

Climate change in Central Asia (Case Study of Kyrgyzstan) and conservation of the runoff formation zone

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1). Climate change has always occurred on Earth and the recent period is no exception to this rule. The changes in climatic parameters (such as temperature) that one observes, show the presence of irregular periodicity in instrumental series of observations ranging from daily up to several decades with evidence of even longer secular changes. In other words, climate change is fundamentally nonlinear in character, and it makes us conclude that any climatic trend will inevitably be replaced by opposite trend. The recent surface air temperature uptrend will hereby give way to decline as evidenced by the results of paleoclimatic studies in Kyrgyzstan.

Undoubtedly, it is possible to impose anthropogenic factors on natural tendencies by strengthening or weakening the latter. However, anthropogenic factors are not as critical as natural ones, since they are basically controllable. The possibility of such control over natural factors is quite problematic, so the main strategy for mankind's survival under all climate change scenarios would be an optimal rational adaptation to changing conditions of existence based on fairly precise knowledge about natural system and the use of advanced technology.

2). The problem of obtaining new and more accurate data is solved by instrumental observations of natural, in particular the climate system. This issue in Kyrgyzstan is addressed by CAIAG in partnership with the German Research Center for Geosciences (GFZ Potsdam) by creating a monitoring network of meteorological, hydrological, glaciological stations within Central Asian Water (CAW) and Global Change Observatory Central Asia (GCO CA) projects, as well as during implementation of other research projects in the field studies.

It is obvious that these observations do not exhaust all elements of the hydrosphere, while the full system study requires examining the groundwater, substantial reserves of which are concentrated in the intermountain basins.

3). Conservation of the runoff formation zone in terms of any climate change trends is almost impossible, whereas application of rational methods of its practical use (resulting in minimal damage to the entire Central Asian region) based on more accurate knowledge of climatic processes in this zone is another matter. In this aspect, it is obvious that optimum alternative in terms of such element of water system as runoff is maximum regulation of runoff by building reservoirs. In this connection the best place for reservoirs is mountain regions, where there is possibility of providing the maximum capacity under the minimum area and minimum environmental and land resources losses, respectively. In this case during high-water period floods can be mitigated, whereas during low-water period accumulated water storage might be used for the benefits of the entire Central Asian region.