

Chapter 4

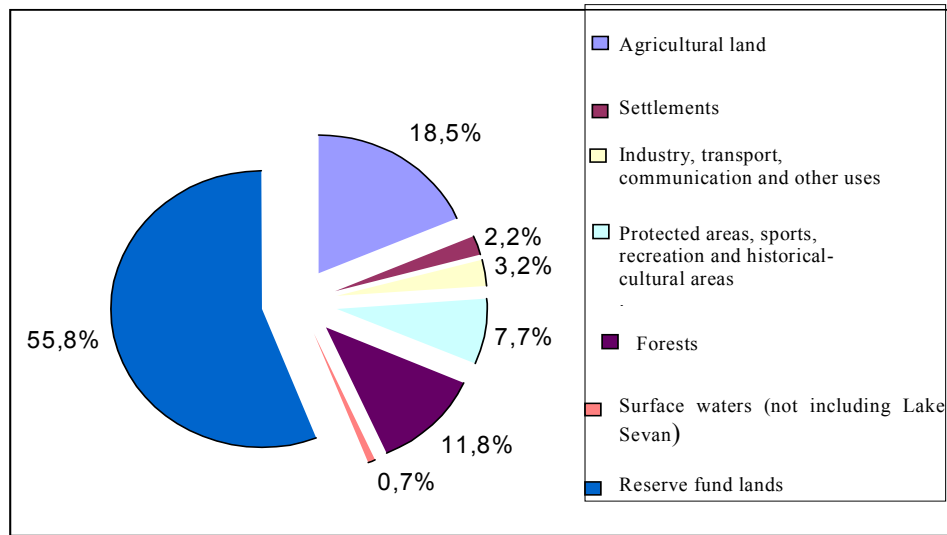
Land and Soil Resources

Distribution of land in Armenia by category and use

The total land in Armenia, according to 1997 data, is 2 974 300 ha.

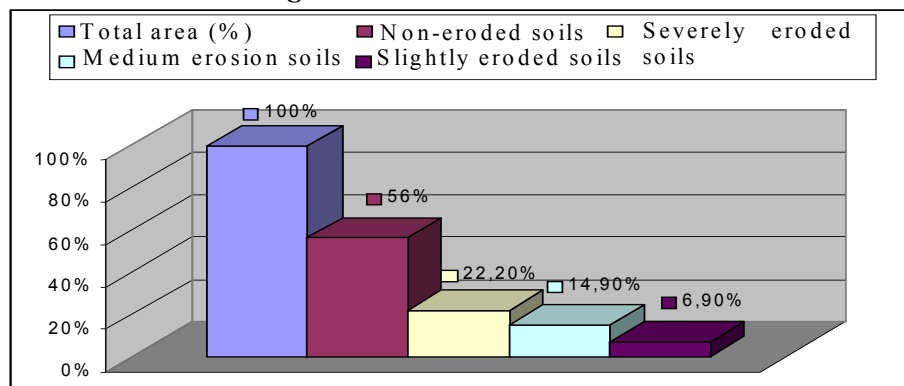
The area of specially protected areas of the republic is about 311 000 ha.

Figure 1.4.1 Distribution of land in Armenia



Source: National Statistical Service of RA

Figure 1.4.2 Soil characteristics



Source: Action Plan to Combat Desertification

Despite the scarcity of land, there is a diversity of soils in Armenia. The territory of the Republic of Armenia is divided to the following zones:

Semi-desert - total area 236 000 ha;

Dry steppe - 242 000 ha;

Forest - 712 000 ha;

Mountainous - meadows - 629 000 ha;

Soil quality

According to data from soil studies (1980-1985), about 44% of the lands of the Republic are to varying extents exposed to erosion. These lands are located mainly in the Marzes of Aragatsotn, Kotayk, Lori, Syunik and Vayots Dzor.

Both natural and artificial factors cause soil quality changes. Of the 464 300 ha of arable lands in Armenia, 94 000 ha (20.3%) are eroded.

Overgrazing results exposes land to erosion. Due to overgrazing, the area of natural meadowlands has decreased from 1.4 million ha in 1940 to 804 500 ha in 2002.

The following factors contribute to soil quality changes:

- Landslides, which occur on 2% of the territory of the Republic or 0.5 thousand km², mainly in the Akhuryan river valley and the basins of the Debed, Vedi, Getik and Vorotan rivers.
- Mud-flows: about 200 settlements in the Republic are affected by mud-flows. In the Ararat plain they affect 30% of the territory, most of which is agricultural land.
- Soil salinization occurs in the Ararat plain, where about 10% of lands are salinated.
- Deforestation reaches significant levels in Armenia.
- Earthquakes and other factors

According to the National Action Plan to Combat Desertification in Armenia, about 24 353 km² of the territory of the Republic, 81.9% (excluding the surfaces of Lake Sevan and water reservoirs), are to different extents exposed to desertification: 26.8% of the total territory of Armenia faces extremely severe desertification; 26.4%, severe desertification; 19.8%, moderate desertification; and 8.8%, slight desertification. Only 13.5% (400 km²) of the territory is not exposed to desertification.

In the period between 1950 and 1999, the area of arable land in Armenia decreased by 166 600 ha: meadows by 15 600 ha and pastures by 136 500 ha.

Land degradation

Lands degraded due to mining activities are found in 281 communities of 11 Marzes of the Republic. According to inventory data, over the period 1978-1998 there were 640 tracts of land degraded by mining, with a total surface area of 7530 ha, of which 3780 ha were used as agricultural lands before degradation. Over the total surface area of these degraded tracts, mining activities have been halted on 3037 ha. These lands should be restored for agricultural use. The remaining 4493 ha are still being mined.

Soil pollution

Sources of soil pollution in Armenia include the agriculture, industry (mining, metallurgy, minerals processing, chemicals, agricultural industries and others), energy, transport, and municipal sectors.

Chemical fertilizers and chemical herbicides and pesticides, especially chlorine-organic compounds that remain in the soil for 15-20 years, have long been used in agriculture in Armenia.

Mining and metallurgy enterprises pollute the soil with heavy metals and chemical compounds.

The volume of accumulated industrial wastes reaches several hundred millions cubic meters.

Land surrounding the Alaverdi copper-molybdenum plant, in a radius of 3 km, is polluted by heavy metals, with concentrations 20-40 times above MPCs.

Land adjacent to the Ararat gold plant is polluted by heavy metals. Similar enterprises are located in Kadjaran, Kapan, Meghri and Agarak, and their surroundings are also polluted by heavy metals (statistical data are not available).

Table 1.4.2 Land Requiring Improvement or Restoration

Type of land according to purpose	Total surface area (ha)	Land, by type of degradation (ha)								
		Exposed to erosion		Salinated	Secondary salinization	De-graded	Over humid	Rocky and polluted by wastes	Water-logged	Desertification
		Wind erosion	Water erosion							
1. Agricultural and forest lands (total)	1762438.7	4275	9170	864	700	1941	1163	33742	8080	3498
1.1 Arable lands	464261.6	1765	2816	790	700	119	528	3477	8060	1395
1.2. Perennial plantings	42896.0	-	-	-	-	-	-	-	-	450
1.3. Meadows	136892.4	2	1572	74	-	1356	620	5540	20	153
1.4. Pastures	633532.7	2412	4714	-	-	466	-	24660	-	1500
1.5. Other	484856.0	96	68	-	-	-	15	65	-	-
2. Irrigated agricultural lands	179209.0	440	186	270	-	-	80	-	2	-
3. Specially protected areas	233324.0	82	22	-	-	-	-	210	-	-
3.1. Nature protection lands	226518.0	82	22	-	-	-	-	210	-	-
3.2. Recreational lands	910.0	-	-	-	-	-	-	-	-	-
3.3 Historic-cultural lands	1912.0	-	-	-	-	-	-	-	-	-
3.4. Other	3984.0	-	-	-	-	-	-	-	-	-
4. Forest land	371326.0	116	68	-	-	-	15	65	-	-
4.1. Forested lands	222687.0	15	65	-	-	-	15	65	-	-
5. Water bodies	149114.0	-	5	-	-	-	-	-	-	-
6. Reserve lands	963343.0	155	12	-	-	331	-	1350	-	12

Source: National Statistics Service of RA

Emissions from vehicles using leaded petrol are among the main causes of soil pollution. The import of leaded petrol into the Republic is now prohibited by law.

Almost all settlements are polluted by industrial and household wastes.

Table 1.4.2 below presents 2001 data on the breakdown of land requiring improvement and restoration (data before 2001 are not available, 2002 data are under calculation).

Almost no measures for the protection and rehabilitation of soils have not been implemented in recent years, due to the blockade, as well as the economic and energy crises.

Table 1.4.3 Soil Protection and Recovery Measures

	Measure	Total		
		2001	2002	
Agro-technical and hydro-technical measures, ha	Irrigation	75875	42514	
	Drainage	2375	-	
	Measures for mud-flow and erosion mitigation	225	722	
	Cleaning of bushes, stones and wastes	11937	1347	
	Restoration of vegetation	15.3	163	
	Restoration of fertile layer	1020	-	
	Soil desalination	-	-	
Chemical and biological measures, kg/ha	Application of fertilizers	organic	9813.5	8950
		mineral	203.3	204,3
	Application of chemical weed-killers and pest-killers	4.5	3.6	
Expenditures for the protection and recovery of soils, thousand drams	Hydro-technical constructions to prevent erosion	7000	75000	
	Construction to prevent mud-flows	4200	8225	
	Construction of terraces	600	25300	
	Establishment of field-protective forest belts	200	200	
	Restoring vegetation	-	6500	

Source: National Statistical Service of RA