DAMS CONSEQUENCES TO DRY FORESTS: A MONITORING FOR THE MAIN SPECIES

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INTRODUÇÃO

At least 45.000 dams above 15m high obstruct sixty of fresh water that flows to the oceans (NILSSON *et al*., 2005), and several problems are actually know. However the artificial lake created by impoundment interfere on terrestrial organisms too, mainly on the vegetation of mountains, and then distant from water sources. These environments became near the lakeshore margin created by dams, and consequences are difficult to prevent.

OBJETIVOS

The main objective of this work was, monitoring the more important species of two seasonal forests that suffer a hydroelectric dam impacts to answers follow questions: 1) Which were the species best adapted to new conditions imposed by the dam? 2) Which were negatively affected?

MATERIAL E MÉTODOS

This study was conducted in two dry forest (18°47´40”S, 48°08’57”W, 18°40’31’’ S, 42°24’30’’ W and 18°39’13’’ S, 48°25’04 W) located in the Amador Aguiar Complex Dam. After damming, the two forests, before distant at least 200m from any water source, now has the riverbed on its edge. The dam water flux is constant and then the water flux not varies over seasons and over years. The first inventory was considered the T0 period and was made before damming, followed by the second (T2 – two years after damming) and third inventory (T4 – four years after damming). In each forest were marked 60 permanent plots of 20 x 10m totalizing 1.2 ha in each area. All trees with diameter at breast height (DBH) of 4.77cm were tagged with aluminum labels. The diameter of the stem was measured at 1.30m from the ground. Based on these inventories, we cataloged the most important species changes, comparing their number of individuals, basal area and overall net change (sums of number of individuals and basal area divided by two).

RESULTADOS

Some changes occurred to more important species in individuals in four years of dam construction. In both deciduous forest, Myracrodruon urundeuva was one of the most important species with 504, however in T4, due to high mortality, lost many trees in the community and in T4 had only 396 trees, a reduction of 21%. The same occurred with Casearia rupestris, Guazuma ulmifolia and Aloysia virgata, which lost many trees too (reduction of 18%, 12% and 42% respectively). Otherwise Anadenanthera colubrina and Piptadenia gonoacantha, which in T0 had 209 and 71 individuals, increase their number in these four years to 280 and 99 (increase of 33% and 39%). Although most species lost basal area due to high mortality, to both deciduous forests the vast majority species showed an extremely high increment (gain in basal area) surpassing the lost by mortality). Anadenanthera colubrina was the species with the higher gain in basal area after four years (5.38m2 to 8.11m2) but many other species (as Inga sessilis, Piptadenia gonoacantha, Platypodium elegans) presents an increment in basal area superior than 20%. Even species with high mortality enhanced their basal area, such as Myracrodruon urundeuva and Guazuma ulmifolia. This the balance in basal area total was positive.

DISCUSSÃO

Water proximity kills many trees of some important species in deciduous forests analyzed (Myracrodruon urundeuva, Guazuma ulmifolia and Casearia rupestris) but other species rise their number of individuals. Many tropical studies in no disturbed sites suggest few changes on species density and turnover (CHAZDON *et al*., 2007), suggesting that stable environments has more recruitment and mortality from most dense species. However, an imbalance after damming occurred, with some species presented high recruitment and low mortality, consequently they had a great positive change, against species highly negatively affected, with high mortality and low recruitment. Even little soil moisture change may induce vegetation changes (NILSSON; SVEDMARK, 2002) then water soil increase cause different responses on species. On one hand, water could kill roots by oxygen stress and consequently anoxia (WHITE, 2007), on the other hand can broke intense seasonal dry period enhance plant growth. Without disturbances, more abundant species tend to had more mortality, but more recruitment too (HUBBELL *et al*., 1990). However, these species recruitment were very low in our study, thereby the individuals negative net change occur due these two factors: high mortality, probably by drowning, and low recruitment. Despite of species changes, the most impressive change was species increment (growth) and consequent gain in basal area. Even species with high mortality obtained positive basal area balance in the four years of impoundment due high trees increment. Otherwise, many species show high increment leading to thick woods on the communities, strongly influencing the forests basal area enlargement. The high species basal area rise on deciduous dry forest occurred probably by the new watershed imposed by the dam construction. This environment has a marked seasonal climate, and the new water access broke the limitation of water in the dry period of the year.

CONCLUSÃO

We conclude that forest is reorganize their structure, species establishment and total basal area supported and damming new condition will change these forests for several years, leading to a different kind of forest. These changes were severe on deciduous forest, because soil are dry, and then, a rise in soil moisture caused a lot of changes.

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