THE LANDCOMP: ENVIRONMENT EVALUATING SYSTEM

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Society, through it's ever increasing demands, stimulates all branches of sciences to the cognition of our environment as comprehensively as possible, including the search of its unexploited facilities and making them utilizable for the economic life. For this, geography, which is in crisis in Hungary, has to find its connecting points. But we have to see that these researches nowadays can't work without the new investigational methods depending on the latest feats of engineering.

In geography, such a new method, a potential connecting point's are is the environment information systems adapted to the nowadays widely spreading personal computers. This is a system consisting of computer, programmes, wich are suitable for the input, store, analysis and graphical description of the topographical data (*Hönig, H.* 1984.).The adaptation of these systems makes the approach of the main task of region-apprasial much easier, which had been drafted by *L. Ádám* like this: "... Beyond the revealing and evaluation of the fundamentals which have unfavourable (or favourable) influense on agriculture, we have to work out a concrete, practically adaptable investigation plan to eliminate those, and on this base we should value the potential of the region's natural endowments."

So the use and development of such information systems is not dealt with by accident in more and more places.

At the Department of the Physical Geography of the Szeged University we developed a new information systen in 1988, as the newert result of a five-year computerized environment research, which can guarantee a substantially preciser approach to the learning of a given environment's condition and fundamentals. This new system of ours – called LANDCOMP – having significance beyond the known home-developed information systems, takes the fact that the surface of the earth is in constant changing and development into consideration pronouncedly. Namely, the dynamic system, like the surface, can't be reliably described by data only providing one element of the change. Now such an approach cannot lead to a fully established result even if the forming of the data base in made with taking the complexness and versatility of the system into consideration. But the successful adaptability of our results also decreases if the data groups serving the description of the various factors were taken not in the same (or nearly the same) condition of the system. Namely, with the comparison or these informations we can't analyze any actually occured state that the system, because so we would „construate" a new state that the system is very likely never to take in any state of its development.

But if we analyze our environment emplaying a datacomplex widely descriting several practically occurred states, we can conclude not only to its temporary conditions, but we can estimate its direction and size, too. Therefore we planned our

system for the handling and comparing such informations, and the wide representativeness of the gainedresults.

But the storing of great quantities of information, the connecting the datagroups in various levels requires a very effective and up-to-date data process system. From such systems we chase dBASE III + programme-pack the usage of which is widely spread in our country, too.

The Formation and Operation of the Database

The dBASE III +'s operating facilities ensure only the raster area depiction, as a first step, you have to divide the examinable geographical unit into a network of elementary regular regions. To a detailed probing of an area the insection of 150–200 factors forming the system may be required, while we use 30–50 data lines to the characterization of one factor. This large quantity of informations limits the dividability of the area for valutation. Cousidering all these facts we planned our system to the storing and using of a maximum of 300 factors, 70 data lines like this, the data-operating system enables the divisions of the area to maximum 20–40 elementary alls. (According to our experiences it is practical if one elementary all means a territory between 0,1 hectars and 1 km^2 in reality.) As a second step, we choose purposefully the factors describing the natural and for economical geographical features of the examined area. After this we do the surveying for every elementary area, factor by factor, on the following way: we divide the values inserted by environmental factors to nine intervals, factor by factor. (On the defining of the intervals, the classification purpose is suggested to be taken into consideration.) To each all on the evaluation by a given factor we cooperate the number of the interval, into which the inserted value in the given all falls by the factor.

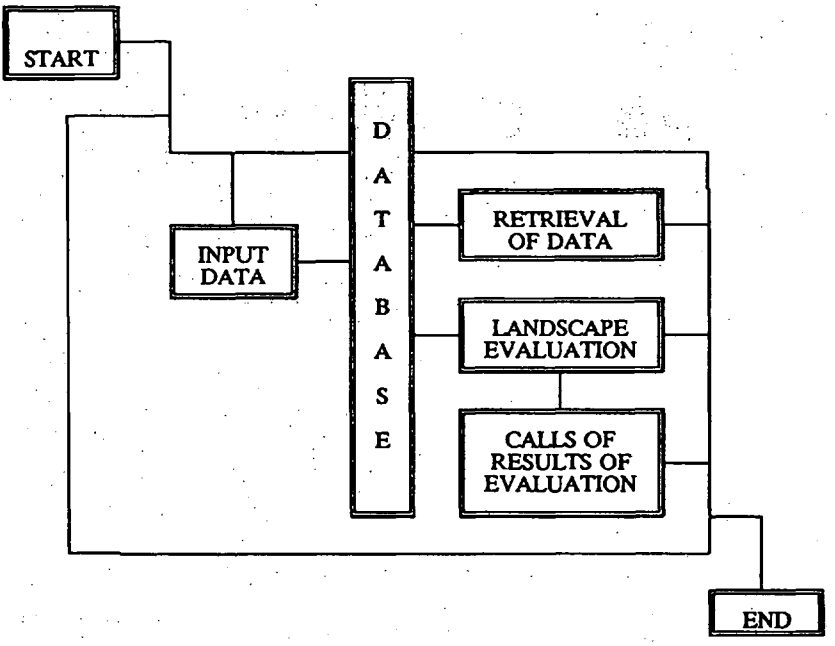
The Structure of the LANDCOMP

The structure of our environmental information system is shown in *Fig. 1.* in the course of the *data reading in*, each factors, is given in code number from 1 to 300, in the order of the reading in. The values of the factors, taken at different point of time are arranged by the system according to the moment of taking. Widening it afterwards with newer data lines in possible. In the unit of *calling of the database* we can choose from three kinds of informational services:

In case of choosing menu

- *list of factors* – the name and code of all factors appear on the screen, page by page.
- *paramenters of factors* – the system asks for the number of the factor. After this the display shown the name of the factor, the intervals of the values of the factor and the time of surveying.
- *Data of factor* – after giving of the code and the time of surveying the name of the factor is shown as well as the division of its values into intervals and its areal values in a matrix of 20x40. (*fig. 2*)

The structure of the LANDCOMP *Fig. 1.*



On projecting the qualification process we took the declarations of several studies based on mathematical courses the appropriate environmental factor. (*Mezősi, G.* 1985., *Kertész, A.* 1988., *Tózsa, I.–Técsi, Z.* 1988.)

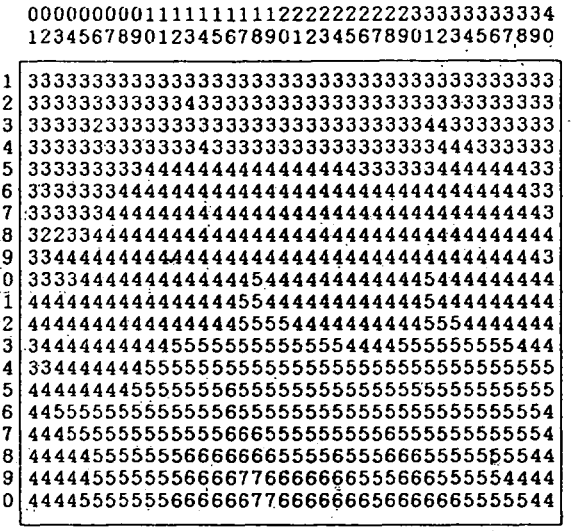
At qualifying the region. if you don't wish to use all the factors of all the data linesof these, there is you qualify the values of the factors taking part in the qualification with a 0 to 9 suitability value, according to your qualification purpose, where 0 is the exclusive, 9 is the most favourable feature. As the factors do not take part in the building of the system and the developing of its states equally, you cordinata a load of 0,1 to 99,9 to each factor, so that the total of the loads sould make 100. As the result of the qualification, we get a score between 100 and 900 for each unit of region, where 100 is the most unfavourable, while 900 is the area unit having the most favourable environmental features according to the given qualifiyng purpose. If a unit ofregion has features exclusive of the given qualifiyng porpose, the co-operated score is 0. As the qualification can be done for all the assumed states of the unit of the region, one by one, thus, on the basis of the reclived results there is a chance of calculating the average, dispersion and trend of the assumed values by elementary areas, which can give help to the determination of the direction of the change.

Areal values of a factors *Fig. 2.*

TESTAREA: BORSOD
NAME OF FACTOR:
Soil quality

Legend

31–40 : 3
41–50 : 4
51–60 : 5
61–70 : 6
71–80 : 7

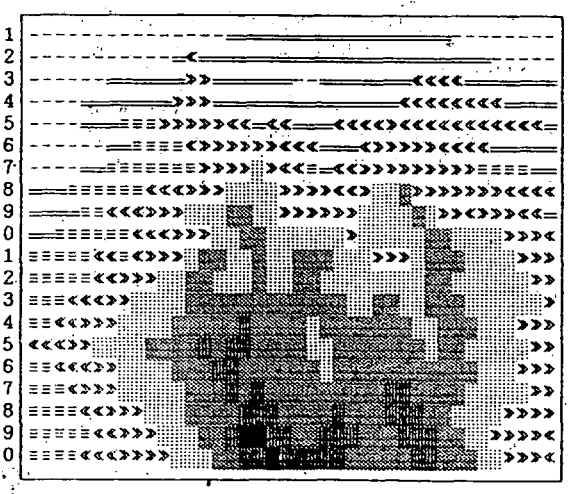


The assesment of suitability of maize-growing with LANDCOMP *Fig. 3.*

TESTAREA: BORSOD
MAPNUMBER: 014
AIM: maize-growing

Legend

-- 347–385
= 386–405
≡ 406–440
« 441–475
» 476–500
501–525
526–550
551–575
576–603



As a first step of the *„investigation of the qualifications"* modul, the programme puts out the division of this interval to maximum nine share-intervals. So each all's score in shown by the serial number of the interval in the 20x40 matrix, to which exclude the given qualification prospect.

The showing of the qualifications in also possibe by numbers or graphical sings, on display as well as on printer(one like this is shown in *Fig. 3*).

Functional Terms of the System

The LANDCOMP system is at present functioning at the following configuration:

IBM PC XT or a computer with this
640 kByte RAM (min. 512 kByte)
20 MByte Winchester
360 kByte Floppy
EPSON FX – 1000 Printer
Colour expanding cards are suggested to use.

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