

ENVIRONMENTAL DEGRADATION IN THE MINEIRO SEMIARID: A WAY FOR DESERTIFICATION?

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INTRODUCTION

The State of Minas Gerais, given to its large territorial extension, presents a variety of natural and cultural landscapes. Its north portion is a region composed of eighty-nine municipal districts, comprising a territorial area of 127,532 km² (21.89% of the State of Minas Gerais), where about 1,472,767 inhabitants live (2000). Characterized by the predominance of semi-humid tropical climate, with rains concentrated in the summer and original vegetative covering of savanna and scrubland, that region is acknowledged by the low socioeconomic indicators it presents. Owing to its climatic characteristics, it has been included in the actuation area of the Agência Desenvolvimento do Nordeste (ADENE), agency that replaced the Superintendência de Desenvolvimento do Nordeste (SUDENE).

In Northern Minas there is strong evidence of environmental degradation associated with forms of disordered exploitation of natural resources, especially in the areas of greater aridity. The intensive anthropic activity whether in terms of deforestation aiming at charcoal business or burnings and forestation with exotic species or the incorrect use of lands for agricultural practice have provoked different levels of accelerated erosion, silting up of rivers and streams, drying up of soil, reduction in the flow of rivers or even their intermittence, problems that reflect, in a significant way, upon the quality of life standards of the regional population, historically characterized by poverty.

It is in this context that the present study, by presenting a more detailed analysis of the environmental situation of certain areas of that region, represents an important subsidy for the planning of the use of that space. With that purpose, the municipal districts of Francisco Sá, Espinosa and Montalvânia, located in Northern Minas Gerais, and Araçuaí, in the Vale do Jequitinhonha, have been selected, areas identified as the most susceptible to desertification according to studies carried out by Boaventura (1983) and reports from technicians of agencies such as Companhia de Desenvolvimento do Vale do São Francisco e Vale do

Parnaíba (Codevasf), Empresa de Assistência Técnica e Extensão Rural do Estado de Minas Gerais (Emater), as well as from rural producers, among others.

Environmental degradation and desertification: a causal relation?

Desertification is a phenomenon of serious socio-environmental consequences to several populations of the world. Nevertheless, it is little studied and difficult to conceptualize, even in the scientific circles. It is necessary, therefore, to start a study on the issue, analyze its concepts and distinguish them from phenomena like drought, deserting, *areização*, or even from deserts.

The term desertification has already been used to designate the expansion process of deserts, that in its turn, notoriously suffers anthropic intervention. Another phenomenon which requires differentiation from desertification is deserting. The term deserting is used to address the socioeconomic phenomena of increasing abandon of a territory, province or region, by the population who lives in it, yielding as a result low demographic densities. It is noticed that, in spite of having the same origin, deserting differs from desert even as ecosystem, bearing the meaning of region abandoned by whatever reason, be it social, economic or political regardless of the region considered having or not arid, semiarid or dry sub-humid climate.

Areização, in its turn, is characterized by the reworking of sandstone deposits, deriving from paleoclimates, by the current climate, being the phenomenon intensified by anthropic action. In the Brazilian case, the processes of *areização* occur in the Campanha Gaúcha region, in Southeastern Rio Grande do Sul, according to Suertegaray's studies (1989). In those areas, the sandy soils with low structural stability existing in slightly crispy topography lands with fragile vegetative covering, present high susceptibility to hydric erosion. Associated with those characteristics, the excessive pasturing and preparation of the soil for agriculture are anthropic factors which accelerate that process.

Nonetheless the drought phenomenon consists

of a constant deficiency of rainfalls, which affects large zones of certain region, and translates itself in a period of a rather prolonged dry climate so that the shortage of water gives place to an acute hydric imbalance. (UNO, 1997)

In spite of being a serious aggravation, the drought alone should not be considered responsible for the underdevelopment of a region. This has as main causes socioeconomic

issues closely related to political decisions. However, there is a relationship between that phenomenon and desertification, since the droughts, many times, end up by masking the desertification impacts by preventing, through its cyclic and brutal rupture of the agricultural productivity, the farmers from noticing the small and constant drop in productivity that follows it.

Regarding desertification, there is a great controversy among researchers due both to the complexity of the phenomenon and the difficulties in studying it. Used in late 1940's to characterize the areas in an accelerated degradation degree, resembling deserts or desert expansion areas, the term desertification had a generalized use. In the following years, several studies have discussed that problematic without, however, reaching a consensus on its real meaning. The polemic around the causes of that phenomenon, whether climatic or resulting from human activities, has remained for many years.

According to Nimer (1988), an important fact in the conceptual evolution of desertification has been the acknowledgment, even before the Nairobi Conference, that that process does not occur only in areas marginal to deserts, but it is "liable to occur in any tropical, subtropical and temperate region in areas of semiarid and sub-humid climate, regardless of the climatic changes".

Several are the conceptions of desertification currently in use. According to Vasconcelos Sobrinho (1978)

desertification is a process of fragility of the dry lands' ecosystems in general, which owing to the pressure exerted by human populations, or sometimes by the autochthon fauna, lose their productivity and capacity to recover.

Similar definition is given by the UNEP (1984) apud Nimer, (1986:17) that considers desertification as an "environmental drying out produced by the impact resulting from anthropic activities which cause the degradation of once-productive lands".

Conti (1994) considers desertification as being "the progressive loss of the ecosystems' productivity, affecting very expressive portions of the sub-humid and semiarid domains in every hot region of the world".

The UNO (1997) has defined desertification as "land degradation in the arid, semiarid and dry sub-humid zones resulting from diverse factors such as climatic variations and human activities". By land degradation it is understood the degradation of soils and hydric resources,

the degradation of vegetation and biodiversity and the decrease in the quality of life of the population affected.

Environmental degradation in the mineiro semiarid: a case study

Diverse factors make certain areas subject to different probabilities and environmental degradation levels. In this sense, the association between the physiographic characteristics and the forms of appropriation of natural resources is fundamental in the comprehension of the degradation picture presently found in the municipal districts researched.

The integration of data and information obtained in field visitation and the analysis of satellite images has allowed the drawing of maps of land use, in which the following were identified: woods, mata galeria, agriculture/pasture, irrigated cultivation, reforestation, burning, exposed soil and urban area. In the municipal districts studied the bottom of valleys and slopes are generally used for subsistence agriculture practice, being very common the occupation of riversides where the soils are more fertile. Burning, as a way to clear the soil, is still rather used in agriculture as well as in the formation of pastures. The association of edaphoclimatic characteristics with an incipient vegetative covering makes the lands even more susceptible to erosion, one of the most serious problems detected in this study. Deforestation, burnings and mining have already provoked an intense degradation of the native vegetative covering, mainly on the tops of the hills or in slope areas, areas of greater environmental fragility. The soils presenting little depth, low fertility and great hydric deficiency, have become more and more susceptible to the erosive processes, noticeably those related to the seasonal regimen of torrential rains.

From the analysis of the maps generated and field observations, it was possible to find similar results in all the municipal districts, which demonstrate that the disordered anthropic action whether to exploit environmental resources, or to open new cultivation lands, has provided great imbalance in the region's original landscape. The savannas that once covered the plains, important reload areas, have been replaced by eucalyptus forestation and pastures, being at a stage of difficult regeneration. It has already been confirmed in several studies that deforestation interrupts evapotranspiration and makes the percolation of water in the soils difficult, altering the hydrologic cycle. With the removal of the vegetative covering, the water, without physical hindrance, will flow off directly to the riverbeds, which after the rains can suffer fast and overpowering floods, when the sediment load, including organic matter and the horizon 'A' will be carried over. What will happen is that, from a slow and progressive hydric loss through evapotranspiration which allowed the environment to keep a good part of its

humidity, the system will start to experience a violent loss in its retention capacity becoming drier. With regard to the consequences of deforestation in the norte-mineiros savanna, Dayrell (1993:12) considers that

annually, about 17,5 billions of cubic meters of water fail to naturally infiltrate in the soils owing to the decrease in the vegetative covering, determining the minimization of the ground water and compromising the regional hydric resources supply . The hydrographic basin of the norte-mineiro territory, composed of 1,138 water courses, had in 1990, 558 of those courses completely dry due to the decrease in the retention capacity of the ground water.

That author's remarks allow assessing the magnitude of the physical and social impacts resulting from indiscriminate deforestation. It is important to further stress that there is a close relation between deforestations and the intensification of the erosive processes.

In the region studied, the erosion provoked by man seems now to be one of the greatest risks for the conservation of a rather fragile soil. The erosion determined by meteorization is generally accelerated by agricultural activities and pasturing, affecting more the sloping lands. The lack of economic resources and technical knowledge to develop procedures that prevent the erosion from happening and induce the rational use of the soil makes conservation difficult. According to Pérez (2001) "La erosión es la enfermedad de la tierra, la desertificación es su muerte". Indeed, in Northern and Northeastern Minas this phenomenon is turning itself into a manifestation of general deterioration of the savanna biome which becomes evident through the decrease in and, most of the times, through the disappearance of the biotic potential.

Among the consequences resulting from the erosive processes, the following stand out: alteration in the soil structure and its constant loss of fertility, formation of surface flow-off canals, slow decrease in soil depth, which by leading to the disappearance of vegetation prevents the water from infiltrating into the deepest layers, flowing off through the surface and accentuating the erosion; disappearance of ground water by hindering the infiltration of water, increase in intermittent rivers, loss of water retention capacity by the soil, silting up of rivers due to the excessive sediment load they receive and that affect the living things, formation of sediment banks which hinder navigation and contribute to the occurrence of marginal floods during the rain season, decrease in the water outflow, among others.

It is important to stress that environmental degradation not only expresses itself through the soil sensitivity to erosion, but, chiefly, through the use imposed on it. The practice of farming and cattle raising, that does not respect the ecosystem limitations, has contributed to the loss of soils and, consequently, to the increase in the seasonal migration which has become common in that region. The drying out of rivers and streams is another consequence of the association of predatory anthropic action with a fragile ecosystem and which has a close relation to the socioeconomic situation of the regional population.

The degradation of the norte-mineiras lands has caused serious economic problems. This fact can be found mainly in the farming and cattle raising sector. The inadequate forms of handling the lands through the deforestation of the savannas for farming and cattle raising practice, or charcoal business and forestation with pinus and eucalyptus, have been provoking the soil degradation and the loss of biodiversity.

Among the municipal districts researched, the one which presents the greatest environmental degradation stage is Aracuaí, where reduced areas with vegetative covering is found as well as the nearly inexistence of mata galeria along the rivers which drain the municipal territory. This fact is worrying when the environment's aridity is taken into account, what contributes to the gradual impoverishment of the exposed soil. At an intermediate degradation stage we find the municipal districts of Espinosa and Francisco Sá, which still have significant vegetative covering on the tops of the highest areas. It does not mean that those municipal districts have satisfactory environmental conditions or that they are not at risk, bearing in mind the predominant edaphoclimatic characteristics. Montalvânia still presents a relatively preserved area in its Southern portion. However, the swampy plains existing along the Cochá River run the risk of extinction.

FINAL CONSIDERATIONS

The consolidation of the concept of desertification as land degradation in the arid, semiarid and dry sub-humid regions, resulting from several factors, among them climatic variations and human activities, allows addressing the environmental degradation problems in Northern and Northeastern Minas within that perspective.

There is a great environmental variability in the regions researched, which present extremely fragile environments, susceptible to degradation. Nevertheless, it is still not possible to speak of the occurrence of desertification in Northern and Northeastern Minas, but of an accelerated degree of environmental degradation which can lead, in the medium and

long term, to that process, in certain areas. Even though the characterization of properly desertic areas is not evident, potentially susceptible areas are found, owing to the edapho-environmental conditions being restrictive to appropriation of natural resources.

The process of appropriation of natural resources in the municipal districts of Francisco Sá, Araçuaí, Espinosa and Montavânia, as in the whole Northern and Northeastern Minas, has occurred without obeying a planning or environmental zoning which would define the possibilities and limitations of the ecosystems. The most expressive results of this situation materialize in the silting up and drying out of rives, deforestation, intensification of erosive processes and, from a socioeconomic view, in the increase in the country/city migration.

It was found, in the area in study, a complex integration among several factors which induce a depredation of natural resources with rather significant social damages, among which we can mention: loss of productive capacity of the family units, increase in migrations and decrease in the quality of life. It is also noticed that the life condition of the population demonstrates a state of poverty. That environmental degradation situation has as its main causes the inadequate use of the soil and immediate regional development models.

In this sense, it is noticed that the areas visited are an integrant part of a fragile ecosystem, where the forms of exploitation of natural resources have resulted in some environmental damages such as silting up, foci of linear erosion (ravines and voçorocas), shortage of hydric resources, loss of native flora and fauna, increase in the loss of quality of life of the population, among others.

The reversal or minimization of that picture demands that defined policies and strategies for conserving the ecosystems through the participation of the public power, the scientific community, NGOs, private enterprises as well as the organized civil society. It means that the way of exploitation of natural resources should take into account the support capacity of the predominant ecosystems.