Wind parameter assessment based on the climate changes (Tbilisi, Georgia)

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Despite the global character of climate changes, intensity and impact scales of its various expression is characterized with local specific correspondingly to the different regions geographical location and meteorology characteristics.

Goal of the study is to evaluate impact of climate changes on the wind regimen for Tbilisi City. Exposition of mountain ranges located around Tbilisi, terrace construction of hollow, hydro-net, vegetative cover and other factors cause significant changes in wind regimen. Correspondingly, reasonable consideration of the city climate is necessary in terms of increasing speed of urbanization, as the city itself may have a significant impact on climate change and incorrect urban planning, in modern ecological terms, may cause changing of climate parameters.

For the study one has used monitoring materials of the Ministry of Agriculture and Environment Protection of Georgia, National Environment Agency, Meteorology Station of Tbilisi City (1969-2018). Within 50 years period one has established wind characteristics, wind speed (average and absolute maximal), direction and lull, change assessment according to seasons for 10 years periods.

Due to the study we have established that under the linear approximation trend average wind speed is changing 1.2m/sec. ÷ 1.8 m/sec., and wind absolute maximal speed – up to 19.2 m/sec. ÷ 18.3 m/sec. So, within 50 years period wind average seed was increased with 0.6m/sec., and wind absolute maximal speed was decreased with 0.9 m/sec.

During the whole period, under the linear approximation trend, decrease of the prevalent northern-western wind speed was outlined, at the same time amount of lull days was reduced in all seasons.

Wind mode of the city to different directions is characterized with difficult spectrum and ranges within quite big limits, depending on layout of streets, quarters, squares and different objects of the city. Prevalent winds cannot always reach to the city center, what has negative impact on the city aeration.