



## A Pedology of Agricultural Land of Shemiranat Regions, Iran

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### Article History

Manuscript No. 149

Received in 11<sup>th</sup> April, 2011

Received in revised form 31<sup>st</sup> May, 2011

Accepted in final form 31<sup>st</sup> May, 2011

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### Keywords

Territorial resources, pedology, land capability, GIS, shemiranat

### Abstract

Studies on territorial resources, land's coverage (vegetative and edaphic) and land capability in Shemiranat region are the in recognizing the area. Here, information has been gathered on different soil types, soil's elevation, gradient, type, origin etc using available data from different recognized sources as well as map using GIS software. It's the attempt to determine the valuation of territorial resources, the land capability for yearly agricultural handling and range management in forestry.

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### 1. Introduction

The milieu of Shemiranat is composed of diverse lands in respect of the soil morphology and characteristics which has been gained through the interaction of different periods of geological times and long time ecological changes.

The region of Shemiranat is one of the nine of Tehran provinces (figure 1). The area of this town is about 1111km which is equivalent to 5.9% of Tehran province and 0.06% of the total area of the country. It has five topographic distributions includes mountains, hills, plateaus, upper terraces, hill valleys and flabellate colluviums. According to the studies on the territorial resources of Shemiranat, a large area of the region is overwhelmed by the mountains and a part of the area is covered by Ltyan dam's drainage area.

### 2. Material and methods

The aim of introducing the Shemirant area is to know sustainable agricultural development and support to the country's national economy .

In order to collect information, the following methods have been used:

- Using GIS software for procuring the map
- Employing the field method for collecting information in the area under study
- Making use of the library for obtaining information using

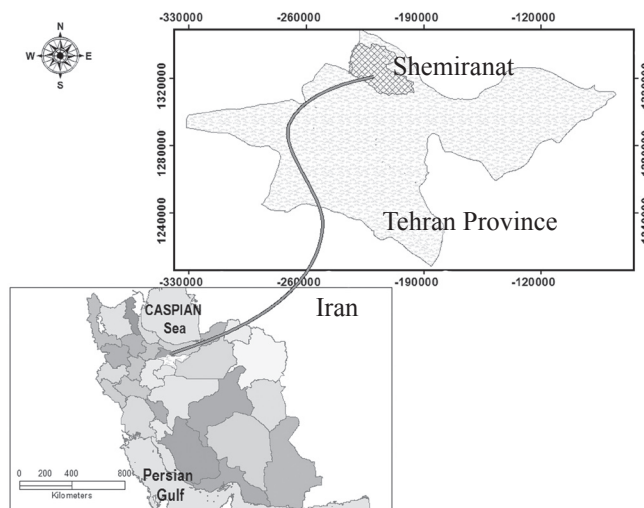


Figure 1: Location of the Shemirant territory in Iran

library documents and accessing research history and various perspectives on rural management

- Using the internet for obtaining information regarding agricultural methods and accessing information from the websites of related organizations
- Drawing upon the information from Iran's Statistics Bureau in order to obtain statistics for different periods

### 3. Sufficiency and Grading of the Investigated Territories



The parameters like soil types (saline and alkaline soil), erosion (water and wind erosion), gradient (relief), ditch draining, flood gating and soil's slipped stones have been evaluated based on land capability and land suitability classification. Land capability has hinted the possible expansion or reforma-

tion over the original in order to adjust or manage the limitation of lands (table 1). Following table evaluates the territorial resources of Shemiranat region as for agricultural use (seasonal and permanent), pastures and more.

### 3.1. Land Capability for Agriculture and Gardening

Table 1: Regarding the territorial capability of shemiranat regions				
Types of capabilities		Area of expansion (ha)		Area
Agriculture (agronomy) and gardening	Yearly farming	3800	16650	<ul style="list-style-type: none"> <li>• Lavasan's valley, north of Lavarak river (east of Niknam village) and around the Lar river</li> <li>• The channels and rivers margins, side hills, debris, and river sides</li> <li>• Upside the Barge Jahan river and west of Jajrood river</li> </ul>
	Gardening	2250		
	Gardening and farming	8750		
	Rainfed cultivation	1850		
Pasturage	Low pasture capability	60500	83200	Mountains
	Middle pasture capability	16500		Mountains and hills
	Intensive pasture capability	6200		Mountains , hills, plateaus and debris
Pasturage Forest (natural and man made)		5550		The west domain of the area particularly at the bank of Jajrood river
Other uses		5600	5600	
Total capabilities		111000	111000	
Source: Based on results of the Comprehensive socio-economic studies of Tehran province				

Valley milieu, channel banks and rivers of the area have partly for agriculture and gardening covering 15% of the total 16650 ha (figure 2). Most of these lands are prepared for gardening except the Lavasan Valley. In addition, rainfed area for cultivation is limited to 1850 ha that include south-west and east expansion of the area.

### 3.2. Land capability for pasturage

An extensive area of Iran, upto 75% of the area of the na-

tion, possesses pasture (figure 3). This is equivalent to 83200 hectares. Most of these lands are capable of low maintenance pasturage. The mountain expanses and country hills have the capability of proper and middle pasturage. This also benefits in a desirable soil cover. These are considered as upland pastures.

### 3.3. Land capability for forestry

Actually, a limited expanse of Shemiranat region which is about 5% of the area, and equal to 5550 ha is susceptible for forest



Figure 2: The view of a garden in village of Afjeh, 2009



Figure 3: External view of a garden in Lavasane-koochak, 2009



and forestry (figure 4).

#### 4. Data analysis

According to the physiographic characteristics, the territorial sources of each area are divided into nine main types (land types). Each of these land types can be divided into the land units based on features such as height, slope, soil type, source



Figure 4: A view of the jungle of Lavasane-koochak, 2009

constituent, status of erosion, relief etc., and are figured as components of land units. There have been demonstrated Five separate types in Shemiranat region and watershed dam Ltyan that include mountains, hills, plateaus, upper terraces, hill valleys and flabellate colluviums. According to the research information, a large part of the area is covered by the mountains which includes about % 15 of Shemiranat region and 85% of the watershed dam of Ltyan. The results are shown on table 2.

After the mountains, hills are the main land use types which have some irrigated area. Other land types share very little areas of the region which include limited expanses of the river margins and south east of the area.

The existing five soil types of the area are divided into twenty smaller units (components of land units).

The land types divided into the land units. The components of land are elucidated below-

(1.1.2) About 9200 ha of the region's territorial resources; these are distributed as six separated units at the northern, western and southern parts of the region.

(1.1.3) 21357 ha occupies about 31% of the region's territorial resources spread in all over the region except southern and central divisions (figure 5).

Table 2: common profiles of the main land types and effective characteristics in each type's division into the land units					
Main land types	Map code	Slope	Effective (side) slope	Difference of land levels	Land units division and its characteristics
Mountains	1	>25%	To different and indeterminate directions	>100 ha and generally 500-1500	Peaks shapes, slipped stones, geological structure, soil characteristic and type, erosion intensity and vegetation
Hills	2	8-25%	To different and indeterminate directions	50-500	Soil type, geological structure, peaks shapes, slipped stones, vegetation, topography, type and erosion intensity
Old brfthay or plateaus	3	upto 5% and convex	Up to 25%	<50 ha	Soil type and depth, gravel, density of erosive watercourse network, soil constituents, vegetation, erosion type and intensity, relief, and public and effective slope
Domain alluvial plains	4	0-4%	Up to 8%	<5 ha	Soil type and depth, composition, salinity and alkali
Valley alluvial plains	4/5	0-1%	Less than %5	<5 ha	Soil type and depth, texture, and relief
Low lands	6	0-1%	Flat with slight concave	Nil	Soil type and texture, salinity and alkali, and vegetation
Torrential (flood) plains	7	0-1%	flat	<4 ha.	Soil type and texture, salinity and alkali, density of watercourse network, and vegetation
Gravelly colluvial fans	8	<5%	Less than 5%	<5 ha	Type and depth of gravel soil, density of watercourse network, , slope and relief
Gravelly alluvial fans	9	<2%	Less than 5%	<5 ha	The watercourse networks condition, erosion and sound grade, channels





(1.1.4) with the expanse equal to 6053 ha, about 9% area of the region's territorial resources are spread over the four separated sections of the area.

(1.1.5) 2356 ha has allocated about 3/4% of the region's territorial resource, these land units are spread in central region of the area, in the northern of Klvgan village and east-west part of the Eagle village.

(1.1.6) 2245 ha which includes about 1/2% of the region's territorial resources distributed in the north-eastern area.

(1.1.7) It has 2102 ha i.e. about 3% of the region's territorial resources which is located along the east-west part as well as north-western area.

(1.1.8) 3272 ha includes about 5% of the region's territorial resources distributed over the extreme eastern part of the section.

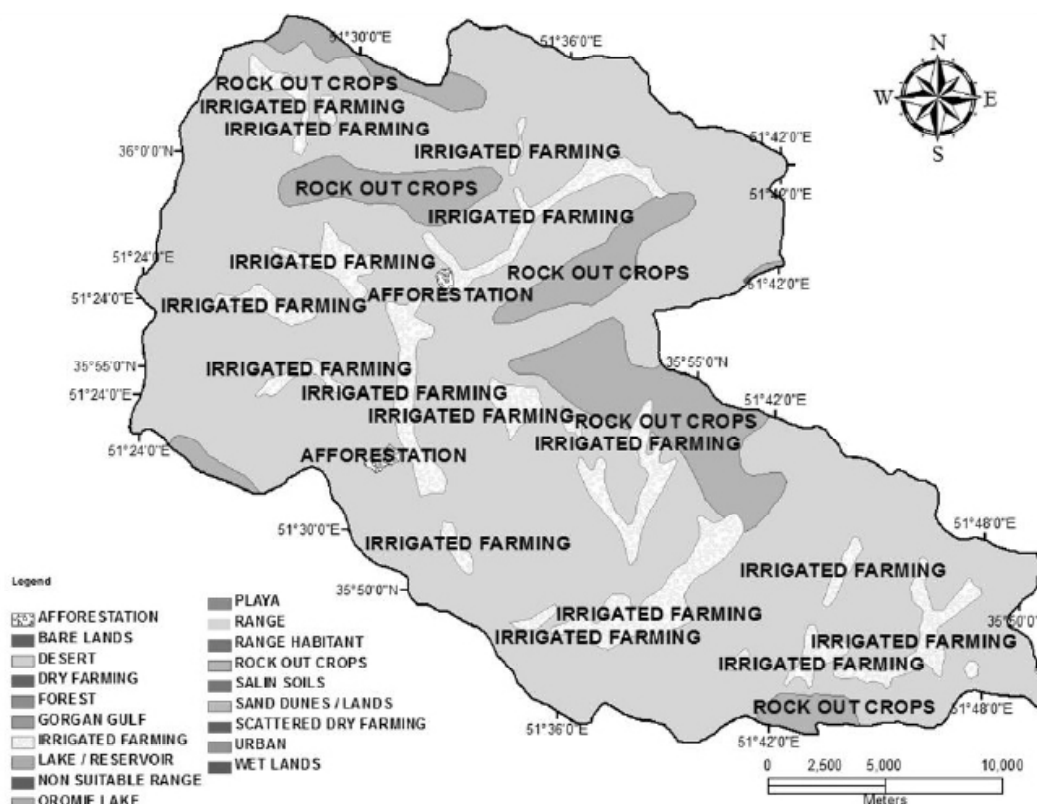


Figure 5: Territorial Resources

About 7508 ha contains nearly 11% of the territorial resources of the watershed Ltyan dam. These units are actually formed of high rugged mountains.

(1.3.1.) About 3/63 ha covers near to 4/5% of the district's territorial resources, that includes Afjeh's settlement as well.

(1.3.2) About 4445 ha contains nearly 3/5% of the district's territorial resources, that are settled in form of two distinct units.

## 5. Conclusion

A review of the results based on evaluating Shemiranat land resources, indicates the extent of these land's capability for agricultural handling (yearly and permanent), different pasturage capabilities, and land capability in fostering (natural and hand planting). The tables reveal the quantity of the region's capabilities in diverse core uses.

Recognition of the protected areas acts as one of basic needs

in land capability assessment. In Shemiranat region, especially Ltyan watershed should be considered. Environmentally, protective areas can be taken for restricted use while area that covers steep slope, slipped stones, gully erosion should not be taken for ordinary uses.

## 6. Suggestions

- Raising land capability in agricultural, forestry and pasture use.
- Using lands in different fields according to their capabilities.
- Providing high level of soil protection in the area.
- Preventing high erosion of soil and diverse land units.
- Expanding organic agriculture of the district.
- Providing training courses to increase the agricultural knowledge of the farmers.
- Developing the state's support for agriculture.