



University of Zabol
Graduate school
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**The Thesis Submitted for the Degree of Master of Science
(in the field of Agricultural Economics)**

**Economical analysis of energy
utilization in wheat and barley product
in Fars province**

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Abstract

In this study, energy productivity and efficiency was determined for crops of wheat and barley for the farming season of 2011- 2012 in Fars province, and abadeh, sepidan, arsenjan, khorambid and pasargad cities. Results show that the highest ratio of energy consumption in wheat product belongs to chemical fertilizers, 36/3 percent (particularly phosphate 14/8 percent). Input energy has increased from 17/1 GJ/h in small farms to 65/8 GJ/h in large farms and the average is 38/6 GJ/h. Average energy consumption of fuel and machinery respectively are 5/7 and 1/9 GJ/h that has direct relation with farms sizes. Output energy of wheat has increased from 22/6 GJ/h in small farms to 263/1 GJ/h in large farms and the average is 124/4 GJ/h. Energy efficiency has increased from 0/75 in small farms to 0/77 in large farms and it is 0/71 in average farms.

In barley, the largest share of energy consumption related to seed, is 28/6 percent and after that, the highest energy consumption related to fertilizer is 27/5 percent (especially nitrogen fertilizer, 16/5 percent). Input energy has increased from 12/6 GJ/h in small farms to 34/8 GJ/h in large farms and the average is 23/7 GJ/h. Output energy has increased from 22/4 in small farms to 140/1 in large farms and the average is 72/7 GJ/h. Energy efficiency, in the study area, is 0/91 in small farms and it is 0/62 in large farms and it is 0/65 in average farms.

Results of energy consumption optimization using linear programming showed that farmers are able to decrease the total input energy of wheat by 26 percent on the average in the studied area and by 25 percent on the average for barley using the same amount of input but more efficient management and optimum consumption of input.

Keywords: Wheat, Barley, Energy efficiency, Linerar programming, GAMS