

## **CARTOGRAPHY, TEACH AND LANDSCAPE**

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### **ABSTRACT**

This study's main purpose is the construction of cartographic products intending to represent the landscape's evolution in the area where the campus of the Universidade Estadual de Maringá – UEM (in the State of Paraná, Brazil) is situated. We have considered the 50's and 60's, the period that anteceded the building of the campus, and also the 80's and 90's, already with its installation. The base map was elaborated using as a reference the topographic map of the city hall of Maringá in the scale 1:5000, and the university campus' draft (physical occupation) in the scale 1:2500. The vegetal coverage's maps from the 50's, 60's, 80's and 90's were made using photo interpretation and basing in the graphic semiology, and also techniques of geoprocessing with the application of the software AutoCad-R14. The thematic maps' analysis helped in the study of the landscape dynamics, which made evident conexions among different elements those compose the environment. We also noticed that the native forest retirement was associated to the agricultural expansion, and the native forest extinction, to the building of the campus. Therefore, the studies showed that the main cause for the landscape evolution was related to the anthropological action. The elaboration of the different cartographic products did with that that work presented a face returned to the applied research. However, it is possible to extract another face of the same, that returns to the teaching. That happens because the researched area constitutes the environment where students go around, and when they observe and represent the atmosphere in which they circulate, they can project that practice in the exercise of their profession. Considering the nonexistence of studies with bases essentially cartographic pertinent to the UEM's campus, it was used, the cartography to transmit to the society (in a special way to the university community and the Center of Pedagogic Application - CAP) questions about the landscape dynamics and the changes registered in the last decades. Thus, the vegetable coverage of that area was reconstituted starting since the 50's with some parts still of native forest, passing to the prevalence of coffee, arriving to the building of the campus, with larger introduction of exotic plants, coming, in that way, the evolution of this landscape.

### **INTRODUCTION**

Since the beginning of the century and more strongly after the decade of 50, the northeast of the State of Paraná has been presenting intense modifications, in the rural area as well as in the urban area. In a first moment, the native forest was substituted by the culture of coffee; in the same time were founded the urban agglomerates; in a second

moment, the culture of coffee was changed by the temporary cultures with the appearance of new urban agglomerates, besides the expansion of those already existent. In this sense, the present paper seeks the study of the evolution of the vegetable coverage of the UEM's campus, once this is inserted in the urban context of Maringá, using bases essentially cartographic and photogrametric documents those defined the temporary cutting of the 50's, 60's, 80's and 90's.

Therefore, to analyze the facts that configure a dynamic process of the scenic picture of that area is one of the objectives delineated in this research, in agreement with Bertrand (1971), when he defines:

"The landscape is not the simple addition of discharged geographical elements. It is, in a certain portion of the space, the result of the dynamic, therefore unstable combination of physical, biological and anthropological elements those, reacting in dialectic with each other, make the landscape to become an unique and indispensable group in perpetual evolution".

Thus, this work seeks to search, to analyze and to understand the dynamics of the combinations among the physical, biological and anthropological elements of the area in research, showing especially the vegetable coverage. This study, in a regional scale level, also presents new practices for the teaching, since it induces to the observation and graphic representation of the environment where the academics go around, making possible even to project this exercise in the ambit of these professions.

## **AREA'S LOCATION**

UEM's campus, the area choosed for this research, is located in the north region of Maringá and cut by the parallel 23° 25' S and by the meridian 51° 57' W, according to the illustration 01.

## **DEVELOPMENT (MATERIALS AND METHODOLOGICAL PROCEDURES)**

The base map was elaborated using as a reference the topographic map of the city hall of Maringá with 1:5000 scale, and the university campus' draft (physical occupation) in the scale 1:5000, with equidistance in the contour line of 5 meters and the draft of the university campus' draft (physical occupation) in the scale 1:2500. A clinographic map of the campus was also elaborated starting from the method developed by De Biasi (1970). The vegetal coverage's maps from the 50's, 60's, 80's and 90's were made using photo interpretation of the field activities and of the resources of the applied informatic. To rescue the existent vegetal coverage in the 50's, 60's, 80's and 90's, were used the photos respectively of: 1951-52, with scale 1:25000; 1962-63, with scale 1:70000; 1980, with scale 1:250; 1995, with scale 1:8000.

The construction of the cartographic products required yet techniques of geoprocessing for which the software AutoCad-R14 was used.

Tending in view the application of the cartography in this study, we may not consider only the techniques adopted for the elaboration of the maps, but also its methodology. According to Queiroz (1994), *the maps are considered vehicles in the process of cartographic communication. Thus, to execute its communication function in*

plenitude, they should be expressive, readable, present symbologies those facilitate the apprehension of the information. So, there was a great concern with the symbology used to represent the features in the thematic maps in subject. The methodology developed by Bertin (1978, 1980, 1988), which is based in the line of the graphic semiology - identifies the order "diversity" and "similarity/diversity" relationships - was taken as a reference. It is important to emphasize that the built maps denoted an order (hierarchization of the anthropological action), that brought on the use of the visual variable "value" applied according to the chorocromatic circle. The procedures taken also took as a reference Sanches' conceiving (1981), when he says:

"The Cartography is a science among the sciences and, at the same time, it is one of the instruments of the sciences that, direct or indirectly, worries about space distributions. The Cartography can be defined as a science that worries about the studies and the scientific, artistic and technical operations resulted from observations and direct measures or explorations of graphic representations as: drafts, maps, graphs, diagrams and other expression forms, as well as its application".

### Illustration 01

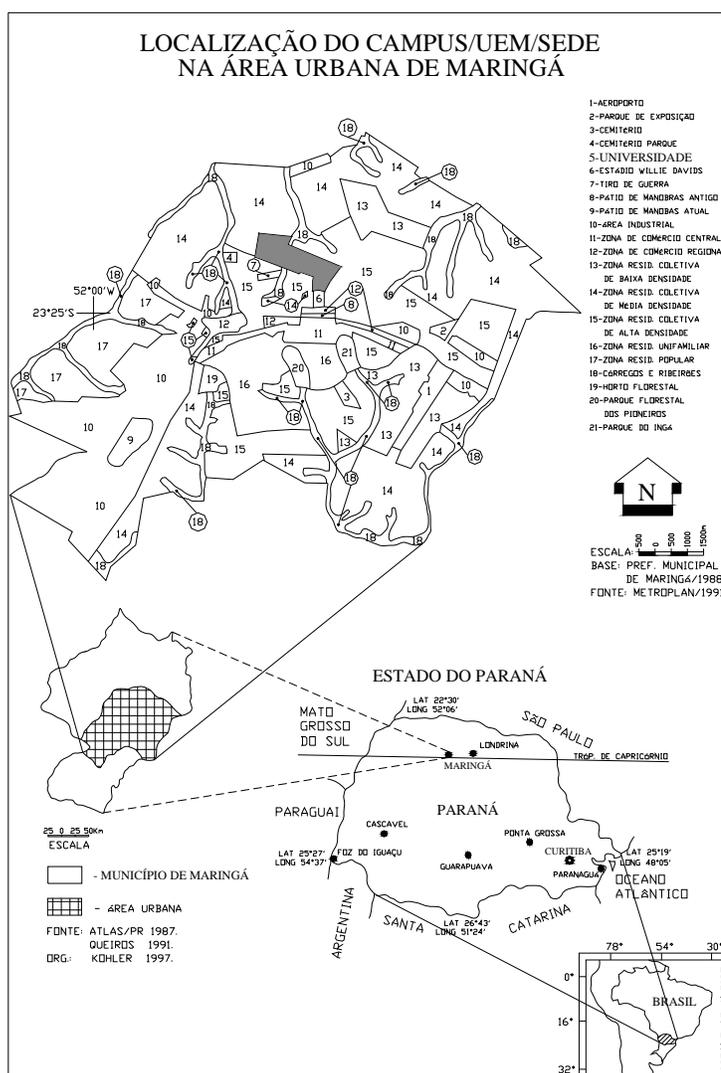


FIGURA 01 - Localização do campus/sede na área urbana de Maringá

## RESULTS AND DISCUSSION

By means of proposed him in this study, elaborated the thematic maps involving the evolution of the vegetable coverage in four different decades were elaborated. For so much, there was the need of the construction of some support maps as "Planealtimetrical Mapa UEM's Campus", "Map of Limits of the UEM's Campus" and "Clinographic Map of the UEM's Campus".

For the elaboration of the vegetation maps of the studied periods, the legend was organized so that the classes were presented in a common way to all them. Due to a pre-consultation in studies as those from INPE (1989) and IBGE (1972), the anthropological action was formed into a hierarchy, starting with the native forest and going until the reforestation. Thus, the legend came with the following classes for all the maps: "native forest", "ciliary forest", "low vegetation with arboreal", "low vegetation with arboreal and exposed soil", "low vegetation", "low vegetation and exposed soil", "cultures with disseminated arboreal", "permanent culture", "reforestation" and "not defined vegetable coverage". Following the methodology of Bertin (1978, 1980, 1988), the variable visual "value" was applied with the use of the green color in different intensities, so that the anthropological action was formed into a hierarchy. The results for every studied decade will be now exposed.

### DECADE OF 50

The map of the decade of 1950 already denotes the influence of the anthropological action in the area. That area presented only 7% of native vegetation, 60% of permanent culture, 18% of low vegetation with arboreal and 7% of cultures with disseminated arboreal. The 8% remaining were distributed among the other classes. This decade can be considered as a transition period among the forest "felling" and the cultures "establishment".

### DECADE OF 60

The map of the decade of 1960 compared to the map of 1950 shows changes in the landscape picture in relation to the element vegetation. The permanent culture expanded approximately 8% in relation to the previous registrations. In the 50's the native forest represented 7% of the vegetable coverage, while in the 60's it was reduced at 1%. The low vegetation and the exposed soil appear with a larger percentage: 11%. The landscape picture was in a new transition phase because areas with exposed soil started to appear. Through the aerial photos it was noticed that the areas around the one of the research also presented great transformations.

In the 60's there was already a concern with the arborization of the city, but the studied area - that would constitute the campus - kept apart of this process. This area belonged to prived properties where coffee was cultivated. With the urban expansion, the area of the UEM's campus interfered in this context, causing a valorization of this and of surrounding areas.

## DECADE OF 80

The map of the decade of 1980 reveals a situation in that the vegetable coverage has been changed in comparison to the previous decades. Just some testimonies of the whole native forest were remained; the permanent culture appears only in some redoubts while the low vegetation and its compositions started to prevail.

The aerial photo of the decade of 80 shows that the UEM's campus was already totally inserted in the urban context. The neighborhoods those grew because of the university also had its modifications through the verticality.

## DECADE OF 90

The map of the decade of 1990 also reveals the intense anthropological action in the landscape picture. That statement was verified through some facts:

- gardenings: when comparing the map of the decade of 90 with the one of the previous decades, an expressive increase of spaces destined to that end was verified;

- buildings: the areas destined to the buildings have presented a progressive increase, especially in the last two decades, following the UEM's pilot plan;

- the coffee, permanent culture verified in the decades of 50 and 60, extended to the right margin of Mandacaru Brook, while in the decade in subject there was a retaking of that cultivation to the brook's left margin. The first cultures were related to the private system, and the most recent articulated, to the teaching and to the researches of the state university system.

- areas of special cultivation - vegetable gardens, vivarium and ecological park: the vegetable gardens are destined to specific ends; they are divided in sectors, assist the creche and the employees of the maintenance, and are also destined to studies developed by the Department of Agronomy. In relation to the vivarium and to the ecological park, they are addressed to the molts plantation for the campus' gardening, intending to become a matrix generator in the future.

## **FINAL CONSIDERATIONS**

In a historical process, Maringá, in a relatively short time - 50 years -, expanded its limits since the "Old Maringá" until its current limits. The UEM's campus, created by decree in 06.11.1969 (Decree/6034), was founded in 28.01.1970. The urban limits were enlarged and the campus was itself inserted in the urban context of Maringá.

Intending to show the evolution of the landscape of the UEM's campus and knowing about the nonexistence of cartographic documents that portray this thematic, it was tried, using the geoprocessing (AutoCad-R14), to elaborate maps and to train teams so that they could be capable to elaborate the maps.

The field and cabinet activities made the integration of the information for the elaboration of the cartographic products possible. With the maps "UEM's Campus - Vegetation in the decades of 50, 60, 80 and 90" it was possible to detach the anthropological action as one of the main agents of the landscape's modification.

It was verified that the studied area in the 50's passed by a transition period between the forest "felling" and the cultures "establishment". The human action was one of

the fundamental factors for the elimination of the exuberant forests those covered in other times the whole area of the research. In the following decade it was noticed the reduction of the native forest for 1% of the total area, increasing even more the permanent culture sections. In the 80's, the vegetable coverage's situation was already changed a lot and presented only some isolated testimonies of native forest remaining, while the permanent culture was limited to some redoubts. The maps of the decades of 80 and 90 showed a landscape picture totally modified in comparison to the decades of 50 and 60's maps. In the studied periods, a fast alteration from a rural to an urban landscape could be verified.

Therefore, the native vegetable coverages' extinction and the agricultural expansion process of the area that corresponds today to the UEM's campus, reflects the nonexistence of the pioneers' environmental conscience, whose main concern was to survive, being induced by a government politics which motivated the total deforestation and inhibited the conservation activities with the lack of an appropriate fiscalization service.

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