

MULTIDIMENSIONAL POVERTY IN SILVEIRA MARTINS/RS: AN APPLICATION OF ALKIRE-FOSTER METHOD (AF)

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ABSTRACT

The Capability Approach, as proposed by Amartya Sen (1979, 1985, 1987, 1999a, 1999b), analyzes poverty beyond monetary income in considering dimensions as health, education, sanitation and others that are valued by people. From this proposal, Alkire and Foster (2007) have developed a method of measuring poverty that aggregates the various aspects of people's lives in a multidimensional measure. The objective of this study is to explore the Alkire-Foster Method (AF) and present the general measurement obtained in a study in the city of Silveira Martins (RS). The final measure revealed that people are most deprived of the freedom enjoyed in the community, access to income, employment, basic services and education, which supports the senian view that poverty is beyond monetary income. Based on the AF Method, it is possible to formulate policies aimed at the dimensions in which many people suffer more deprivation.

KEYWORDS: Alkire-Foster Method. The Capability Approach. Multidimensional Poverty. Silveira Martins (RS).

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1 INTRODUCTION

The concept of poverty has evolved and the proposals for measuring poverty have evolved with it. Until the 1970s, monetary income was the only dimension used to measure poverty, with a single cut line that distinguished the poor from the non-poor. Through the multidimensional proposal developed by Sen (1979) and the Capability Approach, poverty was defined as the scarcity of access to the functionings one values, the limitation of one's set of capabilities (the set of functionings one can choose to perform – freedom of choice). The set of dimensions factored in the measurement of poverty was expanded, now encompassing conditions of income, health, education, sanitation and other functionings that are valued by people. Having the Capability Approach as a background, since the 1990s human development has come to be conceptualized as the process of expanding people's choices, and poverty has come to be defined as the denial of this possibility. With the evolution of the concept of poverty, the methods for measuring poverty have also changed. An effort has been made towards the creation of methodologies that would allow aggregation of a greater number of variables on the various aspects of people's lives through multidimensional measures.

The Multidimensional Poverty Index (MPI) is a measure of poverty resulting from the Alkire-Foster (AF) method based on the approach proposed by Sen (1979, 1985, 1987). It proposes a measure of how multidimensionally poor those identified as deprived are. The Alkire-Foster Method (2007) results in a measure with some advantages to its use, such as the flexible choice of indicators and dimensions (each dimension is composed of a set of indicators) according to the area; the indicators/dimensions may or may not have equal relevance depending on the objective. It allows for the use of a variety of data (cardinal, ordinal or categories), and may also use a combination of them. With a single number, the measure reflects the range of poverty amounting in the multiple deprivations from which a family suffers, but it can be broken down and compared across regions, specific groups and even across dimensions or indicators. Having this development in mind, this study aims to apply the Alkire-Foster (AF) method in the construction of a general and disaggregated measure of multidimensional poverty across neighborhoods in the municipality of Silveira Martins (RS) with information collected through field research.

The article is structured in four sections apart from the introduction. In the first one, the theoretical background and the AF Method are exposed and thereafter, the method applied to the municipality of Silveira Martins is exposed. The results of the application of the AF Method are discussed in the third section. Finally, some considerations are presented in the last one.

2 THEORETICAL BACKGROUND AND THE ALKIRE-FOSTER METHOD

This section presents the theoretical background of the AF Method, which proposes a measure of multidimensional poverty based on Amartya Sen's Capability Approach (1979, 1985, 1987).

2.1 CAPABILITY APPROACH AND POVERTY

The aim of the Capability Approach is to expand the analysis of poverty beyond monetary income, encompassing several functionings (nourishment, literacy) and the freedom that results from the possibility of choosing to perform the functionings one considers of major importance in one's life (capabilities⁶).

⁶ Capabilities refer to the person's freedom to achieve valued functionings.

Well-being is then understood as not just *per capita* income growth, but as an expansion of what people can be or do. When the notion of well-being is regarded from this angle, unlike the interpretation of the traditional welfare economy, it becomes necessary to expand the informational focus beyond utility, and to include information ranging from basic pointers, such as health, education, and housing to more complex ones, such as the individuals' autonomy or happiness.

The human development is then characterized as a process of expansion of the human capabilities (substantive freedoms) (SEN, 1999a). The functionings, according to Sen's conception (1992, 1999a), are the elements that people may consider valuable and might range from being well nourished to more complex accomplishments, such as being happy. The set of elements or functionings that people can accomplish accounts for capabilities. These functionings reflect what a person does, while the capabilities represent what a person can do or accomplish. Robeyns (2000) points out that the definitions of the functionings and capabilities are close but distinct. The former refers to something that has been or can be achieved and the latter reflects the ability to achieve something. The functionings are, for example, the conditions under which one lives and their distinct aspects, while the capabilities refer to the freedom, that is, the real opportunities that people have in their lives.

Therefore, the Senian approach has two parts in its formulation – functionings and capabilities – without either, the formulation of Sen's normative proposal (1999a) would be incomplete. The concept of functionings is rooted in Aristotle and reflects the things one values doing and being (SEN, 1999a, pp. 74-76). When he regards the distinction between human means and ends, Sen (1999a) quotes Aristotle, for whom wealth is not in itself the good we seek, but rather, is something useful that we seek for other reasons. *"Aristotle saw 'the good of human being' in terms of the richness of 'life in the sense of activity', and thus argued for taking human functionings as objects of value"* (SEN, 1999a, p. 12). In this sense, income would be a means to reach other accomplishments.

The Capabilities Approach advocates the study of poverty from non-monetary sources, through a multidimensional view that addresses the various aspects of people's lives. When we look at poverty from this angle, it can take on many forms besides the scarcity of monetary resources. The eradication of poverty requires that the sources of deprivation of human freedoms be withdrawn, that is, not only must one consider the monetary income, but also the life the person wants. One must be free of deprivations to be able to get what one wants, that is, one must have a set of capabilities that provide the desired functionings.

In the face of this new complexity to the concept of poverty, new proposals of measures⁷ with multidimensional methodologies have emerged. Alkire and Santos (2010) point out that the interest for multidimensional measures has three motivations. The first being that measures like poverty lines are increasingly considered inadequate, and to get results that better represent the reality of the population's welfare over the years, many countries have an interest in the development of indexes that capture multiple deprivations. The second reason presented by the authors is the identification of recipients of public programs. Many countries have public services directed at supporting the poor, and methods that consider income are often erroneous. The last reason refers to the evaluation of processes in which multidimensional measures are developed for monitoring and assessment and can contribute to weighing the impacts of public policies and programs.

⁷ Sen (1976) argues that a measure of poverty must fulfill the axioms of transparency and monotonicity. The first axiom argues that the index should be sensitive and have an increase in the measurement of poverty when a person below the poverty line transfers part of their income to a richer person. The axiom of monotonicity refers to the sensitivity to the distribution of income among the poor, that is, a reduction in a person's income below the poverty line should have an impact on the index so that there is an increase in it. If we move to a multidimensional measure, the poverty of the individual will not be restricted to income, but rather the number of dimensions or indicators in which said individual is deprived, in that sense the increase in the number of deprivations will be reflected in the final measure.

The Human Development Report (UNDP, 2010) uses the Multidimensional Poverty Index (MPI)⁸ employing the AF Method, which is based on the Capabilities Approach. With a single number, the measure developed by Alkire and Foster (2007) reflects the range of poverty amounting in the multiple deprivations from which a family suffers, but it can be broken down and compared across regions, specific groups and even across dimensions or indicators. The next section provides details about the specificities of the AF Method.

2.2 THE ALKIRE-FOSTER METHOD (AF)

The measurement proposed by Alkire and Foster (2007) can be broken down in two major steps: the identification – where individuals are identified as poor or non-poor – and the aggregation – which consists of allocating data of poor individuals in one indicator of poverty. The dual-cut-off method is one of the advantages of the AF Method, since it makes use of two cuts or lines in the identification of individuals who are multidimensionally poor. The first cut syphons internally for each indicator (where the individual will either be considered deprived or not) and the second cut is used between indicators (representing a minimum number of indicators in which the individuals must be deprived to be considered multidimensionally poor).

Alkire and Foster (2007) highlight the unification or intersection as the most used methods for the second cut. The unification method defines that for being considered multidimensionally poor, it suffices that the individual be deprived of one indicator, however, when a set of several indicators is used, all the subjects are likely to be considered multidimensionally poor. The intersection method establishes that those who are deprived of all indicators will be considered multidimensionally poor, but the authors argue that not being deprived in one dimension is not enough to avoid poverty. Thus, Alkire and Foster (2007) suggest the use of an intermediate number for the second cut, that is, a value between the intersection and unification method. The aggregation of data on the poor in a final M_0 measure is carried out based on the The Foster-Greer-Thobercke measure (FGT)⁹. The AF Method consists of twelve steps that ultimately result in the IPM.

The steps of the Alkire and Foster Method (2007) are:

1. Choosing the analysis unit: the first step is choosing the analysis unit, which could be an individual, family, or a community, school, clinic or another unit;
2. Choosing the dimensions: the choice of dimensions is important and less random than one might assume;
3. Defining the indicators: for each dimension considered is necessary to define the indicators;
4. Establishing poverty lines: a poverty cut is defined for each indicator so that it defines the individual as deprived or non-deprived in a given dimension /indicator. For example, when the indicator is education time in years (how long did you study?), if the subject is illiterate or studied up to the fourth grade of Brazilian educational system, this subject will be considered deprived, but if the subject studied until the fifth grade or further, they will not be considered deprived;
5. Applying the first poverty line: comparing the subject's response with each cut considered. For example, in the health dimension, when the indicator is BMI and the

⁸ It should be noted that in the 1990 Human Development Report, the UNDP (as a development measure) and, in 1997, the HPI (as a measure of poverty) had already been formulated. In 2015, IPH was replaced by MPI. Since they are two measures with different focuses, the first measuring the development and the latter measuring poverty, they are not comparable. For more details on the subject, see Anand and Sen (1997).

⁹ The Foster-Greer-Thobercke measure (FGT) is presented in a World Bank publication (2005).

- response is a value not contained within WHO's acceptable range, the person will be considered deprived within this indicator, which will be represented by the letter P, otherwise, the subject would be considered non-deprived and coded with NP;
6. Counting the number of deprivations of each individual: the number of indicators in which the person is deprived;
 7. Establishing the second cut of poverty: identified as k , this indicates the number of dimensions/indicators in which a person must be deprived to be considered multi-dimensionally poor;
 8. Applying cut line k : to get the group of poor people and ignore data from people who are not considered poor (the non-poor group returns zero in the dimensions/indicators results);
 9. Calculating the H incidence: the proportion of poor people who are deprived in k dimensions or more dimensions (d) (indicators) out of the total number of individuals analyzed;
 10. Calculating the average poverty gap (A): A corresponds to the average number of deprivations the poor person suffers. It is calculated by summing the proportion of total deprivations that each person suffers (for example, person 1 suffers deprivation in 4 of the six dimensions / indicators and person 4 suffers deprivation in 6 of 6) and divides by the total number of poor people. $A = (4/6 + 6/6) / 2 = 5/6$;
 11. Calculating the adjusted incidence M_0 : $M_0 = (H \times A)$;
 12. Decompose and segment: break down the results based on groups and segment them based on dimensions.

The use of primary data collected in field research makes it possible to define dimensions according to the individuals' own perception of the context in which they are inserted. By defining the dimensions to be weighed in the measurement of poverty based on a mechanism of partaking, the researcher can obtain results that are consistent with the diversity of realities and needs of each analysis unit.

"Although the AF methodology has a specific structure for identification and aggregation, its implementation is flexible: parameters such as dimensions, cutoffs, and weights can be chosen to reflect the purpose of the measure and its context" (ALKIRE; FOSTER, 2011, p. 14).

In this sense, the Capabilities Approach supports the development of the measure proposed by Alkire and Foster (2007), since the selection of the functionings (dimensions), according to Amartya Sen, must be carried out based on value judgments (which are different based on the focus group) via public debate, in many cases (ALKIRE, 2002).

For Alkire (2005), the operationalization of the Capabilities Approach must consider some remarks: the first being that not all basic capabilities in a list will be relevant to the evaluation and measurement processes; the selection of functionings or capabilities must be done repeatedly. The second being that the operationalization must be made in different countries, levels and in connection to various problems. The third observation refers to the way the Capabilities Approach is "managed". According to Alkire (2005), the system presents freedom in many degrees that are more restricted in actual situations. Finally, the last remark is that the approach is not operationalized by any researcher. Since Sen (1979) does not prescribe a list of basic capabilities to be used, the researcher is free to define them according to the problem at hand. That is why sensibility is necessary on the researcher's part regarding the context analyzed.

The approach leads to a mechanism of partaking selection and is not bound by one a theory (ALKIRE, 2005). The operationalization of the Capabilities Approach is not a simple task. According to Alkire (2005, p. 130), it should be done in the molds of a collaborative enterprise, with several researchers simultaneously working on distinct aspects and with constant communication to develop a group of simplifications and create group dynamics.

By combining the average poverty gap (A) and the incidence of poverty (H) in the final measure, the method proposed by Alkire and Foster (2007) does not violate the axiom of monotonicity. What this means is that if an individual is deprived in three dimensions and due to an event comes to be deprived in four, in other words, in case there is an increase in the number of deprivations, according to the axiom of monotonicity, the final measure should increase. Another important axiom is transference, which means that should the income of a subject below the poverty line be transferred to someone with a higher income, an increase in the incidence of poverty will be caused (SEN, 1976).

The AF Method also meets the decomposability axiom, which allows for the final index to be disaggregated into subgroups (regions, ethnic groups, gender, etc.), making it possible to identify the characteristics of multidimensional poverty for each group. The index also enables disaggregation by dimension, which shows which dimensions have the greatest contribution to the total poverty in a given group (ALKIRE et al, 2015).

Finally, Alkire and Santos (2013) point out yet another advantage of the AF measure, which is the flexibility in the use of several types of data, such as cardinal, ordinal and category variables. With the coding of variables in deprived and non-deprived through the dual cut-off, no interpretation is lost in the combination of several types of data.

The use of the AF Method in the poverty analysis in the municipality of Silveira Martins is relevant due to the possibility of identifying who the multidimensionally poor are and to what extent poverty ravages them. Furthermore, the flexibility in the development of the research instrument adapted to the context analyzed and the disaggregation of the final measure in groups of neighborhoods and age groups is also a valid justification.

3 THE AF METHOD IN SILVEIRA MARTINS/RS

In the first stage of this study, the research technique was indirect documentation through bibliographical research in several sources of scientific references, such as books, journals and scientific articles published in institutions such as the United Nations Development Program, the World Bank and IPEA. This stage aimed at understanding the concept of multidimensional poverty proposed by Amartya Sen and the AF Method.

The second phase consisted in the calculation of the multidimensional poverty measure in Silveira Martins/RS using the Alkire-Foster Method (2007) through field research. To that end, first a provisory form was used to identify the life dimensions valued in the community of the municipality¹⁰. The final research instrument was developed based on said results: the tool used to collect data for this study. Data processing and measurement were performed using Microsoft Excel (MICROSOFT, 2010). The following section presents the 12 steps of the AF Method applied to the municipality of Silveira Martins/RS.

10 On the identification of life dimensions assessed in Silveira Martins-RS, see Marin et al (2013).

3.1 APPLICATION OF THE ALKIRE-FOSTER METHOD

The first step of the AF methodology consisted in the definition of the analysis unit – the people of Silveira Martins (RS). The municipality was selected for the study due to the small population count of 2,449 inhabitants according to data collected in 2010 for the Human Development Atlas (2013), which facilitated the execution of this study.

Under the multidimensional perspective, the dimensions of poverty are not necessarily linked to income, education, or health, but rather to the expansion of the individuals' capabilities. However, Sen (1979) did not prescribe a list of dimensions or an identification method to be followed. John Finnis (1980 apud Alkire, 2008) believes that valued dimensions can be identified through introspective questioning about the reason why one acts in a certain way, that is, questions like "why do I do this?" or "why do people act this way?". With this line of questioning, the subject reflects on their life experiences, beliefs, relationships and preferences according to the culture and reality in which they live. Thus, it was possible to define the most relevant dimensions for the people of Silveira Martins using a research tool based on the works of Barros, Carvalho and Franco (2006), Santos (2007) and Marin and Ottonelli (2008) with the mechanism of partaking (ALKIRE; FOSTER, 2007).

Twenty-five people¹¹ were interviewed using the first research form, which allowed the selection of a set of dimensions according to the reality and the perception of the people targeted by the research (SEN, 2004). Based on these preliminary results, a definitive research instrument adapted to the particularities was developed. This instrument conforms to the objective of the AF Method of identifying who and how poor the multidimensionally poor are. However, should not this be replicated in another analysis unit, it would not reflect the needs and perceptions of a new study focus, therefore the definition exercise for the municipality of Silveira Martins should not be reused, but rather the definition of dimensions should be redone.

The main objective of the survey at Silveira Martins was to investigate the basic reasons or values behind their actions through an introspective questioning process. The following dimensions were identified along the interview: health; work/income; housing; safety; education; access to basic services; prejudice; proper nutrition and social participation. That is, people have identified these as the most valued dimensions in their lives.

After the defining the dimensions¹², the third phase of the AF Method comprised the definition of the indicators for each of the dimensions indicated as most valued. Table 1 presents each of the nine dimensions with their respective indicators and cut lines.

11 For further information on the application of the first form of research that identified the life dimensions valued, see Marin et al (2013).

12 To select the dimensions, Alkire and Foster (2007) present five mechanisms: the selection mechanism is a deliberative or partaking exercise; the second is the use of a list that has legitimacy and a stable type of consensus such as human rights or Millennium Development Goals; the third is based on a theory, such as that of Martha Nussbaum, who structured a group of 10 capabilities; the fourth mechanism is the use of existing data and the latter is a list based on empirical information about the behaviors and preferences of people collected from psychological studies or consumer or marketing research.

Table 1 – Dimensions, indicators and cut lines

Dimensions	Indicators	Non-deprived if...
Health	<ol style="list-style-type: none"> 1. BMI 2. Hours of sleep 3. Stressful routine 4. Physical activity 5. Access to healthcare 6. Medical care 7. Medication 8. Addiction 9. Family health condition 	<ol style="list-style-type: none"> 1. BMI is between 18 and 24.99 kg/cm² 2. Has 6-8 hours of sleep 3. Routine is little stressful 4. Practices physical activity 5. Has access to healthcare 6. Has never been deprived of medical care when needed 7. Has never lacked means of buying medication 8. Has no addiction 9. Family health conditions are good or great
Work/Income	<ol style="list-style-type: none"> 1. Employment 2. Workload 3. Household Income 4. Governmental welfare 	<ol style="list-style-type: none"> 1. Has a job 2. Works up to eight hours a day 3. Household income is above minimum wage 4. Does not receive any kind of governmental welfare
Housing	<ol style="list-style-type: none"> 1. Home ownership 2. Appliances 	<ol style="list-style-type: none"> 1. Owns house 2. Has refrigerator, TV and radio, stove and electric shower
Safety	<ol style="list-style-type: none"> 1. Policing 2. Violence 	<ol style="list-style-type: none"> 1. Policing is available in neighborhood 2. Did not suffer any type of violence in the neighborhood or city
Education	<ol style="list-style-type: none"> 1. Education time in years 2. Further education 3. Illiteracy 	<ol style="list-style-type: none"> 1. Has attended at least 5th grade of Elementary School 2. Did not want to pursue further education despite having the possibility 3. There are no illiterates in the family
Access to basic services	<ol style="list-style-type: none"> 1. Services offered 	<ol style="list-style-type: none"> 1. Has access to electricity, has piped/treated water/well, waste collection, drainage for the sewer and public lighting
Prejudice	<ol style="list-style-type: none"> 1. Discrimination 2. Discrimination in the workplace 3. Omit or change housing location 4. Be well dressed to be respected 5. Rights upheld 	<ol style="list-style-type: none"> 1. No one in the family has suffered any kind of discrimination 2. Living in that neighborhood was not an obstacle when getting a job 3. No need to hide or relocate to get a job 4. Do not think it necessary to be well dressed to be respected in or outside the community 5. He thinks he has his rights guaranteed as much as other residents of the city
Proper nutrition	<ol style="list-style-type: none"> 1. Meals 2. Feel well fed 3. Lesser amount of food 4. Exchange food for cheaper option 	<ol style="list-style-type: none"> 1. Has at least three meals a day 2. Always feels well fed 3. Has never had to buy lesser amount of food for lack of money 4. Has never needed to exchange food consumed for cheaper option
Community life	<ol style="list-style-type: none"> 1. Can freely express opinion in the community 	<ol style="list-style-type: none"> 1. Always has the freedom to voice opinions in the community

Source: Developed by the authors based on the definitive research instrument.

The dimension “health” is intended to capture how healthy people are and the coverage of access to healthcare. This capability is relevant because it serves as a foundation for the expansion of other capabilities. For example, a healthy person can be a part of the workforce, and thus have access to income, which is a means of gaining greater freedom when it comes to the access to the things this person wants.

The dimension “work and income” is relevant because access to monetary resources represents a limit in the freedom of choice of items one can access. Thus, “one can exchange what one owns for another package of goods” of corresponding monetary value (SEN, 1999b, p.15). Relative deprivation of income can generate an absolute deprivation of skills. Sen (1999b) argues that the right to exchange goods does not depend only on the market, but also on the State, when its influence is present, for it provides exchanges as part of its social program. Income

from welfare programs, such as unemployment, retirement and other specific benefits affect the goods a person can control. According to Sen (1999b), social security provisions are essential to complement the processes of market and production exchange and are still particularly important in the context of food shortages.

The dimension “housing and access to basic services” provides people with a better quality of life. An individual with access to basic sanitation services is less likely to be contaminated by diseases, which leads to a healthier life. Likewise, the access to public transportation facilitates one’s entry in the workforce and the performance in society. These issues became even more prominent since they were included in the Millennium Development Goals under universal access to drinking, sanitation and solid waste collection. The Brazilian National Plan for Basic Sanitation (PLANSAB) established goals and defined investment budgets to meet them by 2030 (OMD, 2014).

The dimension “safety” is important insofar as poverty can be increased by the lack of safety one is exposed to. Oftentimes, poor and heavily populated neighborhoods have a higher incidence of violence and this may increase the deprivation of the freedom for its inhabitants. People do not feel safe to go outside, which means their freedom is restricted and they do not have the choice to leave the house at any day and/or time they want. If they do, they are exposed to the risk of being robbed or being a victim of more violent crimes.

The dimension “education” influences the practical freedom of the individual to have a better life. Sen (1999a) argues that the lack of education, in the sense of access to encyclopedic knowledge, acts as a blockade for one’s participation in economic activities. Furthermore, a person with higher education has more information about how to avoid health problems, which makes for a healthier life. In this sense, education serves as a foundation for the expansion of other freedoms.

The dimensions “prejudice” and “life in the community” refers to the individual’s deprivation of being an active part of their community and social exclusion. According to Sen (1999a), the need to participate in community life can induce demand for modern equipment (such as televisions, automobiles, among others) in a country where these amenities are almost universal, imposing pressure on people who are relatively poor. Such items may be necessary for the individual to be accepted into a group. Likewise, poverty itself can represent a restriction to one’s freedom and generate exclusion. Narayan (2000) identified this very sense of exclusion among poor people, for they are aware of their lack of freedom to expose their ideas and their vulnerability. Moreover, not being able to participate in traditions, celebrations and rituals is likely discourages the maintenance of social relations.

The dimension “proper nutrition” was intended to capture a basic functioning, since “food is the most primitive of rights” (SEN, 1999b). However, there is a difference between surviving and being well nourished. Those who survive need to be sufficiently well nourished to live with dignity and to live up to their respective life plans (UNDP, 2010). Thus, being well fed acts as a support for the expansion of other capabilities.

The definition of the indicators within each dimension and their respective cut-off lines were based on poverty researches using the Capabilities Approach as background. The definitions were also based on the reading and comprehension of the existing literature on the subject studied here, notably the work of Alkire and Santos (2010), which is the foundation for the calculation of the Multidimensional Poverty Index (MPI) published in the Human Development Report.

The definitive research instrument, composed of these nine dimensions and thirty-one indicators, was applied to 120 people living in distinct neighborhoods (Downtown, Vila Brasília and Bairro Linhas) in Silveira Martins by January and February, 2012¹³. Of the 120 people interviewed,

¹³ The development of the sample took into consideration the sampling for finite population and the need to cover the different neighborhoods of the city. The sample size was found from the estimation for finite population, margin of error of 10%, coefficient of

36 live Downtown, 38 in Vila Brasília, and 46 in Bairro Linhas. The information collected with the definitive research instrument was used in the following steps of the research to calculate the measures of incidence (H), intensity (A) and adjusted incidence of poverty (M_o) proposed by AF.

The fourth step of the AF Method consists of the definition of the first poverty line, that is, the definition of a cut-off point (which allows the comparison of the person's actual performance and the ideal performance) for each of the indicators considered according to the third column of Table 1.

In this stage, the person is identified as deprived (P) or non-deprived (NP) according to each of the indicators of the defined dimensions. For example, in the daily workload indicator, within the work and income dimension, a person who works up to 8 hours a day it is not deprived, but if the workload exceeds this limit, this person is considered deprived. We have the matrix X with the education dimension as an example, with three indicators (education time in years (A), illiteracy (B) and further education (C)) for the first ten subjects, as shown in the first column of matrix X. According to the fifth step of the AF Method, the indicators for the subjects who are non-deprived (NP) are set with the value zero (0). The indicators for subjects who are deprived (P) are set with the value one (1). In doing so, the matrix results in g^0 . The next step consists in counting the deprivations suffered by each subject from the deprived sample, which results in the matrix c.

$$\begin{array}{c}
 \begin{array}{l}
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 \end{array}
 \begin{array}{|c|c|c|}
 \hline
 A & B & C \\
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 7 \\
 8 \\
 9 \\
 10
 \end{array}
 \begin{array}{|c|}
 \hline
 1 \\
 3 \\
 2 \\
 1 \\
 0 \\
 2 \\
 1 \\
 1 \\
 0 \\
 1 \\
 \hline
 \end{array}
 \quad (3)
 \end{array}$$

Then the deprivations are aggregated (six step), that is, the sum of all indicators showing deprivation is obtained, as shown in matrix c. In doing so, it is possible to see, for example, which indicators within each dimension have the largest number of deprived subjects per geographic analysis unit.

Table 2 shows the number of people deprived according to indicator and region considered. The information above shows that the indicators with the highest scores are "further education", "exchange food for cheaper option" and "physical activity" respectively with 97, 84 and 82 deprived subjects. The indicators that showed the lowest scores were "access to healthcare", "omit or change housing location", "meals"/"appliances", and "feel well fed" with 0, 3, 6, and 9 deprived subjects respectively.

confidence of 95.5% in the hypothesis of $p = 0.5$. Based on this, the statistically significant sample would be 96 people, but the survey covered 120 people residing and randomly selected in three neighborhoods in the city.

Table 2 – Deprivation score number according to indicators and neighborhoods

Dimensions	Indicator	Neighborhood				
		Downtown	Vila Brasília	Linhas	Total	Total (%)
Health	1. BMI	4	15	10	29	0,24
	2. Hours of sleep	18	12	20	50	0,42
	3. Stressful routine	7	8	24	39	0,33
	4. Physical activity	17	34	31	82	0,68
	5. Access to healthcare	0	0	0	0	0,00
	6. Medical care	3	9	5	17	0,14
	7. Medication	6	17	14	37	0,31
	8. Addiction	11	18	12	41	0,34
	9. Family health condition	10	13	20	43	0,36
Work and Income	1. Employment	4	21	0	25	0,21
	2. Workload	6	20	16	42	0,35
	3. Household income	2	19	6	27	0,23
	4. Governmental welfare	11	22	4	37	0,31
Housing	1. Home ownership	5	3	6	14	0,12
	2. Appliances	0	3	3	6	0,05
Safety	1. Policing	20	3	39	62	0,52
	2. Violence	3	11	3	17	0,14
Education	1. Education time in years	7	16	15	38	0,32
	2. Further education	27	29	41	97	0,81
	3. Illiteracy	2	10	4	16	0,13
Access to Basic Services	1. Services offered	10	18	17	45	0,38
Prejudice	1. Discrimination	7	13	10	30	0,25
	2. Discrimination in the workplace	27	3	11	41	0,34
	3. Omit or change housing location	2	1	0	3	0,03
	4. Being well-dressed to be respected	10	21	18	49	0,41
	5. Rights upheld	10	26	21	57	0,48
Proper Nutrition	1. Meals	1	5	0	6	0,05
	2. Feel well fed	3	3	3	9	0,08
	3. Lesser amount of food	6	16	14	36	0,30
	4. Exchange food for cheaper option	26	27	31	84	0,70
Community Life	1. Can freely express opinion in the community	10	19	25	54	0,45

Source: elaborated by the authors based on research data.

Considering the greatest deprivations per neighborhood, Downtown we see that the indicators “further education”, “discrimination in the workplace” and “exchange food for cheaper option” amount the largest number of deprived subjects, respectively 27, 27 and 26. In Vila Brasília, the deprivations with the largest scores are in “physical activity”, “further education”, “exchanging food for cheaper option” and “rights upheld”, respectively with 34, 29, 27 and 26 deprived subjects. In Linhas, towards the outskirts of the municipality, “further education”, “po-

licing”, “physical activity” and “exchanging food for cheaper option” proved to hold the highest number of deprived subjects, respectively 41, 39, 31 and 31.

After counting which deprivations each person suffered from, the second cut is established (seven step), consisting in the number of indicators (k) of which a person must be deprived to be considered multidimensionally poor. Indicators for subjects who are not considered poor will all be set as zero. Considering the example given of the education dimension above, the second cut line, set as 2, will result in the matrix $g^0(k = 2)$.

$$c(k = 2) = \begin{matrix} 1 \\ 2 \\ 3 \\ 4 \\ 5 \\ 6 \\ 7 \\ 8 \\ 9 \\ 10 \end{matrix} \begin{bmatrix} 0 \\ 3 \\ 2 \\ 0 \\ 0 \\ 2 \\ 0 \\ 0 \\ 0 \\ 1 \end{bmatrix} \quad (4) \quad g^0(k = 2) = \begin{matrix} 1 \\ 2 \\ 3 \\ 4 \\ 5 \\ 6 \\ 7 \\ 8 \\ 9 \\ 10 \end{matrix} \begin{bmatrix} A & B & C \\ 0 & 0 & 0 \\ 1 & 1 & 1 \\ 1 & 0 & 1 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \\ 1 & 1 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix} \quad (5)$$

In the first place, P and NP are replaced respectively with 1 and 0, according to matrix X. The following step is to sum up the deprivations from which each subject suffers, resulting in matrix c . Then, the cut line k (eight step), set as 2 for the example, is applied. While building the matrix $g^0(k = 2)$, the subjects with two or more unattended functionings are considered multidimensionally poor, and therefore are set as 1. On the other hand, subjects who suffer from fewer than two functionings have all their deprivations set as zero, that is, they are disregarded, as shown in matrix $c(k = 2)$.

Following the nine step, for each value of k the Headcount is calculated, that is, the percentage of poor people in relation to the total number of people, as seen in equation 6 below:

$$H = q/n \quad (6)$$

Where:

H = Headcount;

q = number of multidimensionally poor people;

n = total number of people;

To get the result of q , one should consider the second cut, which is 2, according to the example. Following the example of the education dimension for the first 10 subjects interviewed, there are three multidimensionally poor people out of a sample of ten people. In this case, the incidence of poverty would be 0.3, which is to say that 30% of people are multidimensionally poor.

The tenth step is the calculation of average poverty (A), which shows the average fraction of dimensions of which subjects are deprived. If $A = 0.5$, it indicates that people are deprived of 50% of the dimensions/indicators considered on average. If $A = 1$, it indicates that all the multidimensionally poor people are deprived of 100% of the analyzed dimensions/indicators (GALLO; ROCHE, 2012). To determine A, it is necessary to sum the deprivations’ ratio for each poor person and the total of indicators; the result was then divided by the total number of people.

Step 11 results in the calculation of the adjusted poverty incidence (M_0) found by multiplying average poverty A by the incidence of poverty ($H \times A$). The M_0^{14} is sensitive both to the frequency and intensity of poverty, that is, variations in the number of poor people and/or the number of indicators that a person suffers from deprivation may cause changes in the final measure (GALLO; ROCHE, 2012). The adjusted incidence of poverty, according to Gallo and Roche (2012), is interpreted as the proportion of deprivations faced by the poor population in relation to the maximum number of deprivations from which the entire population could suffer, represented by M_0 equal to 1, or in percentage terms, equal to 100% (the whole population is poor and is deprived of all dimensions/indicators considered).

Finally, measures of incidence and intensity of poverty were broken down according to regions (neighborhood) in the municipality. Let it be emphasized that these last steps of the AF Method are specified and demonstrated in the next section.

4 DISCUSSION OF RESULTS: M_0

The last four steps of the AF Method generate the measures of incidence of poor people (H), the intensity of poverty or average poverty (A), the incidence adjusted by intensity (M_0) and broken down by groups. It is important to note that there is no default value for the second cut (k), even though it cannot be at the extreme ends. If k equals 22, there are no people who suffer deprivations, that is, there are no poor people in multidimensional terms. However, if k equals 1, all people interviewed will be deprived (100% of the subjects will be multidimensionally poor), which means that the higher the value of k , the smaller the M_0 . Table 1 shows the aggregate results corresponding to steps 7 to 11 of the AF Method for the sample considered in the study.

Table 1 - Multidimensional poverty in the municipality of Silveira Martins for k indicators

k	Total of people	Number of poor people	Headcount (H)	Average Poverty (A)	Adjusted Headcount Ratio ($M_0 = H \cdot A$)
5	120	104	0,87	0,34	0,29
6	120	99	0,83	0,35	0,29
7	120	87	0,73	0,37	0,27
8	120	75	0,63	0,39	0,24
9	120	65	0,54	0,41	0,22
10	120	53	0,44	0,44	0,19
11	120	45	0,38	0,46	0,17
12	120	39	0,33	0,47	0,15
13	120	30	0,25	0,50	0,12
14	120	18	0,15	0,55	0,08
15	120	14	0,12	0,57	0,07

Source: elaborated by the authors based on research data.

The results on Table 1 refer to different values of k ($k = 5, \dots, 15$). According to each of these, the respective numbers of poor people, the incidence of poverty (H), the poverty intensity (A) and the adjusted incidence (M_0) were obtained.

In general, if we consider that $k = 6$, the number of poor people measured by H equals 99, that is, 83% of the sample is multidimensionally poor. We can observe that in Silveira Martins the greatest deprivations are not in the monetary domain. Table 2 shows that the indicators with

¹⁴ The M_0 can be decomposed according to each subgroup of the population, after which one can analyze the contribution of each dimension to general poverty. A is divided by the poor in dimension j , resulting in A_j , which multiplied by H results in M_{0j} , the adjusted dimension that shows the participation of dimension j in global poverty.

the greatest deprivation scores are related to the education (81% of the deprived sample in the “further education” indicator), proper nutrition (70% of the deprived sample in the “exchange food for cheaper option” indicator), health (68% of the deprived sample in the “physical activity” indicator) and safety (52% of the deprived sample in the “policing” indicator) dimensions. This indicates that measuring poverty exclusively based on income, which is the usual practice, would underestimate the poverty rate, that is, the greatest deprivation belongs in other aspects of people’s lives and not necessarily in the lack of money. If we compare the incidence of poverty – H and the incidence of one-dimensional poverty in terms of income¹⁵ – we can observe that there is 60.5 percentage points of difference between indexes. The incidence of one-dimensional monetary poverty is 22.50%, which means that 22.5% of the sample represents a household in which the total income is lower than the minimum wage.

The average poverty (A), which measures the intensity of poverty – with the same value of $k = 6$ – indicates that people suffer from average deprivation in 35% of the 31 indicators considered in the survey. The adjusted incidence shows multidimensional poverty adapted to its intensity, that is, the M_0 indicator will increase if the multidimensionally poor are deprived of a larger set of indicators. The general measure (M_0) found in the municipality of Silveira Martins was 0.29, which means that the total number of indicators in which the poor suffer deprivation represents 29% of the maximum number possible considering the study sample.

When the disaggregated measure is analyzed based on region (step 12 of the AF Method), we have the results of table 2.

Table 2 - Multidimensional poverty in the municipality of Silveira Martins based on region, for k indicators.

k	Neighborhood: Downtown					Neighborhood: Vila Brasília					Neighborhood: Linhas						
	Total of people	Number of poor people	H	A	M_0	k	Total of people	Number of poor people	H	A	M_0	k	Total of people	Number of poor people	H	A	M_0
5	36	26	0,72	0,27	0,20	5	38	37	0,97	0,40	0,39	5	46	41	0,89	0,32	0,28
6	36	22	0,61	0,29	0,18	6	38	37	0,97	0,40	0,39	6	46	40	0,87	0,32	0,28
7	36	16	0,44	0,33	0,15	7	38	34	0,89	0,42	0,38	7	46	37	0,80	0,33	0,27
8	36	14	0,39	0,34	0,13	8	38	31	0,82	0,44	0,36	8	46	30	0,65	0,36	0,23
9	36	10	0,28	0,37	0,10	9	38	30	0,79	0,45	0,35	9	46	25	0,54	0,38	0,21
10	36	6	0,17	0,43	0,07	10	38	28	0,74	0,46	0,34	10	46	19	0,41	0,41	0,17
11	36	4	0,11	0,48	0,05	11	38	26	0,68	0,47	0,32	11	46	15	0,33	0,43	0,14
12	36	4	0,11	0,48	0,05	12	38	22	0,58	0,49	0,28	12	46	13	0,28	0,44	0,12
13	36	3	0,08	0,52	0,04	13	38	19	0,50	0,50	0,25	13	46	8	0,17	0,47	0,08
14	36	2	0,06	0,56	0,03	14	38	12	0,32	0,55	0,17	14	46	4	0,09	0,52	0,05
15	36	1	0,03	0,68	0,02	15	38	10	0,26	0,57	0,15	15	46	3	0,07	0,55	0,04

Source: elaborated by the authors based on research data.

The results shown in table 2 of measure M_0 for several k show that Vila Brasília has the highest adjusted incidence of poverty, above the general average in the municipality of Silveira Martins (RS), while the downtown neighborhood has the lowest result regarding this measure, followed by Linhas, both represent the outskirts of the municipality and are respectively below the average. With k set to 5, of the 38 people in Vila Brasília, 97% are multidimensionally poor and are, on average, deprived of 40% of the 31 indicators considered. On the other hand, in the central area, of the 36 interviewees, 72% are multidimensionally poor and are, on average, deprived in 29% of the 31 indicators. In the Linhas neighborhood, of the 46 people interviewed, 89% are multidimensionally poor and are, on average, deprived in 32% of the 31 indicators considered in the survey.

¹⁵ The one-dimensional monetary incidence was calculated by dividing the number of deprived individuals in the household income indicator that earned less than the minimum wage at the date of data collection – according to the total sample – 120 people interviewed.

The incidence of poverty based on income represents 50%, 5.55% and 13.04% of the poor sample in Vila Brasília, Centro and Linhas, respectively. When the incidence of multidimensional poverty and income poverty are compared, it becomes clear that there is an underestimation of poverty rates, since poverty is much more intense when dimensions other than income are considered. Vila Brasília, in a multidimensional perspective, shows the highest incidence of poverty based on income (50%), and that figure is even greater if seen from the multidimensionality perspective (97%). The largest deprivations of the people living in Vila Brasília are related to the health (89.47% of the sample is deprived of the “physical activity” indicator), education (76.31% of the sample is deprived of the “further education” indicator) and prejudice (68.42% of the sample is deprived of the “rights upheld” indicator) dimensions.

In the neighborhood Linhas, which includes the outskirts regions of the municipality, we could also observe underestimation of poverty when it is only linked to monetary income, with a difference of 75.6 percentage points between the estimates of the incidence of single and multidimensional poverty. The highest deprivations of the sample in this neighborhood are related to education (89.13% of the sample is deprived of the “further education” indicator), safety (84.78% of the sample is deprived of the “safety” indicator) and health and proper nutrition (67.39% of the sample is deprived of the “physical activity” and “exchange food for cheaper option” indicators).

The central region has the lowest incidence of poverty in the municipality, both considering single and multidimensional poverty. Still, it is possible to observe that the greatest deprivations are not related to the lack of monetary income, but rather, to other aspects of the life of the population. The biggest deprivations are in terms of prejudice and education – where 75% of the sample are grouped in the “discrimination at work” and “studying longer” indicators – and proper nutrition and safety – where 72.22% and 55.55% of the sample is deprived of the “exchange food for cheaper option” and “policing” indicators.

These results indicate that people from different regions have different deprivations. In this sense, in terms of implication for public policies in the eradication of poverty, the AF Method assists in the formulation of policies not only focused on the deprivations seen in that the sample of the municipality, but also in the elaboration of deprivation-specific solutions for that neighborhood.

The following tables present the results according to age group corresponding to the last five steps of the AF Method described above. The results refer to different values of k ($n = 5, \dots, 15$). According to each of these values, the respective numbers of poor people, the incidence of poverty (H), the average poverty (A) and the adjusted incidence ($H \times A$) were obtained.

Table 3 – Multidimensional poverty in the municipality of Silveira Martins for k indicators according to age range up to 25 years and 26 to 35 years.

k	<i>Age group: up to 25 years</i>					<i>Age group: 26 to 35 years old</i>				
	Total of people	Number of poor people	H	A	M_0	Total of people	Number of poor people	H	A	M_0
5	14	14	1,000	0,339	0,339	18	14	0,778	0,406	0,315
6	14	13	0,929	0,352	0,327	18	14	0,778	0,406	0,315
7	14	10	0,714	0,400	0,286	18	13	0,722	0,422	0,305
8	14	8	0,571	0,444	0,253	18	12	0,667	0,438	0,292
9	14	8	0,571	0,444	0,253	18	12	0,667	0,438	0,292
10	14	8	0,571	0,444	0,253	18	10	0,556	0,468	0,260
11	14	7	0,500	0,461	0,230	18	9	0,500	0,484	0,242
12	14	6	0,429	0,478	0,205	18	9	0,500	0,484	0,242
13	14	6	0,429	0,478	0,205	18	7	0,389	0,512	0,199
14	14	3	0,214	0,538	0,115	18	5	0,278	0,548	0,152
15	14	2	0,143	0,581	0,083	18	4	0,222	0,573	0,127

Source: elaborated by the authors based on research data.

Table 3 shows the results of the AF Method application for the age groups of up to 25 years (total number of 14 people) and 26 to 35 years (total number of 18 people). In the first age group, the number of poor people goes from 14 ($k = 5$) to 2 ($k = 15$). The average number of deprivations per person goes from 33.9% ($k = 5$) to 58.1% of the 31 indicators ($k = 15$). The total of indicators in which the poor have limitations represent 33.9% ($k = 5$) and 8.3% ($k = 15$) of the maximum poverty that this portion of the sample could suffer, considering the respective cut lines. In the second age group, the number of poor people goes from 14 ($k = 5$) to 4 ($k = 15$). The average number of deprivations per person increased from 40.6% ($k = 5$) to 57.3% of the 31 indicators ($k = 15$). The adjusted incidence (M_0) ranges from 0.315 ($k = 5$) to 0.127 ($k = 15$), that is, the total number of indicators in which the poor of this second age group suffer from deprivation represents 31.5% and 12.7% of the study sample, in the respective cut lines.

By adopting a value for median k (equal to 6), 93% of the sample is multidimensionally poor and the percentage of deprivation suffered by these people is 35.2% of the average indicators for the age group up to 25 years. For the age group of 26 to 35 years, the incidence of poverty is lower, 77.8% of the sample is multidimensionally poor, being deprived on average in 40.6% of the 31 indicators. It should be noted that even though there is a lower incidence of poverty in the last age group, they are deprived in a greater number of indicators than the former.

Table 4 - Multidimensional poverty in the municipality of Silveira Martins for k indicators for the age group 36 to 45 years and 46 to 59 years.

k	Age group: 36 to 45 years					Age group: 46 to 59 years				
	Total of people	Number of poor people	H	A	M_0	Total of people	Number of poor people	H	A	M_0
5	15	12	0,800	0,282	0,226	34	32	0,941	0,338	0,318
6	15	12	0,800	0,282	0,226	34	30	0,882	0,349	0,308
7	15	10	0,667	0,300	0,200	34	28	0,824	0,361	0,297
8	15	7	0,467	0,332	0,155	34	24	0,706	0,383	0,270
9	15	4	0,267	0,387	0,103	34	20	0,588	0,408	0,240
10	15	3	0,200	0,419	0,084	34	17	0,500	0,429	0,214
11	15	2	0,133	0,468	0,062	34	14	0,412	0,452	0,186
12	15	2	0,133	0,468	0,062	34	12	0,353	0,468	0,165
13	15	2	0,133	0,468	0,062	34	9	0,265	0,495	0,131
14	15	1	0,067	0,516	0,034	34	5	0,147	0,555	0,082
15	15	1	0,067	0,516	0,034	34	4	0,118	0,581	0,068

Source: elaborated by the authors based on research data.

Table 4 shows the results for the age groups of 36 to 45 years (15 people) and 46 to 59 years (34 people). Whereas M_0 ranges from 0.23 to 0.034 in the first age group, a variation of 0.32 to 0.07 was observed in the second age group. The second age group has a higher M_0 for all values of k , which denotes greater deprivation, a fact characterized by a more intense deprivation in a greater number of indicators. By adopting a value of $k = 6$ for the range of 36 to 45 years, 80% of the sample is multidimensionally poor on average in 28.2% of the indicators. With the same value of k , in the age group of 46 to 59 years, 88.2% of the sample are considered multidimensionally poor, on average in 34.9% of the indicators. These results indicate that incidence of poverty, average poverty and M_0 have higher values in the last age group.

Table 5 - Multidimensional poverty in the municipality of Silveira Martins for k indicators for the age group of 60 years or more.

Age group: 60 or more					
k	Total of people	Number of poor people	H	A	M_0
5	39	32	0,821	0,324	0,266
6	39	30	0,769	0,334	0,257
7	39	26	0,667	0,356	0,237
8	39	24	0,615	0,367	0,226
9	39	21	0,538	0,382	0,206
10	39	15	0,385	0,419	0,161
11	39	13	0,333	0,434	0,145
12	39	10	0,256	0,458	0,117
13	39	6	0,154	0,505	0,078
14	39	4	0,103	0,548	0,056
15	39	3	0,077	0,581	0,045

Source: elaborated by the authors based on research data.

Table 5 shows the results of the AF Method for the age group of 60 years or more (total of 39 people). Defining $k = 6$, we can observe that 76.9% of the sample is multidimensionally poor, being deprived on average in 33.4% of the indicators. The total number of indicators in which the poor suffer deprivation represents 25.7% of the maximum possible in the sample.

When comparing the different age groups considered with $k = 6$, the age group with the highest adjusted incidence of poverty is the age group of up to 25 years, at 0.327, that is, the total number of indicators of which the poor people in this age group are deprived represents 32.7% of the maximum possible in this group, and 92.9% of people in this age range are multidimensionally poor and have deprivations on average in 35.2% of the 31 indicators.

In the age group up to 25 years old, the largest deprivations are in the prejudice (85.71% of the sample is deprived of the “rights upheld” indicator), safety and proper nutrition (78.57% of the sample is deprived of the “violence” and “exchange food for cheaper option” indicators) and health (71.42% of the sample is deprived of the “physical activity” indicator) dimensions.

The largest deprivations in the 26 to 35 age group are the security (83.33% of the sample is deprived of the “policing” indicator), education and proper nutrition (77.78% of the sample is deprived of the “further education” and “exchange food for cheaper option” indicators), health and prejudice (61.11% of the sample is deprived of the “physical activity” and “rights upheld” indicators) dimensions.

In the age group of 36 to 45 years the highest deprivations are in the education (73.33 of the sample is deprived of the indicator “further education”), safety, proper nutrition and health (66.67% of the sample is deprived of the “policing”, “exchange food for cheaper option” and “physical activity” indicators) dimensions. In the sample from the group ranging from 46 to 60 years old, the greatest deprivations are related to the education and security (82.35% of the sample is deprived of the “further education” and “policing” indicators), proper nutrition (74.47% of the sample is deprived of the “exchange food for cheaper option” indicator) and health (67.65% of the sample is deprived of the “physical activity” indicator) dimensions.

Finally, in the age group of over 60 years, the greatest deprivations are in the education (92.31% of the sample is deprived of the “further education” indicator), health and safety (71.79% of the sample is deprived of the “physical activity” and “policing” indicators) and proper nutrition (58.97% of the sample is deprived of the “exchange food for cheaper option” indicator) dimension.

It is perceptible that the lack of monetary income is not the greatest deprivation neither in the region nor in the different age group segments, on the contrary, the deprivations are mostly related to health, safety and education. In this sense, this explains why the measurement of poverty exclusively based on income is underestimated. When other aspects of people's lives are considered, it is possible to capture several deprivations otherwise ignored and by doing this, the incidence of poverty increases. For all age groups, the incidence of poverty based on income is lower than H. As the largest deprivations of the sample are not in income-related indicators, poverty is more intense when other variables are included. Table 6 shows the differences between the different age groups.

Table 6 – Comparison between the incidence of multi ($k = 6$) and single dimensionally (income) poverty.

Age group	Headcount (H)	Incidence via income	Difference percentage
Up to 25 years old	92,86	21,42	71,44
26 to 35 years	77,78	38,89	38,89
36 to 45 years	80,00	26,67	53,33
46 to 60 years	88,24	26,47	61,77
over 60 years	76,92	10,25	66,67

Source: elaborated by the authors based on research data.

The largest difference can be seen in the age group of up to 25 years old, with 71.44 percentage points, followed by the age group of over 60 years old, with 66.67 percentage points. The smallest difference between the incidence of single and multidimensional poverty is in the age range of 26 to 35 years, with 38.89 percentage points. The importance of knowing the region (such as the neighborhoods), people (age groups) and the types of deprivation that affect people's lives are major factors in the planning of public policies focused directly on the different types of poverty a given population suffers from.

It is important to note that measuring poverty exclusively based on income does not provide a greater diversity of data for the public planning of localized actions to alleviate the various forms that poverty takes on. For example, Vila Brasília is perceived as the neighborhood with the highest incidence of poverty, once we know that the greatest deprivations are related to education, health and prejudice, it is possible to carry out public policies that focus on these aspects. Even with the use of disaggregated data, such as age groups, it is possible to set up specific programs for targeted audiences, such as programs focused on qualitative aspects of health, nutrition, safety, education in caring for the wellbeing of people over 60. The analysis of poverty based on its various dimensions provides an informational diversity that is important for the formulation of public policies that stimulate human and economic development locally and regionally.

5 FINAL CONSIDERATIONS

The study carried out in Silveira Martins to identify and measure poverty based on the AF Method allows the development of policies focused on the dimensions in which most people interviewed suffer more deprivation and according to the specific needs of each neighborhood. The highest incidence of deprivation suffered by the interviewees is in the realm of dimensions related to the freedom they have in the community, access to income, work, basic services and education. With this result, it was shown that monetary income is not the only dimension in

which individuals can suffer deprivation, there are other concerns and problems suffered by the subjects in the sample that must be considered in the elaboration of policies to eradicate poverty in the municipality.

When groups decomposition is considered, we see that the attention dedicated to the people of Vila Brasília should be different from other actions implemented on the other groups due to the greater deprivation suffered in the neighborhood. Likewise, when age groups are disaggregated, we can see that different deprivations affect the distinct groups, and a deeper understanding of the nature of deprivation can help public planning in the formulation of targeted actions. This study corroborates the Capabilities Approach, since it shows that the greatest deprivations affecting the population of Silveira Martins are not related to monetary limitation, and even though it is important, there are also other aspects that must be considered when the measuring poverty.

In addition to the multidimensionality, the implementation of two cut lines, the possibility of group decomposition and segmentation in dimensions and indicators, the development of the measure of poverty proposed by the AF Method represents a step forward in relation to previous poverty measures when it comes to its contribution within the scope of public policies. The capabilities of the people must be expanded through greater coverage of access to education, health, basic sanitation and other aspects. The expansion of capabilities results in an indirect and direct increase in the practical freedom that people have and in lessening their deprivation. Knowing of how poverty affects people enables better planning for the design and implementation of poverty reduction public policies, as they will focus directly on the deprivation suffered by the people.

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