

Environmental changes and human work in the region of the Upper Paraná River floodplain: processes and interactions

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Abstract

The environment and society constitute a complex of elements and interactions. Thus, an understanding of the processes in which the environment and psychosocial elements are involved may not be gained from knowledge of just one isolated variable. Based on such premises, the present paper, which summarizes the results of a series of studies, adopts work relationships as its main focus, but in addition, it has two complementary objectives. One is to present some analyses on the interaction between human actions and the environmental changes that have been taking place in the region of the Upper Paraná River floodplain and in its boundaries. A secondary aim is to show how those two factors have been changing people's working and living conditions and the identity configuration of some of the human groups that live at that site.

Keywords: human work, environment, social processes, tourism.

Mudanças ambientais e trabalho humano na região da planície de inundação do Alto Rio Paraná: processos e interações

Resumo

O ambiente e a sociedade são conjuntos complexos de elementos e de interações. Por isto, a compreensão de processos em que estejam envolvidos tanto elementos ambientais quanto psicossociais não pode ser feito a partir do conhecimento de uma ou outra variável isolada. Partindo destas premissas, este texto adota como eixo principal as relações de trabalho e tem dois objetivos complementares. Um deles é o de apresentar algumas análises sobre a interação entre as ações humanas e as transformações ambientais que vêm ocorrendo na região da planície de inundação do Alto Rio e em seus entornos. O outro é o de mostrar como aqueles dois fatores têm alterado as condições de trabalho, de vida e até mesmo a configuração da identidade dos participantes de alguns dos grupos humanos que ali residem.

Palavras-chave: trabalho, ambiente, processos sociais, turismo.

1. Introduction

What is usually termed “the environment” is, in fact, a complex of countless elements, their interrelations and the effects produced by their interactions. In a similar way, although social processes happen in specific spaces and periods, they constitute parts of events and processes whose spatial and temporal inclusion are much larger.

Sometimes, it is possible to measure the effects of a specific form of human action on an isolated environmental variable, or conversely, to evaluate the influence of a change in the environment on the behavior, the organization or the conceptions of a human group. However, the understanding of any of these processes demands an investigation of the multiple variables and relationships involved in them, along with other processes that interfere in the environment.

The regulation and the changes of the Upper Paraná River flow are decisive aspects of a number of environmental and social factors in the floodplain region. At the same time, the social processes impacted by the floodplain suffer other influences. Consequently, the psychosocial studies that have been carried out in this region, besides taking into account the local environmental changes, have considered factors such as history and political processes.

Different groups of researchers from the State University of Maringá in the region of the Upper Paraná River floodplain have carried out projects that, in addition to being concerned with the preservation of the physical and biological aspects of the local environment, include attempts to improve the local conditions and the

life quality of traditional populations. This refers to the human groups that are less favored economically and that keep intense and frequent contact with non-urbanized areas, living through the exploitation of such activities. Thus, the main focus of the present study is the work activity developed in that region.

Work is a fundamental human activity. People create good conditions for their subsistence through work and organize most of their social relationships around work activities. Work is the activity that defines the individual as a social subject (Bosi, 1998).

Through their work, humans transform nature and change themselves, realizing their creative potential. Thus, human work transforms the environment and, simultaneously, depends on the environment to be carried out. Consequently, work activities are always an element of great importance to be analyzed in projects that aim at connecting environmental transformations to the life conditions of human groups.

In accordance with such a line of reasoning, the objectives of the present investigation are: a) to present some analyses on the interaction between human actions and the changes in the environment that have been occurring in the region of the Paraná River Floodplain and its boundaries and b) to show how those two factors have been changing the working and living conditions, and even the identity configuration, of some of the human groups that live in the region.

2. A Summary of the Local History and Economy

The riverside region of Paraná River, located along the current border of the states of Paraná and Mato Grosso do Sul have been a place of conflict for centuries. Before the arrival of European settlers, such conflicts happened between different Indian tribes and nations. After the XVI century, Portuguese and Spanish groups were also included, as were groups of farmers and small Brazilian agricultural producers somewhat later. From 1870 on, the national government started to encourage the occupation of the region by agricultural properties. In spite of this, around 1920 a great part of the regional native forest was still preserved (Rosa, 1997).

From 1940 on, the colonization of the Northwest Region of the state of was intensified. The forest was gradually cut down in larger scales, and coffee was planted. However, it was always sown with other crops that were used for the workers' and proprietors' subsistence. This process reached its peak at the beginning of 1960, when 20 new municipal districts were founded locally. In 1965, facing a crisis created by the overproduction of coffee, the federal government started to encourage the substitution of other productions forms for coffee plantation (Rosa, 1997).

Coffee plantation and other agricultural activities, which used to depend on a large number of workers, were substituted with extensive cattle breeding, which

generated far fewer jobs. Consequently, the number of regional inhabitants, which was increasing at the time, started to decrease. Most of the families that had migrated to the region in search of land or jobs had to move again to other regions or to bigger and more developed municipal districts within the region. Some of those families started to occupy the islands of the Paraná River, where they started to produce food, thereby guaranteeing their own survival (Rosa, 1997).

The municipal district of Porto Rico, the main focus of the present study, was founded in 1964. In 1970, Porto Rico had 6213 inhabitants, 1029 living in the urban area and 5184 in rural areas. In 1980, the total number of residents was around 5344, and in 1991, this number fell to 3205 (IBGE, 1970, 1980 and 1997). A data collection carried out in October 1993 showed that the urban area of Porto Rico sheltered 1129 residents (Tomanik et al., 1997).

The combination of the collected data showed that, in just over two decades, the urban population presented a growth of 9.7%, but later, the total number of residents of the municipal district decreased by 48.4%. Following the regional trend, the municipal district of Porto Rico stopped attracting new residents and became a place for emigrations.

The decrease of job opportunities could be observed not only in the number of jobs offered but also in the age of the local population. The same data collection showed that in Porto Rico village, the number of people over 50 years old was proportionally larger and the number of people from 25 to 49 years old was proportionally smaller than the national distribution. Data showed a more intense emigration of people, at the peak of their working capacity, from the municipal district (Tomanik et al., 1997).

The number of residents in the islands decreased in a more intense way. In some islands of the region, there was a decrease of up to 97% of the total population in a period of two decades (Tomanik and Godoy, 2004).

In the urban nucleus of Porto Rico, job opportunities were scarce. Only 17.5% of the local workers worked in professions that were connected to the river and its tributaries. Occupations involving working with the earth, such as agricultural work and extraction of natural plants, represented only 25.3% of local jobs. The market of urban jobs, especially work in the Municipal Village Hall and other public segments, was the largest source of working positions. However, in addition to not absorbing the entire available workforce, it absorbed specifically semi- or unqualified workers. Housemaids constituted another important professional category available in the urban area. This category encompassed 26.9% of all women who participated in some form of earning activity. Thus, the local workers' income was low (Tomanik et al., 1997).

A new data collection completed in 2001 showed a growth of 25% in the population of Porto Rico village, thus rising from 1129 inhabitants, figures found in the

first data collection, to 1141 residents in the most recent collection. This growth was due to the number of people who left the rural region and the islands of the region to move to the urban area (Tomanik and Godoy, 2004).

The comparison of data obtained in the census taken in the village of Porto Rico and the surrounding region shows a small evolution in the formal education level of the local population. In 1993, the average education level was around the incomplete fundamental school (1st to 8th grades); in 2001, the average education was closer to the conclusion of 8th grade. In general, the level of formal education in the whole region is low, which shows that a large number of people do not possess the minimum qualifications demanded by job markets of larger and more industrialized urban areas (Tomanik and Godoy, 2004).

The second census taken in the region showed a larger concentration of people working in the urban area. Activities such as non-qualified work for men (i.e., manual or physical work), housemaid or local shop positions for women and especially positions in public services, for both men and women, showed an increase of 160 workers. On the other hand, activities connected to the river or to the earth decreased. The number of fishermen dropped 37.5%. Jobs connected to the earth suffered a remarkable decrease: in 1993, this group of workers was 10.6% of Porto Rico residents; in 2001, this proportion dropped to 4.4% (Tomanik and Godoy, 2004). Therefore, the increase of typically urban activities, associated with the decrease of job opportunities in other categories, was not enough to follow the total growth of the population. The proportion of people who did not work in any earning capacity increased 30.3% in absolute terms and 4.31% in relation to the total population. The working income in Porto Rico remained low: 42.6% of workers were paid an average of half the regional minimum wage (Tomanik and Godoy, 2004).

3. Local Fishermen

Among the economic activities performed in the region, professional fishing is the one that plays a role in the apprentices' more direct, intense and permanent contacts with the floodplain. Consequently, this activity, performed professionally in the region, has been observed with special interest by researchers.

In 1993, 52 men and 4 women had fishing as their main professional activity in Porto Rico. The fisherman group corresponded to 5% of the population and 6.6% of the total local workers. Seventeen additional people used fishing as a way of supplementing the earnings of their family groups (Tomanik et al., 1997).

During that period, the professional fishermen of the Porto Rico region generally considered fishing a very difficult and low profit activity. The main difficulties faced by these people were: a) the shortage of fish in the river and regional tributaries, the Baía and Ivinheima Rivers; b) the low price of fish and the difficulties of

selling their wares, since they depended on middlemen for the resale of fish in larger centers; c) the high cost of materials (e.g., ice bars, fuel) and fishing equipment (e.g., boats, motors, nets); and d) the fast wear and tear of equipment as a result of continuous and intense use and adverse natural conditions (Tomanik, 1997).

In addition to the difficulties mentioned above, the most often mentioned elements, and those showing larger emotional involvement, were legal restrictions on fishing, especially legal inspections. Fishermen were aware of the damages incurred by the environment through their use of inappropriate techniques and through fishing during inappropriate periods, and in fact, they condemned such practices, but they did not agree with some of the established rules and especially with the way legal inspection of such issues was carried out (Tomanik, 1997).

The existence of dams and their system of operation were elements hardly ever mentioned. Some of the interviewees pointed out the closing of Itaipu Hydroelectric Dam, downstream, as the responsible for a general decrease in the number of fish in the region, for the extinction of some species with higher value in the fish market, such as dourado *Salminus brasiliensis* (Cuvier, 1816) and jaú *Zungaro zungaro* (Humboldt, 1821), and for the appearance of other species considered inappropriate for human consumption and commercialization, like arraias *Potamotrygon cf. motoro* (Müller and Henle, 1841) e *Potamotrygon cf. falkneri* Castex and Maciel, 1963. In general, however, dams were not seen as the main source of fishing difficulties (Tomanik, 1997).

In the region, the skills and knowledge considered necessary for professional fishing are usually transmitted from father to son or to a wider group of relatives. Consequently, in order to study the context of generational continuity in professional fishing, a second qualitative study was carried out by involving the fishermen's children and the young fishermen living in the Porto Rico region. The study involved two periods of data collection, January 1999 and January 2000, soon after the closing of Porto Primavera Hydroelectric Dam, upstream (Paiola and Tomanik, 2002).

The first data collection involved 15 fishermen's children and young fishermen, of whom 12 fished professionally and 3 had previously worked in the activity. Out of the latter, 1 individual stated that he would like to fish again, but he wondered if this activity would guarantee his survival. Among the fishermen interviewed, 10 considered that fishing conditions in the region were worse than in the past. According to them, the number of fish had decreased considerably on account of two main and complementary factors: the decrease in flooding and the closing of Porto Primavera Hydroelectric Dam. Evidently, at the beginning the dam operation had caused impacts felt immediately by Porto Rico fishermen (Paiola and Tomanik, 2002).

When asked about other factors that hindered fishing, the population interviewed mainly mentioned uses

of the soil, deforestation, the cost of fishing material and the low value obtained in fish sales. In spite of the difficulties mentioned, 8 out of the 12 interviewees stated that they would not stop fishing, especially because they liked this work in which they were not controlled by others and had direct contact with a natural setting that had not suffered large environmental changes. In December 2000, the same 8 fishermen were sought for a second data collection, but 2 of them could not be interviewed because they were working out of the municipal district, due to a period of fishing prohibition. Out of the remaining 6 individuals, 1 had stopped fishing professionally, in contradiction with his previous statement. All of the interviewees declared that fishing at the present time was much more difficult than in the previous year. One of them said that he could not say why this was the case, but the other 5 individuals pointed to the control of the river flow by dams as the main cause for the change (Paiola and Tomanik, 2002).

Before this and other environmental and economic changes, the number of resident workers in the village of Porto Rico, who fished as their main occupation, fell from 56 to 35 in 1993. In absolute numbers, the number of fishermen dropped 37.5%, and relative to the total population, the proportion of fishermen was reduced to one half (Tomanik and Godoy, 2004).

4. Tourism

Tourism has been on the rise in Porto Rico. At first, the village and the surrounding region attracted amateur sport fishers. Today, other leisure activities, always linked to the river, have also been attracting a growing number of people. Summer vacation houses have been built on the river banks (not always respecting the environmental laws), new houses have been built in the village, and old houses are being purchased and rebuilt. A new hotel and a garage for boats were recently opened. Local leadership see in tourism the solution for local unemployment and the poverty level seen in the municipal district.

Worldwide, tourism has been pointed out as a non-polluting economic activity that has great potential for income generation. On the other hand, in spite of the positive potential of tourism, two factors may be responsible for negative impacts and consequences to the region under tourism development. The first factor is tourists' impact on the resources, environment, landscapes and cultural conditions of the communities receiving tourists. The second factor is the possibly unequal distribution of the costs and benefits of tourism among the residents of the regions in which tourism is developed (Lemos, 1999).

A study involving 174 families from the village of Porto Rico showed that in 106 (60.9%) of the families, no one was involved with tourism occupations. In the other 67 families, at least one member worked in connection with tourism. A total of 76 relatives working with tourism were mentioned (Tomanik et al., 2006). Table 1

Table 1. Activities connected to tourism and performed by families.

Activity	N.	%
Boatman	16	21.05
Maid/servant/Housemaid	15	19.73
Merchant/Businessman	7	9.21
Surveillance during nightshift	4	5.27
Employee of marina	4	5.27
General services	4	5.27
Bricklayer	3	3.95
Doorman	3	3.95
Cook	2	2.63
Homemaker	2	2.63
Waiter/waitress	2	2.63
Fisherman	2	2.63
Hotel receptionist	2	2.63
Lifeguard	2	2.63
Artisan	1	1.31
Work involving sanitary embankment	1	1.31
Shop assistant	1	1.31
Tourist guide/advisor	1	1.31
Entrepreneur	1	1.31
Gardener	1	1.31
Priest	1	1.31
Bait salesperson	1	1.31
Total	76	100.00

shows the activities performed by workers connected to tourism.

Among the interviewees, 135 (77.6%) considered the existence of tourism in the region as a positive factor, 20 stated that tourism had brought as many positive consequences as negative ones, and 9 pointed out only the negative consequences. Of the remaining interviewees, 5 reported that the tourism did not bother them, 3 did not know how to answer the question, and 2 answered in different ways.

A second question investigated was the interviewees' reasons for having evaluated the existence of the regional tourism the way they did. Among those who were able to detail the reasons, the positive, negative and double impacts of tourism on the residents' group were frequently mentioned (see Table 2).

Although the data above represent just part of the data obtained through this investigation, results have already shown that the increase in tourism in the region has significantly impacted the local population and environment. On the one hand, tourism seems to offer a partial solution to the lack of job opportunities in the municipal district. On the other, the activities performed by local workers are generally ordinary ones that demand low professional qualifications, often with low and irregu-

Table 2. Evaluation of tourism impact on different factors.

	Evaluation of impacts			Sums
	Positive	Positive and negative	Negative	
On the community	109	7	10	126
On the interviewee	8	0	6	14
On the environment	0	0	4	4
On the tourist	2	-	-	2
Total	119	7	20	146

lar earnings. This is a result of a combination of factors that include not just people's low education and lack of professional qualifications but also the way that tourism activities have been exploited in the region, involving scarce investments in professional advancement of local workers (Tomanik et al., 2006).

Among people whose family groups are not directly involved with tourism activities, the prevalent belief is that such activities are beneficial for the community, even if tourism may not bring direct benefits to them. Similar attitudes were expressed by people directly involved with tourism. Results showed that the growth of tourism activities in the region may bring positive changes, although not to the direct or proportional benefit of the entire local population (Tomanik et al., 2006).

Negative appraisals were also expressed. The rising prices in local shops, the privileged treatment given to tourists by some local merchants and businessmen and the not always respectful treatment adopted by some of the tourists are elements of great concern since they constitute potential sources of local conflict (Tomanik et al., 2006).

5. The Meaning of Work

Working is an important factor in the lives of even those seen by society as having no need to work. Porto Rico seniors, over 60 years old and retired, continue using work (or the lack of work) as the main reference for evaluating their current life conditions. The women in the group, even if homemakers, do not refer to housekeeping as "work"; however, they feel happy when they manage to continue doing what they have always done: taking care of their houses, washing, cooking, and so on. When, due to health problems, they are not able to carry on with housekeeping, they feel useless. On the other hand, men who were used to doing external work feel useless when their activities are reduced to household activities. The report of one of the individuals interviewed synthesizes this sort of dissatisfaction: "The sort of life that I have now may not be considered as a life. It is too monotonous, once I am a person who has always worked... Fishing is impossible for me now. Today I went down the street, bought food, made lunch and afterwards I slept. Ah! That is not a life for me. For women it may be all right because they have always taken care of the house, but for man that is too hard" (Fernandes and Tomanik, unpublished data).

For this group, from an economic point of view, Porto Rico working conditions are worrying. According to the Brazilian Institute of Geography and Statistics – Census 2000, the Economically Active Population (EAP) of the municipal district was around 1,113 people. The same study pointed to the existence of 318 formal jobs and 508 workers with informal occupations. Such data show the shortage of both formal (28.6% of EAP) and informal work (45.6% of EAP). In addition, data show that almost half of the EAP has informal occupations and therefore lack legal rights. That is, they earn wages based on days worked or tasks accomplished (IBGE, 2007a). Consequently, in 2000, 33.8% of the village population fell below the poverty line, with per capita income lower than half of the legal regional minimum wage and 11.1% of residents falling below the line of misery, with per capita income lower than one-fourth of the regional minimum wage (IPEA, 2007).

This situation may have worsened in the period from 2000 to 2005. Even though the EAP of the municipal district increased from 1,113 to 1,575, the number of formal jobs decreased from 318 to 297 (IBGE, 2007b).

The situation is complex in this region. Low earnings, the miserable conditions for performing informal work and the shortage and decrease of formal jobs are interconnected with, and impact, the local environment. Consequently, there are fewer possibilities of performing traditional work activities, such as fishing and working in subsistence agriculture, which used to guarantee income for most of the local population in the past.

From the psychosocial point of view, other elements are relevant. Among these are the relationships with work, work satisfaction, motivation to work and workers' expectations. These elements contribute not only to positive professional performance but also to workers' general welfare and mental health.

In December 2006, 174 Porto Rico workers were interviewed. One of the questions asked of them was: "Why have you been practicing your current working activity?" Replies to that question were arranged in three large categories, as follows: the practice of a work activity due to personal choice, a choice that resulted from a lack of alternative options, and the existence of personal limitations or local market limitations. The lack of choice was the category that comprised most of the answers: 62.1%; the existence of limitations was pointed out by 12.1% of the individuals interviewed, but only 24.1% of

the answers showed results concerning the practice of a work activity by personal choice or option. An additional three interviewees said that they did not have an answer or just refused to answer the question (Tomanik and Fernández, 2007).

In an apparent contradiction, 55.1% of the interviewees expressed satisfaction with their work activity, 35.1% said that they were not satisfied, and 9.8% did not answer the question. A question emerges at this point: If they perform their working activity due to lack of other options, why do they declare themselves satisfied? Answers to other questions explained this contradiction: in fact, they were satisfied because they had an occupation, even if it was not exactly what they would have liked to do, because at least they were not unemployed. In a similar way, even with low earnings, 60.9% reported satisfaction with their earnings because at least they could survive (Tomanik and Fernández, 2007).

In a market with scarce working opportunities, the need to survive is imposed, and as a result, any working opportunity is welcome. The alternative of moving to other, more developed and industrialized urban areas does not seem viable because job opportunities in the big cities usually demand higher levels of professional qualifications, which the interviewees do not have. Thus, both staying in Porto Rico and leaving it is difficult. Therefore, what keeps local people performing their jobs is not their level of satisfaction but necessity and conformity.

Facing such lack of prospects, the interviewees had difficulty imagining other possibilities of living and working. They were also asked about which would be "the best work in the world for them". The largest concentration of answers was "I do not know" (21.3%), other answers (27.0%, with high dispersion), "all sorts of jobs" and "any job" (12.1%, together in a set). The sum of answers classified in these options reaches 60.4% of the total answers; that is, 6 out of 10 interviewees "did not know". Therefore, "the best work in the world" is a category with little meaning for the interviewees. What really matters is the here and now, that is, any work that can be found (Tomanik and Fernández, 2007).

6. Summary

In the complexity of interactions among the environment and social processes, frequently the motivation and interests of some social groups determine actions that significantly impact environmental elements and processes. Consequently, such changes impact the living and working conditions of the same group or, most of the time, impact the participants of other groups with lower power of political decision and transformation of their living environment.

This tendency seems to be a constant fact in the history of the Upper Paraná River floodplain region. At first, the decisions and interests of royal families and European merchants led to the capture, displacement or elimination of Indian groups. The forest that represented

a source of subsistence and cultural production to native people represented a source of territorial power and commercial gains to Europeans.

At the end of XIX Century and first half of XX Century, national economical interests determined a) the displacement or definitive elimination of Indian groups, b) the substitution of native vegetation with other agricultural species, and c) the attraction of migrant groups to that region who saw the possibility of fulfilling their aspirations in that colonization movement.

Thereafter, new changes in the environment led to a series of expulsions of workers and their descendants. The replacement of the coffee culture by cattle breeding and different crops combined with the absorption of small agricultural properties by the largest ones displaced people to other areas, specifically to the islands or to the urban nuclei. Floods and, more recently, the transformation of the islands into environmentally protected areas forced the local people to move to urban nuclei. Today, the real estate expansion, a consequence of the tourism growth, also threatens to expel them from their homes.

The national demand for electric power led to the construction of high scale hydroelectric dams along the whole basin of the river. The construction and management of dams have caused changes in the whole regional hydro system. The changes mentioned, combined with environmental protection laws and the logic of the market, harm the local people, who, even when living in the urban area, obtained their subsistence from the river. Gradually, work on the river becomes more difficult, job opportunities in agriculture are scarce, work alternatives in the urban nuclei are not enough for all, and work opportunities in other centers are small.

In addition to the economic factors mentioned, psychosocial processes have been affected by the changes in the local environment. Traditional activities, such as fishing or agriculture, made it possible for local workers and their families to obtain forms of non-economic income. When performing their work activities, besides using physical effort, local workers made use of groups of theoretical knowledge (of natural elements and cycles) and technical knowledge (of how to act, when to act, which instruments to use). Moreover, as a bearer of such knowledge, the worker had the power of decision about the work to be accomplished, the right moment to accomplish it and the actions and objectives to be reached.

Thus, this form of working was also a means of sustaining the worker's identity as a person endowed with useful knowledge, qualified for this sort of job, autonomous and capable of providing or of contributing for the support of his family group.

Forced to participate in repetitive and controlled work, the worker loses most of the elements that used to be the basis of his identity. The worker's previous theoretical and technical knowledge are of little use for performing new work activities. His autonomy disappears, and he becomes an employee subject to rules and norms,

subject to the employer or to the company schedules and to pre-established rhythms of work. Without work stability and with reduced earnings, the worker can no longer be the provider for his family. Facing such adverse conditions and so many limitations, it is hard to plan or make changes. Lacking his own space, a job and perspectives of a better life, who is such a person?

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