STUDY OF GREAT EROSIONS: A PROPOSAL OF METHODOLOGY

Raifran Abidimar de Castro – UEMA/CESI – raifrandecastro@bol.com.br
Luiz Carlos Araújo dos Santos UEMA/CESI – delcineide@yahoo.com.br

INTRODUCTION

The erosions, are urban or agricultural they, have much time worry the urban and agricultural population, the public power and the particular companies. This concern has stimulated the studies on this partner-ambient problem. Guodie (1990 apud Guerra e Mendonça,.2004, p. 228) "they affirm that the erosion of ground is the main and more serious impact caused for the action human being on the environment. Impacts these that can enclose since the loss of patrimony until problems of ambient degradation and losses of lives human beings."

Guerra & Cunha (2003, p.337), they affirm that: "In the reality, so that the problem can be understood of global form, integrated, holistic, it must be taken in account the existing relations between the ambient degradation and the causing society from that, at the same time, it suffers the effect and it looks for to decide, it recoups and it reconstitutes the degraded areas". Therefore one of the urban problems that more contribute for the growth of erosions is the occupation of inadequate areas.

As it is known first attitude that must be had for a necessary study of erosions is to analyze the erosive processes that act in the same one. On this subject, Guerra & Mendonça (2004, p. 229) they affirm that: "Some factors are the ones that intervene on the erosive processes: kinetic energy of the water of rains, chemical and physical properties of ground, forms and declivity of the hillsides, vegetal covering and handling of the ground ".

Another necessary step is the mapping of the same one. In the study of erosions some thematic maps and letters must be produced. On this subject Guerra & Cunha (1998, p. 212) they teach that "the advance of techniques that use the geoprocessing and the remote sensing, as well as the integration of these data through the of Geographic Information System (GIS's), also has made possible a great advance in the studies that involve erosions". Valério Filho (1994 apud Silva, Schulz & Camargo, 2004, p. 28) in they teach them that: "a GIS's is destined to act it as an efficient tool of planning in all the applications that make use of maps.

Therefore, all the activities that involve the collection of data on the terrestrial surface can be benefited by a system of this nature ".

It is for these reasons that were decided to elaborate a work with the main objective to divulge to the interested parties in the study of erosions a form of use of GIS's in the study of erosions, mainly erosions of great transport, erosions these that already can be found in almost all domestic territory, and that, had its great dimensions they make it difficult a complete analysis of the operating processes in these.

For practical analysis of this proposal of methodology, the study it was applied in an erosion of bairo Jacu, in the city of Açailândia - MA, city this already sufficiently known by its great amount of urban erosions.

The ground of the region of Açailândia has low natural fertility, with high aluminum texts and great amount of water. The geologic sketch is characterized by arenaceous sediments of the Pleistocene and argillaceous, arenaceous sediments and gravels (IBGE 2002). The geomorphology characterizes for pediplonadas surfaces and Pré-cambrianas rocks, with retaken of recent erosion, areas conserved and re-covered well by unfastened superficial deposits, dissecado in ravines and erosive tabular surface. The main characteristics of the ground are: Latossolo yellow and Latossolo red-yellow, Dystrophic, with argillaceous texture; concressionaires; indiscriminate characteristic (GERPLAN – MA, 2002).

In accordance with Guerra, Coelho & Marçal (1998, p.138), "in Açailândia, the erosion risk is associated with the irregular topography, to the geologic composition of formation sedimentary, to intent rains of winter, the deepening of the canals opened for the sewer the open sky and to the inadequate orientation of the cuts of the streets".

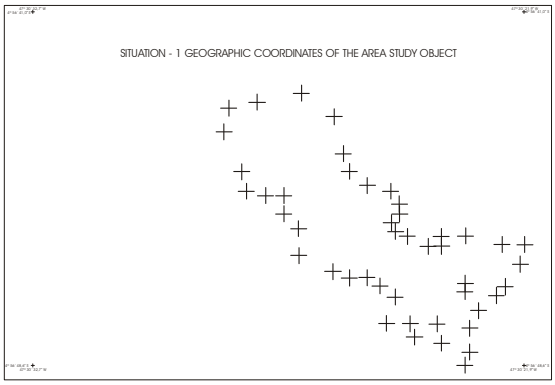
METHODOLOGY

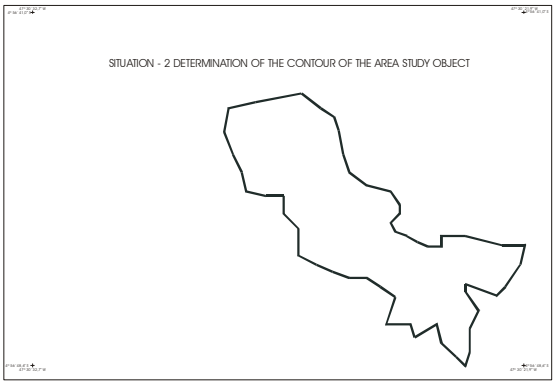
One arose a bibliography specialized in erosions, erosive processes and mechanisms and Systems of Geographic Information. Without followed, the field for study of the area became some visits where if it locates the erosion. During these studies one collected the coordinates in all the passage of the erosion for the elaboration of the thematic letters and became analyses of the operating erosive processes in the growth of the erosion, as well as

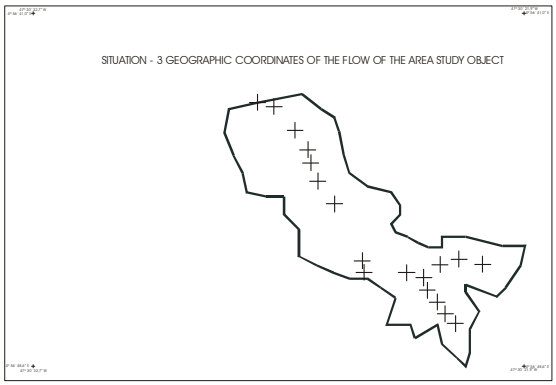
interpretation of its dynamics. In the field studies, a photographic documentation for interpretation of photos of the sectors of the erosion was collected where determined erosive processes they act.

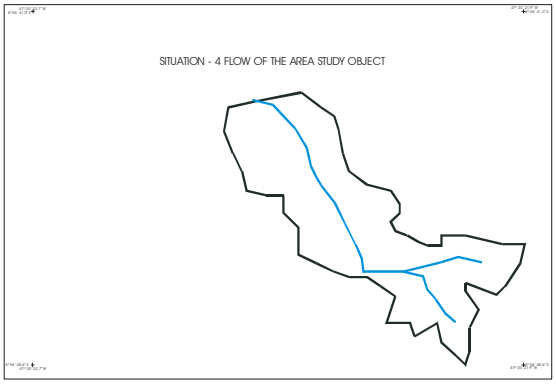
After made all the field works, were broken for the cabinet analyses where a detailed analysis of the photographic documentation became collected. Later this analysis elaborated letter of the erosion with the use of the collected coordinates and software Springer 4.0. Concluded the letter, one initiated the studies of division of the erosion in point strategically.

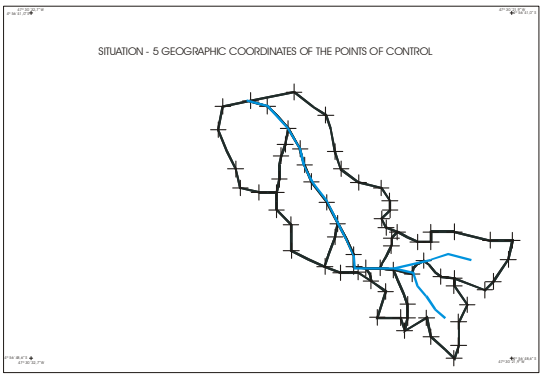
For the division in strategically points one was overcome as main criteria the operating erosive processes in the erosion, its characteristics and its disposal in the same one, as well as the extension of the same ones. As source base of the division it was used letter of the general vision and to complement the same one, was collected the coordinates of the main water flow of the interior of the erosion, for use of the same one as control point therefore was observed that the same it has great influence in the growth of the erosion and for evidencing to little variation of its position in the interior of the same one. Finished this second letter, initiated the studies of localization of the erosive processes, conjugating the comments of field, the photographic documentation and the second produced letter. To leaving of this third phase mounted one fourth letter distinguishing itself each point through a legend. This last letter was produced with the aid of software Corel Draw. The sequence can be observed to follow:

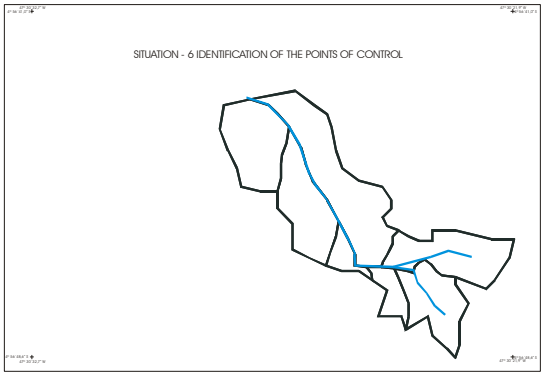


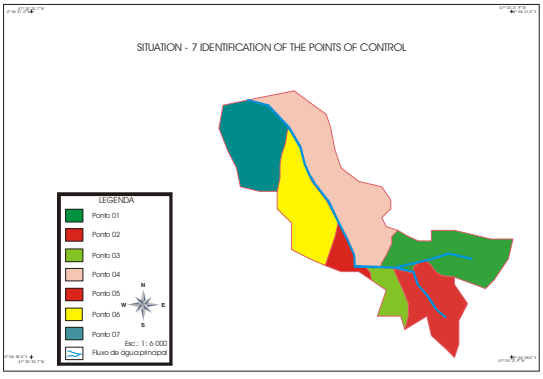


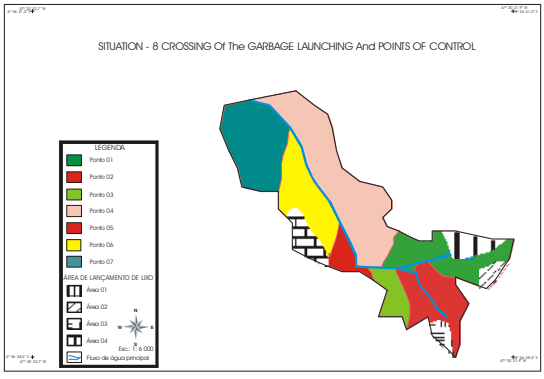












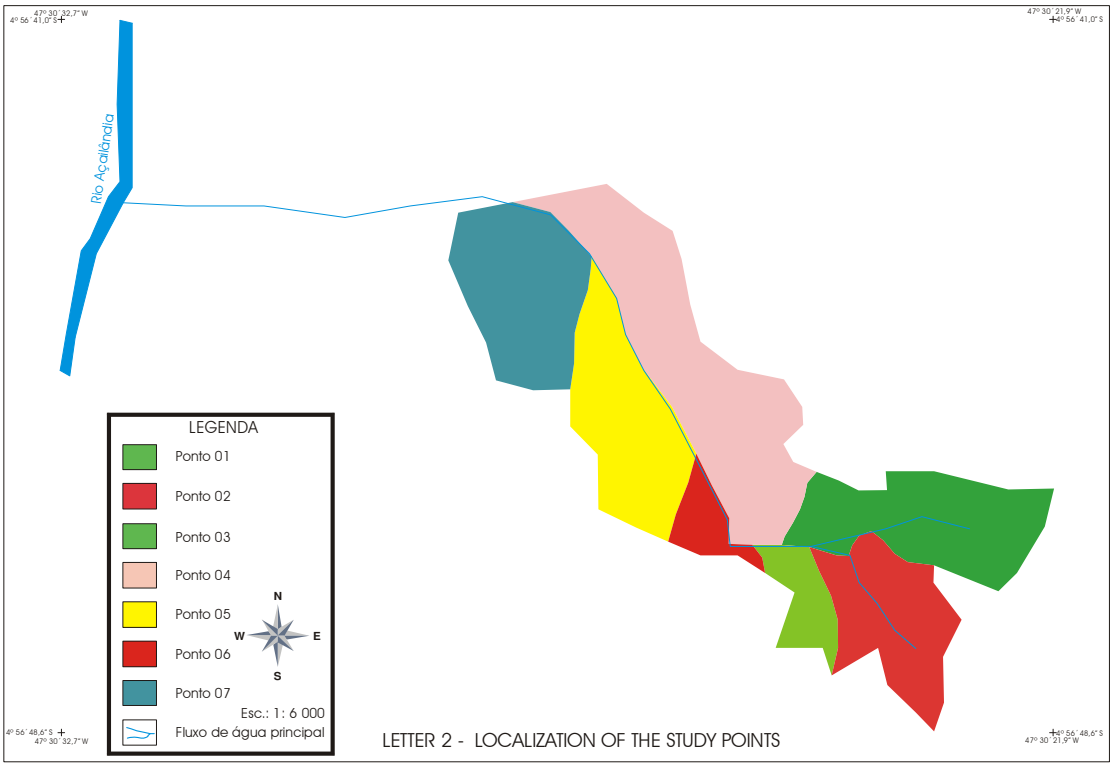
Erosive interpretation of the processes and mechanisms:

During the visits of field and with the bibliographical survey, with prominence it stops Oliveira (1999), Guerra & Cunha (1998), and Guerra & Mendonça (2004) it evidenced that the mechanisms and processes that more influence in the growth of the erosion in study, are:

- Collapses of slope base;
- Net of ravinas;
- Ravinas formed in the surfaces of the walls of erosion (vertical half lines);
- Particle transport of the ground for the diffuse or concentrated superficial draining.

Better to understand the effect of the erosive processes, one divided the same ones in seven points, as it shows the letter to follow, later follows commentary on each one.

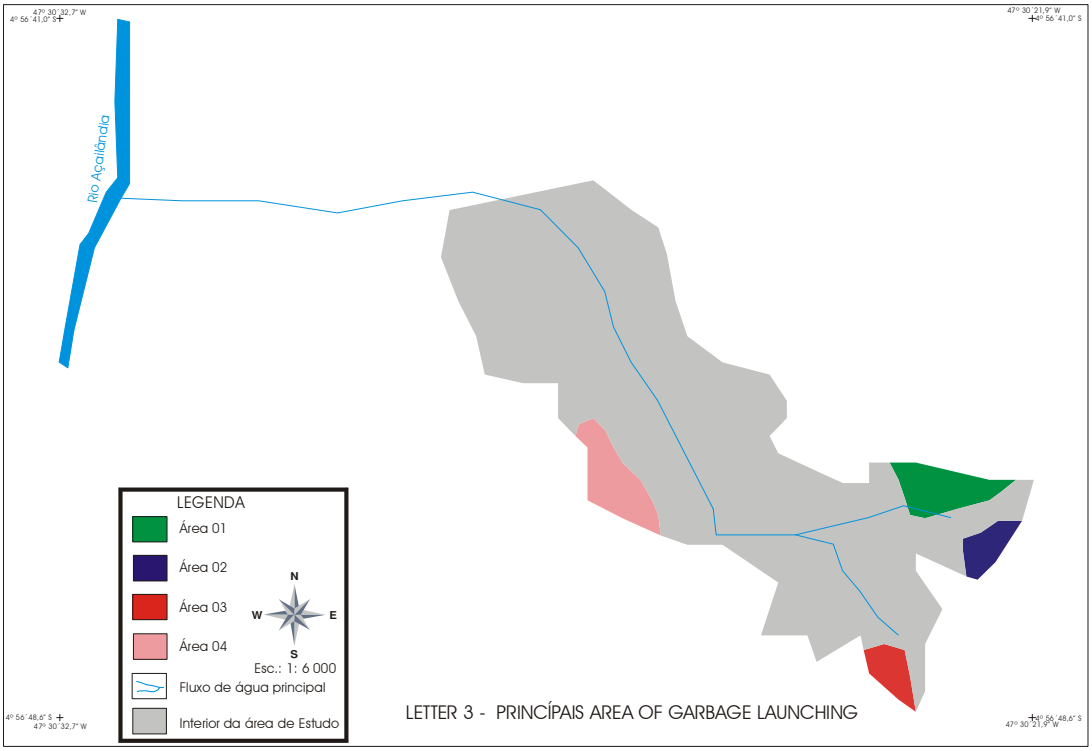
Letter of Division in Strategically Points:



LETTER 2 - LOCALIZATION OF THE STUDY POINTS

Point 01

In this point great area re-covered for garbage is had domesticates, causing upheaval to the inhabitants next, this is launched in two areas Southeastern where it finishes street JK and in the end of the street Pedro Álvares Cabral.(Letter of garbage Launching)



LETTER 3 - PRINCÍPAIS AREA OF GARBAGE LAUNCHING

The east of this point more necessarily between the coordinates: Longitudes 47º 30' 22.0 "- 47º 30' 22.5" W and Latitudes 04º 56' 46.10 "- 04º 56' 46,1" S, verified the occurrence landslides of the bases of slopes caused for water concentrated flows of rain, for vertical half lines and residential sewers.

The occurrence of ravina excavated for concentrated superficial waters (pluvial) in the headboard of the erosion, with 4,43 dimensions of m of length for 1,94 m and 2,12 m of width of superior surface and base respectively for 1,10 m of height. In this point slopes with heights are found varying between 4 and 9,5 meters.

Point 02

Garbage launching meets in this point, however, less frequent in relation to the point, being the garbage deposited in area 3 (Letter of garbage Launching), more necessarily between the

coordinates: Longitudes 47º 30' 23.5 "- 47º 30' 23.3" W and Latitudes 04º 56 ' 48,5" - 04º 56' 48,7 " S.

In this area of the erosion the landslide of base of slopes can be observed caused by permanent flows of sewers domiciliary, which arrive at a height of 8,2 m, the sewers have provoked ravina growth.

Point 03

It is distinguished in this point, successive movements of mass caused by the fragile composition of the ground, therefore, this he is composed basically for "wooden dust" launched in the area for the public power (city hall) to contain the erosion, however the same after burnt, becomes agent in this process, aggravated for the absence of vegetal covering. It does not have garbage launching in this area. But it is observed mainly formation of intent pluvial water flow, provoking growth sped up of the length of this part during rains.

It is also noticed, the presence in the part west (geographic coordinates: Longitudes 47º 30' 24.8 "- 47º 30 ' 25,0" W and Latitudes 4º 56 ' 47,2 "- 4º 56'47,8" S of this point to the formation of vertical half lines which are responsible for landslides.

Point 04

This point constitutes of bigger extension of the studied erosion. The main agents of growth of this point are ravinas of small average e transport located in all the extension of the point, detached from the draining net, influenced by small residential flows of sewer.

Other factors of growth are the landslides of the slope base provoked for the torrents that excavate the bases, and for located vertical half lines.

Point 05

This point is formed by two average erosions, which have its growth stimulated for small intent pluvial water flows, and by formed vertical half lines in the walls.

Point 06

This point is formed by an erosion of average transport, its growth is instigated by a flow of permanent sewer and vertical half lines the east of this erosion, also formed for an area that has its growth influenced solely for the formations of vertical half lines. Garbage launching is also observed.(Letter of garbage Launching)

Point 07

This point is characterized by great net of ravinas and its 27 dimensions are m of superior width, 52 m of width in its base and 38 length m. In some points, the ravinas if connect forming small erosions, what it has contributed for growth fastest e a greater drags of particles of the ground.

CONCLUSIONS:

When observing the results previously displayed we can observe that this methodology of division of great erosions in strategically points can very contribute for a general and specific understanding of the processes and operating erosive mechanisms in the erosions, are urban or agricultural they. Its main contribution says respect to the biggest dynamism that the same one can bring for the study of this problem, therefore not only makes possible the study of an erosion in a general vision, but also with a vision of points that they can have common or total different erosive processes, making possible a search of more efficient solutions for each strategically point and its influences in the other points.

One expects that this presented study it comes to contribute so that it has an improvement in the study of great erosions, thus contributing for the reduction of serious accidents that come occurring due the lack of research in the area of erosive processes, and due to in the implantation of the few research that still is effected.

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