

The Relation among the water resources condition, grain production and human activities in the North China Plain

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In the recent years, water shortage becomes a serious problem in North China Plain. The first widely concerned problem regarding to water shortage is the security of food production. This study intends to investigate the interrelationship among the grain production, water resources condition, and other socio-economic factors in the North China Plain (NCP).

In this study, 43 counties along the latitude of 38N are selected for analyzing. Topographically, the counties rightly are located on a transect zone of piedmont plain, lowland plain, and coastal plain from west to east. They almost represent the different typical hydro-geological regions in NCP.

The socio-economic statistical data from 'Hebei Economic Statistical Yearbook' (1984-2002) are employed to analyze inter-annual change of grain production and the main influencing reasons through correlation analysis and GIS technique.

The grain yield of counties located in piedmont plain is relatively high because there is abundant groundwater in alluvial fan for irrigation. In contrast, the grain yield of counties located in east side of the lower plain is relatively low and vulnerable to be affected by weather conditions because less fresh groundwater is available in eastern area due to high TDS in shallow groundwater.

Then a good correlation between inter-annual change of grain production and grain yield is considered. Besides the limit of regional hydrogeology and water resources conditions, the grain production seems also strongly affected by some socio-economic factors, e.g. change of food policy, improvement of technology, and the cost of production (chemical fertilizer, electric or mechanical power) and etc. This phenomenon has suggested a possibility that the increase in cost for pumping groundwater will affect grain production as a limiting factor. The cost for pumping should increase when the groundwater level decline.