

## THE CURRENT SITUATION OF SOIL resources IN TAJIKISTAN AND THEIR PROSPECTS IN FUTURE

Sanginov S.R. Soil Science Research Institute, TAAS, Dushanbe, Tajikistan

The total area of Tajikistan is 14 million ha, 93 % of them mountains. Agricultural lands account for 23% of the total area, the relief is extremely varying from 300 m above sea level to 7495 m. Tajikistan as mountain country is characterized by vertical belts.

The climate is sharply continental with low air humidity, considerable fluctuation of annual and daily temperatures, minor quantity of precipitation and also long, hot, arid summer and short winter. Average winter temperatures vary between -3°C and -20°C, but can fall below -45°C in the mountain regions. Average summer temperatures vary between 19°C and 32°C. Average annual precipitation is 338 mm, varying from less than 70 mm in the plains and deserts to 2 400 mm in the mountains.

Distinctive feature of soils in many vertical belts, as a whole in Tajikistan is the low content of organic matter and nutrients, very high erodibility, unfavorable drain status of soils that are limited by a poor maintenance of drainage system.

The path to democracy and market economy for Tajikistan has had many setback as well as political and socio-economic shocks. Developing a democracy from a turbulent past is a difficult and slow process. However, some positive progress has been made and many changes are visible. We established so-called private sector, new types land use system, free price system for agricultural products and there is a relatively good economic activity. Compared to 1995, total agricultural production has trend for increase. The international community has encouraged the efforts to move towards democracy and free market reforms by supporting several development projects.

At the same time during last decades Tajikistan faced with the numerous problems in agriculture:

- decreasing the yield of crops, especially cotton two times.
- increasing the area of eroded land.
- increasing the area of saline and waterlogged soils.
- content of organic matter and available nutrients in soil decreased.
- application of mineral and organic fertilizers decreased 10 times.
- desertification

The main reasons of existing situation are:

- new farmers are short of investment for reclamation of soil.
- state land ownership and mismanagement.
- uncontrolled cultivation of sloped land, converting slope pasture land to rainfed

**Land and soil resources.** Historically in ancient time Tajikistan has been one of the main agricultural centers. Cotton has been produced for almost a century; thus, the soil productivity currently has become very low. During the Soviet time, agriculture was characterized by high rate of mechanization use; heavy use of chemical fertilizers and pesticides; development of monoculture in the regions and by use of excessive quantities of water for irrigation. As a result, soil deterioration has become dramatic. Although substantial resources were allotted for agricultural intensification during 70-90<sup>th</sup>, the farm yields in the last decade of transition have decreased. According to this data, around 2% of the total area in the Tajikistan is cropland, 25% is rangelands, 4 % is forest, 64,8% other areas. Irrigated area is 75% (of the cropland)

**Soil Degradation.** However before to estimate degradation processes which seized territory of the republic, it is necessary to mention that Tajikistan is one of the most mountainous countries. The standard estimation is: 93 % of its territory is mountains and only 7 % of it is

leveled valleys. Vakhsh natural-economic area is situated in the less mountainous part of Tajikistan. Thus there are no high mountains. Nevertheless more than 55 % of its territories are considered to be mountain lands. More mountainous is the territory of Sugd natural-economic area - almost 73%. The most mountainous are Kulab and Hissar natural-economic areas – 84% and almost 91% accordingly. First of them contains territories concerning lowland plains (Kizilsu-Jahsu valley). The territories of Kharm and Badahshani Kuhi Autonomy Region are whole inside mountain systems. The levelled sites of their territories are small in mountain hollows in the bottoms of mountain rivers gorges and on cone of sediments of their tributaries. Exception is East Pamir plateau with its extensive river valleys of Murgab, Alichur and bottoms of Karakul, Rangkul and other lakes. However the plateau is raised on the height more than 3500 m above sea level and that is why the whole territory is in the high mountains. Mountain ranges, foothills and intermountain valleys are in continuous physico-geographical interconnection. Its factors are water drain, gravitational field and atmosphere circulation. Each of them is specific in economic as well as in agricultural relation. Thus analysis of orographic data shows that almost 90% of republic territories are covered with mountain ranges and foothills. Rest 10% is so-called lowland valley of such large rivers as Amu-Darya, Sir-Darya, Panj, Vakhsh, Zeravshan and their tributaries. However, in economic relation the picture looks different. All irrigating agriculture is concentrated in rivers' valleys, and no irrigated agriculture, gardening and part of forestation (pistachio bushes) are in the foothills. 90% of agricultural production is produced in irrigated zones and more than 9/10 of country population lives there. The complex analysis of climatic and soil parameters shows wide distribution of desertification-degradation phenomena in Tajikistan. According to soil data and existing classifications the most part of its territories should be referred to various types and subtypes of deserts and semi-deserts. Each of them is characterized by an originality of natural condition complexes and by high-altitude belts location. General review of Tajikistan territory shows that the country is situated between two different leveled desert belts – lowland and high-mountain, very hot and cold. The specification of features of these deserted belts together with humidification allows considering that there are two types of desertification process: arid hot subtropical and arid cold high-mountainous (frozen). In landscapes with ground humidification and poor draining of both types of deserting salt accumulation in soils, and underground waters develops. If the management of this irrigated land is inappropriate, salt accumulated on the ground surface, making it impossible to continue cultivation on such land. There are 4 types of deserts and 1 type of semi-deserts on Tajikistan territory which are subdivided on 10 subtypes. Undoubtedly, during more detail researches the number of them can increase according to hierarchical attribute. They are different size on the occupied area from several thousand hectares and less, up to several millions hectares, totally making 54 % from the area of RT. In geographical aspect they are either fragments of vertical soil-climatic belt or the whole belt itself. However one of desert types - gravitational, by its expanding fragments is extended from below (lowland plains) up to snowy and glacial tops, where super high-mountain district forms. Genetic feature of deserts and semi-deserts is that all of them are of natural origin, which are appeared and developed as a result of Pamir-Alai and Tian-Shan mountain systems formation.