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Currently research is conducted on the subject. However, their results are not intended to assess the water demand modes with specificational required to meet the challenges of flow regulation.

The paper deals with one of the possible approaches to the problem of assessing the impact of climate change on agriculture at the regional level.

Analysis of different models for the calculation of irrigation modes and irrigation norms allowed to choose as the base model a model that is based on A. Budagovsky' method. The advantages of this method is due to its versatility, the release of an explicit "climate" variables as well as providing background information.

We consider an array of irrigated area S , containing N cultures. The area occupied by each crop is S_n . For each culture supposed to be given a set of parameters and agro technical and economic characteristics. For the irrigated area a set of meteorological characteristics as a long series of observations on a monthly or decadal breakdown is given.

The task is to evaluate the changes in volumes and modes of water demand for various scenarios of climate change and the determination of damages arising from the underestimation of global climate change. The difficulty of solving this problem are due to: (1) uncertainty and significant time and spatial aggregation of climate scenarios; (2) insufficient number of parameters presented in scenarios of climate; (3) the absence of a representative series of observations of the water demand of agriculture (in order to verify the model) due to changes in the structure of production, economic and agronomic conditions of cultivation, etc.

The report discusses the results of the calculations obtained for the North Caucasus region (Stavropol region, Kabardino-Balkarian Republic).

NEURAL NETWORK APPROACH FOR COGNITIVE MAPS CONSTRUCTION

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This paper presents a method for constructing a cognitive map consisting of input data optimization, data dimensions and cognitive maps structure. Data dimensions are optimized by input data clustering. We perform data clustering using cluster analysis, i.e., data set partitioning into a finite number of homogeneous groups. Partitioning is carried out by agglomerative hierarchical cluster analysis. The main idea of these methods is that at the first stage, each object is treated as a single cluster. The clusters combine sequentially. The closest objects of distance or similarity based matrices are merged [1]. The paper presents algorithm of hierarchical cluster analysis in general.

Optimization of the cognitive map structure means automatic optimization of the scale of concepts influence on each other with the help of machine learning methods.

Statement: For any cognitive map K there is a corresponding single-layer neural network.

We present a notion of cognitive maps in the form of a single-layer sigma pi neural network. All input signals are applied to all neurons. The output signals of the network may be some or all of the neurons output signals after a few cycles of the network operation. By statement, for training based on cognitive maps we applied the single-layer sigma-pi neural networks. This method consists in iterative tuning of weight matrix, which consistently reduces an error in the output vector [2]. The algorithm to automate this method is presented. This procedure optimizes the weight relations in the cognitive map for the future prediction of the system development.

Create a cognitive map and tune the influence weight with the learning algorithms of the single-layer sigma-pi neural networks (train cognitive map). This procedure makes the cognitive map more accurate. The only thing that provides correct tuning of the scale is the training sample (the system operation data according to which a cognitive map of previous time period is drawn up).

References

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GENERALIZED FC-GROUPS WITH CHAIN CONDITIONS

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Let c be a positive integer. A group G is called an FC_c -group if each element of G has only finitely many conjugates by $\gamma_c G$ and $\gamma_c G$ is contained in the FC -center of G . FC_c -groups with the minimal condition or the maximal conditions on abelian subgroups are investigated and characterizations of them are obtained. A group is called an FC_c -soluble group if it possesses an FC_c -series of finite length. Another aim of this article is to give necessary and sufficient conditions for FC_c -soluble groups to satisfy the minimal condition or the maximal conditions on abelian subgroups.

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