



“Gheorghe Asachi” Technical University of Iasi, Romania



SIMULATING HUMAN-INDUCED CHANGES OF WATER RESOURCES IN THE UPPER XILIAOHE RIVER BASIN, CHINA

Hao Lu^{1,2*}, Zhang Xiaoyu³, Gao Jingmin⁴

¹Key Laboratory of Agro-meteorological Science of Jiangsu Province, Nanjing University of Information
Science & Technology, Nanjing, P R China

²Dept. of Applied Meteorological Science, Nanjing University of Information Science & Technology, Nanjing, P.R.China

³Ningxia Institute of Meteorological Science, Yinchuan, 750002, P R China

⁴Binjiang College, Nanjing University of Information Science & technology, Nanjing, P.R.China

Abstract

Human activities can considerably change water resources of river basins. This is particularly true in Laohahe River Basin (LRB) located in upper Xiliaohe River in northern China, where intensive irrigation has resulted in almost full cessation of the water inflow, as well as the drastic drop in underground water level. The impact induced by climate change effects and human activities on stream flow changes in LRB was weighed up and distinguished by using Soil and Water Assessment Tool. Simulation of temporal water budgets shows a significant impact of human activities on stream flow reduction. The observed differences in stream flow are largely attributed to human activities. The biggest negative contribution induced by humans is during the period of 1990-2000, the least is during the period of 1968-1979. The negative contribution due to human accounts for 72.99% of the total for 1980-1989, the biggest among three periods. The lower streams of the watershed, with much human induced, experience a relative greater stream flow reduction than the upper.

Key words: climate change, contribution, human activities, hydrologic model, stream flow

Received: March, 2011; *Revised final:* July, 2011; *Accepted:* July, 2011

* Author to whom all correspondence should be addressed: e-mail: hl_haolu@163.com; Phone: +86-25-58731539