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Effect of irrigation-induced erosion on the degradation of soils in river valleys of the alpine Pamir

Golosov V., Sosin P., Belyaev V., Wolfgramm B., Khodzhaev S.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

© 2015, Pleiades Publishing, Ltd. Results of a study were analzyed, which was conducted on the arable stony alpine soils in the Gunt River valley and the upper Panj River. Such soils are occurring in different regions of the Western Pamirs. The physicochemical properties of the soils were studied using conventional methods, and the degradation rate of the soil cover was determined using the radiocesium method. Low contents of humus (<2.5%) and nutrients, primarily related to the natural pedogenesis conditions, were indentified for the subsoils of the studied river valleys. The limiting factors are temperature and precipitation. The irrigation-induced erosion, which is manifested on slopes of >2–3° with furrow irrigation, is the main anthropogenic factor of soil degradation. The lower content of humus in the soils of the Panj River valley is due to the larger portion of slopes >3° with furrow irrigation, on which also maximum rates of irrigation-induced erosion (>30 ha/year) were observed.

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Keywords

137Cs, alpine soils, degradation, irrigation-induced erosion, Western Pamir