ASPECTS OF FOOD SOVEREIGNTY AND LABOR SHARING IN DOMESTIC UNITS AT THE MAMIRAUÁ AND AMANÃ SUSTAINABLE DEVELOPMENT RESERVES

ASPECTOS DA SOBERANIA ALIMENTAR E DIVISÃO DO TRABALHO EM UNIDADES DOMÉSTICAS DAS RESERVAS DE DESENVOLVIMENTO SUSTENTÁVEL MAMIRAUÁ E AMANÃ

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KEYWORDS:

Amazon;

Food sovereignty;

Family farming.

ABSTRACT

From 2004 to 2006, monitoring was performed in agroecosystems in 193 families from 13 communities of the Sustainable Development Reserves (SDR) of Mamirauá and Amanã. For this analysis, the relationship between production and the level of self-consumption of crops was considered, and this paper describes aspects of labor sharing with regard to gender.

As a result, it is possible to see that in wetland areas production is more consumption-oriented, whereas on upland areas selling the production is preferred. As for labor sharing, each community follows a different pattern, but overall, both in wetland and upland areas a trend is observed that those activities that generate greater cash flow and require more effort are performed by men, while women are responsible for agricultural activities directly related to the consumption of the domestic group.

Therefore, it corroborates with the assumption that the work performed by women contributes significantly to food sovereignty of the households studied, since they are primarily responsible for providing the food to be consumed.

PALAVRAS-CHAVES:

Amazônia;

Soberania alimentar;

Agricultura familiar.

RESUMO

Durante os anos de 2004 a 2006, foi realizado o monitoramento de agroecossistemas em 193 famílias de 13 comunidades das Reservas de Desenvolvimento Sustentável (RDS) Mamirauá e Amanã. Para a atual análise, foi considerada a relação da produção e o nível de auto-consumo dos produtos cultivados, bem como descreve aspectos da divisão do trabalho no recorte de gênero.

Como resultado é possível verificar que em várzea a produção está mais direcionada ao consumo, enquanto que em terra firme há uma tendência maior a comercialização. Já na divisão do trabalho, cada comunidade segue um padrão diferente, mas, no geral, tanto em várzea como em terra firme, observa-se uma tendência de que as atividades que geram maior fluxo monetário e exigem maior esforço físico são realizadas pelo gênero masculino; enquanto as mulheres são responsáveis pelas atividades agrícolas relacionadas diretamente ao consumo interno do grupo doméstico.

Portanto, corrobora-se com o pressuposto de que o trabalho realizado pelas mulheres colabora significativamente à soberania alimentar das unidades domésticas investigadas, uma vez que são elas as principais responsáveis pelo provimento dos alimentos que serão consumidos.

1. INTRODUCTION

The narrative about food consumption by riverside-dwelling populations in the Amazon, whether in wetland and/or upland areas, goes against previous studies. According to the impressions of such writers as Murrieta & Dufour (2004) and Adams et al (2006), the nutritional importance from the consumption of fish and cassava, the latter being associated with the possibility of producing a considerable amount of processed products, is certain and undisputedly great. Concomitantly, a significant increase in the purchase and consumption of manufactured goods has been verified (GIUGLIANO et al, 1978; MURRIETA, 1994; 2001; LIMA, 2010), such as milk and sugar, i.e., these are added to the consumption of secondary food items (fruits and vegetables) from home gardens and the agroforestry [1].

However, as Murrieta and colleagues (2008: 125) review and analyze it:

> "The few studies on the dietary patterns of countryside populations have a profile marked by the idiosyncrasies of the Amazon environment: moderate levels of chronic malnutrition (GIUGLIANO et al, 1984; Murrieta, 1998; Murrieta & Dufour, 2004; Piperata, 2005), low intake of micronutrients due to high rates of parasitic infestation and limited variety of food items (GIUGLIANO et al, 1984; Silva 2002; Murrieta & Dufour, 2004) and high protein intake in relation to energy intake, with a slight shortfall in energy terms (Murrieta , 1994, 1998, ADAMS, 2002; Murrieta & Dufour, 2004, Adams et al, 2006)"

Having as a background the dietary intake of riverside-dwelling populations, what is intended hereby is not to challenge any of the assertions regarding the poor nutritional values, but rather to address the topic that hangs over the issue of food sovereignty, which, according ALTIERI (2002), lies in the autonomy to decide what is to be grown and consumed and in what way, a decision that is initiated in the family unit that produces its own food. In view of the characterization of the consumption of food from grown products and the description of gender-based labor sharing with regard to farming activities, the main objective of this study is to get to know the role of both women and men in the distribution of productive work and the level of diversification and consumption of wetland and upland families.

[1] The home gardens systems are ways of land use using several species of trees, including fruit trees, which are grown along with the perennial and annual crops, generally located in the vicinity of the main house (WIERSUM, 1982).

MATERIALS AND METHODS

Study Area:

The Mamirauá SDR (1,124.00 ha) and Amanã SDR (2,350.00 ha) are located in the Middle Solimões River region; the former is located at the confluence of the Japurá and Solimões rivers, and the latter is in the watershed of the Solimões and Rio Negro rivers. That area is adjacent to the Jaú National Park, making up the Mid Amazon ecological belt, one of the largest blocks of protected rain forest on the planet (SCM, 1996; QUEIROZ, 2005).The Mamirauá SDR is fully located in a floodplain, so that in the flood season it may become completely flooded. The Amanã SDR comprises upland, wetland and 'campinarana' areas, and is cut through by black water and white water rivers and streams (Pereira, 2008).

The flooding of the Amazon floodplains originates mainly from the melting of the Andes and rainfall in the headwaters of major rivers and tributaries (JUNK, 1983; GOLDING, 1997; JUNK, 1997).In the wetland, the variation in water level of rivers is on average 11 meters (SCM, 1996), thus setting a period of flooding in the Amazon wetlands of about 230 days per year (JUNK, 1989). The flooding of forests, inhabited and cultivated areas by the white waters, rich in nutrients and sediments from the Andes Mountains, allows for the deposition of about 20 cm of soil per year (Piñedo-Vasquez, 1999).This natural fertilization prompted by the rising of waters allows for farmers to enjoy unique features (shorter fallow period and longer period of consecutive use of the same area) of the slash-and-burn system commonly used throughout the tropical regions of the planet (RICHERS, 2010).

As for upland environments, characterized by the formation of acid, low-nutrient soil, fertilization of cultivated areas depends on the burning of pyroligneous material resulting from the slash-and-burn process. This characteristic restricts the productivity over successive years, thus requiring that every two years the cropped areas are abandoned and new ones are opened in mature forest areas.

In the Mamirauá SDR there are 206 villages with approximately 10,800 inhabitants, divided into 2,000 large families, including residents and users of the natural resources of the reserve. The Amanã SDR, despite having a larger area compared to the Mamirauá SDR, has 79 villages with approximately 3,500 inhabitants in 550 large families, including residents and users.

Between 2004 and 2006, monitoring was carried out with 193 families in 13 communities within the Mamirauá SDR and the Amanã SDR. Out of the thirteen communities that were surveyed (Figure 1), nine are located in the wetland ecosystem (Barroso, Maguari, Marirana, New Colômbia, Samaria, São Francisco do Aiucá, São Paulo do Coraci, São Raimundo do Jarauá and Vila Alencar), where the annual high waters in the region floods the croplands.Four other communities (Boa Esperança, Boa Vista do Calafate, Monte Sinai and São João do Ipecaçu) are part of the upland ecosystem, where the crop areas are not usually affected by the annual floods.

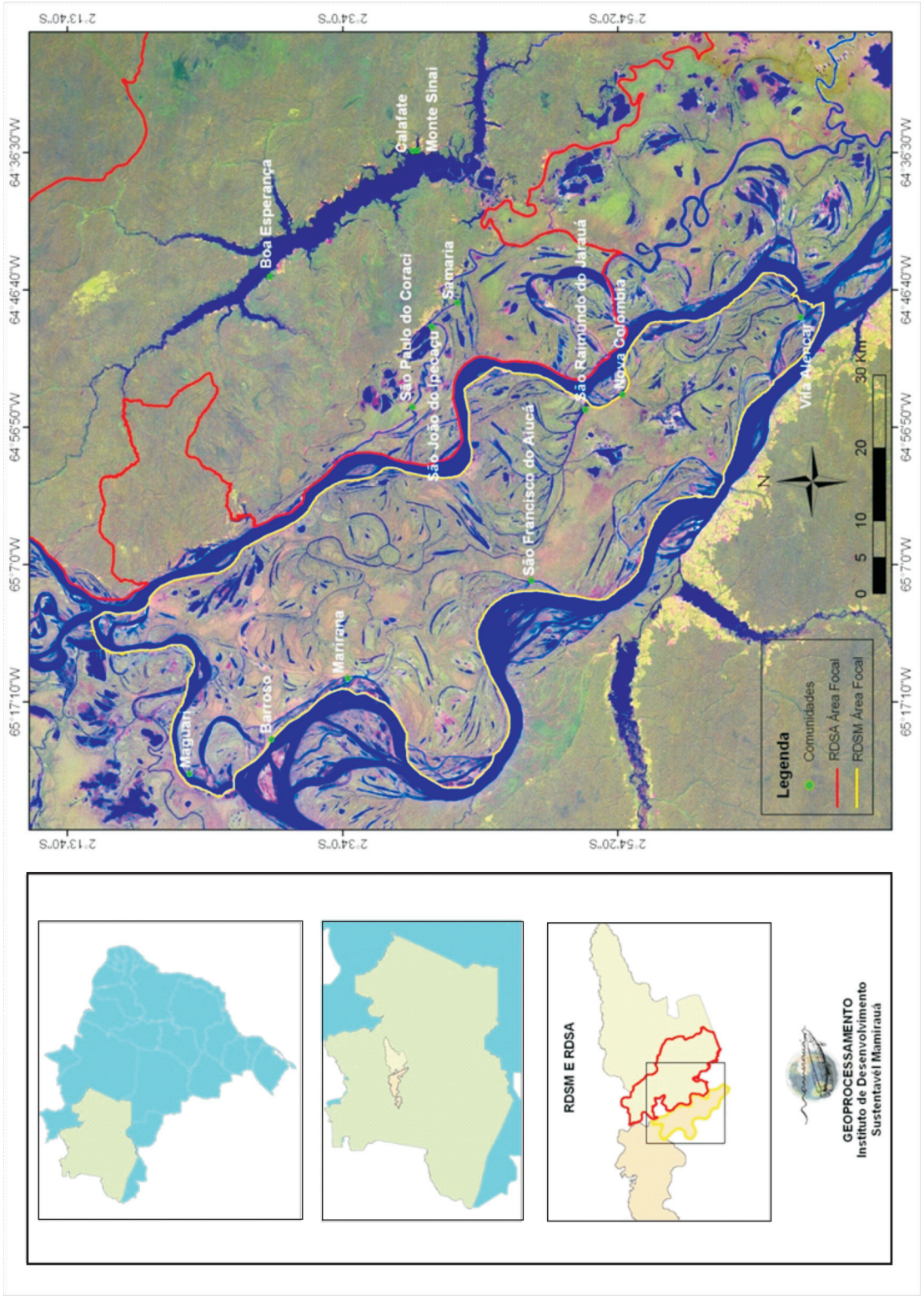


Figure 1 - Area of the Central Corridor, where the Mamirauá and Amanã reserves are located.

Data Collection

During monitoring, one person from each community applied the semi-structured questionnaires monthly to every household, noting, amongst other things, the whole agricultural production and consumption of the products thereof. Elements were recorded such as: crops (quantity and variety) and amount (weight or units) sold; consumption was calculated after subtracting the production and sales.

Amongst all the activities carried out by the farmers, only fourteen were considered to describe aspects of labor sharing by gender, namely: 1. slash (clearing of secondary vegetation or forest); 2. burn (of slashed material) 3. raking (heaping of material left over after the first burning); 4. slash-and-burn (new burning of slashed and raked material); 5. crop planting 6. hoeing; 7. cassava harvest; 8. flour making; 9. making of 'goma', 'tapioca' and 'tucupi' (cassava products); 10. site clearing; 11. corn planting; 12. harvest of 'açaí' berry in the woods; 13. chestnut breaking; 14. logging for firewood and timber.

It can be noticed, descriptively, that nine out of the fourteen activities considered above are oriented solely to the production of cassava flour - from planting to harvesting and the effective production of yellow flour. The yellow flour is the main farming product commodity, thus contributing to family income.

To calculate the aspects of food sovereignty, the following were considered: 1. the diversity of farming products grown by the family (total number of products), and 2. the consumption percentage of the entire food production (consumption % out of the total production in weight/unit of grown products). As for the method used in analyzing how labor is shared with regard to gender, it quantified the participation of men and women in the farming tasks described above (14 related activities).

3. RESULTS AND DISCUSSION

Production and Consumption in households in the Mamirauá and Amanã SDR

According to data collected, sixteen major products (grown and processed) consumed by households were considered, namely: pineapple, avocado, banana, 'beiju', cassava dough cake, 'cará', cupuacu, yellow flour, 'goma', pumpkin, cassava, watermelon, corn, peach-palm, 'tapioca' and 'tucupi'. Other crops produced and consumed in smaller quantities were also recorded.

In order to facilitate viewing of the production and consumption in wetland and upland environments (Figures 2 and 3), the X axis of the graphs below represent the consumption percentage of the farming yield (of the total amount produced of each crop) produced by the household units, and the Y axis represents the number of crops grown by the same household units. The households surveyed are represented by the dots distributed in quadrants, each dot is a different household unit.

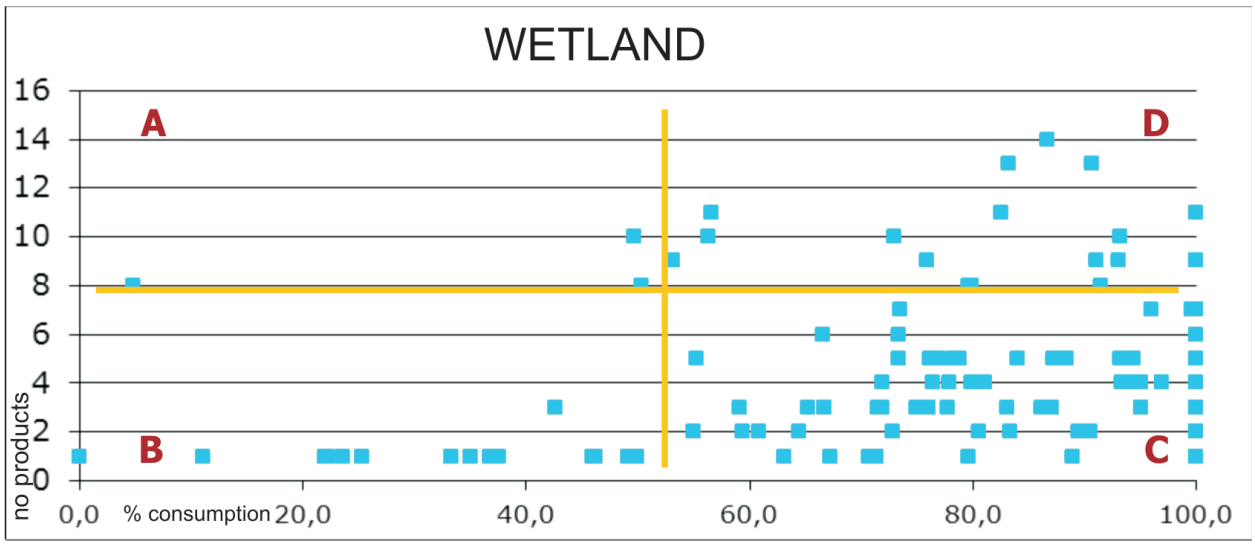


FIGURE 2 - Number of products produced (y) per percentage of total consumption (in kg or units) (x) in a wetland rea.

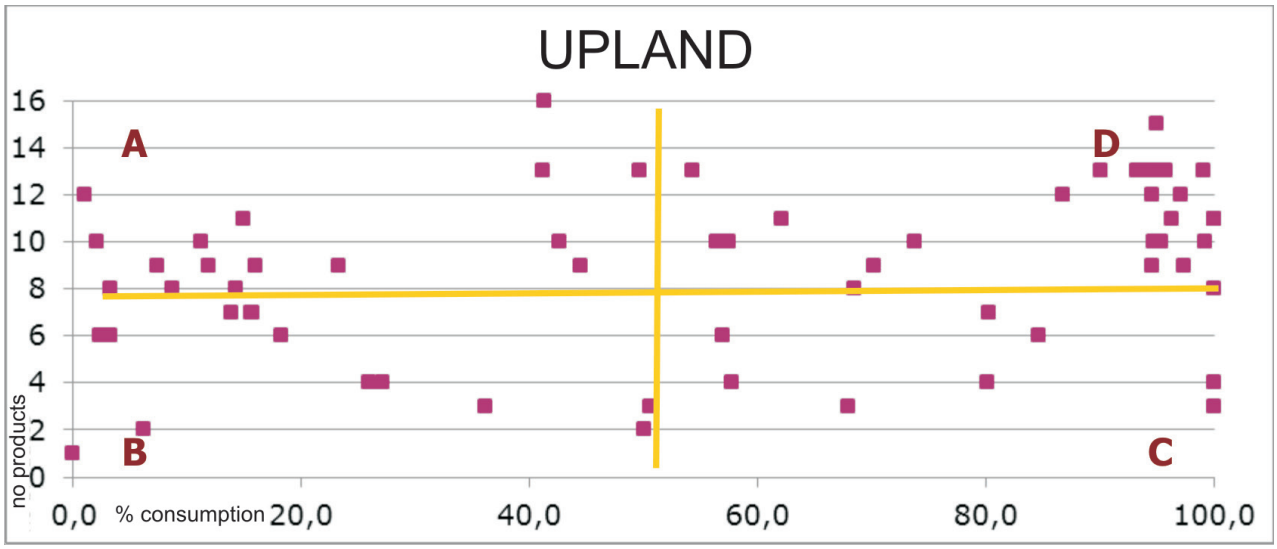


FIGURE 3 - Number of products produced (y) per percentage of total consumption (in kg or units) (x) in an upland environment.

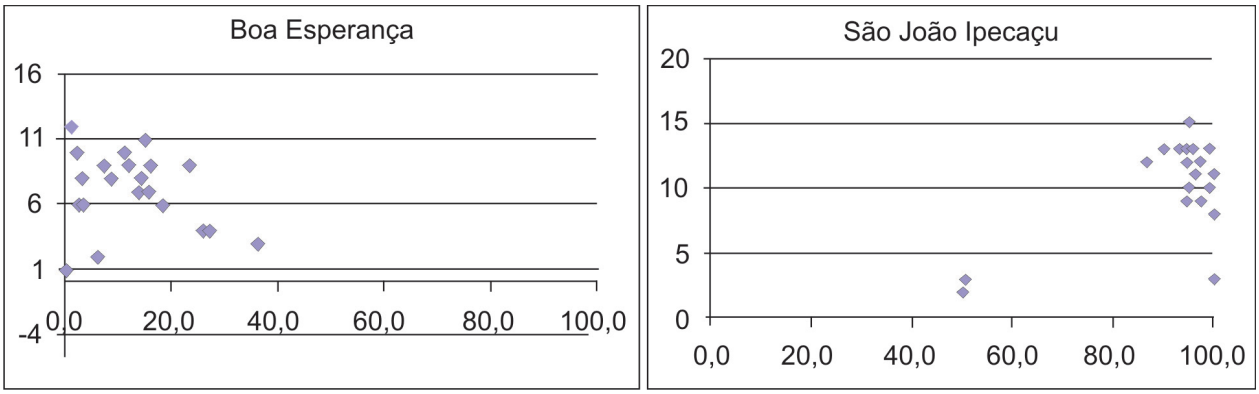
If we assume that the graphs above have four quadrants, we can see that the A horizon of the graphs (upper left) the profile of farmers is directed towards the high diversification of production, which is intended primarily for selling. The B horizon (lower left) has families with low diversification of agricultural production, also intended for selling. In the C horizon (lower right) the profile of households has a low level of agricultural diversification for their own consumption, while the D horizon (upper right) includes those families whose profile is given by the high level of diversification for their own consumption.

Production in an upland environment is greater in the number of products (8.6 ± 3.5). Such diversity stems from the establishment of farms and homegardens, whose areas are not subjected to annual flooding. Therefore, the main activities carried out by the households in upland communities are those directly related to agriculture. In these communities, fishing, even if performed daily, only adds to the supply of animal protein for the households, and it involves reduced labor and takes less time (PEREIRA, 2008). Agriculture is the activity that promotes a greater flow of money to the households of this environment, despite being a more labor-intensive activity and is dependent upon a number of environmental variables (dynamic tidal regime, market seasonality, production outflow, processing and storage) to be successful.

As for wetland ecosystems, diversification of crops is reduced (4.1 ± 3.1) with cassava being the most expressive crop. This is a because the productive wetland areas are farmed annually in the dry season, which ranges from August/September through February/March (four- to six-month production annually). The processing of cassava products (yellow flour, 'tapioca', 'goma', 'tucupi', 'biju', cakes, and 'pé-de-moleque') provides a range of other products which are eagerly consumed and hardly marketed by riverside dwellers. In this environment, there is a tendency that most agricultural production is primarily intended for consumption by the households, while upland families are prone to marketing their production.

It is noteworthy that both fishing and agriculture coexist in almost all households and make their production system. Just like flour is the most important food for the supply of calories, fish is the main protein source for residents of coastal communities in the Amazon (Pereira, 2008).

Still, it is possible to verify that the pattern of households in upland environment depends on the community under analysis. It can be seen that, for example, Boa Esperança (Figure 4) and São João do Ipecaçu (Figure 5) are located in upland ecosystem and have different strategies concerning the production and consumption of agricultural crops.



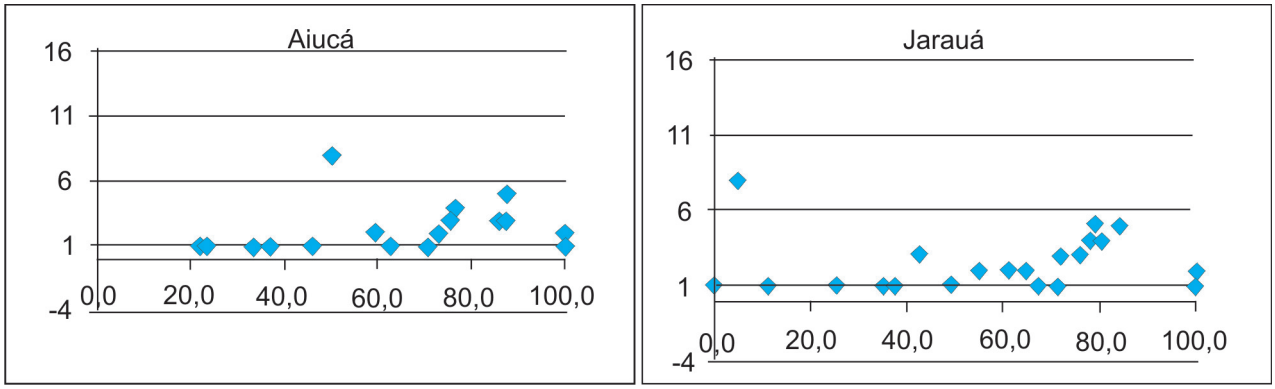
FIGURES 4 and 5 - Number of products produced (y) per percentage of the total consumption (x) in an upland environment.

We see that, while the community of Boa Esperança has an average regular diversification (7 ± 3 products) primarily oriented to selling (12% ± 9 of production is for its own consumption), the community of São João do Ipecaçu has a high productivity trend in terms of agricultural diversification (10 ± 3 products), giving priority to its own consumption, followed by marketing (92% ± 13 of its production is for its own consumption). In both cases, it is possible to see that the families with higher rates of marketing their agricultural production are those having less crop diversification.

However, it would be wrong to say that the families of Boa Esperança were consuming less yellow flour. In fact, if we look specifically into the case of these two communities, we will see that the quantity of flour consumed per person can be the same in both, the difference lies in the production scale. Since the scale of cassava flour production in the Boa Esperança community is higher when compared to the community of São João do Ipecaçu, the percentage of production for consumption will be proportionally lower, even though the daily per capita consumption does not vary much among the families.

Two other cases which are atypical of the current study refer to the production trends observed in the communities of Jarauá and Aiucá (Figures 6 and 7) which, despite being established in a wetland area, they do not match completely with the pattern of agriculture in this environment: low production diversification oriented to domestic consumption of households. The communities mentioned herein, in addition to commercial fishing, also work on the production of cassava flour for the local market (such strategy is usually adopted by those families living in uplands).

An important factor that may be promoting an increase in the production scale and marketing orientation of agricultural products in these communities is the fact that the sandbanks in these communities are higher than those in most floodplain areas.



FIGURES 6 and 7 - Communities of Aiucá and Jarauá, in the wetland environment, but with production strategies suitable to the upland environment.

The areas of high sandbank represent high wetland terrains most suitable for agriculture from the standpoint that they are less likely to flooding due to their higher elevation. Floods last, on average, 2 to 4 months per year. Water height in sandbank areas during the flood periods ranges from 1 to 2.5 meters above ground (AYRES, 1995).According to farmers, these are the best areas in the floodplain for planting crops, which can be grown for a longer period, the main species grown being cassava and banana (PEREIRA, 2008).

Gender-Based Productive Labor Sharing

It is the center of the production unit that the family uses its autonomy to establish its intervention strategies and work processes, organizing the space and combining diverse plant and animal species to ensure its criteria for production and reproduction. In this process, man and women farmers use their creative self-confidence, the empirical knowledge and local resources available. These players have developed sustainable agricultural systems, in which local knowledge and methods are derived from individual or collective experiences.

Each family has a different standard as to the participation of its members in production chores; but, in general, both in wetland and upland, there is a tendency for the activities that generate income and require more effort (felling, logging for firewood and timber) are performed by men, while women have higher performance in farming activities related to domestic consumption of the household (production of 'goma', 'tapioca' and tucupi, and corn planting) (Figure 8), although there may be exceptions in both cases.

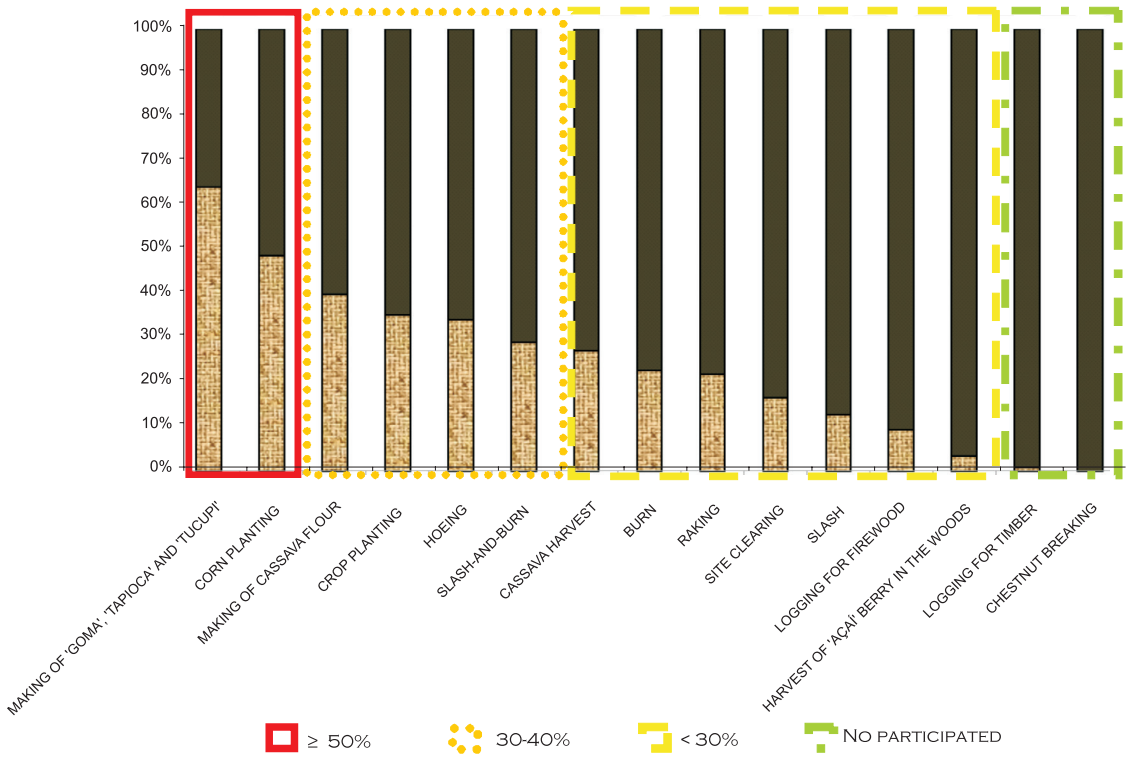


Figure 8 - Agricultural Activities and Gender-Based Labor Sharing in the thirteen communities of Mamirauá and Amanã SDR.

For data analysis purposes, the activities were divided into four groups: i) those where women account for 50% or more of the labor in the activities; ii) those where women account for 30% to 40% of labor; iii) those where women account for up to 30% of the labor; and iv) those activities in which women do not participate or barely participate in productive activities, which are performed primarily by men.

It was identified, i.e., that the women, with the help of their daughters and younger sons, hold the primary responsibility for food production mainly focused on their own consumption (³ 50%) through the activities of processing 'goma', 'tapioca' and 'tucupi' and corn planting.

Likewise, women from the two reserves are responsible for taking care of the home, for their children's education, for raising small animals and, not less important, for many important farming activities.

For a farming surplus (mainly flour) to be generated by household unit, it takes intensive labor and that members can exert moderate physical effort (for making flour, weeding and planting). For this activity, a quite intensive female participation (between 30% and 40%) was observed, although lower than the male participation. The activities related to preparing, harvesting and maintaining the crops are systematically shared by both genders, always in accordance with the culture and tradition of the local community.

As for those activities that require greater physical effort (burning, felling, harvesting) or involve an unaccompanied trip to forest areas or sites (for hoeing, harvesting 'açaí', chestnut breaking) and those directly related to obtaining the family income tend to be performed mainly by men.

In the communities studied hereby, men and women have the knowledge of the production process in the countryside, from the land preparation techniques, the planting calendar, production processing, outflow strategies, and means for natural control of insects, even if such jobs are shared.

The results regarding labor sharing in those activities that make up the riverside-dwelling lifestyle demonstrate that these are shared according to biological rationale, although there are exceptions as to production skills, with cases in which the women harvest 'açaí' and break chestnuts, i.e., thus confirming the thesis that the verification of any gender-based labor sharing system shows that it is culturally determined and not only on the basis of a biological rationale (Laraia, 2001).

CONCLUSIONS

The study showed that farming production policy in the communities studied hereby is both for family consumption and for selling, the latter being more representative in upland-dwelling communities. It also shows that regardless of the nutritional value of food consumed, the families, with representative participation of women, decide what will be planted, and out of that amount, how much will be spared for consumption by the family.

Women contribute to food sovereignty by increasing the quality of the diet with the production of cassava products such as cake, 'tapioca', 'tucupi', 'pé-de-moleque', and those harvested in their backyards and/or at sites close to their houses, such as cassava, peach-palm, corn, etc.In this case, women play an important role in the reproduction of their families by performing duties as an educator and activities related to family maintenance, and are broadly engaged in the production processes of processing and marketing food and other non-agricultural products.

Therefore, one comes to the conclusion that the work performed by women contributes significantly to the food sovereignty of the domestic units of the Mamirauá and Amanã SDRs, since they, with the help of sons and daughters, hold the primary responsibility for providing the food that will be produced in the farms and consumed by the family.

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