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Food and Nutritional Security: evaluation and determining factors in cities consortium, Bahia, Brazil

Segurança Alimentar e Nutricional: avaliação e fatores determinantes em consórcio de municípios, Bahia, Brasil

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Abstract

Introduction: The Brazilian legal mark for the promotion and guarantee of Feeding and Nutritional Security contemplated the implementation of a system. The challenge of building this municipal Food and Nutrition Security System involves information and knowledge of the situation and its determining factors, that are generally deficient or do not exist in smaller municipalities. Studies in this direction guide the local management for interventions that have greater impact on changing the population's living conditions. From this perspective, the Consortia of Feeding Security and Local Development were created to deal with social problems. *Objective*: To evaluate the feeding security situation and its determinants in municipalities that part of the Consortium. *Method*: The Brazilian Scale of Food Insecurity, a socioeconomic questionnaire and the indicators protocol were used to characterize the food and nutritional security situation. *Results*: the Brazilian Scale showed food insecurity in 70.3% of households, with predominance of severe and moderate insecurity (36.0%). The indicators protocol identified light food insecurity in the dimensions of availability, consumption and biological use of nutrients and moderate insecurity for access, indicating which variables are defining the situation. *Conclusion*: The instruments made it possible to obtain the results that show there are social deficits that compromise the families' food security. These can guide the management to actions and interventions that minimize this situation, being strategic subsidies in the planning, elaboration, monitoring of local public policies for the Human Right to Adequate Feeding promotion.

Keywords: Food and Nutritional Security. Social Indicators. Public Policy.

Resumo

Introdução: O marco legal brasileiro para a promoção e garantia da segurança alimentar e nutricional contemplou a implementação de um sistema. O desafio de construir este sistema de Segurança Alimentar e Nutricional municipal envolve informações e conhecimento da situação e seus fatores determinantes, que geralmente estão deficientes ou inexistem em municípios menores. Estudos nessa direção orientam a gestão local para intervenções de maior impacto na alteração das condições de vida da população. Nessa perspectiva, foram criados os Consórcios de Segurança Alimentar e Desenvolvimento Local para o enfrentamento dos problemas sociais. *Objetivo*: avaliar a situação de segurança alimentar e seus determinantes em municípios integrantes do Consórcio. *Método*: Utilizaram-se a Escala Brasileira de Insegurança Alimentar, questionário socioeconômico e protocolo de indicadores para caracterizar a situação de segurança alimentar e nutricional. *Resultados*: A Escala Brasileira demonstrou insegurança alimentar em 70,3% dos domicílios, com predomínio da insegurança grave e moderada (36,0%). O protocolo de indicadores identificou insegurança alimentar leve nas dimensões de disponibilidade, consumo e utilização biológica de nutrientes e insegurança moderada para acesso, sendo possível indicar quais variáveis estão definindo a situação. *Conclusão*: Os instrumentos permitiram obter os resultados que indicam existir *déficits* sociais que comprometem a segurança alimentar das famílias. Estes podem orientar a gestão para ações e intervenções que minimizem esta situação, sendo subsídios estratégicos no planejamento, elaboração, monitoramento de políticas públicas locais na promoção do Direito Humano à Alimentação Adequada.

Palavras-chave: Segurança Alimentar e Nutricional. Indicadores Sociais. Política Pública.

Introduction

Food and Nutritional Security (FNS) is an ongoing strategic public policyobjective guided by the principles of Human Rights to Adequate Food and Food Sovereignty, which encompasses andaims at the eradication of hunger and malnutrition and more severe manifestations of food insecurity (FI).[1] It is believedto guarantee, to all, conditions of ongoing access to basic quality food in sufficient amounts without compromising access to other basic needs, based on dietary practices that allow the healthy reproduction of the human organism, thereby contributing to a dignified existence.[2] When there is a violation of this human right, situations of FI are generated.[3]

The Food and Agriculture Organization (FAO) of the United Nations guides and recommends that FNSbe promoted by the municipality, as a possible organizer of political actions. Brazil substantiated this principle with the approval of Law no. 11.346, which created the National System of FNS (SISAN), the construction of which is the taskof the national, state, and municipal spheres.

In spite of national surveys to evaluatehouseholdFNS in the country, one of the obstacles to deploying and implementingFNS systems is the lack of information about the situation and its causes in the poorest and smallestmunicipalities, precisely where there is the greatest risk of food and nutritional insecurity (FNI), asshown by the results of the National Household Sample Survey (PNAD).[4,5]

In Brazil, there has been an investment in the treatment of social issues froma regional perspective; that is, there is a tendency for interventions to not merely be analyzed from and targeted at individuals or families. Thus, Consortia of Food Security and Local Development (CONSADs) were created, aiming to promote links between municipalities with low human development index, resulting from a partnership between public authorities and the civil society. These integrate actions and programs managed by the Ministry of Social Development and Fight against Hunger (MDS).

This article presents the results of the analysis of factors related to the occurrence of FI in municipalities that make up the Vale do Jiquiriçá CONSAD, given that such knowledge is strategic for consequent interventions and potentially capable of reducing the problem in the region..

Method

Study Scenario

The creation of consortia in Brazil aims to value the space where the subjects live and enable joint actions. Its main objective is to create ongoing links for the promotion of actions in an institutionalized way, with the primary aim of integrating the production, commercialization, consumption, and credit in the poorest regions of the country that face the greatest risk of FNI. Thus, it is an efficient form of cooperation that makes it possible to discuss, plan, decide, and implement local development actions and life improvement for the populations involved.[6]

According to data from the MDS, 40 CONSADs are established in Brazil, covering all regions of the country. Two have beenimplanted in Bahia: one in the Brumado, in the southwest region, and the other in the Vale do Jiquiriçá, in the Recôncavo Baiano. Due to logistical issues and accumulated research experience in the region, the Jiquiriçá Valley CONSAD was selected for this study. It was implanted in 2003, when the Zero Hunger Program was at its peak, with the purpose of coordinating the deployment of agrifood actions and projects in the nine municipalities of the valley that make up the area of this consortium.

The Jiquiriçá Valley, located about 160 km from the capital, is made up of 25 medium and small municipalities, of which only five have over 20 thousand inhabitants and constitute the Identity Territory of the Jiquiriçá Valley, a form of territorial organization adopted by the State of Bahia to implement public policies.[7] According to the National Cooperative of Advice and Planning (CONAP) for the deployment of CONSADs, joint action is considered beneficial,encompassing various associations of producers, community associations, professional unions, cooperatives, and credit institutions in a region. Family farming predominates with the exploitation of diverse subsistence crops, such as cassava, beans, corn, and banana.[8]

The municipalities of the valley, in general, have a low level of development, especially compared to the average for the State of Bahia, indicating the importance of the development of projects that can act collaboratively to tackle the problems and intervene effectively and efficiently.[8]

The current research was approved by the Research Ethics Committee of the School of Nutrition at the Universidade Federal da Bahia (ENUFBA), under opinion 207.389. All participants signed a Free and Informed Consent Form (ICF)..

Field work

Application of the Brazilian Food Insecurity Scale (EBIA)

A stratified random sampling technique was adopted for adirect household assessment, with each municipality divided into two strata: urban and rural areas. The sample size for each stratum was calculated usingcriteria maintaining the sampling fraction in each stratum equal to the global sampling fraction with systematic allocation;thus each stratum has a proportionate share.

The calculated sample size for this study was 2,591 households for municipalities with a precision of 5% with 50% prevalence of (moderate and severe) FNI for the rural and urban areas. The number of households initially taken into consideration wasbased on data from the 2005 census of the Brazilian Institute of Geography and Statistics (IBGE). Next, the number of households to be included in the sample was considered by applying the rule of proportionality in each municipality, thus obtaining the number of households to be visited in each locality.

The community health agents (ACS) were mobilized and trained for data collection, assuming that they would reach 100% of households in the region, know the urban and rural areas in detail, are recognized and respected by the population, and bear in mind that being orientedto the various public policies in the field of health is one of their actions.[9] Interviews facilitated the empowerment of local actors.

In each locality, the ACSs were instructed to count and number all households, calculate the systematic interval (total number of households divided by the number of households to be visited) and perform a random selection to start data collection.

For the direct evaluation, the data were collected in visits from November 2010 to February 2011, with application of two instruments - one to evaluate food security/insecurity using the EBIA; another, a questionnaire on social and economic data of residents, to obtain explanatory factors for the findings.

The EBIA is an adapted and validated version of the scaledeveloped by the United States Department of Agriculture (USDA). This instrument has been applied at the national level for measuring directly, the perception of FI and hunger at household levels, which makes it possible to estimate its prevalence in the population.[10]

The questionnaire was applied to characterize the social and economic conditions of the families studied, and focuses on the factors associated with FI in other studies.

The following variables were considered for this study: monthly family income, using as a reference, the minimum wage legislation (01/01/2010 - R$ 510.00), being categorized into three strata: <¼ minimum wage; ¼ to ½ minimum wage and > ½ minimum wage; education of household head (three levels considered according to the school grades processed: I - until the 4th grade; II - from 5th to 8th grade; and III –high school and higher education);and sex of the household head (male or female). The following householdcharacteristics were analyzed: basic sanitation (access to water supply network, access to garbage collection, and existence of sanitation), wherethe index was classified into two strata: adequate (score ≤ 04), when the responses to all items were positive, and inadequate (score > 04), when the response to at least one of the items was negative; number of inhabitants per household (up to 4 inhabitants, 4-6 inhabitants,and ≥7 inhabitants); access to social programs: information about access of household inhabitants to social programs of different types and under the responsibility of different spheres of government, and also of non-governmental organizations, was verified.

Evaluation of Municipal FNS

The protocol of indicators adopted in this study was developed from the selection and establishment of indicators considered capable of expressing the situation of small-sized municipalities and not generally accessed by national surveys that apply the EBIA and without the technical and financial capacity to conduct specific studies.[11] Details of this protocol including the name of the indicators in the different aspects, parameters, and the score (between 0 and 10) and the means of verification and assumptions that provide intelligibility to the results obtained, are arranged in Table 1. To read the results, the scale is divided into four parts, such that the sum of the results by size may correspond to different percentages of performance aspects, which relate to different situations of FNS and FNI, as shown in Table 1.

Table 1. Scale of values and categories for evaluation of municipal food and nutritional security with the use of a protocol of indicators. Bahia, 2008.

Percentage	Category	Definition
>75	Food and Nutritional Security	Represents an ideal situation in which a set of factors present in the dimensions considered act to ensure the full implementation of the concept of food security and nutrition
50 to 74.9	Mild Food and Nutritional Insecurity	Represents a situation in which some factors present in the dimensions considered jeopardize the full realization of the concept, with relative vulnerability to deprivation and hunger
25 to 49.9	Moderate Food and NutritionalInsecurity	Represents a situation in which a greater number of factors present in the dimensions considered would jeopardize the full realization of the concept, characterizing a situation of greater vulnerability to deprivation and hunger
0 to 24.9	Severe Food and Nutritional Insecurity	Represents a situation in which a greater number of factors present in the dimensions considered would jeopardize the full realization of the concept, characterizing a situation of deprivation and hunger

Source: Panelli-Martins et al. (2008).

The aim of the instrument is to develop a methodology to assess municipalities, using indicators calculated from secondary data available in public databases, such as the Department of Informatics of the Unique Health System (DATASUS), IBGE, and Information System of Basic Care (SIAB), among others. The site is a platform to recorddata and clarify the situation of FNS status of the municipal population. The evaluation is performed using a set of indicators, and managers can obtain a diagnosis of the situation bearing in mind the aspects of food availability, access to food, food consumption, and biological utilization of nutrients, as defined below:

- *Food availability* - related to aspects linked to ongoing local production and commercialization of food, in sufficient quantity
- *Access to food* - refers to the physical and socioeconomic aspects that may interfere with the acquisition of food by the population
- *Food consumption* - refers to the feeding patterns of a population and to social, economic, and cultural factors that may interfere with this consumption
- *Biological utilization of nutrients* - includes the conditions of access to social services, sanitation, and health that relate to the state of health of the individual, whichmay limit the biological utilization of nutrients.[11]

Data analysis

The direct house hold assessment was initiated with a descriptive analysis to measure the frequency of the study variables. The association between the variables was then analyzed through the chi-square test, graphical analysis, and pertinent inferential techniques. To measure the association between the outcome variable and the independent variable, three categories of outcomes were defined as: *Food Security*, *Mild FI*, and *Moderate/Severe FI*, where the latter was treated as a reference category.

Univariate logistic regression analysis and polytomous logistic regression were performed. Only those variables with a $p < 0.05$ remained in the model. The information was transcribed to a digital tool, with inconsistency and amplitude checking, and the Epi Info 6.04 Program (*Centers for Disease Control and Prevention, Atlanta-USA*) was used by double typing. Statistical analyses were performed using the Statistical Packagefor Social Sciences (SPSS) for Windows (version 13.0).

Results

Household FNS

The application of the EBIA revealed that FIaffected 70.3% of households in the CONSAD (Figure 1).

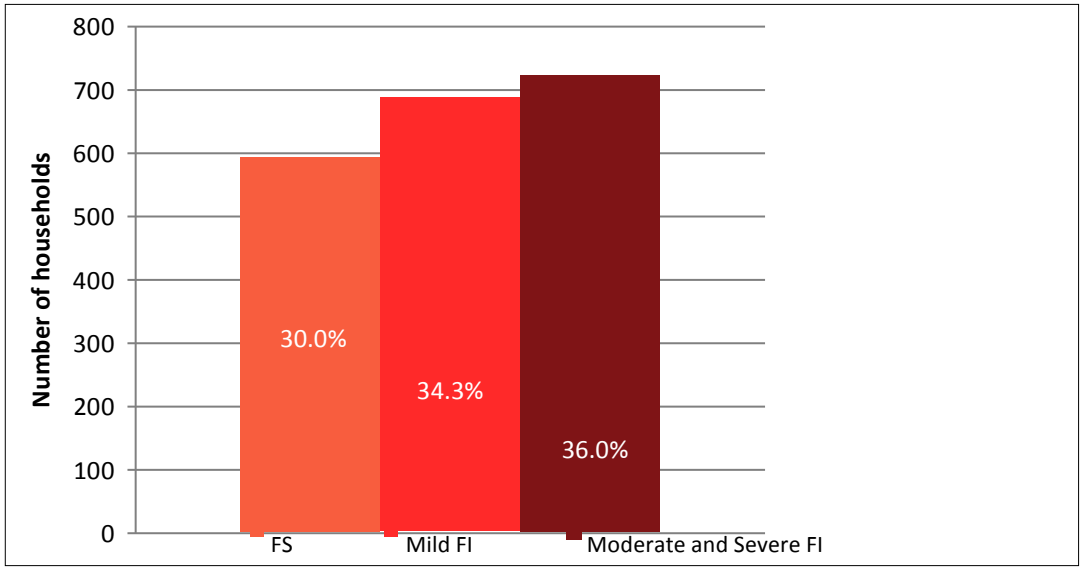

Figure 1. Percentage of households in a situation of food insecurity. Vale do Jiquiriçá CONSAD - BA, 2011

Source: Household Survey, 2010-2011.

The polytomous logistic regression results adopted in this study to identify the associations of interest in the elucidation of the size and distribution of FI in the territory studied are presented in Table 2.

Table 2. Association between food insecurity and demographic and socioeconomic variables. Vale doJiquiriçá-BA, 2011.

Variables	n	% Mild Food Insecurity	% Moderate and Severe Food Insecurity	p Value
Household head sex*				
Male	369	29.5	35.8	0.119
Female	931	33.4	37.6	
Per capita income				
< 1/4 minimum wage	997	32.2	46.5	<0.001
≥ 1/4 minimum wage	647	35.9	18.1	
Inhabitant under 18 years				
Yes	1799	33.3	39.6	< 0.001
No	203	43.3	3.9	
Education of the household head				
Up to the 4th grade	872	30.5	41.6	<0.001
5th to 8th grade	157	38.2	42.7	
High School and higher	259	33.6	19.3	
Number of inhabitants in the household				
Up to 3 inhabitants	732	34.8	25.8	<0.001
4 to 6 inhabitants	966	34.6	38.8	
≥ 7 inhabitants	150	21.3	65.3	
Environmental Indicator				
Inadequate	1083	32.8	40.5	<0.001
Adequate	778	34.8	29.6	
Residence Area				
Rural	1166	33.4	39.0	0.003
Urban	836	35.5	31.8	
Family Allowance Program				
Yes	1122	33.1	45.9	<0.001
No	519	31.8	23.1	

Source: Household Survey, 2010-2011.

Among the households investigated, those headed by women predominated, but there were no positive and statistically significant associations between the sex of the household head (female) and moderate and severe FI. This relationship, however, was present with mildFI. A statistically significant association was observed between schooling and mild FI (category "until 4th grade") and moderate/severe FI(category "until 4th grade"/95%CI) and category "5th to 8th grade."

Mild and moderate/severe FI showed positive and statistically significant associations (95% CI) for the variables: schooling of the household head, living conditions in the household in relation to family income per capita less than ¼ of the minimum wage, in relation to the largest number of residents per household and the environmental indicator also showed a positive and significant association. However, for the presence of a resident under 18 years in the household, the association was observed only for mild FI.

Municipal FNS

Using the protocol of indicators, the Vale do Jiquiriçá CONSAD, taking all of the dimensions into account, obtained a performance of 53.7% of the total score, placing it in the range of mild FNI, according to Table 3.

Table 3. Assessment of the situation of food and nutritional security by dimensions in Vale do Jiquiriçá-BA, 2011.

Size	Maximum score	Score obtained	Scale of points (%)	Food and Nutritional Security Situation
Availability of food	60	35.0	58.3	Mild FNI
Access to food	30	14.4	48.1	Moderate FNI
Food consumption	30	17.2	56.7	Mild FNI
Biological utilization of foods	60	30.0	50.0	Mild FNI
Total	180	96.6	53.7	Mild FNI

Fonte: Ribeiro (2011).

In the aspectsof "Availability," "Consumption," and "Biological use of food," the indicators obtained a score that was classified as mild FI. However, for the aspect "Access to Foods," the score indicated moderate FI.

Discussion

The prevalence of FI found in the region was quite high (70.3% of the households), considering that results from other studies with the application of EBIA also showed percentages of food insecure households below the results obtained in the region. In studies conducted in the municipality of Duque de Caxias,[12] in Rio de Janeiro, there was a prevalence of 53.8% of households with FI; in Paraíba, researchers found 52.5% of households with FIin14 municipalities withconsiderable poverty.[13] However, studies conducted in the poorest regions obtained different results, as astudy undertakenin the (urban and rural) municipality of São João do Tigre, of the CaririsVelhosmicroregion, State of Paraíba, with 458 families with children under 5 years, found 87.3% of FI.[14]

Studies on the distribution of FI have indicated the importance of the expansion of Brazilian social programs in reducing the problem. However, even with the reduction observed for the Northeast and Bahia, specific areas of that state still suffer from a high prevalence of the problem. FI not only affects the inland municipalities; in Salvador, the capital, a study conducted in 2007 in a sample of homes of families of schoolchildren from the public system found a prevalence of 71.3% of FI.[15]

To better understand the FI prevalence results, multivariate analysis showed that several factors increased the probability of households sufferingfrom FI, which are: the monthly household income *per capita* <¼ of the minimum wage; more than four inhabitants in the household; and unsatisfactoryenvironmental indicators. The interpretation of these results can guide the public administration in the regionon the direction of the necessary actions.

As in other studies, in this one, the monthly family income *per capita* was relevant for the definition of FI. Moderate and severe FIwas present in 46.5% of the households with a monthly *per capita* household income less than ¼ of the minimum wage (MW). This prevalence was reduced to 24.1% among those households with income between half and ¼ of the minimum wage, and to 8.4% among those with monthly income greater than ½ MW. With only two categories of income, the prevalence of moderate and severe FI was 46.5% for those with income less than ¼ of the MW, a statistically significant result. A detailed analysis showed that households with a monthly income less than ¼ of the MWwere almost thrice more likely to be in a situation of moderate and severe FI. In households with a female head, with average family income *per capita* less than ¼ of the MW, the FIwas moderate and severe, well above that recorded in the household whose head was male: respectively, 21.2% and 16.7%.

In Brazil, 43.1% of the households with amonthly income *per capita of* up to ½ MWpresented a situation of FI.[5] A study conducted by Souza in the Northeast region revealed that, among the households with a *per capita* income of up to ¼ of the MW, the chance of FI was 27.3 times higher than for other income brackets.[16] Studies conducted by several authors have shown that the lower

the class of monthly householdincome *per capita*, the higheris the proportion of households with moderate and severe FI.[13,17]

Many of the variables used in the analysis of FI have a direct relationship with the number of residents in the household, and this has been anexplanatory variable for FI in several studies. In this study, more than 50.0% of the households had 4-6 inhabitants, and 8.1% had seven or more inhabitants. Moderate and severe FIwas present in 38.8% of households with 4-6 inhabitants and reached 65.3% of households with seven or more inhabitants. These results were statistically significant (Table 2). In the likelihood analysis, the households with seven or more inhabitants were 3.19 times more likely (95% CI 1.80 - 5.68) to be in a situation of moderate and severe FI. This likelihood was reduced to 1.22 times (95% CI 0.90-1.65) among households with 4-6 inhabitants. A study conducted by Anschau found an 83.0% higher Odds Ratio for moderate and severe FI in households with five or more inhabitants.[18]

Table 4. Adjusted odds ratio to assess factors associated with food insecurity and nutritional status of households in the Vale do Jiquiriçá CONSAD -BA.

Variables	Mild Food Insecurity		Moderate/Severe Food Insecurity	
	OR	95%CI	OR	95%CI
Per capita income				
≥ 1/4 minimum wage	1	-	1	-
< 1/4 minimum wage	**1.45**	**1.070 – 1.957**	**2.91**	**2.117 – 4.000**
No of inhabitants in the household				
Up to 3 inhabitants	1	-	1	-
4 to 6 inhabitants	1.11	0.829 – 1.481	1.22	0,905 – 1,651
≥ 7 inhabitants	1.28	0.677 – 2.426	**3.19**	**1.796 – 5.677**
Environmental Indicator				
Adequate	1	-	1	-
Inadequate	0.95	0.722 – 1.243	**1.34**	**1.012 – 1.771**
Family Allowance Program				
Yes	1	-	1	-
No	**1.81**	**1.325 – 2.463**	**2.31**	1.665 – 3.205

Source: Household Survey, 2010-2011.

Housing conditions are closely related to the vulnerability of families to FI. In households with high population density per bedroom, FI appears with a higher prevalence.[16]

Since the 1990s, there has beenan understanding that food security, in addition to the food and health dimension, includes the sanitary quality of food and water. This aspect is also contemplated in the Brazilian definition de FNS, as foreseen in the Organic Law on Food and Nutritional Security (LOSAN).[2]

In this study, housing characteristics, such as access to basic sanitation services (treated water, existence of sanitation in the household, and sanitary sewage), were integrated into a dichotomous environmental indicator, classifying them as adequate or inadequate for the household. In the households studied, 58.2% were classified as inadequate and 41.8% as adequate. FI is present in 73.3% of households with an inadequate environmental indicator, a statistically significant result. Focusing on the severe and moderate FI, this was present in 40.5% of households with inadequate conditions and in 29.6% of those withadequate conditions–an important difference affecting the intensity of FI. In the odds analysis, it was observed that a negative environmental indicator increased 1.34 times, the odds of moderate and severe FI, signaling the importance of correcting such problems.

Income transfer programs were created in Brazil as a strategy to complement income in situations of unemployment and low income in significant portions of the population. In the Vale do Jiquiriçá CONSAD, 68.4% of the households studied were covered with the benefit of the Family Allowance Program (PBF); of these, 45.9% hadFI. These results indicate the proper targeting of the program for those who are most in need of benefits and are compatible with other studies.[13] From the point of view of public policies, the program is important to improve the living conditions of families, although, by itself, it does not guarantee satisfactory rates of food security which are associated with the broader picture of poverty.[19]

FNS in the municipality

Search results identified using the protocol of indicators in the municipality of Mutuípe-BA revealed a situation of moderate FNI, considering the aspects of availability, access, consumption, and biological use.[11]

In the area studied, FNS, anaspect of food availability, is related tothe local production and marketing of foods. This means that, for the municipality, given the indicators used, there is no problem with the food supply as such. Several factors contributed to the existence of these results: good road access to the city and facilitating the flow of products produced between rural and

urban areas, which can encourage a greater supply of food, such as lower cost; strategies to bring together small producers and consumers through the weekly fairs, facilitating the access to food amongthe population with alower income; a cooperative of small producers, favoring the increase in local food supply and income for families of small producers; diversity of credit lines to small producers, positivelyimpacting family farming and self-consumption, increasing income, and guaranteeing minimum conditions for the maintenance of agricultural activities.

Even with good results in this aspect, the municipality displayed an absence of warehouses that could ensure food storage to supply the domestic market for at least two months. This would ensure that possible problems that affect production, such as changes in weather conditions and commercialization, due to the inter-harvest period that raise prices, for example, do not compromise the whole population's access to food.

In relation to the aspect "access to food," the main factor that contributed to the result obtained was the low education level of the head of the household, measured by years of study. This influences not only the probability of obtaining better remuneration at work, but also the selection, acquisition, and preparation of food, and is also associated with the possibility of using goods and services essential forhealth maintenance. The same results were found in the municipality of Mutuípe, with the application of the same instrument.[11]

In the aspect "food consumption," the factors that contributed to the results found were: a high percentage of children with low birth weight reflecting maternal malnutrition during pregnancy; a high percentage of children under five years with a weight deficit for age, which indicates a current state of malnutrition, reflecting poor health, income, and family education.

The high percentage of exclusive breastfeeding was an important result of the study in the definition of mild FI, based on the assumption that it qualitatively and quantitatively provides adequate nutrients for growth. The cited study observed that the same indicators were related to similar results.

In the "biological use of food" aspect, the result obtained is due to poor coverage of basic sanitation, such as: lack of access to treated water, household waste collection, and sanitary sewage, such that family exposure to adverse conditions of basic sanitation directly influenced family health. The result of the study in the municipality of Mutuípe was not different from that in CONSAD.[11]

It is important to note that the coefficient of infant mortality contributed to better results in this aspect, given the premise that this indicator reflects the health conditions of the population in general. It should be noted that the Family Health Program was implemented with 100% coverage by ACSs in all municipalities in this study.

Conclusion

It is advantageous to CONSADs thatthe creation of local systems of FNSbe placed on the political agenda.Such policies contribute in modifying the living conditions of people in the local areaequiring information about the local situation and its constraints. Thus, the present study aimed to identify the situation of FNS and its determinants in municipalities in the territory of the Consortium of Food Security and Local Development - Vale do Jiquiriçá CONSAD.

To generate the results and analyses required, the research applied the EBIA, the socioeconomic questionnaire, and the protocol of indicators, to assess the local situation and the factors associated with the results. Being a cross-sectional study, and in the total absence of previous studies in the region on the subject, this study faced limitationsincluding the impossibility of establishing causal relationships between the outcome variable, FI, and the independent variables considered.

In summary, the global analysis of the results indicates that there are *social* deficits that compromise the FNS status of the families. It should be emphasized that the problems were less associated with the attributes of individuals who live with FI, and more strongly associated with their social conditions depending on public action. Therefore, these results can guide managers in taking actions and designing interventions that are potentially capable of minimizing FI and be a strategic guide for planning, preparation, and monitoring of local public policies, with the aim of promoting the Human Right to Adequate Food.

The methods applied were feasible instruments for the evaluation of household and municipal FNS. The EBIA has been used in several studies and especially by the National Survey by Household Sampling. The protocol of indicators developed for implementation at the local level is an important instrument for the evaluation of municipal FNS, as it assessesFNS in relation to four aspects, implying access to data and information from different systems.

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Collaborators

Ribeiro JCS participated in all stages of the research, planning, and activities in the field studies, and analysis and interpretation of data; Santos SMC was responsible for overall coordination of the project; Buranelli Soares TM and Accioly JABC participated in all stages of the research.

Conflict of Interest: The authors declare no conflicts of interest.

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