

LUBUMBASHI SYMPOSIUM
ON THE CARTOGRAPHY OF THE ENVIRONMENT IN THE TROPICAL REGIONS
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The seventh meeting of the International Geographical Union Working Group on the Cartography of the dynamical environment has been held in Lubumbashi from 10th to 19th October 1983.

The inaugural address made by professor A. JOURNAUX, chairman of the Working Group gives first the aims of the Symposium :

- i. to promote the reciprocal information and the improvement of the methodology.
- ii. to develop an awareness of the specific problems of tropical regions through those of Shaba,
- iii. to prepare recommendations for the mapping of the environment within the scope of integrated surveys for planification in the developing countries to be presented at the 25th International Geographical Congress of Paris (August 1984).

Professor JOURNAUX's contribution is also providing a good epistemological and methodological redefinition of the cartography of the environment and also recalling the main points of the legend adopted by the Working Group. The object of maps drawn up in that way is then discussed. Finally, the main conclusions of the Caen symposium (1971), which was devoted to developing countries are evoked as the basis for discussions that will take place in the Shaba.

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The researchers of the Geographical Department of the University of Lubumbashi have tackled such problems of cartography in two fields important for tropical regions which had been approached at the symposium of Caen : great urban centres and rural areas with low population density.

Concerning urban centres, BRUNEAU who has drawn various analytical maps of Lubumbashi (street pattern, population density) and maps of systems (differentiation of the urban area), is now able to present a cartographical synthesis useful for planning and management.

Concerning the second case, MALAISSE and his team have analysed the square degree of Lubumbashi from the point of view of agriculture, deforestation and water pollution. The synthesis map deals with eight natural and semi-natural vegetation types, the area of the cultivated land according to its use, the surfaces devastated for construction wood, fire wood and charcoal and finally reaches polluted by industry or bilharziosa.

Deforestation problems have also been approached by remote sensing methods. SOYER and WILMET show that a.o. the compounded colour technique is useful to estimate the value of the area deforested around Lubumbashi between 1973 and 1981. Remote sensing is likewise very useful to bring into sharp relief the expanding urban districts and to reckon the increase for the built-up area. In the latter case, the use of the vegetation index was the most interesting.

Another example of the interest of remote sensing for discerning and mapping the dynamical environment is given by BERG with the survey and the inventory of the irrigated rice fields in the Niger basin.

By means of more traditional methods of field observation and photointerpretation, DARCIS and SOYER were dealing with the agricultural development of a wide alluvial plain situated between Lubumbashi and Likasi. The natural environment is there mapped as vegetation-soil-drainage-microrelief complexes which are conditioning the drainage planning essential to a rational transformation of this environment.

Erosion problems have also been discussed at this symposium. Thus ADAM has presented a map example of soil vulnerability in the Ketou area in Benin. This map is emphasizing the main factors of the environment : vegetation types and some landforms such as slopes or lateritic crust outcrop.

LOOTENS has analyzed a dense gully pattern in the upper Lufira basin in Shaba. Their localization is influenced by structural factors. Gullies were interpreted as inherited forms which were reactivated by present-day human action.

In their paper on socio-economic environment, M.T. LOOTENS and MBUYI have drawn by using criteria such as school attendance, local commercial exchanges, sanitary assistance, the attraction area of a rural centre situated thirty kilometers away from Lubumbashi.

Other contributions have enriched the Lubumbashi symposium. Thus MONDJANAGNI has given an account of some methodological aspects of social environment mapping in Africa. Human facts resulting from customs or political decisions show that such environmental phenomena are liable to mapping.

With examples taken in Morocco, LAQUINA has analyzed evolution mechanisms of the landscape where hills, small plains, pediments and mountains are placed side by side.

SHIKI, after mentioning scientific works devoted by the Japanese to the environment in Africa, comments on some land-use maps realized more particularly in Kenya.

During this symposium, a stimulus was given to the discussions by field works as well in the urban agglomerations (Lubumbashi, Kolwezi, Fungurume) as in the rural areas with low population density.

A thorough visit of the town of Lubumbashi where one finds side by side, residential districts, planned or spontaneous working class districts, industrial areas, central business districts, workmen's or military camps, peri-urban districts helped the participants to understand the problems of a rapidly increasing tropical town.

In rural areas, environmental transformations have been observed, starting from the natural environment arranged in a descending order from the dry evergreen forest-dry woodland, different types of degradation savanna till you reach the alluvial plains assigned to agro-industrial monoculture and the high sandy plateaus covered with steppic savanna exploited as extensive grazing ground.

The Shaba region is particularly suitable to environment mapping for its evolution was taking place rather slowly owing to low human settlement and the slight impact of the techniques involved. Thus there

remains abundant evidence of natural or semi-natural landscapes. This environment was upset in few decades. The influence of Lubumbashi, a mining town created in 1911 and counting to-day up to more than 700,000 inhabitants, has been considerable. Controlling the town's growth clearly implies some knowledge of environmental factors with a view to a better development. More particularly, urban effects appear as acid smokes mission in districts constantly influenced by the trade winds or when industrial waste containing copper poisons alluvial plains.

In other respects one of the crucial problems of the rural areas in tropical regions is often represented by soil erosion. This problem, however, is posed in particular terms in the Shaba where bioturbation is very active. For example the density of the high termitaries varies from 2,7 to 4,9 per hectare. It results from this that the soil is in perpetual rejuvenation, which among other things fosters a rapid resettlement of the deforested areas by vegetation. One can hardly speak about the menace of a catastrophic soil erosion in such areas as long as natural agents are allowed to counteract the aggressions. The best example is given by the gullies due to overgrazing on the sandy plateaus : they stabilize in few years when their approaches are protected against cattle trampling.

Finally in a special session of the extended Working Group, the provisional legend has been made suitable for the tropical land environment by taking into account the numerous examples that were analyzed in the Shaba province. This legend will be used among others in the final draft of the two maps submitted at the present symposium.