



University of Zabol
Graduate School
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**The Thesis Submitted for the Degree of Master of Science.
(In the Field of Agricultural Economic)**

Title:

**The Consequences of Climate Change on
Groundwater Resources and Agricultural Productions
in Fars Province**

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Abstract:

Climate change phenomenon is an important environmental challenge of the world that has increased its speed with the increasing extension of greenhouse gases and remote relationship phenomena. Changes in precipitation level, drought occurrence and in the level of surface and groundwater resources are the recognized consequences of climate change. In the current study, the consequences of climate change on groundwater resources and agricultural sector production of Fars province was surveyed. First, the climatic trends were analyzed using meteorological statistics during 1958-2008 years. Then, climate change effects on agricultural profit and income were studied using Two-Stage Stochastic Programming. Short-run and long-run changes were examined in this sector using 5 states of pumping limit in compilation with mild, moderate and severe climate scenarios that involves 1, 2 and 4 increases in temperature, respectively. Shiraz, Fassa and Abadeh districts were chosen as studied regions and cultivation statistics and groundwater resources were used during 1978-2008 years. Results of climatic factor trends in three districts showed that the region's climate has changed in the current decades and shift to warm and arid that increased occurrence and intensity of drought is the result of these changes. Results showed that temperature increase and precipitation level decrease has led to reduction in the level of groundwater resources and agricultural production in the studied districts. By establishing constraints on available input levels of agricultural activity that is pumping limit in this study, long-run changes of considered factors such as income, profit and consumed agricultural water is less than short-run changes in a manner that long-run and short-run decrease in agricultural income and profit under scenarios were estimated from 3.5 to 17 percent and from 34 to 85 percent, respectively. Long-run damages of groundwater resources can be prevented by changing irrigation methods and agricultural land consumption under different climatic conditions.

Key words: climate change, groundwater resources, two-stage stochastic programming, Fars province