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# The São Francisco River transposition and Pipipã people's health, in Floresta, Pernambuco, Brazil<sup>1</sup>

## A transposição do rio São Francisco e a saúde do povo Pipipã, em Floresta, Pernambuco

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### Abstract

Government actions to implement development projects in indigenous territories, whose operational model is linked to the prospect of supposed economic and social progress, have affected the perspectives for the future of people in several countries and in Brazil. This study analyzed the socioenvironmental processes of vulnerabilization of the Pipipã people resulting from the transposition of the São Francisco River in the municipality of Floresta, Pernambuco, Brazil. The research used the perspective of social determination of health and proposed a dialectical movement aiming to favor the needed dialogues for a proper understanding of the complexity of health problems. Qualitative research methodological procedures were used for data collection and analysis. Documents, interviews and participant observation were analyzed, emphasizing the understanding of the destructive social processes determined by the transposition of São Francisco river and the perceptions of the Pipipã people about the relationship between health and disease. The research evidenced that the São Francisco river transposition made the Pipipã people materially and symbolically more vulnerable, created compulsorily new territorialities and vulnerabilities raising a threat to the processes of social reproduction of the Ethnic group.

**Keywords:** Indians in the Northeast; Pipipã; Indigenous Health; Development Project; Health and Environment.

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## Resumo

Ações governamentais de implantação de projetos de desenvolvimento nos territórios indígenas, cujo modelo explorador está vinculado à expectativa de suposto progresso econômico e social, vêm afetando as perspectivas de futuro dos povos em diversos países e no Brasil. O estudo analisou os processos socioambientais de vulnerabilização do povo Pipipã, localizados no município de Floresta, Pernambuco, decorrentes da transposição do rio São Francisco. A pesquisa foi realizada na perspectiva da determinação social da saúde e propõe o movimento dialético, no intuito de promover os diálogos necessários para a devida compreensão da complexidade dos problemas de saúde. Os procedimentos metodológicos se pautaram na técnica qualitativa de coleta e análise de dados. As estratégias de pesquisa utilizadas no estudo foram análise de documentos, entrevistas e observação participante, que favoreceram a compreensão dos processos sociais destrutivos determinados pela transposição do São Francisco e das percepções do povo Pipipã sobre a relação com a saúde e a doença. A pesquisa evidenciou que, em função da transposição do São Francisco, os Pipipã foram vulnerabilizados material e simbolicamente, e novas territorialidades e vulnerabilidades foram estabelecidas compulsoriamente, encontrando-se, portanto, a etnia ameaçada em seus processos de reprodução social.

**Palavras-chave:** Índios no Nordeste; Pipipã; Saúde Indígena; Projeto de Desenvolvimento; Saúde e Ambiente.

## Introduction

Living conditions are built collectively, and this same process gives rise to social and power relations that determine the ways in which the set of goods, necessary for social reproduction, is distributed (Breilh, 2006). Aspects and ways that affect the social determination of health, according to Breilh (2006), occur in the form of processes that acquire their own formats and movements, according to the social determinants. The dynamics of the processes that determine health - for example, the ways of living of the populations in the territories; social and environmental relations; work conditions and processes; quality of housing; education; leisure; among others - can design social processes characterized as destructive or protective. These processes can “favor or not the promotion of health and individual or collective life” (Breilh, 2006, p. 203).

The processes of health and disease are related to the ways of coexistence of individuals, and health, according to Breilh (2006) and Nogueira (2010, p. 8), is a “eminently human complex phenomenon and not a biological-natural fact.” The social reproduction of health articulates sociohistorical processes of social production and reproduction, which give rise to tensions and conflicts that motivate actions of reparation and transformation, according to Samaja (2000).

The ways of living of indigenous peoples have been affected by the implementation of developmentalist megaprojects since the 1970s, introducing processes that increased the vulnerability in their territories. Vulnerability is here understood as a result of a context of environmental injustice, and consists in a process in which social groups are affected materially and symbolically, developing health problems arising from the implementation of enterprises in the territories where traditional peoples and communities live (Acselrad; Melo; Bezerra, 2009; Porto, 2011).

The National Policy for the Health Care of Indigenous People highlights distinct situations of social tension arising from the exploitation of natural resources in indigenous territories

(Brasil, 2002). These situations threaten the livelihoods, work, and social organization of the indigenous peoples, deconstructing the entire collective effort of the people to occupy, use, control, and identify with the environment, in countries such as Peru, Bolivia, Ecuador, Colombia, Chile, and also Brazil (Brasil, 2002; Oliveira; Cohn, 2014).

Indigenous territoriality is understood as the collective effort of these peoples to carry out their life projects occupying the territory, controlling it and using it in a sustainable way, turning it into their own and building a local identity. The diversity of expressions appears as a fundamental aspect of the territoriality, which “produces a wide range of types of territories, each one with its sociocultural particularities” (Little, 2002, p. 4).

A government initiative created in Brazil the Growth Acceleration Plan (PAC), including large infrastructure projects, aiming to provide logistic conditions for the production of commodities in Brazil. In July 2003, the federal government announced the project of the São Francisco River transposition, which was part of the Multiyear Plan (PPA) 2004-2007 (Barros, 2014). The project, in the Brazilian Northeast, was regulated by Resolution no. 47/2005, of the National Council of Water Resources, as Project of Integration of the São Francisco River with Northern Northeast River Basins (Silva, 2012). In the semiarid - Submedial São Francisco -, in Pernambuco, the implementation of the project of the São Francisco transposition started in 2007.

This study analyzed the socioenvironmental processes that increased the vulnerability of Pipipã people, resulting from the implementation of the São Francisco transposition, from the perspective of the social determination of health (Almeida-Filho; 2010; Breilh, 2006; Samaja, 1998, 2000).

## Methodological strategies

This is an analytical case study using the qualitative technique of data collection and analysis. The primary data were obtained with participant observation and 27 semi-structured interviews, carried out until achieving similar

responses (saturation of responses). The study was conducted from 2014 to 2017, in the municipality of Floresta, semiarid region of Pernambuco. The prefecture of the municipality is located 433 km away from Recife. The East Axis of the transposition of the São Francisco started in Floresta, and the indigenous area was directly affected by the project, where occurred the direct contact between the physical structures of the enterprise: channels, reservoirs, pumping stations, among others (Brasil, 2004).

The study population totals 1,362 people, according to information regarding 2012 from the Information System of Indigenous Health Care, of the Special Secretariat for Indigenous Health (Sesai) of the Brazilian Ministry of Health. The Pipipã territory was considered directly affected by the transposition, but, to the definition of the sample, the three villages cut by the channel were considered: Tabuleiro do Porco, Caraíbas, and Pedra Tinideira. The samples were “intentional” and collected in the three villages. The purpose of choosing the specific study units was to use those that “generate the most relevant and large data,” according to the study object (Yin, 2016, p. 79).

## Data collection and analysis

### Participant observation

We used the category “participant as observer,” as defined by Minayo (2011), i.e., restricted to the research time. We sought, by participant observation, to build knowledge from the relationship with “subjects involved in the social process”, which include researcher and participants (Alves, 2011, p. 28). We met the leaders of the villages by the caciques (there are two), who indicated some individuals to accompany us throughout the villages during the field work. We took part in family parties and conversations, visited the villages directly affected and those that were cut by the channel, as well as native plants, considered sacred and used in traditional medicine, in rituals, and in Pipipã cooking and art. We took part in the rituals of Aricuri and Toré in Serra Negra. The name “Aricuri” is characteristic

of the Pipipã people, other ethnic groups in the Northeast name the ritual “Ouricuri.” We came to know the various *toantes* (small chants) and walked through Serra Negra, knowing the strategic and symbolic points for the Pipipã. We recorded the information in a field journal.

## Document analysis

We analyzed information from different sources, such as websites and official documents, among which the Support Program to Indigenous Communities of the Ministry of National Integration (MI), aiming to understand the sociohistorical processes of the Pipipã people and the project. We also consulted reports of the National Indian Foundation (Funai), Sesai, social networks and organizations, and other scientific studies that addressed the topic.

## Individual interviews

Interviews were semi-structured, combining closed-ended and open-ended questions, in accordance with Yin (2015). We used a script-guide of the topics discussed, which included, among other things: general aspects about the ethnicity and territory, the perception of Pipipã people on the transposition and the social processes arising from it. The research focused on Pipipã subjects, who inhabit the territory directly affected by the transposition of the São Francisco River. We conducted interviews in the three villages cut by the channel: Caraíbas, Tabuleiro do Porco, and Pedra Tinideira, also called Baixa dos Caibros. We had permission to record in writing and audio.

## Data analysis

Descriptive analysis was applied to the treat the data collected with participant observation. The format for reporting the results was narrative, consisting of full sentences and citations. The key issues were organized by a summarized

description, followed by quotes from participants. Regarding official documents, they were initially collected considering the study object, and then were carefully read to identify the categories of analysis. Discourse analysis was applied to the data from the semi-structured interviews (speeches) and was based on the method of condensation of meanings proposed by Kvale (1996).

The analysis plan included the data matrix of social reproduction and health and was prepared in accordance with Samaja (2000). The main categories of the study were as follows: (1) biological-communal: material conditions of life (land, access to water, and diseases); (2) self-awareness and conduct: social and political organization, symbolism of the landscape/cosmology, relationships between different therapeutic systems, indigenous traditional medicine; (3) techno-economic: ways of living and working, change from self-employed farmer to underemployment in large projects; (4) political: Basic Environmental Program of the MI (PBA 12); and (5) ecological: environmental changes in the indigenous territory with the transposition. The anchoring level of the study was community-based, i.e., the territory occupied by the Pipipã, where the social organization and the production relations occur at the community level (Samaja, 2000).

The research was approved by the Research Ethics Committee of Institute Aggeu Magalhães (CEP IAM/Fiocruz) and by the National Commission of Research Ethics (Conep), and the access to the indigenous area was authorized by Funai.<sup>2</sup>

## Results and discussion

### The Pipipã people: sociohistorical processes

Known as “Indians of Serra Negra,” the Pipipã people live in a territory that is in process of land regularization with 10 villages. The demarcation process of the Pipipã territory started in 2005. With the transposition of the São Francisco, the Prosecutor’s Office in Serra Talhada (PE) filed

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2 Caae: 13474513.4.0000.5190. Opinion no. 1.406.919, of February 14, 2016.

a lawsuit against Funai, judged in favor of the Indians by the 6<sup>th</sup> Chamber. On April 20, 2017, Funai Order no. 3 was published, in compliance with the sentence pronounced in Public Civil Action (0000232-02-2013.7.4.058303). The institution recognized the studies of identification and delimitation of the Pipipã land with approximate surface of 63,322 hectares, occupying the municipalities of Floresta, Inajá, Tacaratu, and Petrolândia (Funai, 2017).

The name “Pipipã” refers to their ancestors, inhabitants of Serra Negra, which, 1,065 meters high and occupying an area of 1,100 hectares, is considered by the Pipipã people as a holy place, where the *Encantados de Luz* (ancestral spirits) are concentrated. The area occupied by Serra Negra was declared Protector Forest of the Federal Government by the Federal Decree no. 28,384, of June 7, 1950, and the Serra Negra Biological Reserve was created by the Decree no. 87,591, of September 20, 1982 (Almeida et al., 2010; Arcanjo, 2003). It is a region rich in springs, concentrating on its surroundings many squatter farms.

The earliest reference to the “Indians of Serra Negra” dates back to 1713, when the Captain General of the Captaincy of Pernambuco informed the Master Captain João de Oliveira Neves that, in Ribeira do Pajeú, there were revolted indigenous groups, among which “the Pipipãos,” designation of that time. The “Pipipãos” were considered “angry” Indians and, in terms of population, the most numerous in Serra Negra (Arcanjo, 2003; Frescarollo, 1883). In the words of Oliveira (2011, p. 664), “on account of their customs, the angry Indians differed completely from other Brazilians, because they did not obey national authorities.”

The study by Pompa (2011) found that the process of foundation of Jesuit and Capuchin villages in the Submedial San Francisco occurred in the late 1660s, and that the missionary actions carried out by the French Capuchins in the region occurred from 1670 to 1702. From this stage, the villages were, for a short time, under the care of the Carmelite missionaries and, later, in 1709, the Italian Capuchins.

As established by the colonial government, according to the mentioned author, the villages in the Submedial São Francisco should be

installed very close to corrals and sugar mills. This approach seemed to be a strategy to awaken more greed in surrounding owners, glimpsing the possibility to take possession and ownership of more land (Pompa, 2011). In addition, the good soil fertility and the expansion of trade in the region contributed to the advances on the land of indigenous villages (Valle, 2011).

In the second half of the 19<sup>th</sup> century, the process of official extinction of indigenous villages in Pernambuco began. However, between 1741 and 1745, the Capuchin villages of Submedial São Francisco already showed signs of extinction. Therefore, among other issues, the ambition for the possession and ownership of land determined conflicts between settled Indians and occupiers of the land next to the indigenous villages (Pompa, 2011; Valle, 2011). The lands in the indigenous villages of Pernambuco were usurped by neighbor owners and extinguished by the imperial government between 1853 and 1870, according to Valle (2011), and historical records show that the violence employed against the Indians, in the process of usurpation, were perpetrated by both the public and the private powers. The process of demarcation of the lands of the villages was characterized by violent and subtle practices by the imperial government, including: Decree no. 426, of 1845; the law on the land (the Land Law no. 601, of 1850); the creation of the State Secretariat for Agriculture, Commerce, and Public Work Businesses, in 1860, subjected to the issues of land demarcation and legitimacy; and “the process of catechization and civilization of the Indians” from Brazil (Valle, 2011, p. 307).

With the official extinction of the villages, according to Silva (2011, p. 7), individuals who lived in the old settlements came to be called *caboclos*, condition often assumed to “hide the indigenous identity in before the numerous persecutions by farmers, indigenous territory invaders, and even authorities.” According to Silva (2011), throughout the 19<sup>th</sup> century, these Indians called *caboclos* continuously claimed their rights and denounced persecution and violence. These Indians questioned beliefs and statements about the disappearance of indigenous peoples and achieved considerable political visibility in recent years.



## Sociopolitical and cultural organization

The sociopolitical and cultural organization of the Pipipã people is basically formed by social life, cosmology (represented by mythology, by traditional knowledge, by the use of plant extracts, and by everyday habits), Health Board, and Council of Indigenous Teachers (Baniwá, 2006). The control of administrative and political power, in the Pipipã ethnicity, is focused on two caciques and in the Leadership Council, consisting of the cacique, shaman, and the leaders of the villages. The shaman takes care specifically of the “powers of tradition,” of healing and customs of the people, according to Arcanjo (2003, p. 57). There are five indigenous schools: one of them is a high school, located in the village Travessão do Ouro, and the others of early childhood education, located in the villages Caraíbas and Faveleira, and all teachers are indigenous. The representatives of the ethnicity are all indicated by the community, according to Almeida et al. (2010).

From the land, the Pipipã people gather the strength and the science - in their view, Earth is the mother. The following speech expressed the importance and the relationship of the Pipipã with the land: *Everything sprouts from the land, for us she is a mother, we gather the strength, the science, everything* (I6). In their traditional medicine and cooking, we can highlight the use of sacred plants, such as: *imburana de cheiro, imburana de cambão, ouricuri, juremeira, aroeira, espinhaço de cobra, pau-ferro, pau-d’alho*, among others. Among their important traditions, we highlight the rituals of Aricuri, Segredo, Mesa da Jurema, and Toré. The Aricuri, sacred ritual in which the Indians get spiritual strengthening, is held annually in Serra Negra for 10 days every October, and only invited people can take part in the ritual. In Segredo, whose participation is exclusive of men, they make prayers and spiritual reinforcement for those who take part in it. In Mesa da Jurema, the Pipipã call their ancestors to heal the diseases of body and soul, sing *toantes*, dance the Toré, and drink the wine of Jurema.

The Toré, among the Pipipã, is perceived as a moment of connection with the *Encantados de*

*Luz: In Toré, we grow stronger spiritually, get more excited, we have many toantes* (I3). The Toré dance usually happens every 15 days and there are four yards, spaces to dance the Toré on the territory.

## The arrival of the transposition

The São Francisco River, for having the main river basin in the semiarid region of the Northeast Sertão, has been the “historic target of numerous projects of use of water resources, planting, and creation” (Scott, 2013, p. 16). Performing a water infrastructure project (transposition of the São Francisco) to bring water to the Sertão and combat drought was a political solution to the issue of severe restriction of water access in the Northeast region (Brasil, 2004). This solution was criticized by social movements, the Roman Catholic Church, and local communities, such as peasants, *quilombolas*, and indigenous peoples (including the Pipipã), who said no to the transposition and yes to the revitalization of the São Francisco River. The extensive revitalization consists of actions planned by the federal government for the São Francisco River basin, including the environmental recovery of degraded areas, the preservation of little degraded relevant ecosystems, and the promotion of the sociocultural development of local populations (Brasil, 2004). However, it has not taken place yet, in the tenth year of the transposition.

The works of transposition of the São Francisco became subject of academic interest, with production of several scientific studies. The study of Baracho (2014) revealed the violation of rights of the *quilombola* communities of Salgueiro, in Pernambuco; the compulsory intervention in the lives of peasants settled in the Rural Productive Villages of Salgueiro was highlighted in the study of Domingues (2016); the deterritorialization of peasants in the municipalities of Sertânia, in Pernambuco, and Monteiro, in Paraíba, and the payment of derisory indemnities were results pointed in the study of Bezerra (2016).

The works for the construction of the East Axis of the transposition were vertically imposed by the MI and initiated in 2007 in the territory

of the Pipipã, in Floresta, with the government ensuring the supply of water to everyone in the semiarid region (Brasil, 2004). Asked about actions of resistance to the transposition of the São Francisco in the territory, the Pipipã launched another question, according to the speech: *How could we stop the transposition? We are small, when they came, [they came] at once. There was no question, no proposal. We are innocent Indians and what's left is just nostalgia* (I24). In addition to the concern in dealing with the new processes of material and symbolic vulnerability that were advancing in the territory, other sources of tension arose between the Pipipã: the demarcation on the land started to separate the Indian families, their goats would run away across the channel, get lost, die of hunger, thirst, which made the territory vulnerable to invasions of non-indigenous people.

### Fragmenting the territory

“Rape” was the term used by the political leadership of the Pipipã people to define the act of violation of the holy land caused by the transposition tractors, which disregarded the territorial rights of the Pipipã to set their own priorities of development, that is, to define their life projects (Scott, 2013), which are recognized in the Federal Constitution (Brasil, 1988) and in Convention no. 169 on indigenous and tribal peoples of the International Labour Organization (OIT, 2011). About the marks and consequences that the developmentalist project left to the Pipipã people, the political leadership said: *This project was a rape in the territory of the Pipipã people, and raping leaves marks, leaves sequelae, leaves pain and that's what this monstrous work did to our territory* (I26).

The fragmentation of the territory for the implementation of the East Axis of the transposition, which, according to the study of Santos (2013, p. 106), is a “great artificial object fixed to the soil and produced by humans,” has destroyed natural goods related to flora, fauna, ponds, wells, *barreiros*, *serrotes*, shoals (best land for agriculture). It was predicted in the Report of the Transposition Environmental Impact (Brasil,

2004), even with the commitment to carry out mitigating actions, which have not yet been fulfilled (in the tenth year of the transposition). According to Zhouri (2011) and Scott (2009), large projects generate collision processes between the works implemented and directly affect the lives of people living near the sites chosen, who, mostly, gather the losses of the project. Thus, people start to suffer, to feel insecurity, fear, tensions (Scott, 2009).

The material living conditions of the Pipipã people were affected in the following aspects: (1) significant loss of animals; (2) loss of pasture; (3) reduction in the production of honey, because the restriction of land reached the territory of bees; (4) financial expenses to move to other places, because of the loss of the best lands used for agriculture; (5) disappearance of hunting; (6) loss of sacred plants used in indigenous medicine, in rituals, and in human and animal feeding; and (7) loss of the main water sources (wells, *barreiros*, ponds), which had great importance in the coexistence of the Indians with the semiarid and symbolic meanings for the Pipipã people.

The destruction of symbolic plants affected the art and the rituals of the Toré, Jurema, and Aricuri, as stated: *It ruined the land, cut our croá, it was hard for us, where the channel passed it took everything and our croá. Where the channel passed it took the Jurema and Toré too* (I14). The *croá* is a plant whose fiber is used in the manufacture of skirts, headdresses, necklaces, and *aió* (type of bag to carry various tools for the Toré). Many symbolic trees were destroyed, such as the *umbuzeiro*, used in feeding, and the *juremeira*, used to make the wine served during the Jurema ritual (Arcanjo, 2003).

Deforestation affected native plants used in indigenous medicine, as explained below: *The pés de pau that were medicine, lambedor, here we had this a lot, the bonome is good, the tea of aroeira bark for inflammation, the umbuzeiro for us to eat. Other plants, such as quince, [they were] destroying everything* (I14). The action that determined the loss of medicinal plants violated article 2 of the National Policy for the Health Care of Indigenous People, which recommends



environmental sustainability in indigenous territories and recognizes the value of indigenous medicine for promoting, protecting, and regaining health by encouraging biopsychosocial balance (Brasil, 2002).

In indigenous cooking, complaints were related to the loss of the following native plants, according to the narrative: [It] *Destroyed the umbuzeiro, macambira, mandacaru, these things. With all this the channel really harmed us* (I20). The *macambira* represents an alternative for feeding animals and humans, and is considered a symbol of the survival of the Northeastern people, because it saved the lives of thousands of pilgrims during the prolonged periods of drought that occurred in the region (Gonçalves, 1997).

The land separation also modified their reference points, hindering access to places and their internal mobility, thus determining a context of insecurity in the place. This situation prevented the Indians from leisure activities in daily life, such as visits to relatives and friends and to the church on Sundays, according to the narratives: *I, when I go there in Caraibas, I'm sorry. We had the points of reference that we passed, being anywhere, when we wanted to go [...]. Today it's all smashed [...]. It's very sad* (I24). According to Santos (2013, p. 106), at the beginning of human history, the "territorial configuration was represented only by the set of natural complexes," but, as "history is being built[,] the territorial configuration is given by the works of people," for example, houses, ports, warehouses, factories, dams, as well as the transposition of the waters of the São Francisco, among others.

Thus, one builds a "territorial setting that is increasingly the result of a historical production and tends to a denial of nature," replacing it with a "fully humanized nature" (Santos, 2013, p. 106). The transposition has replaced nature (natural reference points) by a big fully humanized artificial object, symbolically and materially increasing the vulnerability of the Pipipã.

The imposition of a new development model in the Pipipã territory directly affected the ways of living and working of the Indians, and the category of self-employed subsistence farmer was transformed into the one of worker in a big

construction site in the villages cut by the channel of the East Axis. The contractors have provided 10% of the vacancies to temporarily employ indigenous workers in the activities involving excavations and surveillance. According to the studies of Baracho (2014) and Rigotto and Teixeira (2009), these workers, who are rendered invisible by the developmentalist big projects, are placed in a context of difficult choice between the lack of work options and income generation and the employment in these new ventures.

## PBA 12 and insufficiency

The Support Program for the Indigenous People, part of the Basic Environmental Project of the Integration Project of São Francisco River (PBA 12), was developed to mitigate the impacts on the directly affected area, in the municipality of Floresta. It aimed to promote actions related to the implementation of the infrastructure, land regularization, and training in social organization and productive management, for providing better living conditions and socioeconomic and environmental autonomy for the Pipipã people (Brasil, 2011).

According to residents, the construction of masonry houses, replacing those of wattle and daub, was the only promise kept by MI, but no house was officially delivered to the Indians. This government action ended up being criticized by the Pipipã people: *I criticize who made this agreement. We didn't have to be exchanging benefits, it seems that we returned to the time of colonization. The government's obligation is to give the benefits* (I26). The construction of living infrastructures, even considered a colonial practice by the Indians, was part of the goal set in PBA 12 and the first protective process (Breilh, 2006), in the context of the implementation of the transposition.

The promise of PBA 12 to support the acceleration of the indigenous land demarcation has not yet been fulfilled by MI, and one of the conditions was that the demarcation process should occur simultaneously to the transposition, according to the speech:

*In one of the hearings in the Public Ministry, in the Supreme Court (STF), which judged the conditions of installation of the construction sites of the transposition, one of the conditions was that the demarcation process should walk side by side with the works of transposition, and that did not occur. (I26)*

The promises related to the demarcation of indigenous land and access to water for human consumption were considered, by the Pipipã, the most inclusive and meaningful ones, because they would materialize the dream of land regularization and health promotion in the semiarid region. Scott (2009) stated, in a study conducted with Itaparica dam farmers in context of planned neglect, that the denial of the promised benefits for the people, by the government, indicates violence against people and communities that live in the areas of implementation of such developmentalist projects. The speech of the Indian worker showed the level of violence perpetrated by MI: *so far we are without benefits from the transposition, except for the work, on behalf of wanting the good for all (I10)*. The absence of benefits for people and communities did not fail to fit in another situation, also perceived by Scott (2009), of planned neglect.

### **The social determination of physical and mental problems**

The transposition of the São Francisco River produced a new territorial reconfiguration, unfavorable to health, and determined social processes that culminated in physical and mental diseases in residents of villages cut by the channel of the East Axis (Almeida Filho, 2010; Brasil, 2002; Breilh, 2006; Nogueira, 2010; Samaja, 1998). This action, administered by the Ministry of National Integration, also contradicted the National Policy on Health Promotion in indigenous territories, which recommends the prioritization of health-oriented actions guided from the sustainability in the semiarid.

Another decisive process of physical and mental diseases in the Pipipã people referred to the inefficiency of PBA 12, which failed to fulfill

the promises made to them. This social process refers to the study of Scott (2009, p. 9), carried out in another historical context of implementation of a large enterprise, in which the author mentioned the “violence perpetrated” on its implementation, which made more harm than good to the populations, as in the case of the Pipipã.

In the words of Samaja (1998, p. 32), the processes of health and illness are designed as a component of a system of real (material) and symbolic (cultural) processes, and are affected when any of these processes is “interrupted, violated, blocked, failed, disturbed and the procedures to rebalance them either do not exist or are not operating as they should.” And the presence of the “large artificial object fixed to the ground,” in accordance with Santos (2013, p. 105), was perceived as interrelated and interdependent with the production of disease and not of health, according to the narrative:

*the transposition has already been the largest disease that's been through here, how are we going to be? So I think it's a shame, we pass by the places [...]. There is no more serious disease than that, so I think, my darling, that it's a shame. (I24)*

According to the memories narrated, the most observed processes of illness in the villages were the mental ones, especially depression.

Other cases reported were anxiety, tension, sadness, everyday life with insecurity and fear, stress, hypertensive crisis, acute and chronic allergies because of the constant and excessive dust in the villages (arising from the breach of the transposition agreements to wet the land close to the villages), and aggravation of preexisting respiratory conditions. In addition, we have found a case of lethal stroke, according to the speech:

*I've been noticing people sad, depressed. Even my dad... When he passed by the channel, he blessed himself in seeing so many things destroyed. As soon as the channel started, he had a stroke and died. He hunted, extracted honey, collected macambira, xiquexique. Not only did it affect his health, but that of many people. (I20)*

From the implementation of the works, there was a significant increase in the use of anxiolytics and antidepressants, particularly among older residents from the villages, where the natural pharmacy was destroyed by the construction.

Santos (1988, p. 16), when reflecting on the creation of an artificial geographic environment by people (advancing quickly in the field), mentioned that it is built with “remains of the primitive nature increasingly obscured by the works of humans.” According to the author, the natural landscape starts to “be replaced and artifacts take, over the surface of the Earth, an increasingly broad place.” According to Santos (1988, p. 16), all this takes place in a context of life in which “environmental conditions are outraged, with emergence of mental and physical diseases in populations, where people stopped caring for a friend nature and created a hostile one.”

Another issue interrelated and interdependent with the context of implementation of the “large object” (Santos, 2013) narrated by the Indians related to the fear of being run over by the transposition trucks, in a territory until then totally calm. They reported that the trucks ran at high speed, even with notification of a running over case. The excessive speed of the trucks traveling in the villages refers to the study of Santos (2013, p. 105), which indicated that “[traffic] flows are increasingly diverse, more spacious, more numerous, and more rapid,” both in the field and the city.

Another decisive process of physical and mental diseases in the Pipipã people referred to the compulsory fulfillment of the schedule of explosions established and administered by the Ministry of National Integration. The explosions for excavation of the East Axis channel launched stones, caused cracks of houses, broke roofs and appliances, caused extreme noise pollution, destruction of plantations, animal death, tension, and fear during their executions, particularly among old people. The explosions made residents materially vulnerable: *Some homes in the territory had their walls opened [in Tabuleiro do Porco village] with the explosions... Schools were also cracked and this harmed us. The transposition has harmed us and the little we had, it destroyed... (I16).*

The study of Scott (2009) also reported cases of pauperization that settled in the everyday life of farmers who inhabited the shores of the São Francisco, and that similarly also affected the Pipipã, because they had to assume the losses with the cracks of houses caused by the explosions.

The most affected dimensions of social reproduction and health of the Pipipã were biological-communal and self-awareness and conduct. According to Samaja (2000), the biological-communal dimension refers to the way in which community members renew themselves bodily and in their interrelations, building the communal environment where they take place as individuals, while self-awareness and conduct are related to the production of culture, of symbolic networks mediated by language and development-transmission of learning experiences, in which emerge culture, cosmology, and symbols.

## Final considerations

Indigenous peoples are historically part of the sociocultural and ecological diversity of humanity, and the model of actions administered by MI in the São Francisco transposition was *careless*, since it made these people materially and symbolically vulnerable in the name of a development that did not benefit them. Therefore, this topic must be further discussed and deepened by the government, DSEI, Sesai, Ministry of Health, and national society as a whole.

The transposition of the São Francisco destroyed favorable environments to health and life in the semi-arid, did not promote health in the Pipipã territory, determined great transformations in the environment and in relationships, and directly affected traditional ways of living and working. Therefore, many health promotion recommendations contained in the National Policy for the Health Care of Indigenous People and the National Policy on Health Promotion were deconstructed, in addition to the recommendations of the Federal Constitution (Brasil, 1988) and Convention no. 169 on indigenous and tribal peoples (OIT, 2011).

The Pipipã people claimed that every project to be developed in the Indian territory should be performed from an agreement and the participation

of all residents, so that they can know and understand the government proposals and actions and then agree or not.

The government actions administered by the Ministry of National Integration in the transposition of the São Francisco River, in the Indian territory, were not and are still not being audited by the Union, and this contributed to the production of *carelessness* with the Pipipã people.

The mitigating measures imposed by the transposition project did not benefit the population in question, in addition to being offered in a misguided way, that is, intentionally confused with actions of other public policies or benefits in use by local populations, as in the case of construction of housing infrastructure. New mandatory territorialities were imposed by the implementation of the construction, which resulted in the introduction of new vulnerabilities, that is, by cutting the Pipipã land from end to end, the territory became vulnerable to various actions of land-grabbers, increasing situations of land invasions and conflicts over land and water.

With the inauguration of the East Axis of the transposition, the ambition for more ownership and concentration of land and power rekindles, creating more obstacles to the process of demarcation of the Pipipã land. In addition, our study also pointed to coping challenges for Funai regarding the implementation of the policy of land demarcation in the context of major infrastructure projects on Brazilian indigenous lands.

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