



Tropentag, September 17-19, 2014, Prague, Czech Republic

“Bridging the gap between increasing knowledge and decreasing resources”

The Economic Contribution of Agricultural No Cost Adaptation Strategies to Cope with Climate Change

MOHAMMADREZA NAZARI¹, SAYYED SAFDAR HOSSEINI², HOUMAN LIAGHATI¹

¹*Shahid Beheshti University, Institute of Environmental Science, Iran*

²*Tehran University, Dept. of Agricultural Economics, Iran*

Abstract

Although the nature and size of climate change effects on the physical variables of water resources and agriculture have been well studied, its economic perspectives and the role of adaptation strategies has been less studied empirically. In this study modeling is done of the real economic behavior of stakeholders in agriculture and its integration with socio-economic and climate change scenarios in Zayendeh-Rud river basin of Iran. Achievement of these was pursued through implementation and linkage of weather generator models, hydrology neural networks, crop-water response functions and economic optimisation models of positive mathematical programming (PMP). In this modeling framework, the role of two no cost adaptation strategies in agriculture including optimal schemes of crop irrigation and cropping pattern decisions in mitigation with climate change impacts were investigated. Results showed that by mid-century, climate change will result to reduce precipitation and increase temperature parameters in the Zayendeh-Rud water basin. The direct result of these changes will be reduction of basin water resources by 4.3 and 8.1 percent compared to the base scenario up to 2040 and 2070, respectively. On the other hand, temperature increases will cause higher crop evapotranspiration and water demand. With no adaptation policy, the consequences of this change will be reduction of cultivation area, production and farmers income. However, the results of economic model showed that through implementation of an optimal cropping pattern and by choosing optimal water irrigation schemes good opportunities can be provided to deal with increasing water scarcity and higher temperature due to climate change. Hence, this methodology can also be used to design strategic plans for regional cropping patterns and crop irrigation schemes in other watersheds.

Keywords: Adaptation strategies, agriculture sector, climate change, Zayandehrud river basin