

Quality of Life of the Beneficiaries of the Government's Bolsa Família Program: A Case Study in Mateiros/TO/Brazil

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Abstract—The quality of life index, despite elucidating many discussions, the conceptual subjectivity of the term does not show precision, and consequently, many researchers seek to develop methods aiming to measure this concept, bringing it to a more concrete approach. In this study, the quality of life index method was used to analyze the population of Mateiros, Tocantins, Brazil for quality of life. After data collection, it was compared the quality of life index between the population and the group of beneficiaries of the Brazilian government assistance program *Bolsa Família* (Family Allowance). Some of the people interviewed receive financial aid from the federal government program *Bolsa Família* (22%). Comparisons were made among the final score of the quality of life index of the Mateiros population and the following factors: Gender, age, education, those working or not with tourism and those who receive or do not receive the *Bolsa Família*. It was observed that only the factor, *Bolsa Família* (p-score 0.0138), shows an association with quality of life improvement, noticing that those who have financial aid had a higher quality of life improvement than the rest of the population. It was concluded that, government assistance has shown a decisive element on the enhancement of Mateiros population quality of life, indicating that similar actions should be maintained.

Keywords—Quality of life index, government aid to families, sustainable tourism, Bolsa Família.

I. INTRODUCTION

THE dimensions of sustainability are: Environmental dimension, environmental quality must be pursued relentlessly in order to find a better use of the wealth for future generations; Institutional dimension, through political actions make possible investment in science and technology, in addition to requesting environmental monitoring and protection by the government; Social dimension, previewing the reduction of social inequalities by creating jobs in order to provide a better quality of life for the population; Economic dimension, examining the influence of economic performance on sustainability [1].

The indicators of sustainability were conceived for measuring these dimensions, the concept of the indicators, according to the Organization for Economic Cooperation and Development (OECD) as a set of parameters or value deriving from parameters that give meaning to a phenomenon with a representative extension [2]. Completing the concept, the

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authors recognize that the indicators can be considered as factors, that together, may represent a frame of reference that when analyzed will contribute to the reality of a given geographical region.

The Jalapão region, in the east of the Brazilian state, Tocantins, comprises an area of 53,300 km², which borders the Brazilian states of Maranhão, Piauí and Bahia. Of this total area, 34,100 km² are in the state of Tocantins. It has a low population density (between 0.3 and 0.7 inhabitants per km²).

The Conservation Units (CU) in Jalapão State Park (JSP) are important links of tourist connections and environmental preservation measures: The Ecological Station Serra Geral do Tocantins with an area of 716,000 hectares, the Environmental Protection Area of Jalapão (EPA) with 467,000 hectares, EPA Serra da Tabatinga and National Park Nascentes do Parnaíba with almost 730,000 hectares. The CU sets of Jalapão form one of the largest regions of Cerrado under environmental protection [3], as shown in Fig. 1. Due to this context, this study seeks to identify the impacts of ecotourism in the city of Mateiros, noticed the importance of JSP for the tourism supply chain of the state. It is also known that its relevance - independently of the tourist season situation, which is remarkable in the region - should be studied by various areas of knowledge due to the environmental fragility and the tourism potential of the region.

Mateiros is classified as a small target when considered the definition of reference [4], as an urban-peripheral tourist destination with small populations, minor in its central role and more likely to receive than to generate tourists.

The Jalapão State Park was created by the Law No. 1,203 of January 12th, 2001. It has an area of 158,885 hectares, belonging to the category of the Integral Protection Conservation Unit. Its main objective is the preservation of natural resources in the region, a fact that limits the forms of exploitation of the site, allowing only indirect use of its benefits, restricted only for the municipality of Mateiros. The road to the JSP from Palmas, the capital of Tocantins state, is possible by two different accesses routes, one in the south through Porto Nacional and Ponte Alta do Tocantins and the other in the north via Novo Acordo and São Félix [5].

The region has several river sub-basins that culminate in the river Tocantins, among them, the river Sono Basin, which contrasts the arid aspect of Cerrado [5]. The result of these contrasts is a semi-arid expanse cut by the river clear water, presenting a strong tourist potential, recognized by the Ministry of Environment *Ministério do Meio Ambiente*

(MMA) as a tourist destination of Brazil, included in the Ecotourism Development Program of the Legal Amazon *Amazônia Legal* - PROECOTUR [6], as it can be quoted the main attractions [5]:

- Cachoeira da Velha: Has a format of two horseshoes with 15 meters high, its waters allow for rafting;
- Dunes of Serra do Espírito Santo: More than 20 meters of high, surrounded by trails, the stream of Areias and a pond;
- Formiga Waterfall: Its crystal waters form a well for swimming with approximately 8 meters of diameter;
- Fervedouro: A natural white sandy pool of warm water, where the natural phenomenon of water flowing through the sand forms air bubbles with so much pressure swimmers are constantly floating, even if the person tries to dive.

Mosaic of Conservation Units
Region of Jalapão – Tocantins, Brazil

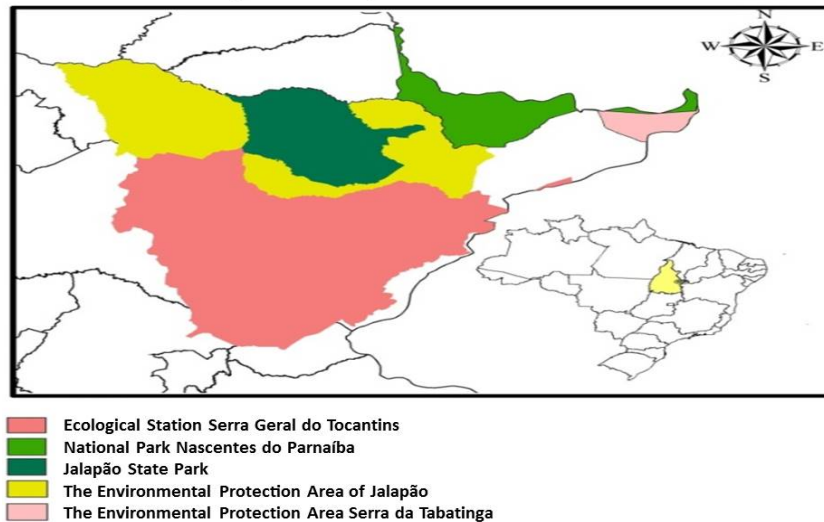


Fig. 1 CUs from Jalapão

As it can be noticed, the city was chosen for this study because it is the main beneficiary of the tourist practices in the region and for accommodating the most of the attractions of Jalapão.

According to [7], which conducted an analysis on the profile of tourists visiting the region; more than half of visitors are aged between 15 years to 45 years (86%), featuring a young profile, showing also that a majority of them has a high income and a high level of education, 41% of visitors stated that they had an income above R\$ 4,000.00 and half stated that they had a college degree (51%).

Through the method of Limits of Acceptable Change (LAC), [8] analyzed the environmental impacts that have occurred in attractions and camps used intensively. They analyzed the biophysical aspects such as the amount of waste, exposed roots and damaged trees. The main impacts observed were soil erosion, the construction of paths to access the attractions, vegetation degradation and garbage left at the attraction sites. The study presented an analysis of the tourism carrying capacity of each attraction, in which it was possible to measure the acceptable level of visitors to the tourist attractions at any one time. Despite these tourism carrying capacity limitation studies, when visiting region it is possible to see that these set limitations are often not being respected, even though the need for such actions were explained to the

local population. There is still the issue that most of natural local attractions belong to private owners and are seen as a way of exploiting tourism, and hindering inspections by environmental agencies. Furthermore, another old debate in the region is whether the roads to the municipality of Mateiros should be asphalt paved or not, creating a park road, whereas currently the roads that connect the city to the capital of the state and other states are unpaved, making access difficult [7]. Firstly, it would facilitate the access, and consequently, enhance health and infrastructure conditions; nevertheless, it would also encourage tourism, and could attract more people to an area that is not fully prepared to receive a greater number of visitors without studies and environmental supervision.

Due to the local environmental fragility and tourism growth in the region, this study emphasized the socio-environmental analysis of indicators such as the Quality of Life Index (QLI) to evaluate whether tourism has brought benefits to the local community. The analysis of the Indicators of Sustainable Development from the United Nations (UN) obtained from secondary data and compared to the Ecological Footprint (EF) in order to measure the impacts left by tourism in the region. All socio-environmental indicators were evaluated considering the applicability in small tourist attractions, such as Mateiros.

The idea for this research came as a way of continuing the research conducted in 2007 [6], in the quilombola community

of Mumbuca, in the municipality of Mateiros, as well as the suggestion of using an instrument of research that could measure the period before and after the implementation of tourism. The main conclusion of the study was determined by an LQI of 0.390, which is still a low level of development. However, after tourism activities in the region there was an increase of 112.95% in the index. Oral narratives showed that residents are satisfied with their living standards and attribute that enhancement to the tourism and trade of Golden Straw (*Capim Dourado*) crafts. Thus, it was noticed that despite low levels of quality of life in the region, the community showed satisfaction with the betterments brought by tourism in the region. After analyzing this data, the desire to know whether the reality of Mateiros was similar to the community of Mumbuca was aroused.

An indicator is a tool that allows researchers to obtain information about a reality. Its main feature is the power of synthesizing a complex set of information retaining only the essential meaning of the aspects analyzed. It is still seen as a symptomatic response to the activities performed by humans within a system [9].

Among the development indicators, the Quality of Life Index (QLI) is highlighted. Quality of life usually involves the material conditions, primary and fundamental conditions of human life, as well as material forces of production, transformation of the material conditions and social constitution [10]. The QLI subsidizes the analysis of development. Several approaches have been used to conceptualize and evaluate the quality of life [11]. Some focus on material possessions and others, more comprehensive, consider the material, cultural and social aspects that influence human life. Therefore, this study aimed to build, from primary and secondary data, the Quality of Life Index of the city of Mateiros, TO, Brazil comparing the population's quality of life in general with the respondents who are the beneficiaries of government aid, the *Bolsa Família*. The *Bolsa Família* (Family allowance) program is an initiative of the Brazilian Federal Government that provides financial assistance to people living in low-income, and in return, is requested, the permanence of the families' children on basic education.

II. METHODOLOGY

The study was conducted by collecting primary data obtained through the survey done, which refers to data collected for the conception of the community QLI.

A total of 141 people were interviewed in the community of Mateiros. The use of QLI procedure was performed using [12] and defined by the equation:

$$QLI = \frac{1}{Z} \sum_{i=1}^Z Ci \quad (1)$$

$$Ci = \frac{1}{n} \sum_{j=1}^n \left(\frac{1}{m} \times \frac{\sum_{v=1}^m Evj \cdot Pvj}{\sum_{v=1}^m E_{max}v \cdot P_{max}v} \right) \quad (2)$$

where, QLI = Quality of life index before and during the implementation of tourism activities in the city of Mateiros, TO; C_i = Indicator contribution (i) in the quality of life index; S_{vj} = score of the factor v^{th} , obtained by the family j^{th} ; W_{vj} = weight of the factor v^{th} , defined by the family j^{th} ; $v = 1, 2, \dots, m$ factor; $j = 1, 2, \dots, n$ families; $i = 1, 2, \dots, z$ indicators; S_{maxv} = maximum score of v^{th} factor; W_{maxv} = maximum weight of v^{th} factor; m = number of factors; n = number of families; z = number of indicators.

It was considered to establish the increase of the index, the guidelines of the Human Development Index – HDI. The closer to 1, the greater is the value of the Quality of Life Index in the community. It was decided to establish the following criteria aiming to consolidate the indicators [13]:

- Low level - $0 < QLI < 0.499$
- Middle level - $0.5 < QLI < 0.799$
- High level - $0.8 < QLI = 1.0$

III. RESULTS AND DISCUSSIONS

Analyzing the respondents' profile, it was noticed that when they were asked about having children, most answered yes (86%). Almost half (49%) of the respondents said they lived with 4-7 persons in the same household, but almost the same percentage (41%) said they lived with 1-3 persons, which shows a large number of people living in the same household.

Entering in the analysis, which is part of the Quality of Life Index, an indicator that is concerned with housing, more specifically, home-ownership; all the factors presented an evolution in the living standards of the local people. For that reason, it is considered that if someone changes from living in a rented home to living in a rent-free home, the person is no longer spending money on rent and could invest that money in other actions that might encourage progress in one's living standards. Consequently, if someone passes from the previous conditions to living in an owned home, there would also be betterments in one's quality of life.

The results did not differ concerning the type of houses construction. There was a decrease in the number of rammed earth houses (built with earth), an increase in the number of houses built with brick and those constructed with brick and coated with roughcast. For calculation purposes of the QLI, it will be analyzed from the population's social point of view. Similarly, the data showed related results when comparing before and after the implementation of tourism in the aspect of the type of floors of houses. Most of the houses used to be earthen floor, what the residents' statements showed at all periods as "*chão batido*" (earthen floor). There was a decrease in the number of people living in houses without cement or

ceramic floors, while there was an increase in the number of families who live in houses with these structures. In terms of thermal comfort, there are studies [14] indicating that the ceramic floors can contribute to thermal comfort, reducing the temperature of the houses, this aspect is of the utmost importance to the location studied.

In terms of lighting, it was noticed that this was the biggest gain in the quality of housing for the local population. Reports of residents showed that the houses used to have kerosene lamps, candles and/or gas lamp as lighting structures before the implementation of tourism. These data corroborate those found by [15] in which they state that the increase in the number of households served by the power grid is due to the creation of the "National Program of Universalization for Access and Use of Electric Energy - Light for All" (*Programa Nacional de Universalização do Acesso e Uso da Energia Elétrica – Luz para Todos*), which was established by the Federal government in 2003. This program aimed to bring free energy to the rural population. It is not possible to deny the betterments in quality of life concerning the social aspects of the families in spheres of health and well-being. Nevertheless, it is impossible not to notice the lack of state investment in alternative energy, such as solar energy, which is undeniably less impactful than gas-powered or hydroelectric power plants. Especially in terms of sunshine prevalence in the region, as well as its aspect of geographic isolation, it could have been a model for renewable energy city.

It was asked at the end of all indicators in the survey, what was the level of satisfaction with the following aspects: In the case of housing, the results showed that both "bad" responses and "regular" showed a decrease. For the responses "bad", there was a remarkable drop. At the same time, the "good" responses showed that most of the population is satisfied with the current living standards (60%), but a considerable portion (38%) still believes that conditions could be improved.

The quality of sanitation and environmental protection conditions is inversely proportional to the prevalence of parasitic diseases and the investments in sanitation are still incipient [16]. Reference [17] confirmed this by comparing the increase in gross domestic product (GDP) and the evolution of households connected to the sewage system. Analyzing the data only from Tocantins, which is the focus of this study, the authors showed that while the evolution of per capita income (GDP per capita) between 2002 and 2009 increased 14.2%, the rise in the number of households served by the network sewage in the same period grew only 10.4%, showing that it has not followed the GDP increase. This research showed that in Mateiros the situation was no different.

It was observed that there was an evolution in health aspects when analyzing the item human waste, since there was a decrease in responses "outdoor dumping" and "buried". Despite of the presence of answers "sewage" by some respondents, it was perceived that during the collection of data from UN indicators that there is no sewage treatment station and that most households have septic tanks. These answers are attributed to the lack of knowledge by the population about this specific aspect, as it is not visible or because there are

pipes linking the house to the septic tank, they consider this as belonging to a sewage network, however, there is no central sewage treatment station in place according to data obtained in an interview with a representative of the Mateiros Town Hall.

The household waste collected at the site has also shown a good performance in this indicator. Before the implementation of tourism, demonstrated by the interviewees, there was almost no garbage collection for households, and residents used to either dump outdoors, bury or burn the waste produced. After the implementation of tourism activities, waste collection was organized by City Hall. If the data was analyzed for the indicator, it could have been positive, if they had stopped burning garbage, for instance, it would have emitted less CO₂ in the city. Therefore, in an interview with the local managers, they stated that there is garbage collection, but there is no treatment. Thus, the human waste from the city is deposited in a dump.

Concerning the residents' level of satisfaction, this indicator showed that the population does not feel fully satisfied. Progresses have been made, it is truthful, but the numbers show that a small minority is satisfied with the situation. Most describe as bad or regular, the sanitary conditions, which shows that the government should invest more in actions aiming to implement decent conditions for the residents of Mateiros.

Respondents were asked what kind of access to durable goods they had, which was divided into two groups and compared to their access to those goods before and after the implementation of tourism activities. The results were grouped to those who had no access to the goods listed, those who had access to at least to one of the goods in group 1 and none of group 2, or those who had at least one of the goods of groups 1 and 2.

As previously discussed, the concept of quality of life goes beyond the concept of possession; nevertheless, it is not possible to deny that the consumption relation is present in this concept. Quality of life "includes aspects related to the material conditions of life and the subjectivity in the relations of mankind among themselves and with nature" [18]. According to this, access to consumer goods saw a considerable rise before and after the implementation of tourism activities in Mateiros. Most responses show that there was an increase in the purchase of goods in both groups after the implementation of tourism activities, remarkably in the first group of equipment including a television, fan, refrigerator, and in the second group a satellite antenna and telephone. This indicates that there was an increase in the economic conditions of the city after the 2000, when access to those goods became possible to the local population.

The degree of satisfaction with the purchase of consumer goods shows that there was a considerable reduction in the answers "bad", still there was an increase in "regular" answers. This indicates that despite the fact that residents consider that their living standards have evolved after the implementation of tourism, there are still many residents who consider that they can further improve these conditions, according to the information obtained from the statements of residents

throughout the interviews. Many said they were happy with what they had, but at the same time, they considered themselves desiring to acquire something they did not have or to remodel goods they had or wanting something newer.

It was also asked what kind of access they had to mainstream media currently available, as radio, television, newspapers and magazines or the Internet. It is important to remember that due to the geographical isolation of Mateiros, access to current newspapers and magazines is difficult. For calculation purposes of the QLI, they were grouped as follows: (1) who has no access to any means of communication; (2) who listens to the radio and watches television, but does not have access to newspapers and magazines; (3) who has access to all means of communication excepting the Internet; and (4) who has access to all means of communication and the Internet.

There was a considerable increase only regarding access to the Internet. The lack of access to newspapers and magazines, as said earlier, is due to the geographic isolation of the city, as well as the high illiteracy rate (42%) and low level of education, which can be seen in this study in the education indicator that will be presented later. Due to these factors, it makes more difficult for the community to have access to information via these means of communications. At the same time, the great enhancement of Internet access can provide the community the same information as newspapers and magazines. Reference [19] quotes Castells (1999) to state that the Internet has become an essential means of communication and organization in all spheres of activities, ranging from social and political movement processes, to act, inform, organize and dominate cyberspace, and of course, to assist the consumer network.

The importance of leisure spaces to give life to cities, allowing sociability, bringing together different groups around the space, enabling the reduction of violence in the streets [20]. In this scenario, it is believed that there were no significant changes in the leisure areas in the city of Mateiros. The most mentioned responses were football, recreation center and natural environments showing no variation from before and after the implementation of tourism. This might indicate that few spaces for socialization were built in the community.

Health is one of the indicators that have greater emphasis on the community quality of life index. Good health is the best resource for personal, economic and social progress and it is an important dimension of the quality of life index [21]. The authors point out that the World Health Organization classified into five dimensions the quality of life index: (1) physical health, (2) psychological health (3) independence level (in aspects of mobility, daily activities, dependence on medication, medical care and labor capacity), (4) social relations, and (5) environment.

The health indicator showed that there was a slight improvement in the conditions of health services provision in the region compared to before and after the implementation of tourism. Most respondents considered that there was a health center in the region, but comparatively, there was a decrease on answers stating the non-existence of health center or

support from community health workers before the implementation of tourism. A considerable increase in the responses stating that there is a health center with basic care was verified.

Oral narratives showed that there is only one doctor serving the city and he comes from the neighboring municipality, Dianópolis which is 246 km from Mateiros, to make scheduled visits. This fact has serious consequences, not only for the local community, but also for tourism. It is a requested a minimum structure to receive tourists, in the case of emergencies, it could result in serious issues due to the poor conditions of the roads. In a speech given by the Mayor of Mateiros, one of the biggest barriers to local development are health problems, as the municipality must send emergency cases to the city of Porto Nacional which is located 263 km away, and with the precarious roads in the region that journey can take more than nine hours, and for most of the year, it requires a four-wheel drive vehicle to overcome the obstacles. Moreover, in case of patients needing medical exams, the City Hall affords not only the transportation of the residents, but also their hosting until they do the necessary exams, committing a hefty portion of the budget of the city.

At the same time, most of the community seems to be satisfied with the current health conditions. When analyzed, the level of satisfaction with the health conditions, it was noticed that 48% of the population stated that the conditions before the implementation of tourism were bad and 39% said it was regular. However, after the implementation of tourism this falls to only 15% of people considering bad and 41% regular. Still, some 44% of the people considering health conditions in the place as good must be reviewed. It is believed that these numbers are reflections of the comparison of before and after the implementation of tourism. It is something that once showed a poor condition and currently seems to be better. But, in the speech made by the Mayor and in interviews with some residents, it was noticed that the analysis for this indicator was not effective.

It was observed that concerning the educational attainment of the interviewees, the higher range concentrates among one to four years of study (28%), and (26%) of them had a high school diploma. The percentage of respondents with a bachelor's degree or higher were considered low, because there is only an online university with Pedagogy and Portuguese Language courses in partnership with the State Government. This shows that more actions should be established in the region to expand the offer of courses, so that fewer young people would need to leave the area to continue their studies.

Similarly, there was a substantial improvement in the community level of satisfaction concerning education. Many stated that it was bad (39%) before the implementation of tourism or regular (36%). After the implementation of tourism, some residents said that current education condition was good (55%) and others stated that is still regular (35%).

There was a slight increase in family income before and after the implementation of tourism. More than half of respondents (54%) lived with less than the minimum wage

before tourism activities. After the implementation of tourism there was an increase in the percentage of people interviewed (60%) living with one or two minimum wages per month. Although, it is still considered low, the increase should be considered only for the QLI calculation purposes. It is important to highlight that this increase in income of the population should not be attributed to tourism, since it is added to this indicator a percentage of the population living with the government aid *Bolsa Família* (40%) from the year 2004, and on.

Most respondents receive assistance from the *Bolsa Família* program (22%), the remainder (18%) receive income from commercial activities, and are public servants (16%). Only a small portion survives exclusively from tourism (10%). Some residents work with tourism as a way to complement their monthly income. From those who work with tourism formally or informally, 56% work with (*Capim dourado*) golden straw crafts, 24% work in tourism services such as hotels, bars and restaurants, 12% as environmental guides and 8% work in the local Tourist Service Center.

The survey revealed that only 19% of the population stated that they had a retirement allowance, and only 8% said they were pensioners, 8% stated that they had rented properties and 6% received financial aid from children or relatives.

After an individual analysis of the indicators, as seen in Table I, the contribution of each indicator to compose the quality of life index of families of Mateiros, TO, Brazil compared before and after the implementation of tourism activities in the region of Jalapão.

TABLE I
SCORES FROM INDICATORS AND THE QLI OBTAINED IN THE CITY OF MATEIROS, TO, BEFORE AND AFTER THE IMPLEMENTATION OF TOURISM

Indicators	Before	After	%
Social			
Housing	0.110757	0.160638	45.03
Communication and Leisure	0.160757	0.214079	33.17
Health	0.249409	0.351655	40.99
Education	0.144208	0.187943	30.32
Economic			
Income	0.019127	0.034386	79.77
Durable goods	0.316312	0.43617	37.89
Environmental			
Sanitary aspects	0.082033	0.123641	50.72
Environment	0.214894	0.215426	0.25
QLI	0.162187	0.215426	
Increased to QLI	0.162187	0.215426	32.83

It is noticeable that there was an increase of 32.82% in the QLI in the city of Mateiros after the implementation of tourism, especially for families who work in the production of golden straw handicrafts, according to the research. Changes in the order of 0.162 to 0.215, presented in Table I and in Figs. 2 and 3, indicate that whereas there was an increase in the quality of life of the families interviewed, the values for the index, according to the proposed methodology, still remained at a low level, that is, with values between $0 < QLI > 0.499$,

demonstrating that the quality of life of the families is not satisfactory.

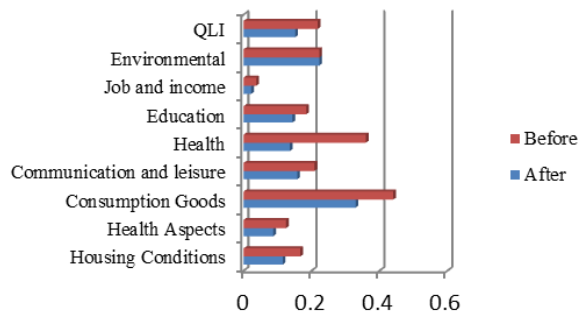


Fig. 2 Scores from indicators and the QLI before and after the implementation of tourism from the families working in tourism activities

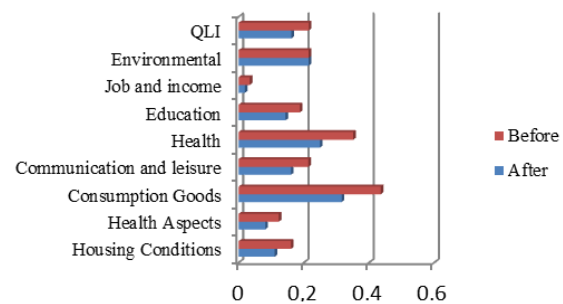


Fig. 3 Scores from indicators and the QLI before and after the implementation of tourism from all the families interviewed

Still, even with a low level of quality of life, the population from Mateiros demonstrated through oral narratives that they remain satisfied with their living standards, despite the fact that they recognize that much needs to be done in all spheres of the proposed indicators, emphasizing the sanitary aspects, health and education.

Finally, an analysis was conducted comparing several factors of the sample and the QLI before and after the implementation of tourism. The comparison considered was the Mann-Whitney test for the factors: sex, tourism and *Bolsa Família* and the Kruskal-Wallis test for education and age.

It is perceived that before the implementation of tourism (QLI before) there is an association with the educational attainment (p-score 0.0244) and the presence of *Bolsa Família* (p-score 0.0140), concerning the QLI, the higher the level of education, the higher the QLI, and those who do not receive *Bolsa Família* the financial aid have higher QLI than those who are beneficiaries of *Bolsa Família*.

It was observed that only the factor *Bolsa Família* (p-score 0.0138) shows an association with improvement in the quality of life, and those who are beneficiaries of *Bolsa Família* showed greater enhancement in the quality of life than those who do not receive *Bolsa Família* financial assistance, although, again it must be emphasized that those who are not beneficiaries of *Bolsa Família* presented higher QLI.

IV. CONCLUSION

The QLI in Mateiros municipality is still considered low. This is basically due to the health conditions, education, communication and leisure factors that the community has access to. Although, even with a low quality of life, the population of Mateiros demonstrated through oral narratives that they remain satisfied with their living standards, despite the fact they recognize that much needs to be done in all spheres of the proposed indicators, emphasizing the sanitary aspects, as well as health and education.

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