TURKEY SOIL INFORMATION SYSTEM

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ABSTRACT

This paper describes the establishment of a soil information system for Turkey, and the progress made in this work to date by the General Directorate of Rural Services (GDRS). Initially for soil and water it will be termed the National Soil and Water Information System. A countries economic development is dependent on its wealth of natural resources and the appropriate use of these resources. Our countries rapid development is tied to the formation of a database containing correctly surveyed natural resources and maps and tied to the transformation to the users and planners. This ambitious project is of great significance for the modern state of Turkey as, until this system was initiated, there was no definitive, managed national information resource underpinning land and water resource management. A team of professional scientists and technologists has been assembled in the GDRS Headquarters in Ankara, within the Department of Research Planning and Co-ordination. The complex process of compiling the first national soil map in digital format will be one of the first tasks for this group, as well as the establishment of a national infrastructure for distributing the information amongst the GDRS managers and scientists.

With the likely forthcoming accession of the Turkish Republic to the European Union, alignment of the National Soil Information System with European standards and protocols will prove to be an important facet of the ongoing development.

INTRODUCTION

The work regarding soil classification and mapping is rather new to our country like many other countries in the world. In 1950, modern soil science was established in Turkey by K.Ö. Çağlar. In the same year, he began distributing 'Soil Science' publications and he prepared ' Turkey's Soil Classification ' schematic map. He took the soil colour as the main factor, mapping Turkey's soils into eleven different classes.

THE SOIL MAP RESOURCE BACKGROUND

In Turkey the real understanding of soil survey and mapping began in 1952 with the help of FAO. The Turkish team, led by the American soil consultant Harvey Oakes, undertook the first reconnaissance survey. As a result, a map of Turkey at a scale of 1:800,000 called 'Turkey General Soil Map' was prepared. A report and map of Turkey's soils was completed between 1952-1954, with geological and topographical maps being used to develop a reconnaissance-level study of all the regions. Results were obtained by taking soil samples, analysis them and labeling the different soil types. The land study was finished in 9 months. In this study map units relating to the 1938 American Classification System of great groups together with groups like slope, stoniness, drainage and saltiness were added. Turkey Soils Zonal, Intrazonal and Azonal orders were placed. This report was considered a rather important work because it was the first work showing the soil resources in Turkey.

After this, full classification and mapping was made for Turkey's soils. The maps were formed by the General Directorate of Soil and Water (today known as the General Directorate of Rural Services) by co-ordinating studies made at a national level. After the European initiative to prepare a small-scale map of the European Soils was commenced, the General Directorate of Soil and Water decided to make use of this map study in 1966-1971. The General Directorate of Soil and Water prepared the Turkey Development Soil Map (TDSM), based on a 1:25,000 scaled topographical map at the reconnaissance level. In this study, map units were recorded relating to the 1938 American Soil Classification System based on soil groupings including land determinants including the important phases of depth, slope, stoniness, erosion degree and other similar characteristics. After evaluating the data, two maps were produced. Firstly, the 'Soil Resource Inventory Map' was published for every

province at a scale of 1:100,000. Secondly, the 'Watershed Soil Map and Report' was produced showing 17 of Turkey's 26 major watersheds, or catchments, at a scale of 1:200,000. Because of the reconnaissance level of the survey, the level of detail at the scale of 1:25,000 was not sufficient. In Turkey, this was the first original land study that mapped nation-wide knowledge and at the same time brought out important problems of soils and their distribution areas. Today this study is the main resource that can be applied to the problems and uses of Turkey's soils.

Another important study was developed called Soil Taxonomy and first example applied in mapping the soils of Konya plain and the Küçük Menderes (Little Meander) valley. These were done in conjunction with Nederland Wageningen University Soil and Geology Department researchers and GDRS Soil and Fertilizer Research Institute.

The Turkey Soils Potential Survey and Non Agriculture Aims Land Usage Planning Project was replaced with the Turkey Development Soil Map Surveys by the General Directorate of Soil and Water between 1982-1984. These reports identified differences in soil depth, soil stoniness, soil erosion levels and distributions in all of the provincial Great Soil Groups supported by data obtained from field trips. In addition, occurrences of differences in drainage, saltiness, alkalinity problems, land usage and land feasibility classes were made, bringing the maps up to date by incorporating readings made at the scale of 1:25,000 from field studies.

From 1987 onwards, maps were prepared from the results of the Turkey Development Soil Maps Surveys at a scale of 1:100,000. With the consultation of the GDRS and the surveys, a map called the Turkey Soil Zones Map was also prepared at the scale of 1:2,000,000. This was published as the Turkey General Soil Management Plan. However, it is emphasized that in the future, generic classes should be scrutinized and an adaptation in new classifying ways and more details and the up to date mapping of country maps is necessary.

Turkey doesn't own its soil classification system. In order to from a system, our country needs more information about our soils. On the other hand, a lot of countries are thinking about establishing systems of classifying by using a single international system, instead of their own systems. A clear example of these thoughts which are happening is the FAO-UNESCO Word Soil Map Legend (1974) and Soil Taxonomy (Soil Survey Staff, 1975).

In the same way, the 1938 American Soil Classifying System by using Harvey Oakes and the General Directorate of Soil and Water is a pedogenesis system. Because the categories do not cover new defined soils in the Earth, many countries do not use the pedogenesis system. Instead of morphometric systems, they use FAO-UNESCO (1974, 1990) and Soil Taxonomy (1975, 1996, 1998-1999).

GDRS and Wageningen University Soil and Geology Department used this new classifying system for the first time for the Konya and Ege Watershed. In addition, this new system was used completely for the GAP Fırat watershed on detailed soil maps and reports with a scale of 1:25000. Because of the productivity of the land, a map was prepared with greater detail on a scale of 1:5000. Studies were done by the country's University researchers, master students and doctoral students by using the new soil classifying system, which created detailed soil surveys and maps.

FUTURE DEVELOPMENTS

A countries economic development is dependent on its wealth of natural resources and the appropriate use of these resources. Our countries rapid development is tied to the formation of a database containing correctly surveyed natural resources and maps and tied to the transformation to the users and planners. Until now a database meeting the needs of our country has not been created. There is a great need to define and to create a database in our country. We have to use this developed technology. The ideal method would be for our country to use the Geographic Information System (GIS) and Remote Sensing (RS). GIS and RS are a conception, which helps in decision making or management relationship techniques, and provides information about a lot of different geographical structures, and analysis and usage of human resources. GIS and RS provide a great facility for users by offering the input, storage, analysis and use of data for users. For this reason, last year the

Soil and Water Resources National Information Center (NIC) was formed. The Center has two main projects:

1. Turkey Soil and Water Resources Database Formation Project;

- To form a national soil and water resource database

- It is a goal to analyze and plan natural resources because of time constraints and the sensitivity of the situation. By using the GIS and RS techniques, the transformation of other map bases will greatly speed researchers, users and decision-makers in their work.

- In order to form the preparation of our country 5 Year Development Plan and the base for the Rural Area Development Plan, national soil and water resource service maps must be formed.

- By using the national database, preparations can be made for solving problems related to the usage of natural resources and its management. New data can be provided, the differences can be monitored and brought up to dating.

An immediate task facing the NIC team has been to commence the systematic capture and integration of the paper-based national soil map into the information system. The 1:25,000 soil maps of Turkey are presently being digitized. The principal sources of this key national dataset are pencil tracings and annotations on transparent material. The soil map legend represents a wide range of environmental parameters, as each unit was labeled with a compound alphanumeric symbol giving information on various soil and site attributes. There are over 5547 1:25,000 scale soil maps covering the whole of Turkey and to create a national database from these data is a task requiring significant resources with an estimated time of 1 year (KHGM, 1999).

2. According to FAO-UNESCO and New Soil Taxonomy the GDRS Turkey General Soil Maps and Report Updating Project;

Instead of using its own system, the wisest choice is to use and adopt the current international system. In Turkey the detailed soil survey and mapping according to the FAO and Soil Taxonomy System, the details has been going on for a long time and involves much expense. Moreover, we do not have enough soil surveyors for this job. It will be more appropriate from an economic standpoint and production of new data time to evaluate the current data on the GIS. With this project we can make use of the 1938 American Classifying System which scales maps at 1:25,000, 1:100,000 and 1:200,000. Until now according to new soil classification system new soil maps which are prepared can be evaluated by updating Turkey's soils. Soil maps on the scale of 1:25,000 will be digitized and than generalized small scales maps. With the new methods the old great groups of 1938 American Classification System can be matched up with the FAO and Soil Taxonomy Map Units. According to Soil Taxonomy in the near future soil maps will be digitized and useful information will come out. Finally, our countries updated scaled 1:1000000 General Soil Maps along with a soil interpreted report will be prepared by GDRS' National Information Center in conjunction with the Soil Survey and Project Department, Çukurova University Agriculture Faculty Soil Science Department with an estimated time of 2 years (KHGM, 1999).

CONCLUSION

It is felt that countries must work together in soil classification. For this reason, the amount of soil research and knowledge has increased dramatically in the last few years. Also, possibilities are being created which allow findings about different kinds of soil research being done to be reliably transferred to other countries with the same soil. As a matter of fact, some of the agricultural research which is done in our country and presented at international meetings, because it was based on the old American Classification System, a scientific relationship can not be established. Therefore, to the costly research that was done is openly criticized.

Turkey sees itself as a integral part of Europe and part of the process in becoming a member of the European Union. Just like other areas in our country, Turkey will surpass common soil problems and can be integrated into the European Soil Information System. It is possible to be in continuous and active cooperation in these matters and to speed up the technical and scientific help that we can obtain.

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