e) floods: small rivers are particularly badly affected by floods: their banks are eroded, and coastal fortifications are disrupted or destroyed.

The anthropogenic factors approve a great impact on the river ecosystems functioning, disrupting the natural water passageways and introducing unusual components that cause changes in the composition and properties of water in the water body, ie cause deterioration of its quality.

Conclusions and prospects for further research include environmental measures aimed at socio-economic and cultural development of the S'an river basin, based on the analysis of the socio-economic situation and technologies for the reconstruction of sewage treatment plants [1]. Measures that will contribute to the improvement of the ecological condition of water resources:

1. reconstruction of existing and construction of new treatment facilities;
2. complete sewerage of cities and towns, stopping the discharge of untreated wastewater into rivers;
3. providing coastal protection strips of reservoirs and catchment areas proper sanitary state;
4. implementation of all planned environmental protection measures at ecologically dangerous objects;
5. clearing of channels and rivers bank strengthening;
6. implementation of current water protection legislation by water users.

Literature

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INFLUENCE OF GREEN ARCHITECTURE AND PERMEABLE PAVEMENTS ON POLLUTION LOADS IN SURFACE RUNOFF – MODELING STUDY

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Devolvement of urbanization, related to increase in sealed surfaces area in urbanized regions, affects the natural balance of catchments causing increase in surface runoff and decrease in infiltration and groundwater aquifer supply. The elevated volume of surface rainwater in urbanized catchments, in relation to the recent climate changes, may result in frequent flooding endangering local development. On the other hand, the commonly observed direct discharge of untreated rainwater straight to the surface waterbodies, including rivers or lakes, causes serious anthropopressure. Application of low impact development (LID) rainwater management methods, including green architecture and permeable sealing surfaces, may significantly improve the distorted water balance of urbanized regions. It is possible due to reduced surface rainwater runoff as well as increased infiltration, interception and retention volume, allowing also the decrease in loads of pollutants delivered to rainwater receivers. This paper presents results of numerical studies concerning influence of green architecture and permeable pavements application in urbanized catchment on quality of runoff water. The simulations in EPA SWMM were performed for a selected object, school complex, of total area 4.42 ha, covering roofs, pavements, parking lots,

roads, football pitch, grass and high vegetation. The numerical studies were performed for the representative rainfall event of H=27.1 mm and 4 h duration and three various types of rainfall distribution, i.e. DVKW, Euler type II and block. The four variants of calculations were considered: i) existing catchment sealing; ii) introduction of green roofs; iii) application of roads and pavement cover by permeable concreate; iv) combined application of green roofs and permeable roads and pavements cover. Numerical calculations covered rainwater outflow as well as total suspended solids (TSS) concentration and load values for the existing sealing types and after application of green roofs and permeable pavements. The obtained results allowed assessment of the environmental impact of LID manners tested.

ADSORBENTS FOR ARSENIC COMPOUNDS REMOVAL

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Arsenic compounds are often observed in natural surface water or groundwater and even in drinking water. It may be possible due to human influence on an ecosystem or as a result of natural, nonanthropogenic processes. Every year a lot of people are affected by toxic action of arsenic compounds [1]. That's why dearsenication is very important in a treatment of arsenic-containing water. Today in the field of water treatment, there are different, competing and effective ways to remove arsenic compounds. These methods include coagulation, anion exchange, reverse osmosis, chemical precipitation (lime softening) and also adsorption [2].

Adsorption is one of the most effective and popular ways of arsenic removal, because it allows the use of reusanable adsorbents. Further to it, adsorbents can be made of recyclable, environmentally safe materials, while the efficiency of the method is not disimproved.

Adsorbents of various origins are used to take the contaminant (arsenic) and include porous materials, both artificial and natural, such as aluminum or silica compounds, activated clays, sawdust, ash, turf, slag etc. Activated carbon of various brands and different fine particle iron-containing adsorbents are likewise effective adsorbents for arsenic removal. It should be notes that activated carbon and iron-containing or aluminum-containing adsorbents are more popular and used for the adsorption of arsenic compounds in addition to other chemicals. Usefulness of this action is determined by a number of factors that must be taken into account by selecting an adsorbent [3,8]. At the start, these reagents must befit a number of criterias, including a low affinity for water molecules and a high interaction with organic compounds, as well as being enough large-porous. High selectivity adsorption capacity is required of adsorbents. The strength and rate of wetting with water are the next significant elements in the adsoption process of arsenic compounds [3].

A magnetite is also used to synthesize adsorbents for arsenic compounds removal. Among other nanomaterials, magnetite nanoparticles offer various benefits. For starters, these nanoparticles have a big surface area, a small border effect and a strong tunnel effect. These effects are very important in the adsorption process. In addition to the natural mineral that can be found, it is possible to produce it in the laboratory from solutions holding ferric and ferrous ions, therefore, they have a strong interconnection for such pollutant as arsenic [4].

The use of nanoparticles and nanostructured materials, which made by magnetite nanoparticles, as efficient and competitive alternatives to conventional adsorbents in the removal