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Globalization and Health in a Small Town in the Amazon Region

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Abstract

The chapter describes results of a study conducted in Ponta de Pedras, a small municipality (27,000 inhabitants) in the estuary of the Amazon River on Marajó Island, in the State of Pará. Close to 400 questionnaires were applied to the population to assess the impact of globalization on the municipality. The main revenue of the municipality comes from the export of açai fruit, which became a global product after being discovered by two Californian surfers in around 1990. The city is three and half hours by boat from a large city, but it is connected to the world by Internet via mobile phones (95% of urban and 79% of rural population have a mobile phone), which is used for social media access, studies, açai sales, and to buy products. Effects on cultural and eating habits have been observed, as processed foods are replacing fish and açai among youngsters in the local diet. Hypertension was the main morbidity reported by the interviewees, particularly those living in the rural area. On the other hand, the urban area has poor sanitary infrastructure and public services. The chapter ends by discussing the complex role of globalization in the development of communities and how local governments and health policies could act to balance the effects of globalization on health.

Keywords: globalization, açai fruit production, eating habits, health, Amazon region, Ponta de Pedras

1. Introduction

Amazon as a biome has a vast and large tropical forest, a diverse and greatly desired ecosystem that is important to the world in an environmental, social, and economic perspective. It attracts the attention of different people with varied exploitation interests. The use of its

natural resources has intensified, especially for export, with few benefits for its socioenvironmental sustainability. Anthropization of the territory and changes in the natural landscape reflect intense rural-urban migratory processes.

The Brazilian Amazon is the largest region in the country with 4 million km². It has 12.9 million inhabitants, according to [1], corresponding to 8.2% of the Brazilian population. The end of the twentieth century, at the Amazon frontier, brought important structural and territorial transformations in the economic and social relations resulting from globalization [2]. This phenomenon promoted changes in the Amazon and affected the forest biodiversity [3, 4]. Globalization conveys the ideas of speed and fluidity that are connected to the characteristics of modern global society, defined by [5] as the technical-scientific-informational environment. Globalization is not only the existence of this new system of techniques, but it is also the result of the actions that ensure the emergence of a so-called global market. It is related to a consumer society, a technological society, or capitalist information societies, referred by [6] as the network society.

Considering these aspects, this chapter aims to analyze the production of açaí for the inclusion of the region in the globalization process, in the municipality of Ponta de Pedras, in the Brazilian Amazon, located in Marajó Island, Brazil. This relationship was studied in rural and urban areas, based on three elements: access to consumer goods, changes in eating habits, and population health.

Açaí (*Euterpe oleracea* Mart.) has been increasingly used in national and international cuisine, so it is globally marketed, after it was discovered by two Californian surfers in around 1990. The production of açaí fruit is one of the main elements of the income and consumption of the riverside population of the State of Pará, with heart of palm as a by-product [7]. Also known as açaí-do-Pará, açaí-do-baixo Amazonas, açaí-de-touceira, açaí-de-planta, and true açaí, it has countless uses [8]. Its production is best developed in floodplains, during the rainy periods of the region. The expansion of the açaí economy occurred due to a combination of internal and external factors. This expansion cannot be understood as a result of rural migration and urban growth only, but also due to changes and maintenance of eating habits, taste preferences, and forms of consumption, which occurred together with changes in the symbolic value related to açaí [9].

For the development of this quali-quantitative study, a field data collection methodology was used, with questionnaires applied to the person in charge of the household, 320 in all urban sectors and 68 in the rural area of Ponta de Pedras, following randomized, stratified sampling (approved by the Ethics Committee of the Public Health School of USP, 099377/2015). In the rural area, the communities located along Rio Fortaleza, Rio Jupuba, Rio Marajó-Açu, and Rio São Miguel were selected because of their economic importance in the production and sale of açaí, and because they are close to the urban area. The following information was obtained: socioeconomic profile of the residents, family income, educational level, ownership of consumer goods as electrical and electronic equipment, eating habits and types of food consumed, waste disposal, sanitation habits and infrastructure of households, and health conditions. The field study was conducted between January and July 2016.

2. Ponta de Pedras: a municipality in the Brazilian Amazon

Ponta de Pedras is part of a group of small cities in the Brazilian Amazon. It is located at latitude $01^{\circ}23'25''$ South and longitude $48^{\circ}52'16''$ West, and it is one of the 143 municipalities of the State of Pará (Figure 1). Its site is on Marajó Island, in the estuary region of the Amazon River, 3 h and 30 min by boat from the state capital, Belém. The municipality has an upland (Terra Firme) and a lowland influenced by the Rio Marajó-Açu. The water system connected to this river varies in depth between summer and winter, causing changes in the human dynamics of the municipality, such as fishing and collecting forest products, as well as in the navigation on the river. Several durable and industrialized products are brought from the capital by boat for supplying the local commerce, and, on the opposite direction, the local production is distributed to Belém, such as fish, açaí, heart of palm, among others. The degree of urban/rural mobility is determined by factors that include the distance between the communities and the City Administration and the economic power in the urban area [11].

The municipality had 27,000 inhabitants, 49% of them in the urban area, an annual population growth of 3.35% between 2000 and 2010, and Human Development Index (HDI) of 0.562, lower than the Brazilian index of 0.768 [1]. Regarding the municipal HDI, in 2010, longevity presented a 0.77 index, income 0.558, and education 0.412, the worst component of the local index, indicating a high proportion of children and youth out of school. As discussed by [12], between 1969 and 2010, the small town of Ponta de Pedras expanded physically by more than 100%,

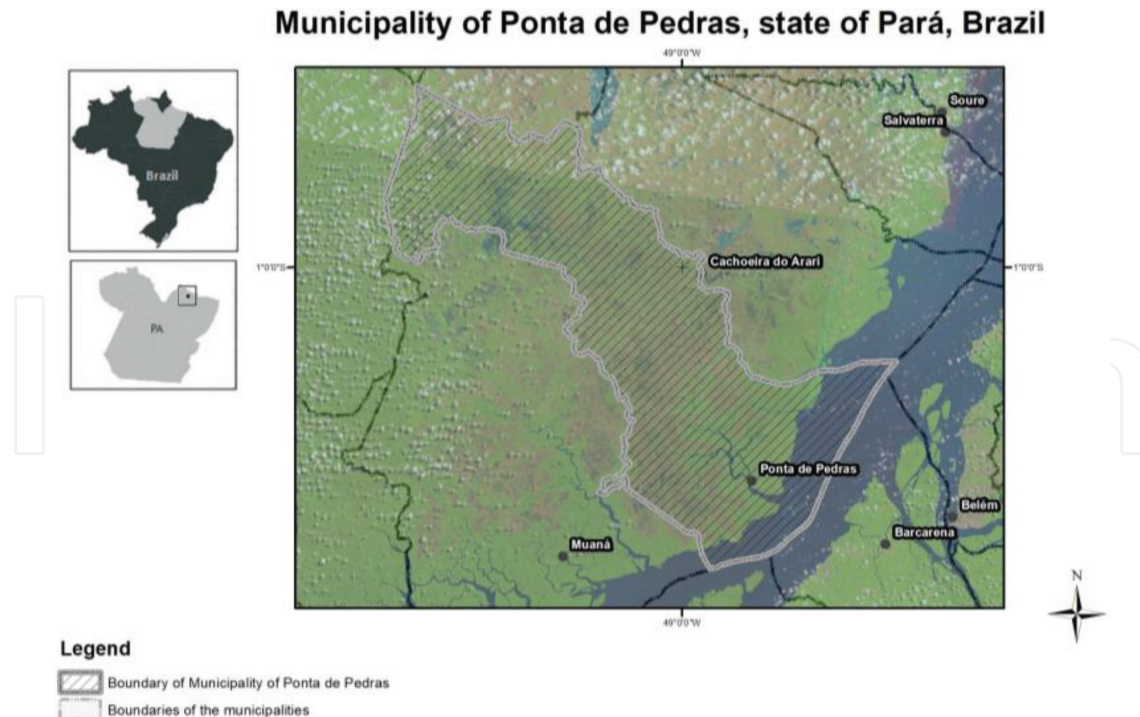


Figure 1. Location of the municipality of Ponta de Pedras. Source: produced by Laboratory for Studies of Cities—UNIVAP [10].

and this growth meant a significant increase of its urban area. The municipality's predominant economic activity is the açai production and fishing. Poor sanitation and health services are widespread. The urban area of Ponta de Pedras, despite presenting economic growth, does not provide proper services and basic infrastructure to its residents [13]. On the other hand, 99% of urban households have electricity, and in the rural area, it is 90%. The population reported that the Federal Government's "Electricity for All" program, starting in 2009, improved their living conditions and provided access to energy-dependent goods and benefits. Electricity in households already had increased from 32.19% in 1991 to 74.84% in 2010.

More than half of the urban population (61%) has a family average income of 1–3 minimum wages (US\$ 250), and among the rural population, 25% receive up to one minimum wage. Minimum wage is paid as salary or retirement to Brazilian population, and it is established annually by a federal decree. At the time of the fieldwork, it was around 250 US American dollars.

Higher income in the urban area is due to the possibility of developing autonomous activities and small services, such as the sale of açai at home. Regarding their income, the interviewees reported that the benefits received from the government (such as family minimum allowance, unemployment insurance to fishermen and retirement) are important in the domestic budget to cover family expenses, and contribute to the local economy and access to consumer goods, such as mobile phones and household appliances, internet services, etc. In Ponta de Pedras, 55% of the inhabitants in the urban area and 51% in the rural area receive the family minimum allowance. In the rural area, the unemployment insurance to fishermen is the most important benefit, received by 76% of the interviewees. In addition, the high number of workers in açai extraction activity in rural areas indicates it is the main source of local income. Of the total number of interviewees from the rural area, 8% have the family allowance as their sole source of income as they do not have any formal employment or other income. In the urban area, 18% of the interviewed families do not have any income, and in the rural area, 6% of interviewees reported no benefit and no source of income.

Lack of sufficient income has a direct impact on family health determinants, including food availability. On the other hand, this reality has a smaller impact on rural population, as interviewees reported they can plant and have fruits from the forest such as açai, besides fishing, which guarantees healthier sources of calories.

Regarding the educational level of the interviewed population, 14% are illiterate in the urban area, and 13% in the rural area. Only 22% of the urban interviewees concluded high school, and in rural communities, only 4% have this degree. Low educational levels have a negative impact on finding a good job, according to the interviewees, especially for young people.

3. Açai: from local consumption to global production

The Amazon region, or Legal Amazon, has always played an important role in the extraction economy. The region went through several economic cycles, including rubber, fruits and plants from the inland, and nowadays the *black gold* referring to açai. This new economic

moment has also resulted in new land and social conflicts, inserting the Amazon in the global agenda. In Brazil, the State of Pará is the largest producer of açai [14].

Açai has become a key cultural symbol of the region, valued for the quality of its fresh juice, heart of palm, its multiple uses, and unique esthetic beauty of the plant that is sold for gardens of all social classes [9]. Besides manioc, açai is a staple food and a vital source of calories for the local population. The market of açai export to the United States, Japan, and other countries¹, in 2012, amounted to more than US\$ 17 million. The trend is to increased exports due to an investment in açai handling and production, processing of the fruit, and expansion of exports to other countries [8, 15].

As açai won the preference of consumers abroad, it also became a global market product, which inserted Ponta de Pedras, a small municipality in the Amazon with excessive production, in the global market. However, the exported amount is still below its full potential. Globalization has reduced the distance between markets [16].

With the internationalization of açai fruit, its production and distribution network, particularly of the State of Pará, invested in marketing, targeting the external market. With the advent of technologies and social media, the product has received even more attention, leading to new consumers out of Pará, leveraging this global consumer market.

When a product is inserted in the global market, its condition, entity, or local identity is extended beyond national boundaries and becomes global [17]. The local production of açai, when winning the international market, is submitted to this process beyond borders. However, the commercial transaction of this extractive product has generated economic and ecological benefits to the local population, contributing to the economic sustainability of many riverside families. In addition, the workers of the açai production chain, and other extractive products, adopted sustainable practices for the extraction and conservation of açai palm trees [9]. In this new economic cycle of the fruit, large commercial cities, and small towns in Amazon, like Ponta de Pedras, were benefitted.

The globalization process allows insertions from local to global level; however, it requires dynamism that, often, does not correspond to the local reality. It is related to environmental, sociocultural and sometimes economic deteriorations that directly or indirectly impact the population, especially on the riverside [8]. On the other hand, this space transformation in the Amazon contributes to the strengthening of urban networks [18].

Açai started to be sold in the state of Pará, at supermarkets, gyms, and fast food chain stores, in order to fulfill new market niches and cover consumers with higher purchasing power [19]. The fruit exploitation is conducted in native açai plantations, which present low productivity, especially between harvests [20]. Because of this problem, many families adopt deforestation practices to produce subsistence crops, turning the environmental problems in the region worse. Social and economic connections involved in the açai trading have changed the fruit

¹Abu Dhabi, Germany, Angola, Argentina, Australia, Belgium, Canada, China, South Korea, Denmark, United Arab Emirates, Slovakia, Estonia, France, Holland, England, Israel, Norway, New Zealand, Peru, Puerto Rico, Portugal, Czech Republic, Russia, Singapore, Sweden, Switzerland, Taiwan, and Uruguay [8].

production practices and land use, and intensified the relations between rural and urban families and communities living in açai production municipalities like Ponta de Pedras.

The production of açai is considered an extractive activity, with exemption from federal [14] and Pará state taxes.

3.1. Açai in Ponta de Pedras: from local staple food to global market

Ponta de Pedras is an important producer of açai, which is mainly marketed in Belém, and then exported to other regions of Brazil and abroad. Ponta de Pedras harvests 12% of the total amount of açai produced in Brazil [18].

Açai extraction can be considered a sustainable activity, fulfilling the regulations issued by the United Nations for Sustainable Development for a global sustainable economy [21]. In Ponta de Pedras, the açai extraction is part of a local sustainable economy [22].

For many riverside families, this production represents a low-cost way to survive. However, in addition to açai production, they fish and extract other fruits and heart of palm, with a stable family economy during the açai crop cultivation. The population has a very close relation with the place where it is inserted, and the main economic activity of both urban and rural inhabitants of the municipality is related to the production of açai [23].

Figure 2 shows pictures of the açai fruit production chain, from the açai trees to the end product ready to be shipped and sold in *paneiros* (woven containers).

The type of açai produced on Marajó Island is widely accepted in the market because of its quality due to the climate and to the physical characteristics of the soil [24]. With globalization, the small producers of açai have changed the rhythm of production to serve an increasingly growing and demanding market. By the end of the twentieth century, açai was considered a staple food product of the local population, consumed with manioc flour, fish, and shrimp [25].

According to reports obtained in the field, workers who act as açai harvesters receive a low remuneration (R\$ 5.00—five reais or one and a half dollars) per *paneiro* (not full) or a large can, which corresponds to around 18 to 20 kg. However, açai is the main source of income for many families, who complement their income with the sale of fish, shrimp, pig, and poultry and/or government allowance programs. Another study about açai conducted in Ponta de Pedras [18] demonstrated that the fruit has changed the reality of several families, who manage to survive between harvests with savings due to the price the product reaches in the market. This way, açai moves the formal and informal economy of the municipality.

According to the field survey, 92% of the interviewees who work with açai do not have a labor record booklet in the urban area and 100% in the rural area. Census data [1] also confirm these numbers: 23% of the population living in Ponta de Pedras had a job but without a formal contract, and 52% were self-employed, which characterizes widespread informal employment.

Açai inserted Ponta de Pedras in the economic and gastronomic scenarios at national and global levels [17], placing the municipality in the global scenario. Ponta de Pedras is in the



Figure 2. Açaí production in the municipality of Ponta de Pedras (a), sale of açaí by canoe in the community of Fortaleza (b), and Açaí open market in Ponta de Pedras (c and d). Source: collection of the Laboratory for Study of Cities—UNIVAP [10].

process of developing other economic sectors, with potential for tourism activities. However, açaí remains the most important item that advertises the municipality, as it is the largest producer of the fruit.

4. Globalization, consumption goods, and health in a local perspective

This study attempted to analyze whether this insertion in the global economy, due to açaí exports, has impacted the quality of life and health of the population of Ponta de Pedras. Globalization of healthcare is a complex theme, due to its intricate and varied aspects, but an intriguing topic to be studied. Historically, international health relations have helped find the cure of many diseases and develop technologies to fight or mitigate epidemics.

The perspective of globalization in healthcare has strong consequences on demography, production, consumption, and the environment and reinforces the need for new approaches that consider the relations between local and global/universal aspects [26].

Brazil might be considered a predatory state, due to the over-exploitation of natural resources for more than three centuries, with little care for the environment: gold, iron, various agricultural products, nonrenewable natural resources and, in particular, the Amazon rainforest, with its biodiversity that has been highly valued until the present times [6].

Health in its full conception inevitably includes the economic development of countries [27]. The future of health depends more and more on new processes related to the advancement of globalization.

A recent report issued by the World Health Organization (WHO) on chronic diseases indicates that cancer, diabetes, and cardiovascular disease are the main causes of death in the world [28]. Of the 38 million lives lost in 2012 by chronic diseases, 16 million, or 42% were premature and preventable (an increase of 14.6 million deaths over 2000), and 80% of these deaths worldwide occur in low- and middle-income countries [28].

The cities of the Amazon region, due to their geographic and population characteristics, and different aspects related to the development of public policies, are sensitive to environmental problems, which reflect in the quality of life and health of the population [29].

In this sense, studying the urban dynamics in the Amazon is critical to understand the health-disease complexity in this vast territory [30]. The major challenge lies in the different spheres of power and should involve the articulation of a coherent model of development, which considers natural, social, economic, political, and cultural processes in order to minimize negative impacts on the population, especially to more vulnerable groups.

Thus, the globalization process imposes complex consequences on the least developed countries, and which are reflected locally.

4.1. Globalization and access to consumption goods

Riverside families gained visibility and economic resources due to their açaí production, but the resources did not bring many improvements in their living conditions. For the residents of Ponta de Pedras who work with açaí, in plantation, extraction or sale, the fruit has brought mainly increased purchasing power and access to consumer goods and communication technology.

This study showed that the globalization process in which Ponta de Pedras is situated was largely driven by changes in açaí trade at regional, national, and global levels. The investments made were destined mainly to provide internet access to the municipality and it was critical for its insertion in the commercial scenario. In an attempt to understand how this municipality is included in the context of globalization, the interviewees were asked about their access to technologies, especially telephones, social media, and consumer goods. This study found that the connection between the small community and globalization through the açaí economy, combined with the availability of electricity and the operation of communication services, has allowed the access to an infrastructure of communication such as the Wi-Fi and LAN centers, ensuring new technological spaces. In 2016, Ponta das Pedras became the first digital city in Marajó island, as optic fiber wire for high-speed internet was installed in public buildings and free Wi-Fi area was inaugurated in the main public square.

The search for better living conditions, for many interviewees (49%), led to the migration from rural to urban areas. The reasons for this migration are varied: access to health services for 75% of the interviewees who were seeking medical specialists; access to a variety of stores; and access to communication services, particularly mobile telephony and internet.

Regarding the access to technology, it provided new options to modernize the urban activities. Most interviewees reported they had a mobile phone because it was the easiest way of communication: 91% of them from the urban area and 79% from the rural area. In the rural area, the distance from the urban center of Ponta de Pedras reduces the reception quality, which is a constant complaint of the residents.

Even among the population that earns less than one minimum wage, more than 40% buy high-cost mobile phones of famous brands. Some interviewees reported they buy high-cost mobiles to access apps that allow them to connect to Facebook®, WhatsApp®, internet, more advanced games, among other reasons.

Half of the respondents (50%) answered they use their mobile phone to access internet because it is more practical and economically viable, besides allowing a better control of expenses with mobile credits; and some of them said they partially used their social benefits for this purpose. Young people use the cell phones more frequently to access the internet, since the elderly, due to their low educational level and poor familiarity with electronic devices, use fixed telephones to communicate. In rural areas, 81% of respondents said they did not know how to handle the device or access the internet, which is the responsibility of another family member, usually their children or grandchildren. In the urban area, 51% of the respondents answered they did not know how to access the internet via mobile phone.

The internet is mainly used by the interviewees and their families to study (78%) and access social media in the urban area, and in smaller proportions in the rural area. Some interviewees reported it as an important means of communication because it enabled them to hear from family members and solve some health-related issues, such as setting medical appointments and exams. For a small portion of rural producers (3%), a mobile phone allows them to call açai dealers to set the product price for the current harvest. They explained it helps them figure out how much they could profit from the harvest, since *paneiro* cost varies greatly. Small producers use mobile phones via satellite to check the price of the açai *paneiro*, a very common practice in the globalized world, especially used by large companies that use technological benefits. It places global and local contexts closer, thus reducing the distance and access between people. The circulation, mediated by technology, is accelerated, in particular by the new forms of telecommunication via computers (networks) that constitute the material basis of the “space of flows of financial capital” [31].

However, this technological universe in Ponta de Pedras is a new world, something like a technological revolution in environment of the Amazon region, due to the conditions of access from long distances, or the cost of mobile phones, which for many residents is high. Despite that, 70% of the rural interviewees answered they had a mobile phone at home, and in the urban area 80% answered they had two or more mobile phones (up to 6) at home.

4.2. Eating habits

Regarding the eating habits and types of food the interviewees consumed, this study found these aspects also had the influence of globalization.

Changes in the eating habits of the population in Amazon are associated with strong marketing strategies that large international food companies develop in the region to attract new consumers. In this study, despite the low percentage of interviewees who reported changes in their eating habits, the introduction of processed and ultraprocessed products in their diet was observed, especially among the young population, who consumes a higher variety of processed foods [32]. In addition, the heads of families have the perception that the processed food consumed by young people is not good for health and mentioned their worry about increased number of diabetic and hypertensive people in the municipality. This perception is reinforced by official data about diabetes and hypertension [33]: there were 3 cases of diabetes and 43 cases of hypertension in 2007 at the municipality of Ponta de Pedras. In 2011, 16 cases of diabetes and 285 cases of hypertension were reported, demonstrating the increase.

Industrialized food products are sold in stores and represent a food transition, which has affected the health standards of the population. Answers on eating habits of the families indicated the consumption of chicken, pork, beef, and sausage, despite the population's preference for fish and flour. The weekly consumption frequency of the inhabitants is as follows: sausage in the rural area, 25 and 15% in the urban area and chicken once a week, 31% of rural residents and 38% of urban residents.

Table 1 shows the processed foods purchased every month, in proportion to the number of urban and rural interviewees. Some foods, which are not part of the traditional Amazon diet or manufactured with local products, are bought by a high number of families. The lack of a refrigerator could explain the purchase of canned goods and noodles, but yogurt bought by more than half the rural families, and 66% of urban families, weakens this argument.

Type of food	Urban population in %	Rural population in %
Pasta/noodles	85.9	94.1
Yogurt	65.9	55.9
Soft drinks	58.8	61.8
Canned/conserved food	49.4	60.3
Cereals/grains	44.4	38.2
Candies/sweets	35.6	25.0
Ketchup/mayonnaise/mustard	28.1	10.3
Snacks	24.1	11.8

Source: field study conducted by the authors.

Table 1. Processed and industrialized foods bought monthly by the population.

At the urban area, 6% of interviewees at 19% in rural communities reported that their children and grandchildren had exchanged fish and açaí for other foods. This did not happen with the elderly, because these are traditional staple foods of local population.

4.3. Health and globalization in a small town in the Amazon

The North region of Brazil has a history of low health indicators. Health has to be seen today as a global issue, and healthcare globalization is a positive aspect that should be developed in a clear and well-planned manner [34]. At the current stage of globalization, the policies that promote health [28] have not brought considerable improvements for the population of Marajó Island, especially low-income population. Globalization is consistently consolidated as it pulls down the relationship between territory and its natural products and the community. Then, characteristics of the urban way of life, such as diseases, also appear in rural areas, resulting from the consumption of industrialized and globalized products, pressure for increased productivity on workers, and the appeal to the consumption of goods and merchandise.

The dynamics of small cities show limited development due to several factors, such as low educational level, scarce resources, difficult communication and transportation, and lack of sanitation infrastructure, which affect health conditions.

This research used the questionnaires applied to residents to identify health problems. One can observe that their perceptions on their health problems are more focused on new health issues than on diseases that historically are part of their everyday life.

The interviewees did not frequently report diseases, such as diarrhea and malaria, often cited in studies analyzing these riverside environments and registered in official data. Infant mortality in the municipality is very high, 30.2 per 10,000 newborn, placing it in the 4199 place among 5570 Brazilian municipalities. Also, there were a tax of 9.2/1000 hospital admissions due to diarrhea, in 2014 [1]. The Information System on Social Indicators of the State of Pará reported 924 hospital admissions in 2010, in Ponta de Pedras, of those 199 (18.3%) were due to infectious and parasitic diseases. These represent the second cause of internment after baby deliveries (231 hospital admissions).

In the interviews, 17% of people from the urban area and 21% from the rural area reported physician diagnosis of hypertension. High cholesterol levels were reported by 8% of urban interviewees and 7% of rural; and diabetes was reported by 6% of urban interviewees and 4% of rural ones. In fact, Information System from Ministry of Health indicates a large increase in the number of hospital admissions due to diabetes mellitus in Ponta de Pedras, in the last 10 years. There was 1 admission in 2009 due to this disease, 2 admissions in 2011, 5 in 2012, 6 in 2013, 15 in 2014, 22 in 2015, 25 in 2016, and 25 in 2017.

During data collection, some interviewees complained about the lack of physician and medicines for the treatment of diseases such as hypertension, diabetes, and high cholesterol levels, especially in the rural area, where the access to health services is more difficult. They reported

that the Family Health Program (FHP) from the government does not always provide medication, and because of their low income, they cannot buy pharmaceutical products.

Chronic noncommunicable diseases (CNCDs) account for 58.5% of all deaths worldwide and 45.9% of the global burden of disease [28]. In Brazil, these figures have increased more than three times since the 1990s. Chronic diseases have played an important role in the epidemiological profile of populations, especially those living in urban areas; the study also reports different determinants in this type of anthropic space organization [35].

Despite the large water supply in the Legal Amazon, official data show that the worst regionally evaluated indicators belongs to this region: 56% of the households do not have water supply from the public system; of the total water volume distributed by the public system, 32.5% had no treatment, and 92% of the municipalities in the region had no sewage collection system [1]. In Ponta de Pedras, many residents, because they need these essential services, had to improvise water access and storage systems.

Most interviewees from the urban area (75%) reported access to water supplied by the Pará State Sanitation Company (COSANPA), but that the water is not treated. Less than 10% of the interviewees reported access to water from a neighbor or an artisanal well. The situation is different in the rural area, where 90% use river water and 10% store in gallons, water that comes from the urban area. In the interviews, residents complained about the constant lack of water, for up to 3 or 4 days a week, which explains using the neighbor's water. Many residents store water inadequately at home, often creating an environment that favors the proliferation of vectors such as *Aedes aegypti*, the mosquito that transmits dengue virus. The environment presents precarious conditions reported by the interviewees, with stagnant water and garbage. The perception of water quality by the population is ambiguous; although they find impurity and recognize the scarcity of water and sanitation, they see the river and the forest as natural resources essential for them.

In spite of the belief that water is of good quality, 76% report water treatment before consumption, as they do not trust its origin. In the rural area, 67% treat it before cooking and drinking. However, rural residents have the perception that the "river is clean," as they eat fishes and shrimps from this environment. Before using the water, some urban residents reported that they "boil" it (3%), filter it (16%), or use sodium hypochlorite (43%); in the rural area, 72% answered they use sodium hypochlorite distributed by the Municipal Health Department. Considering the above, their low reference to waterborne diseases and diseases transmitted by vectors is not consistent with this unhealthy situation. More than 45% of urban respondents and 65% of rural respondents did not know the predisposing factors to their diseases.

When asked about disease concerns, rural residents answered they had symptoms of a viral disease due to poor water quality. However, only two families were submitted to laboratory exams and found a parasitic disease (the resident did not know how to describe the disease). In Ponta de Pedras, waterborne diseases, most reported by residents, were viral (12% in rural and urban areas) and diarrhea (5% in the urban area and 3% in the rural area). This study in Ponta de Pedras highlighted the lack of infrastructure, such as piped water and sewage system, and that its availability does not cover all sections of urban and rural areas. In the urban area, the neighborhoods were occupied in diverse periods, while public investments in infrastructure were made in different stages and paces.

Regarding sewage discharge, the most common practice is discharge in a watercourse, compromising the water quality of the river and its source. In the urban area, 43% of the residents adopt this practice, and in the rural area, 82.6% justified by the absence of a sewage system, except for the cesspools. Septic tanks are the second option of sewage disposal to 32% of urban residents, especially for those living in floodless areas.

Sewage discharged in a stream eventually goes to the river, where the residents wash clothes, fish, where children take a bath, and whose water is used in home cleaning and other daily activities. Regarding waste disposal, 21% of urban residents burn the waste, claiming that the city does not collect solid residues as it should. In the rural area, burning residues is conducted by 98% of the respondents, who claim that burning is better than throwing them in the river.

This study found that the population of Ponta de Pedras is not satisfied with the services provided by the municipality, including the cleaning and other essential services such as education and health. Health services are top complaints, reported by 67% of the interviewees as an unsatisfactory service.

In Ponta de Pedras, the problems are perceptible in the landscape. **Figure 3a–d** shows how the environment and health are intrinsically related, affecting the quality of life of the population.



Figure 3. Urban area that represents an environmental and sanitary risk to the residents. (a) Stilt houses and precarious wooden bridge to access the houses, (b) residence with wooden bridge, (c) and (d) precarious access to water and environmental and health vulnerability. Source: collection of the Laboratory for Studies of Cities—UNIVAP [10].

The environment plays a fundamental role associated with health conditions, as environmental factors can cause ecological imbalance and, consequently, the proliferation of pests, which can be vectors of diseases [34]. Wooden houses are characteristic in the Amazon and are mostly built on stilts to avoid river flooding, for being economically viable, and to provide some thermal comfort to residents in local climatic conditions. Based on data collected, the epidemiological profiles of the region and the municipality are marked by overlapping of diseases resulting from local living conditions and low access to prevention and control measures, in addition to poor health services.

5. Final remarks

Institutions such as the World Health Organization (WHO) and the Pan American Health Organization (PAHO) [36, 37], ministries and health departments are responsible for planning, monitoring, inspecting, and promoting actions to promote health in the world. In the last five decades, several important global events have been held in relation to global public policies, especially those that reinforce health promotion.

Intersectoral dialog has become increasingly necessary between institutions and countries. Advances in technology and science allow a better analysis and understanding of environmental interventions in order to mitigate damages caused to exposed populations. Globalization causes strong impact on economic, social, political and cultural areas, and, at the same time, on spatial organization that reflects on health conditions. The scales of the impact caused by globalization are differentiated around the world and very particular in realities like the municipality of Ponta de Pedras.

Ponta de Pedras is one of the largest açai producers in Brazil, but the fruit trade has brought only few benefits to the population, particularly to small and medium producers and traders of the fruit, even with the overall projection of açai consumption. This study, although lacking comparative temporal data, points to the direction that the global açai market might have interfered in the health conditions of the residents. Both perception of inhabitants and some available official data point that noncommunicable chronic diseases are becoming more important health issues among the residents. On the other hand, infectious diseases and high infant mortality persist, very much related to the poor sanitary infrastructure and public services, low educational level, and poverty.

In spite of efforts of the federal government in providing electricity, public internet access, and minimum allowance for underprivileged population, local governments find it difficult to implement health policies and sanitation systems, and to receive and use resources for a number of reasons of administrative, technological, educational nature, and distance from regional centers that make important decisions. Thus, although some economic resources and consumer goods are more accessible to a portion of the population, most of the residents remain vulnerable to social and environmental health determinants.

Deficiencies in the form of poverty exist at all territorial scales—regional, national, and global—and increasingly affect remote municipalities, such as Ponta de Pedras, and directly influence health, a scenario that is commonly seen in many other Brazilian municipalities.

Public policies must consider this ongoing process in order to extend the social benefits to the vast Amazon region. Health policies could also act to balance the effects of globalization on health.

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Conflict of interest

The authors have no conflict of interests to declare.

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