



**2ND MULTIDISCIPLINARY
CONFERENCE FOR YOUNG
RESEARCHERS**

**Sustainable Development Trends and Challenges
under COVID-19**

BOOK OF ABSTRACTS

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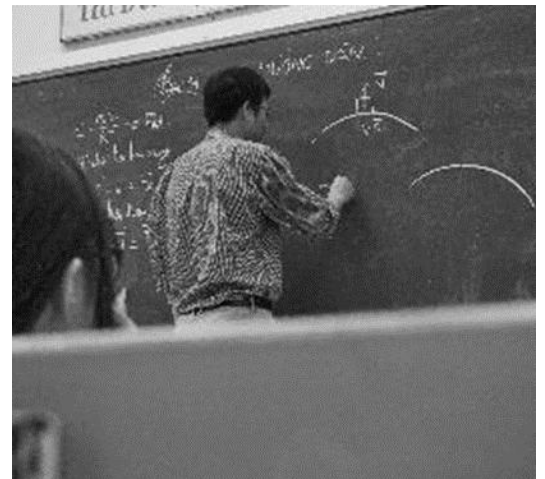
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Assessment of the technical condition of water infrastructure facilities using the example of regulatory basins

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Abstract. Background. Yield growth in the Southern Steppe is impossible without irrigation with the introduction of mineral and organic fertilizers, so the repair, restoration, and construction of new irrigation systems are one of the main tasks of regional and district water management. To repair water management networks and regulate basins of irrigation systems, it is necessary to use inexpensive effective methods of establishing their technical condition. Such methods are geophysical, which allow to identify filtration zones in the regulating basins (RB) of irrigation systems (IS). The aim of our research was to localize the areas of filtration water losses for the future concentration of repair and restoration works in the most disturbed areas, which will significantly reduce the cost of time and money and increase the overall efficiency of the structure.

Methods. The following geophysical methods were used: field research to establish filtration zones by the natural pulsed electromagnetic field of the Earth (NPEMFE) and vertical electric sounding (VES). The NPEMFE method, in combination with the VES method, makes it possible to significantly increase the amount of information, increase economic efficiency and reduce labor costs during the localization of areas of latent increased filtration in the body of RB. Processing and interpret the results of measuring the electrical resistivity of rocks by the VES method was performed using the IPI2Win program. To calculate the filtration losses from the RB in a homogeneous soil with pressure less filtration flow, the formula of V.V. Vedernikov was employed.

Results. NPEMFE survey was performed in the profile version with a distance between profiles and points of 2 m. NPEMFE parameters were measured first in water-filled RB. The profiles were arranged in the following sequence: at the foot of the outer dam, in its central part, on both slopes. When the RB is emptied, the NPEMFE survey will be conducted not only at the dams, but also at the bottom of the basins. According to the results of NPEMFE and WPP research, filtration and water loss zones from basins have been identified. VES works were carried out in a point version within the filtration zones through the dams of the basin, selected according to NPEMFE.