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Regionalization of plant bioclimatic of Karoon Basin using statistical multivariate methods and GIS

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Introduction Climatologists and ecologists have studied a lot on generalization of plant bioclimatic .There are numerous methods for climatology classification presented by botanists and climatologists such as Guassan ,koppan and Emberje .These classifications mainly were based on a few parameters (such as temperature and precipitation) .Whereas weather is very complicated in spite of we use consider 2 or 3 factors only .It is require considering adequate parameters for climatologic zonation purposes (Stinger ,1965) .

Material and methods Karon basin with 4275400 hectares area is located in southeastern of Iran .This region has a variable climate due to intensive topographic conditions .In this study ,seasonal scales were used for precipitation .For other parameters , average annual used July and January months (as an indicator for the first and the second half of a year) and April (as an effective month in vegetation growth) .Data matrix of Q from was prepared .Factor analysis with two methods of component factors and varimax rotation was used to decreasing matrix size .Then cluster analysis with method of hierarchical cluster analysis and ward was performed to determining bioclimatic regions .Maps of these changes were drawn with Surfer software

Results Results of factors analysis indicated that 5 factors had the highest effect on bioclimatic of study area .These factors include 94 .26 percent of variance with eigen value more than 1 .Cluster analysis was performed on 5 factors scores using ward method .Regard to the dendrogram ,regionalization of bioclimatology was done .It is require selecting name for each climatology class .These names indicate general characteristics of the region climate .Map of each climatology region prepared and factor scores classified climatic region that are :Very hot and dry region ,Very hot and semi dry region ,Hot and semi humid region , Semi hot and semi humid region ,Hot and semidry region ,Semi cool and wet region ,Cold and very wet region ,Cold and wet region and Cold semidry with spring precipitation (Figure 1) .

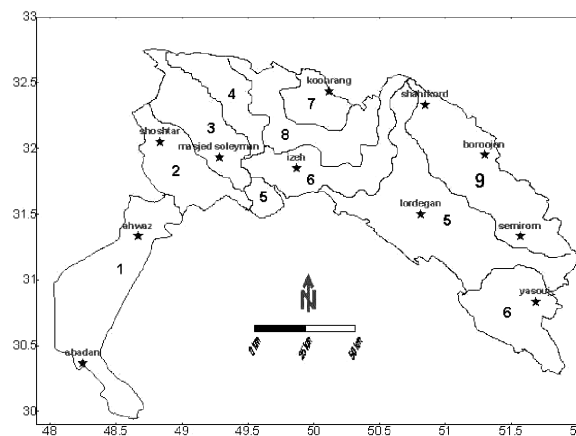


Figure 1 Regionalization of plant bioclimatic of study area .

Discussion In this study 52 climatic variables were selected that have more influence on natural plants growth .These variables reduced to 5 factors using factor analysis .Bioclimatic regions were named regard to factor score and correlation maps of factors . Scores show a lot of changes of extraction factors .Primary variable in 9 climatic regions are similar in each region ,but are different in one or a few factors with each .Results indicated that multivariable method is capable in classification of bioclimatic regions compared with traditional method .It was proved by many researchers .Statistical methods of multivariable have several advantages such flexibility and data reduction that can be used for regionalization purposes and are more suitable than traditional methods .

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