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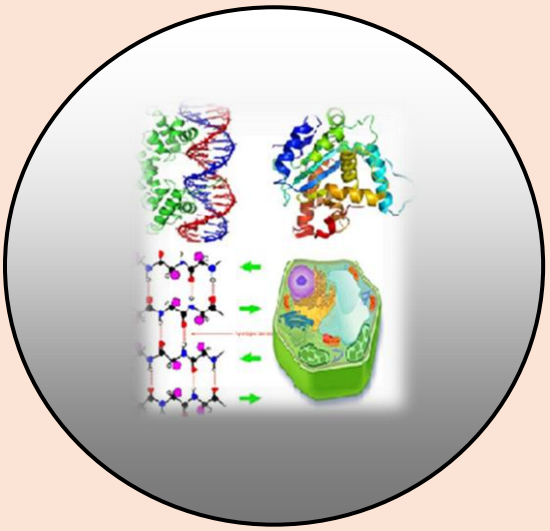

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Soil Types and Map of Iran

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ABSTRACT

A soil map is an object specific spatial model of the soil cover, whose compilation is dominated by the consideration of soil forming processes. This paper investigates the history of soil survey in Iran, particularly more recent developments in the use of digital soil mapping (DSM) approaches rather than conventional soil mapping (CSM) methods. A 2000–2019 literature search of articles on DSM of areas of Iran in international journals found 40 studies. These showed an increase in frequency over time, and most were completed in the arid and semi-arid regions of central Iran. Artificial Neural Networks (ANN), Random Forests (RF), and Multinomial Logistic Regression (MnLR) were the most commonly applied models for predicting soil classes and properties and ANN performed best in most comparative studies. Soils maps help botanists identify areas with high probabilities of having rare or endemic species – often species that are endangered or threatened as they are restricted to unusual soils (e.g., soils produced from substrates like gypsum, marine clays, or from the interactions of substrates and dynamic geomorphic processes).

Soil maps may be used to understand differences in topography and how these differences affect land use. Pasture yield maps give recommendations for the carrying capacity of a farm based on soil type and slope and predict pasture yield. Web Soil Survey provides "soil ratings" that recommend the Animal Unit Months (AUM) of a given soil type.

Too Wo conducted that the technological advances in remote sensing, computers, terrain analysis, geostatistics, GIS data integration, and instrumentation has made it possible to achieve unprecedented reliability and utility in digital soil maps.

Keywords: Soil map, Iran soil, Soil forming, Soil survey and Environmental variables.

INTRODUCTION

FAO Land and Water Division (NRL) has made an effort to make Soil Legacy data and information available for their users. In that regard, FAO has just finished uploading 1228 soil and land legacy maps (mainly soil maps and also land use, geological and land cover

legacy maps). FAO will continue working in this activity and will include Soil Profile Legacy data soon. The Islamic Republic of Iran Ministry of Jihad-e Agriculture Country report On History and status of soil survey in Iran GSP regional workshop Jordan Amman 1-5 April 2012 Prepared by Bahman Eskandarie Head of soil conservation and fertility Deputy for water and soil and industry Water and soil affairs office Report on Iran's Soil and Agricultural status. Soil patterns vary widely. The abundant subtropical vegetation of the Caspian coastal region is supported by rich brown forest soils. Mountain soils are shallow layers over bedrock, with a high proportion of unweathered fragments. Natural erosion moves the finer-textured soils into the valleys. The alluvial deposits are mostly chalky, and many are used for pottery. The semiarid plateaus lying above 3,000 feet (900 metres) are covered by brown or chestnut-coloured soil that supports grassy vegetation. The soil is slightly alkaline and contains 3 to 4 percent organic material. The saline and alkaline soils in the arid regions are light in colour and infertile. The sand dunes are composed of loose quartz and fragments of other minerals and, except where anchored by vegetation, are in almost constant motion, driven by high winds.

The International Union of Soil Science (IUSS) - at its Seventh Congress, at Madison, Wisconsin, USA, in 1960 - recommended that soil maps of continents and large regions be published. As a follow-up FAO and Unesco decided in 1961 to prepare a Soil Map of the World at 1:5 000 000 scale. The project was completed over a span of twenty years. It was the fruit of world-wide collaboration between innumerable soil scientists and remained until recently the only global overview of soil resources. Since 1995 collaborative efforts have been made between FAO, UNEP, JRC, IIASA and ISRIC World Soil Information to make regional updates of the FAO/UNESCO soil map of the world, notably under the SOTER (Soil and Terrain Database) program. A first revised global product (The Harmonized World Soil Database) was published in 2006 at a resolution of 1km. Recent efforts focus on using Digital Soil Mapping techniques (mapping soil properties continuously rather than soil associations with their related soil properties). A first revised global product made in this way may be expected soon. Other global maps (WRB, Soil Regions and Zobler) are using the original FAO/UNESCO soil map as main source of information.

History of Iran soil map study

Research Institute of Soil and Water 6 agriculture research, education and extension Introduction 1930 Institute study soil from the beginning of the decade with the launch of soil and water established in the country and emerged institution, the institute now has 6 decades struggling as Research Institute and it has an effect on the growth and development of your body. However, at the beginning of the active days of this collection, more and more attention is paid to its different types. The downstream lands of dams, but gradually the need to work in different areas require more effort to move in line with the development of technology, because the growing population on the one hand and the degradation of soil and water resources, emotional stability to environmental change Land use, soil salinization, and the reduction of the basic elements of food contamination have not doubled. Supply on the other hand, constraints, climate change and other took place at the Institute of Soil and Water Research over the past four decades later and delivers the efforts of the Organization of research, education and extension as a subset made It is presented as a figure.

Increasing population and consumption have raised concerns about the capability of agriculture in the provision of future food security. The overarching effects of climate change pose further threats to the sustainability of agricultural systems. Recent estimates suggested that global agricultural production should increase by 70% to meet the food demands of a world populated with ca. 9.1 billion people in 2050. Food security is particularly concerning in developing countries, as production should double to provide sufficient food for their rapidly growing populations. Whether there are enough land and water resources to realize the production growth needed in the future has been the subject of several global-scale assessments. The increase in crop production can be achieved through extensification (i.e. allocating additional land to crop production) and/or intensification (i.e. producing a higher yield per unit of land). At the global scale, almost 90% of the gain in production is expected to be derived from improvement in the yield, but in developing countries, land expansion (by 120 million ha) would remain a significant contributor to the production growth. Land suitability evaluations yield gap analysis, and dynamic crop models have suggested that the sustainable intensification alone or in conjugation with land expansion could fulfil the society's growing food needs in the future.
The Soil and Water Research Institute was established in 1952 under the auspices of the Ministry of Agriculture and as an independent irrigation company.

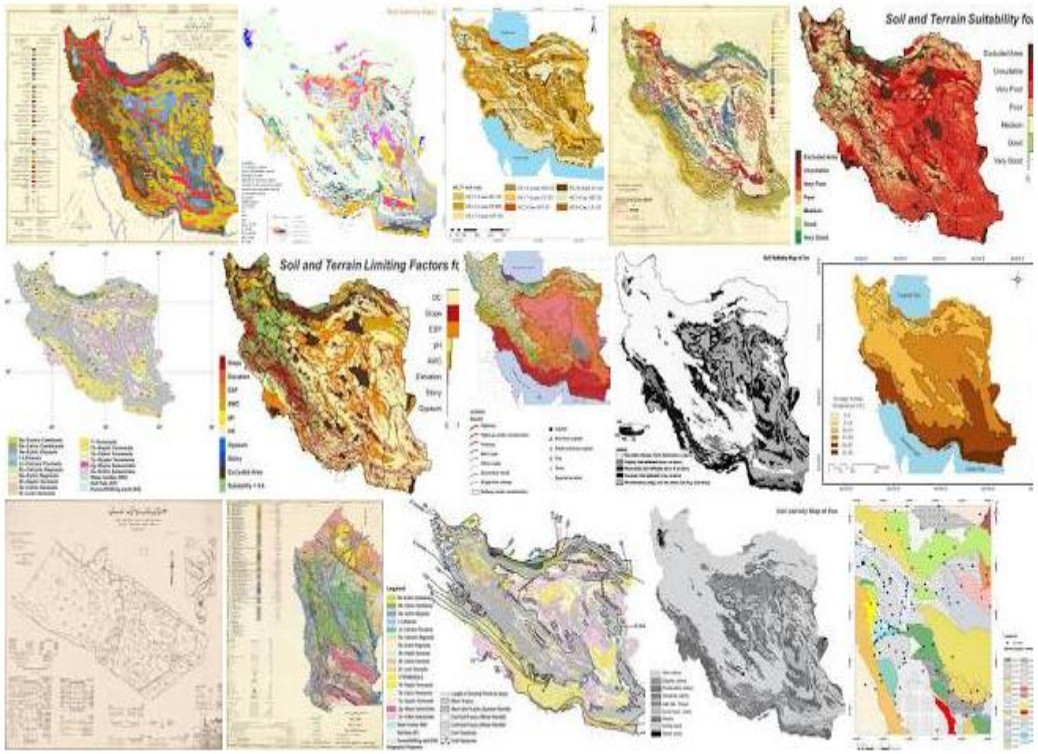

Figure 1. Different Soil map at Iran exist.

At the very beginning, earthy groups were formed at the institute. These groups, in collaboration with UN experts, carried out the first project in Khuzestan and the Karkheh region. In 1955, the Earthworks Laboratory building was opened on the previous site of the institute, located on North Kargar Street in Tehran.

The institute was transformed into an earthworks institute in 1961, and in 1964 the Independent Irrigation Agency was separated from the Ministry of Agriculture and merged with the Ministry of Water and Electricity, leaving the Institute of Soil Science in the Ministry of Agriculture. In parallel with the above activities, in 1958, in order to develop and promote the use of chemical fertilizers in agriculture, the soil fertility project in Khuzestan began its activities and the use of chemical fertilizers, study and research on soil fertility was established. In 1960, with the formation of an organization called the General Directorate of Soil Fertility, the Ministry of Agriculture continued to operate throughout the country. Fig 1 show soil map realization work as 1952 to 2010.

Relation between soil mapping and soil degradation

This chapter discusses soil mapping and soil degradation. Compiling soil maps is an essential objective of classic soil science. Together with relief maps or digital elevation models and land-use maps, they form the basis for many questions and problems in physical geography, e.g., concerning water balance or soil erosion, and have many other practical and scientific applications (United State Department of Agriculture, 1999). Conventional soil mapping is usually based on expert knowledge from closely related disciplines. The map unit boundaries are strongly correlated with changes in topography, vegetation, or land use. The intensity and historic dimension of on-site soil erosion show highly differentiated results and sometimes surprising distributions of soil units. Soil units could be identified, interpreted, and delineated on the basis of soil surface colors (Dewan and J. Famouri, 1964, F.A.O. 1989).

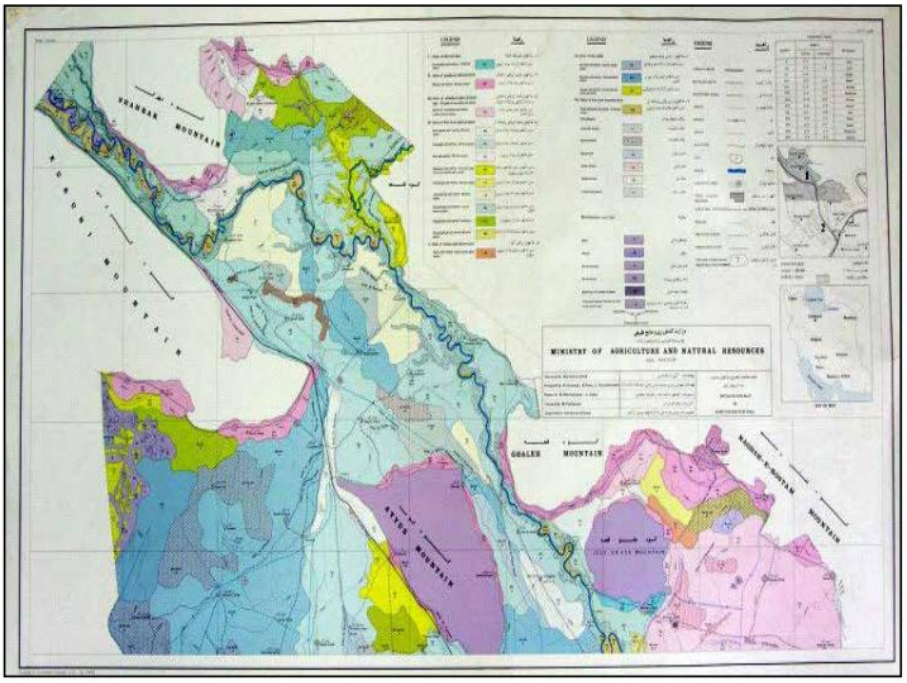

Figure 2. Soil map (prepared by soil experts with the cooperation of FAO).

Engineering and Construction

Soils maps and interpretations are used widely in siting development such as highways, buildings, and other construction. Selecting sites with soils with sufficient load-bearing quality, not subject to flooding, and suitable for on-site sewage disposal result in substantial costs-savings, and reduce the potential for unforeseen failures.

Soils data used by officials in one Illinois county helped decision-makers select a highway site with the fewest limitations, which resulted in savings of several thousand dollars per acre because of reduced excavation and construction costs (United State Department of Agriculture, 1975).

Interpretations can also be used in estimating costs. The cost of laying buried pipelines, for example, is affected by a variety of soil factors. Soils interpretations can inform decisions on special material needs (e.g., pipe composition and rigidity), mitigation required (e.g., extremely wet or differentially draining soils creating needs for protective coatings or cathodic protection), and costs of excavation (e.g., short depth to bedrock or presence of hardpan can increase excavation costs).

RESULTS

In Iran we obtain different soil map, as such

Map interpretive studies of soil classification maps, land a map of interpretive maps classify the land: that is synchronized with the study of soil and using the data collected in field studies and analysis of laboratory soil samples and water is provided. These maps have a wide range of uses in land recycling for different uses and landscaping. The aim of these plans is that a preliminary assessment of land for irrigation practice and the limitations and risks of destruction and degradation of them in relation to soil characteristics, salinity, topography, erosion and drainage show (Baldwin et al., 1938, Mahler, 1970).

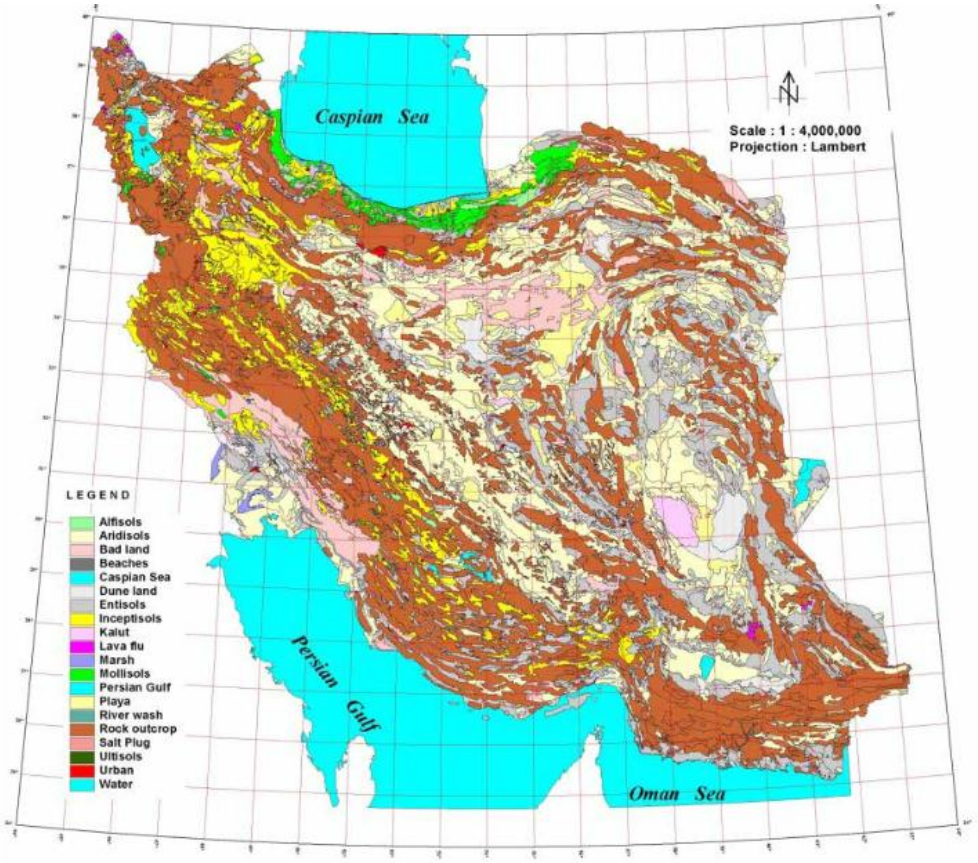

Figure 3. The main categories of soil in Iran.

Applied maps of these studies. In these studies, one of the types of land reclamation operations is required, such as land level drainage, drainage, leaching, etc. These four reform scales are considered appropriate for the workload required. Different levels have been considered for this purpose, so that the amount and amount of investment required in the first half of the year can be reduced to a limited number of different lands. The classification of irrigation capability, a dual classification of the level and type of land reform on the one hand and on the other hand is needed to determine the suitability of land for irrigation after determines corrective actions.

Demand for accurate soil information is increasing for various applications. This paper investigates the history of soil survey in Iran, particularly more recent developments in the use of digital soil mapping (DSM) approaches rather than conventional soil mapping (CSM) methods. A 2000–2019 literature search of articles on DSM of areas of Iran in international journals found 40 studies. These showed an increase in frequency over time, and most were completed in the arid and semi-arid regions of central Iran. Artificial Neural Networks (ANN), Random Forests (RF), and Multinomial Logistic Regression (MnLR) were the most commonly applied models for predicting soil classes and properties and ANN performed best in most comparative studies. Given the scale of inquiry of most studies (local or regional), quantitative environmental variables such as terrain attributes and remote sensing data were frequently used whereas qualitative variables such as geomorphology, geology, land use, and legacy soil maps were rarely used. The literature review of CSM showed that this method is incapable of defining the spatial distribution of soils and also provides a lower accuracy than DSM method. This review has identified research gaps that need filling. In Iran, coherent national scale DSM with consistent methodology is needed to update legacy soil maps, and to apply DSM in forestlands, hillslopes, deserts, and mountainous regions which have largely been ignored in recent DSM studies (Moameni, 1999).

The role of one million sources and the number of lands in Iran in the first and only period is a map that, after the Islamic Revolution of Islam, can be scaled to scale. Also, this map is one of the few scientific maps in the national level that has been produced in both Persian and English languages in the country. This map locating and identifying the sources of the country to manage users agriculture, locating and guiding urban sprawl and preserving agricultural lands, environmental protection, development of tourism, defense and strategic and important cases other uses, and as one It has. Typical of research, education and extension position of Brjsthaz success of Iran, the geographical distribution of soils in the map of a millionth of resources, soils, the soil and the combination map as units of landforms as Zyrgrvhkhay attachment is shown. In addition, the unit maps Mirrors, collection of soils and soil phases of surface soil texture, slope and postal class and a millionth of land resources and talent shows Myblndy Dhd. ayyt soil erosion, salinity and Qlynqshh a millionth of resources, soils it has been produced. Also, in the preparation of the above map of the weather and supply of meteorological maps, land identification maps, natural toll maps of Iran, maps of Iran and the regime of moisture regime. This review has identified research gaps that need filling.

In Iran, coherent national scale DSM with consistent methodology is needed to update legacy soil maps, and to apply DSM in forestlands, hillslopes, deserts, and mountainous regions which have largely been ignored in recent DSM studies. This review should also be useful for producing more local and regional digital soil maps more rapidly as it helps show which covariates and mathematical methods have been best suited to this scale of DSM in Iran.

About 1228 soil and land legacy maps, the maps are available for the following countries like, Afghanistan, Algeria, Angola, Argentina, Bangladesh, Benin, Bolivia, Burundi, Botswana, Brazil, British Guiana, Burkina Faso, Cambodia, Cameroon, Central Africa Republic, Chad, Chile, China, Colombia, Comoros, Congo, Ivory Coast, Costa Rica, Cuba, Dominican Republic, Ecuador, Egypt, El Salvador, Ethiopia, French Guiana, Gabon, Gambia, Guatemala, Honduras, India, Indonesia, Iran, Israel, Jamaica, Japan, Korea, Lebanon, Malaysia, Mauritius, Mexico, Mozambique, Namibia, Nicaragua, Niger, Nigeria, Pakistan, Panama, Papa New Guinea, Paraguay, Peru, Philippines, Rwanda, Senegal, Sierra Leone, South Africa, Sri Lanka, Sudan, Swaziland, Syria, Taiwan, Tanzania, Thailand, Togo, Tunisia, Uganda, Uruguay, Venezuela, Vietnam, Zambia, Zimbabwe.

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