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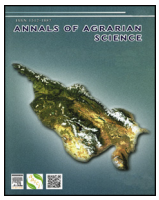

The Red Book of the soils of Georgia

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ABSTRACT

For Georgia, as a small area country, it is very important to popularise and protect soils resources, that will be facilitated by creation of the Red Book. The main arguments for creation the book are: Attracting society's attention to the importance of soil cover; Raising educational/awareness and informational levels regarding soils; Identification of threats and the main reasons for soil degradation and Recommendation for creation legislative base for protection of the soils. Resulting from soil diversity, Georgia is considered a natural open-air museum. Soils from Georgian phedosphere were divided into three groups: Standard, Rare and Memorial. The basis for The Red Book of the Soils of Georgia is Red List of the soils of Georgia.

Memorial group of the soils is represented by three types of soils: Cinnamonic, Meadow cinnamonic and Yellow brown forest. All three types have special historical meaning. They were first described in Georgia and separated as independent types, only after that they acquired international recognition. Rare soil group comprises: Rendzino-red - "Terra Rossa", Moutanin-meadow humus-illuvial, Black brown forest soils and Andosols. Soils from Rare e.g. raritet gorup occupy small area, have limited occurrence, original profile and scientific and practical values. In the Standard group are included soils, that are characterised by more or less complete relevant natural features of the biggest taxonomic units of a classification system - type. In this group are: Red, Yellow, Bog, Yellow podzolic, Yellow-gley podzolic, Brown forest, Raw carbonate, Grey cinnamonic, Meadow grey cinnamonic, Black, Chernozem, Mountain-forest-meadow, Mountain meadow, Mountain-meadow chernozem like, Saline and Alluvial soils.

Threat of degradation can affect all three groups from the book, including natural and cultivated soils. They are affected by degradation from technogenic, agrogenic and natural causes. The main degradation threats for Georgian soils are: erosion, pollution and infrastructural developments (roads, chanels, etc.).

Creation of The Red Book of the Soils of Georgia is crucial: 1. For understanding soil diversity and importance; 2. Facilitation of preservation of natural soil diversity and for that it is important to protect soils and take care of them (for prevention it is important to include all soil types in the book). The materials from Red Book of the Soils of Georgia and The Red List of the Soils of Georgia can be basis of improvement and/or creation of leglislation document, that will guarantee legal protection of the soils from destruction.

Introduction

Creation of The Red Book of the Soils of Georgia will facilitate protection of soils as one of the valuable and practically non-renewable resource. In last period, high attention is payed to creation of Red Book of soils and addressing all relevant problematic issues connected to characterisation of soils that comprise Standard, Rare, Endangered to be destroyed or Extinct groups. Materials presented in the Red Book have been gathered by multiyear expeditional and analytical researches. Results of causes of degradation of soils and approaches of their protection are presented [1] (see Tables 1 and 2, Figs. 1–10).

The Red Book of soils gives ability to create new legislation base for prodetcion of soil diversity [1]. For creation of the book two main approachas can be used: 1. Identification of the main objects of the

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Table 1
Texture of soils.

Profile N	Location, Soil type	Depth of horizons, cm	Particle size (mm), Fraction content (%)						
			1-0,25	0,25–0,05	0,05–0,01	0,01–0,005	0005–0,001	< 0,001	< 0,01
Memorial group of soils									
1	Surami Pass,	A1 - 0–15	3	22	20	13	18	24	55
	Yellow Brown Forest	A2l - 15-30	1	19	18	16	19	27	62
		B1 (g) - 30–50	1	22	19	18	15	25	58
		B2 (g) - 50–80	–	23	18	17	18	24	59
		BC2(g) - 80–100	–	28	18	16	13	25	54
1	Sapara,	A- 0-10	3	35	22	12	10	18	40
	Cinnamonic	AB - 10-22	3	34	20	11	15	17	43
		B1- 22-40	1	34	25	11	10	19	40
		$B2_{ca}$–40-60	0	30	25	10	16	19	45
		BC - 60-95	0	33	20	14	13	20	47
1	Mukhrani,	A' - 0-25	3	26	15	10	17	29	56
	Meadow cinnamonic	A'' - 25-40	1	27	13	8	12	39	59
		AB - 40-50	0	20	19	5	17	39	61
		B - 50-70	0	22	15	12	20	31	63
		BC2 > 70	0	30	10	13	14	33	60
Rare group of soils									
2	Sataplia, Terra rossa	A–0 - 20	1	16	17	13	13	40	66
		B–20–50	1	16	15	12	14	42	68
		CD–50–80	1	14	18	15	9	43	67
3	Tetri Tskaro	A^1 - 0-10	7	38	18	9	12	16	37
	Brown forest black	A^{11} - 10-20	7	32	15	12	14	20	46
		AB - 20-40	3	32	20	10	15	20	45
		BC_1 - 40-60	0	35	18	13	11	23	47
		BC_2 - 60-90	0	33	20	10	15	20	45
1	Bakuriani, Andosol	A - 0-20	2	39	22	14	12	11	37
		AB - 20-40	2	30	25	16	12	15	43
		BC - 40-60	0	31	20	13	15	21	49
		C - 60-80	0	28	24	12	17	19	48
3	Stepantsminda, Gergeti,	A - 0 - 10	1	25	25	10	16	23	49
	Mountain meadow humus-illuvial	AB - 10 - 20	2	23	32	12	16	15	43
		B - 20- 35	2	20	22	14	19	23	56
		Bh1 - 35-51	2	33	22	9	20	14	43
		Bh2 - 51-63	4	28	25	10	16	17	43
		C - 63-85	3	26	26	12	17	16	45

book – Standard, Rare, Unique or Endangered to extinction that have high scientific, practical, biospheric and historic importance; 2. Protection of these soils based on creation of relevant legisltive document, allowing to protect soils from destruction and degradation processes (polluton, construction, etc.). One of the most important basis for creation of The Red Book of the Soils is sharing experience from creation of Red Book of Plants and Animals. As it is well known, the plant/animal red book is about species that are Endangered with high risk of extinction in the wild. For protection of these species it is important to know current condition of populations. This was the reason for creation of „The Red Book of Georgia", where Endangered species of plants, mammals, birds, reptiles, ambhibies and fishes were included. Its main goal is to ensure protection and restoration of endangered varieties and conservation of species' diversity and genetic resources on the territory of Georgia. The idea was to create similar book for soils as well. But the full analogy is not possible because of specificity of soil formation factors, diversity of soils and anthropogenic factors affecting it [2].

Working on issues related to pretection of soils became active from the second half of XX century when rapid degradation processes of were obsered. Especially, erosion and pollution on regional and global scales [3]. During identification of soils, that need to be protected, it is important to consider three categories: **Natural** (uncultivated), **Used by humans** and **Cultivated** e.g. high fertility soils that were formed under influence of rational land use. Coming out the fact that for uncultivated soils effect of changes in soil properties are high by human influences, in the book must be introduced soils, that are under risk of abrubt change, degradation of vanishing. The main goal for protection of such soils is conservation of diversity of natural soils, structure of soil cover and their bio-communities. It is still very hard to identify all Rare and Endangered to vanishing soils, because for Natural soils, reasons for that can be different factors: erosion, sealing, pollution, etc.

Introduction in the book of virgin soils, that have very little or no anthropogenic pressure has the same importance in terms of protection, because such territories can still be affected by different degradation processes (depletion, permafrost, salination, etc.). Since exsistence of civilization, because of degradation, humanity has already lost more than 2 billion hectares of fertile soil. The Red Book of Soils represents bases for protection of soils, that are affected by degradation and could be vanished. The goal for its creation is: assesment of levels of degradation of soils, raising awareness and paying attention from scoeity to soil protection issues, that can guarantee sustainable functioning of ecosystems [4].

Creation of the Red Book is important for development of soil protection and degradation questions [2,3,5].

The objectives of the book are mainly united into following groups: 1. Rare e.g. raritet soils, that occupay relatively small area; 2. Unique soils that have significant scientific and historical meaning; 3. Standard e.g. non-transformed soils that are characterised by more or less complete relevant natural features of taxonomic units of a classification system (type, subtype, family, etc.) [4,6]. The red books also comprise soils that are endangered to extinction and need real protection because they are affected by significant negative agrogenic or technogenic effects.

Objectives and methods

Working on The Red Book of the Soils of Georgia goes through following stages: Processing of concept of the book; Creation of list of