH).

According to the Table 4, 34.8% of the brazilian PPHs (17,996,775) were in FI for 2004. This table shows that 45.2% of the brazilian PPHs that has at least one dimension of UBN were in FI (13,692,860).

It is important to emphasize that 60.7% of the PPH that had three dimensions of UBN at the same time were in FI (4,434,087) in 2004 and 1,267,294 of these PPHs were in Severe state of FI. In this year, only 2,864,091 of the PPH that had three dimensions of UBN at the same time were in FS (39.2%).

It is necessary to emphasize that 47.4% of the PPH that had at the same time UBN-H and UBN-E were in FI (5,255,888 PPHs); 56.2% of the PPH had UBN-H and UBN-C were in FI (6,175,768 PPH); and 57.0% of the PPH had UBN-E and UBN-C were in FI (5,549,303 PPH).

More than half of each one of the quantitive values of the PPHs that had at the same time two dimensions of UBN were in FI.

Table 4 - Permanent Private Households, by Food Security Situation and Food Insecurity Type, according to the Occurrence of UBN Dimension - Brazil - 2004

Permanent Private Households and the three Dimensions of UBN and its Conditions	Total (1)	Food Security (FS)	Food Insecurity (FI)			
			Total	Mild FI	Moderate FI	Severe FI
Total of PPH	**51 752 528**	**33 732 277**	**17 996 775**	**8 301 171**	**6 352 611**	**3 342 993**
	100.0%	**65.2%**	**34.8%**	**16.0%**	**12.,3%**	**6.5%**
At Least One Dimension of UBN						
Total of PPH with occurrence of at least one Dimension of UBN	30 288 970	16 576 375	13 692 860	5 615 468	5 132 865	2 944 527
	100.0%	54.7%	45.2%	18.5%	17.0%	9.7%
With three Dimensions at the same time						
Total of PPH with occurrence of three Dimensions of UBN	7 301 207	2 864 091	4 434 087	1 400 608	1 766 185	1 267 294
	100.0%	39.2%	60.7%	19,1%	24.2%	17.4%
With two Dimensions at the same time						
Total of PPH with occurrence of UBN-H and UBN-E	8 814 748	3 552 576	5 255 888	1 727 717	2 063 441	1 464 730
	100,0%	40,3%	59,6%	19,6%	23,4%	16,6%
Total of PPH with occurrence of UBN-H and UBN-C	10 990 959	4 808 942	6 175 768	2 097 373	2 429 325	1 649 070
	100,0%	43,8%	56,2%	19,1%	22,1%	15,0%
Total of PPH with occurrence of UBN-E and UBN-C	9 735 546	4 182 705	5 549 303	1 855 182	2 221 721	1 472 400
	100,0%	43,0%	57,0%	19,1%	22,8%	15,1%
Totals of UBN-H, UBN-E and UBN-C						
Total PPH with UBN-H (2)	24 590 257	12 934 475	11 655 782	4 495 847	4 212 766	2 947 169
	100.0%	52.5%	47.4%	18.3%	17.1%	12.0%
Total of PPH with UBN-E (3)	12 316 088	5 553 519	6 755 197	2 375 002	2 649 816	1 730 379
	100.0%	45.1%	54.8%	19.3%	21.5%	14.0%
Total of PPH with NBI-C (3)	16 451 042	8 222 420	8 221 212	3 024 283	3 218 585	1 978 344
	100.0%	50.0%	50.%	18.4%	19.6%	12.0%
With No Dimension of UBN						
Total of PPH with No Dimension of UBN	21 463 558	17 155 902	4 303 915	2 685 703	1 219 746	398 466
	100.0%	79.9%	20.1%	12.5%	5.7%	1.9%

1- Including the households with Ignored Food Security Situation.

2- Including the inhabitants whose condition in the household was a resident pension, a domestic servant or a domestic servant relative.

3- Exclusive the inhabitants whose condition in the household was a resident pension, a domestic servant or a domestic servant relative.

The totals of PPHs that had at least one dimension of UBN and that hat FI were: 47,4% with UBN-H (11,263,323 PPHs); 54,8% with UBN-E (6,755,197 of PPHs); and 50,0% with UBN-C (8,221,212 of PPHs).

The totals of PPHs that had no dimension of UBN were 21,463,558. From these PPHs, 79.2% were in FS (17,155,902) and 20.1% were in FI (4,303,915).

3. Regression Logistic

Using data of the Brazilian population from the 2004 PNAD, multivariate analyses (weighted logistic regressions) were done to estimate the contributions of some potential explanatory factors to Food Insecurity (FI). In these analysis, the inhabitants with FS were treated as 0 code and the inhabitants with FI were treated as 1 code to likelihood of determined category presents FI by a regression logistic analysis.

Food Insecurity statistical probability was determined by a regression analysis using the potential explanatory variables. The Table 5 presents estimated adjusted odds ratio (OR) and Confidence Interval of 95% (CI 95%) of those logistic regressions. The adjusted odds ratio of the variable was compared to its reference with controlling other variables.

The Table 5 shows the prevalence to the Food Insecurity, OR and Confidence Interval of 95% for the social and demographical variables for the inhabitants of the three types of households [Permanent Private Households (PPHs), Improvised Private Households (IPHs) and the existing residential units in Collective Households (CHs – Hotels, Hostels, Pensions etc.)].

Table 5: Prevalence to the Food Insecurity for the social and demographical variables

Variable	Category	Prevalence of FI		p	OR	95% Confidence Interval for OR	
		N	%				
Gender	Female	36927893	39.6	0.000	1.03	1.025	1.027
	Male	35331607	39.9	.	1.00	.	.
Age Group	Age Group 0-9	16259444	50.4	0.000	1.43	1.416	1.445
	Age Group 10-17	13060467	47.0	0.000	1.41	1.404	1.415
	Age Group 18-64	39524473	36.0	0.000	1.27	1.268	1.277
	Age Group 65 +	3407760	28.1	.	1.00	.	.
Years of Study	Under 1 year	22496708	52.6	0.000	2.03	2.021	2.030
	1 to 5 years	14167332	50.5	0.000	1.84	1.838	1.845
	4 to 7 years	19820298	42.1	0.000	1.49	1.483	1.488
	8 to 19 years	8450741	34.3	0.000	1.30	1.300	1.304
	11 years or more	7145493	18.4	.	1.00	.	.
Household Income	Without income	1157689	71.2	0.000	44.28	43.920	44.634
	to 1/2 minimal wage	39593218	71.8	0.000	34.37	34.251	34.498
	above 1/2 to 1 m.w.	19651923	40.6	0.000	11.20	11.161	11.238
	above 1 to 3 m.w.	9515969	18.0	0.000	4.42	4.400	4.430
	above 3 m.w.	768832	4.0	.	1.00	.	.
State of Household	Urban	56823490	37.6	0.000	1.66	1.654	1.659
	Rural	15436010	49.9	.	1.00	.	.
Color-Race	White	26305536	28.1	0.000	1.08	1.067	1.084
	Black or Mixed Race	45663765	52.3	0.000	1.56	1.547	1.572
	Others	286873	26.9	.	1.00	.	.

In this case, with regard to gender, the distribution of the population is homogeneous. However, women are slightly more exposed to FI (OR = 1.03) than men.

The effect of age also proved to be significant with the age groups of 0-9 (OR = 1.43), 10-17 (OR = 1.41) and 18-64 (OR = 1.27) with more chance of exposure to FI than the group of 65 or more.

Individuals of color/race White (OR = 1.08) have exposure to FI in a similar manner to the Others (reference) group, while the Black or Mixed Race group presents a greater chance of exposure to FI (OR=1.56)

According to years of study, note that the exposure decreases as the FI increases the years of study of the individual, from OR = 2,03 in individuals with less than 1 year of study to OR = 1,30 in individuals with 8 to 19 years of study, when compared with individuals with 11 or more years of study.

The same phenomenon can be observed in the class of per capita monthly income. From households without income and those with half until minimum wage present much more chance of exposure to FI in comparison with the household with per capita income above 3 minimum wages. Such situation continues in the household with per capita income of more of ½ minimum wages up to 1 and more than 1 up to 3 minimum wages presenting. The minimum wage in the reference period is R$260.00. With the dollar in 2004 worth $ 2.9259, we have that the minimum wage in U.S. dollars equivalent to $88.86.

When the state of household is Rural, the households are less exposed the FI than those of Urban area. This fact leads us to believe that in the same stratum of income, individuals from rural areas have easier access to the food than in urban areas, due to production of subsistence.

For using the Unmet Basic Needs (UBN) a cut was necessary, only being considered for the present study the Permanent Private Households (PPH), disregarding the other types of households.

In univariate logistic regression model, each variable is assessed without controlling the others, providing the crude odds ratio (OR crude). The Table 6 shows the prevalence to the Food Insecurity, OR and 95% Confidence Interval for the UBN's in the PPH.

Table 6: Prevalence to the Food Insecurity for the UBN's

Variable	Category	Prevalence of FI		p	OR	95% Confidence Interval for OR	
		N	%				
UBN Isolated	UBN Home	11655782	47.4	0.000	3.24	3.239	3.247
	UBN Education	6755197	54.8	0.000	2.66	2.652	2.677
	UBN Subsistence	8221212	50.0	0.000	2.44	2.430	2.454
UBN Composite	UBN H & E	5255888	59.6	0.000	3.18	3.149	3.208
	UBN H & S	6175768	56.2	0.000	2.19	2.173	2.207
	UBN E & S	5549303	57.0	0.000	2.61	2.571	2.648
UBN Generalized	3 Dimensions UBN	4434087	60.7	0.000	3.08	3.062	3.097

With regard to UBN's, in all cases, the crude OR shows that the presence of any dimension of UBN implies an increase in exposure to FI. This increase is significant and almost doubles the chance of household to presenting FI.

Among other things we should pay attention to the fact that the presence of UBN Home increases by three times the chance of the inhabitants' households presents FI. The same occurs if the associated UBN Home would be associated to UBN Education, where the chance of household presents FI practically increases three times.

It is important to emphasize that if the household has the simultaneous occurrence of at least one item from each of the three dimensions of UBN, the chance of it being in FI increases by three times.

4. Final considerations

The inadequate access to food in Brazil is essentially caused by intense inequalities in the socioeconomic structure.

The analysis showed that some variables, besides the Household Income, such as: Color/race, Years of Study, Age Group, State of Domicile were associated with the issue of Food Insecurity. Other variables related to dissatisfied Basic Human Needs (Unmet Basic Nedds – UBNs) have also show great associations with the Food Insecurity.

It seems especially important when higher levels of dissatisfied Basic Human Needs (UBN) are found with greater exposure to Food Insecurity at the households.

Once more the results presented here demonstrate empirically the intrinsic relationship between FI and other dimensions of UBNs at least in Brazil, and the need to integrate the Right to Food as the Social Rights, and consider it as a collective right, and not only as a"individual right" in order to consider the guarantee to FS as part of the guidelines of social policies. In Brazil, the Brazilian Nutritional and Food Security Organic Act (LOSAN[4]) will complete three years of existence in next 2009, September 15th. The results presented here revealed that LOSAN was more than urgent, and that data collected by the 2004 FS Supplement of PNAD supports the necessity for collecting it in the future PNADs. And so, it is expected that through national public policies, its next results show less impact on social and economic situation of the Brazilian population.

It is thus contribute minimally to strengthen the national knowledge of reality, so that government actions in the field of public policy can be translated in more adherent to the needs of social development, in an attempt to reduce poverty and Food Insecurity at the brazilian scenario.

[4] LOSAN – Lei Orgânica de Segurança Alimentar e Nutricional.

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