

Family Development Index (IDF) in the municipality of Viçosa, evolution between 1980 and 2010

A evolução do Índice de Desenvolvimento da Família (IDF) da cidade de Viçosa entre os anos de 1980 e 2010

Indice de Développement de la Famille (IDF) dans la municipalité de Viçosa, evolution entre 1980 et 2010

Índice de Desarrollo Familiar (IDF) en el municipio de Viçosa, evolución entre 1980 y 2010

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Abstract: This study analyzed the situation of families in the city of Viçosa in 1980, 1991, 2000 and 2010 from a multi-dimensional perspective based on methodology adapted from that of Barros, Carvalho and Franco (2003), which was based on micro-data from the demographic census. Through the enormous amount of information contained in the database, it was possible to undertake a broad analysis enabling the household's living conditions to be evaluated.

Keywords: Family Development Index; well-being; Viçosa.

Resumo: Este estudo analisou a situação das famílias na cidade de Viçosa em 1980, 1991, 2000 e 2010, a partir de uma perspectiva multidimensional baseada em metodologia adaptada da de Barros, Carvalho e Franco (2003), baseada em microdados de o recenseamento demográfico. Através da enorme quantidade de informações contidas na base de dados, foi possível realizar uma ampla análise que permitisse avaliar as condições de vida do lar.

Palavras-chave: Índice de Desenvolvimento da Família; bem-estar; Viçosa.

Résumé: Cette étude a analysé la situation des familles dans la ville de Viçosa en 1980, 1991, 2000 et 2010 dans une perspective multidimensionnelle basée sur une méthodologie adaptée de celle de Barros, Carvalho et Franco (2003), basée sur des micro-données de le recensement démographique. Grâce à l'énorme quantité d'informations contenues dans la base de données, il a été possible d'entreprendre une vaste analyse permettant d'évaluer les conditions de vie du ménage.

Mots clés: Indice de développement de la famille; bien-être; Viçosa.

Resumen: Este estudio analizó la situación de las familias en la ciudad de Viçosa en 1980, 1991, 2000 y 2010 desde una perspectiva multidimensional basada en una metodología adaptada de la de Barros, Carvalho y Franco (2003), que se basó en microdatos de el censo demográfico. A través de la enorme cantidad de información contenida en la base de datos, fue posible realizar un análisis amplio que permite evaluar las condiciones de vida del hogar.

Palabras clave: Índice de Desarrollo Familiar; bienestar; Viçosa.



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1 INTRODUCTION

Social disparity is a problem afflicting most municipalities, especially cities in underdeveloped or developing countries, marked by economic problems, deficiencies in health provision, education, housing precariousness, among other social ills.

In Brazil, income inequality coupled with poverty is part of the country's history, aggravated by numerous economic crises, policies, failures in government actions, and economic development centered on the more fortunate classes. These problems are further aggravated at the municipal level, as the dependence of the population on specific actions of the authorities is much greater when compared to the State and Federal spheres.

1.1 Concept of Poverty

Poverty and social inequality follows the historic line of the development of humanity. According to Schwartzman (2007), until the 19th century, the understanding of poverty based on a natural and inevitable condition for most of humanity, and this situation would only be considered a social problem if poor people put in danger to society.

The characterization of poverty nods to some kind of grace period, which may be solely material or cover cultural and social elements, given the resources available individually or family. This scarcity can be relative or absolute, subjective nature (KAGEYAMA; HOFFMANN, 2016).

The parameters, poverty assessment by the criterion of income, tend to define who are poor those individuals who, temporarily or permanently, do not have access to a minimum of material and financial resources (YAZBEK, 2012). The understanding of poverty as lack of basic needs is very complex, on the assumption that each individual has specific needs.

1.2 The Multidimensional Character of poverty analysis

From critical collaborations of researchers challenging conventional theory, the use of income for the definition of poverty has lost ground to new approaches that emphasize multidimensionality, as indispensable for the characterization of poverty.

The studies of multidimensional poverty defend the thesis that it is only permissible to really understand poverty if it is analyzed in its various dimensions, which involves treating the subject from its multiple chances and its different aspects, evaluating them in particular historical and social context.

Multidimensional analysis, not only characterized by a lack of income, consider other factors such as the absence of rights, of opportunities, of information, of possibilities and expectations (MARTINS, 1991).

Poverty is related to local underdevelopment, which results in poor basic conditions for welfare such as electric light, treated water, sanitation facilities, and poor access to health and education services. However, poverty is also related to the demographic characteristics and limitations of human and financial capital, which affect the ability to raise family income (KAGEYAMA; HOFFMANN, 2016).

1.3 Place and object of study

Viçosa is a city in the Zona da Mata of Minas Gerais, the local economy, based on the services sector, is dependent on the floating population, which resides, for the most part, during the school period in the city. The urban expansion happens in an organic way, adding to already saturated regions and with an old infrastructure. There are currently discussions in society about the benefits and harms of not controlling the local growth model. There are problems of rainwater drainage, transportation, paving, occupancy in hazardous areas, suppression of watercourses, visual pollution, sewage and water supply system, and problems with electricity supply.

From 1960, the process of urbanization of Viçosa is marked by the increase of the speed of urbanization in the already consolidated areas and the expansion of new neighborhoods. This growth was mainly due to the Universidade Federal de Viçosa, which, by expanding its vacancies and courses and expanding its jobs, boosted the increase of the population of the city. This growth generated several problems resulting from the accelerated urbanization process.

Pretending to know the social reality of the municipality in the last decades, the families in Viçosa are used to address human and family development, based on the Family Development Index (Índice de Desenvolvimento da Família [IDF]), created by Barros, Carvalho e Franco (2003), the purpose of which is to present the socioeconomic profile of the city of Viçosa, Minas Gerais, using information from the demographic censuses of the years 1980, 1991, 2000 and 2010. From the IDF, it was possible to analyze living conditions of families in Viçosa, revealing the neediest sectors that have the greatest need for specific public policies.

2 METHODOLOGICAL ASPECTS

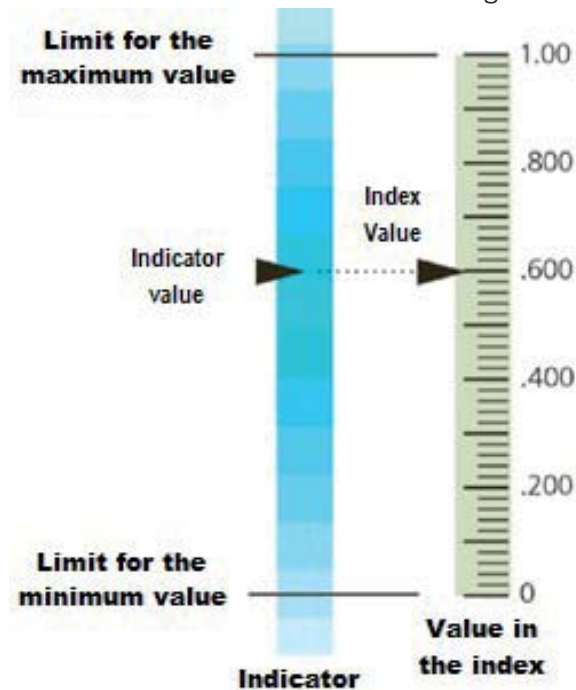
There is a set of data and social indicators that work with and help expose the most important and varied phenomena. Thus, seeking to provide information for this growing demand, the IDF was developed by the researchers Ricardo Paes de Barros, Mirela de Carvalho and Samuel Franco from the Institute of Applied Economic Research (IPEA). Aiming to create a synthetic indicator *S* derived from a series of key indicators, since this is the simplest form of preparing synthetic poverty indicators to measure the degree of family development (BARROS; CARVALHO; FRANCO, 2003).

2.1 Data base

The data used in the present study were extracted from the Integrated Public Use Microdata Series International (IPUMS-International), a project linked to the University of Minnesota in the United States of America, which collects and distributes demographic data from censuses from all over the world. Data for the region of Viçosa, Minas Gerais, Brazil was extracted from IPUMS-International database with information from the demographic censuses of the years 1980, 1991, 2000 and 2010.

2.2 Preparing the Family Development Index (IDF)

The weighting assigned to the dimensions and their corresponding variables are equal, so the family that has the lowest value, in one variable, receives the value 0 for the subindex, relative to that dimension, while that with the highest value receives 1. In this way, all other units perceive values that obey their place in the scale, as shown in Figure 1.

Figure 1 – Schematic model for calculating the index

Source: Braga (2015), based on United Nations (2002).

According to the methodology suggested by Barros, Carvalho and Franco (2003), the elaboration of the IDF in this study was based on the basic information contained in the IBGE questionnaire for the municipality of Viçosa for the demographic censuses of 1980, 1991, 2000 and 2010. Given its linearity, used both in the aggregation of poverty of several families and in the aggregation of dimensions related to poverty, the IDF also allows the level of poverty of the entire population to be obtained with association to each of the dimensions of poverty. For this research, the same method was used, consisting of 6 dimensions and 45 variables, adapting the information contained in the questionnaires of the above mentioned demographic census.

The six dimensions are vulnerability of the family; access to knowledge; availability of resources; child development; housing conditions and access to work. “Each of these six dimensions represents, in part, access to the means necessary for families to meet their needs and, on the other hand, the achievement of ends, that is, the effective satisfaction of such needs” (BARROS; CARVALHO; FRANCO, 2003, p. 8). Chart 1 shows the IDF dimensions and their respective variables.

Chart 1 – IDF and its dimensions

Dimension	Variable
Vulnerability of the family	No woman had a live birth within the last year
	No woman had a live birth within the last two years
	No children (0-11)
	No children or adolescents (0-15)
	No children, adolescents or young people (0-29)
	No elderly (<60)
	Presence of partner
	More than half the member are of working age (15-64)
	No children whose mother has died in the household
	No children who do not live with their mother in the household

Dimension	Variable
Access to knowledge	No illiterate adults
	No functioning illiterate adults
	At least one adult who completed basic education
	At least one adult who completed secondary education
	At least one adult with some form of higher education
	At least one worker with a mid or higher level qualification
Access to work	More than half the members of working age are employed
	At least one occupant has formal employment
	At least one occupant who does not work in agriculture
	At least one occupant with incomes above one minimum wage
	At least one occupant with income above two minimum wages
Availability of resources	Per capita household income above the extreme poverty line
	Per capita household income above the poverty line
Child development	No children under 14 working
	No children under 16 working
	No children under 6 out of school
	No children 7-14 out of school
	No children 7-17 out of school
	No children under 14 more than 2 years behind at school
	No illiterate adolescents (12-14)
	No illiterate young people 15 to 17
	No mother who lost a child
	No more than one mother who lost a child.
Housing conditions	Homeowner
	Home owner or home given
	Density of up to 2 occupants per room
	Permanent construction
	Access to water
	Sewage
	Trash is collected
	Access to electricity
	Access to stove and fridge
	Access to stove, fridge, TV or radio
	Access to stove, fridge, TV or radio and telephone
	Access to stove, fridge, TV or radio, telephone and computer

Source: Adapted from Barros, Carvalho and Franco (2003).

To find the value within the scale, as shown in Figure 1, it is necessary to calculate the proportionality of the value by weighting the variation between the minimum and maximum value of each variable. This calculation is nothing more than the subindex:

$$subindex_i = \frac{observed\ value - min.\ value}{max.\ value - min.\ value}$$

Therefore, the subindex shows the relation of the observed value in the analyzed unit, with the minimum and maximum value of the variable, so that it is positioned within the interval between 0 and 1.

The IDF ranges from 0 to 1, meaning that the better the family conditions, the closer to 1 their indicator will be.

Once all subindexes are calculated, the final index is derived from the arithmetic mean of the subindexes. This mean can be corrected, if the index user evaluates that there is some more

important variable in the final calculation of the index. The following is the formula for creating the index:

$$finalindex = \frac{1}{n} subindex_1 + \frac{1}{n} subindex_2 + \frac{1}{n} subindex_3 + \dots + \frac{1}{n} subindex_n$$

This procedure was used to create the IDF proposed in this research, below is shown how each of the sub-indices was calculated.

3 IDF IN VIÇOSA, MG, BRAZIL IN THE DEMOGRAPHIC CENSUSES OF 1980, 1991, 2000 AND 2010

According to Jannuzzi (2005), a social indicator, referred in an empirical way, supports information on the social reality, or allows transformations in the same one to be perceived. The social indicator is an operational tool to monitor social reality, with the aim of formulating and reformulating public policies.

The IDF, which works with data that look at the concept of poverty beyond the point of view of income, establishes an instrument that enables analyses that are more cohesive with the social reality of the community. Table 2 presents the results obtained in this research for the IDF of Viçosa MG in the demographic censuses of 1980, 1991, 2000 and 2010.

Chart 2 – IDF –Viçosa 1980, 1991, 2000 and 2010

IDF VIÇOSA		1980	1991	2000	2010
		0.624	0.711	0.753	0.794
Dimension	Variable	1980	1991	2000	2010
Vulnerability of the family	No woman had a live birth within the last year	0.726	0.812	0.964	0.930
	No woman had a live birth within the last two years	0.635	0.767	0.774	0.890
	No children (0-11)	0.714	0.735	0.793	0.839
	No children or adolescents (0-15)	0.628	0.658	0.710	0.774
	No children adolescents or young people (0-29)	0.320	0.385	0.426	0.522
	No elderly (<60)	0.933	0.924	0.924	0.890
	Presence of partner	0.349	0.374	0.397	0.421
	More than half the member are of working age (15-64)	0.715	0.761	0.836	0.874
	No children whose mother has died in the household	0.985	0.988	*	*
	No children who do not live with their mother in the household	0.991	0.982	0.988	0.972
Access to knowledge	No illiterate adults	0.813	0.873	0.922	0.945
	No functioning illiterate adults	0.549	0.729	0.830	0.956
	At least one adult who completed basic education	0.504	0.614	0.774	0.858
	At least one adult who completed secondary education	0.359	0.577	0.562	0.633
	At least one adult with some form of higher education	0.157	0.156	0.173	0.262
	At least one worker with a mid or higher level qualification	0.049	0.069	0.127	0.124
Access to work	More than half the members of working age are employed	0.839	0.796	0.785	0.644
	At least one occupant has formal employment	0.689	0.535	0.496	0.604
	At least one occupant who does not work in agriculture	0.852	0.887	0.893	0.944

IDF VIÇOSA		1980	1991	2000	2010
		0.624	0.711	0.753	0.794
Dimension	Variable	1980	1991	2000	2010
Access to work	At least one occupant with incomes above one minimum wage	0.575	0.907	0.841	0.828
	At least one occupant with income above two minimum wages	0.356	0.605	0.418	0.311
Availability of resources	Per capita household income above the extreme poverty line	0.578	0.825	0.749	0.969
	Per capita household income above the poverty line	0.431	0.749	0.610	0.964
Child development	No children under 14 working	0.942	0.970	0.985	0.987
	No children under 16 working	0.895	0.934	0.962	0.973
	No children under 6 out of school	0.020	0.126	0.358	0.637
	No children 7-14 out of school	0.787	0.869	0.987	0.987
	No children 7-17 out of school	0.708	0.713	0.937	0.952
Child development	No children under 14 more than 2 years behind at school	0.733	0.539	0.852	0.570
	No illiterate adolescents (12-14)	0.941	0.947	1.000	0.985
	No illiterate young people 15 to 17	0.952	0.968	0.986	0.984
	No mother who lost a child	0.345	0.753	0.858	0.894
	No more than one mother who lost a child.	0.944	0.937	0.990	0.785
Housing conditions	Homeowner	0.666	0.747	0.765	0.739
	Home owner or home given	0.829	0.870	0.838	0.822
	Density of up to 2 occupants per room	0.459	0.593	0.752	0.870
	Permanent construction	0.918	0.965	*	0.996
	Access to water	0.643	0.878	0.982	0.997
	Sewage	0.522	0.632	0.810	0.890
	Trash is collected	*	0.495	0.871	0.952
	Access to electricity	0.706	0.919	0.988	0.999
	Access to stove and fridge	0.447	0.758	0.907	0.977
	Access to stove, fridge. TV or radio	0.447	0.723	0.903	0.974
	Access to stove, fridge. TV or radio and telephone	0.191	0.235	0.514	0.456
	Access to stove, fridge. TV or radio. telephone and computer	**	**	0.155	0.355

* Data missing from this demographic census

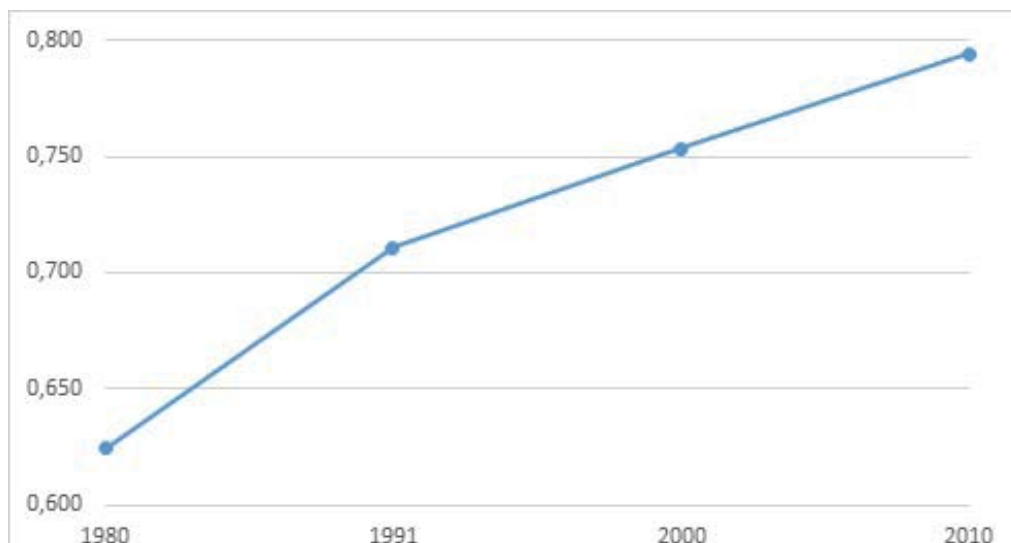
** Home computers were not common

Source: Data from the study

Table 02 shows in detail all the variables and their respective dimensions in the four demographic censuses analyzed. In order to evaluate the families' level of development, a hierarchy similar to that of the HDI was used. Thus, indexes above 0.80 were considered a high level of development, between 0.50 and 0.79 were evaluated as medium development and, finally, indices below 0.50, low level of development.

Based on this specification, although the municipality of Viçosa shows a growth of 27.21% in the IDF between 1980 and 2010, from 0.62 to 0.79, the period still ends with a medium level of development.

Graph 01 shows more marked growth between the demographic censuses from 1980 to 1991, showing a growth of 13.90%, while the variation between the demographic censuses from 1991 to 2000 was 5.97%. In addition, from 2000 to 2010, there is growth of 5.40%, even with constant growth, it was not enough to raise the IDF of Viçosa to the high development level.

Graph 1 – Evolution of the IDF for Viçosa 1980-2010

Source: Data from the study

When observing the difference of the mean of the variables of the IDF of Viçosa in the four demographic censuses analyzed, chart 03 shows a wide difference between the values, between 0.4051 and 0.9665, reflecting great inequality between the dimensions of vulnerability, access to knowledge, access to work, availability of resources, child development and housing conditions in the municipality.

Chart 3 presents some basic and preliminary components that help in understanding the distribution of the data that compose the IDF of the Viçosa families.

Chart 03 – Descriptive statistics of the IDF in Viçosa 1980- 2010

IDF VIÇOSA - MG	Minimum	Maximum	Index	Standard deviation
1980				
Vulnerability of the family	0.3200	0.9910	0.6996	0.2353
Access to knowledge	0.0492	0.8129	0.4051	0.2783
Access to work	0.3561	0.8521	0.6622	0.2059
Availability of resources	0.4306	0.5783	0.5045	0.1044
Child development	0.0195	0.9521	0.7265	0.3106
Housing conditions	0.1910	0.9175	0.5825	0.2128
1991				
Vulnerability of the family	0.3740	0.9880	0.7386	0.2178
Access to knowledge	0.0690	0.8729	0.5030	0.3207
Access to work	0.5348	0.9073	0.7461	0.1680
Availability of resources	0.7488	0.8254	0.7871	0.0542
Child development	0.1261	0.9695	0.7756	0.2679
Housing conditions	0.2347	0.9652	0.7104	0.2141
2000				
Vulnerability of the family	0.3970	0.9880	0.7569	0.2160
Access to knowledge	0.1273	0.9221	0.5648	0.3425
Access to work	0.4177	0.8927	0.6865	0.2150
Availability of resources	0.6102	0.7487	0.6795	0.0979
Child development	0.3578	1.0000	0.8915	0.1952
Housing conditions	0.1550	0.9884	0.7715	0.2428

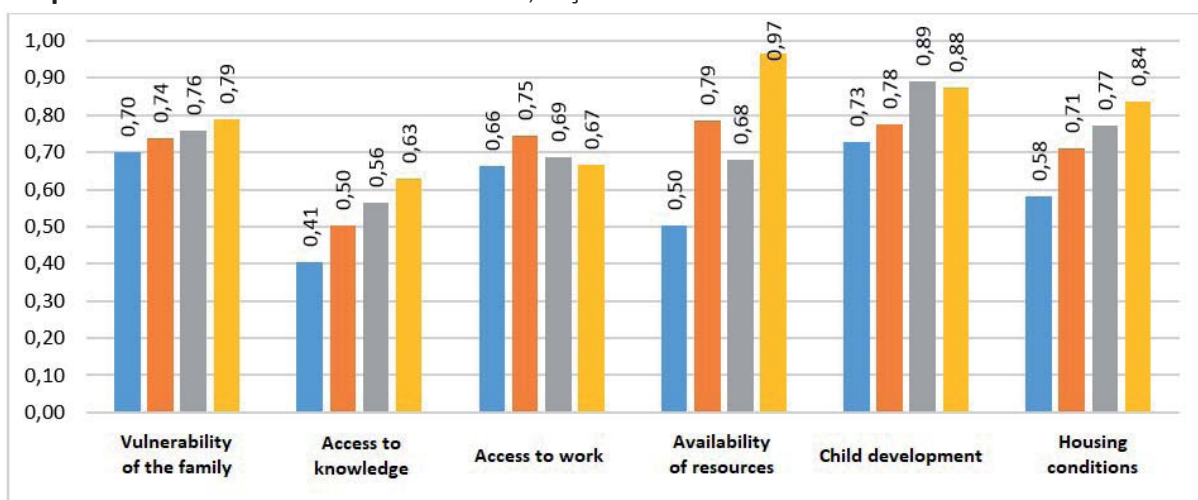
IDF VIÇOSA - MG	Minimum	Maximum	Index	Standard deviation
2010				
Vulnerability of the family	0.4210	0.9720	0.7902	0.1905
Access to knowledge	0.1241	0.9564	0.6297	0.3602
Access to work	0.3111	0.9435	0.6661	0.2416
Availability of resources	0.9643	0.9687	0.9665	0.0031
Child development	0.5696	0.9874	0.8755	0.1575
Housing conditions	0.3551	0.9988	0.8355	0.2174

Source: Data from the study

The index is the measure of central tendency that expresses the information in the data set, here, the highest index belongs to “availability of resources in the year 2010” dimension and the lowest to the dimension “access to knowledge in the year 1980”. The maximum has the highest index within the variables of the dimension, while the minimum has the lowest index among the variables of the dimension.

Graph 2 outlines the evolution of the IDF multidimensional indicator calculated for the city of Viçosa, MG, based on the demographic censuses of the years 1980, 1991, 2000 and 2010 for each of the six dimensions. It can be seen that, in general, for five of its six dimensions, there was evolution in the conditions of families in Viçosa, only the indicator that indicates access to work shows a reduction in its result.

Graph 2 – IDF multidimensional indicator, Viçosa – 1980- 2010



Source: Data from the study

Graph 2 presents the six dimensions in the four demographic censuses surveyed. The greatest advances in the city of Viçosa and that contributed to the improvement of the IDF in the period analyzed are related to the dimensions of resource availability, child development and housing conditions, all presented a development index above 0.8 which is considered very high. While access to work and access to knowledge are categorized as medium development index.

It must be understood that the calculations and analyses carried out in this study demonstrate the relevance of the measurement of the family situation in Viçosa from a multidimensional aspect. Advances in relation to the IDF of Viçosa were better than the results presented by the

Municipal Human Development Index (Índice de Desenvolvimento Humano Municipal [IDHM]). In which, in the latter index, the IBGE evaluates only three dimensions, income, longevity and education. The HDI was calculated from the 1991 population census, Chart 4 shows the difference between these two indices.

Chart 4 – Comparison between IDHM and IDF for Viçosa

Demographic census	IDHM – Viçosa	IDF - Viçosa
1991	0.517	0.711
2000	0.677	0.753
2010	0.775	0.794

Source: IBGE and data from the study.

This result further highlights the relevance of seeking to understand and evaluate the family situation from a multidimensional perspective, since, in harmony with the methodology used in this research, irrespective of whether it is admitted that financial resources are fundamental for reducing family neediness. These isolated factors are not sufficient to guarantee families dignity and to reduce social differences.

4 CONCLUSIONS

This study examined the family situation of the population of Viçosa through multidimensional indicators of the family situation, based on data from the demographic census of the years 1980, 1991, 2000 and 2010. Therefore, the IDF was constructed for the municipality, exploring each of the dimensions that are part of its composition, consisting of absence of vulnerability, access to knowledge, access to work, availability of resources, child development and housing conditions.

In this research, breaking down the family development index, according to the six dimensions, made it possible to develop knowledge of the proportion that each subindex represents in the life of the families in Viçosa. Was possible to highlight the population's needs, producing information for the authorities, so that specific actions can be developed to improve the quality of life of the population.

Through the IDF, it was noted that in the municipality of Viçosa, there was a significant evolution in the level of development of the families, mainly from the 2000s. This performance reveals an important occurrence, that is, a priori, thanks to social programs to supplement family income with counterpart educational obligations, some efficient public policies in social care, education, health and, in addition, the effect of financial stabilization, which promoted the resumption of purchasing power of the disadvantaged classes of society.

While the dimensions evidenced by access to knowledge and access to work, did not provide significant advances in the period, we can see growth in access to knowledge, although still not reaching satisfactory levels, thus confirming that educational policies have not yet been able to expand service to the families of Viçosa, specially the more disadvantaged ones. In the context of access to work, we note the precariousness of employment and the reduction of formally employed workers.

Thus, the research ratifies the need for municipal authorities to establish distinct public policies for sectors of society, seeking progress in quality of life for families at the same time as the reduction of social inequalities.

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