

Analysis the factors affecting management of wheat losses in Iran (Ilam Township)

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Article published on October 09, 2014

Key words: Wheat, Waste Management, Ilam Township.

Abstract

Wheat is considered as a strategic product due to its important role in political and economic areas in the countries. Therefore, any action taken to improve the quantity and quality of this product would be of great importance. One of the factors influencing the quantity and quality of this strategic product is its losses created in various stages of planting and harvesting that its management is very important. The present study was performed to investigate factors affecting wheat crop waste management in the city of Ilam using a descriptive (non- experimental method). It was a cross-sectional survey of causative – communicative research series. The study statistical population included wheat farmers in the city of Ilam in the crop year of 2013-2014. Using a stratified sampling method, 300 subjects were studied as the sample. A questionnaire was used for field data collection, and its reliability was confirmed by Cronbach's alpha (0.95) . The results of regression analysis showed that the followings were as explaining factors affecting wheat waste management: Variables of age, history of wheat cultivation, number of family labor, the rate of wheat yield per hectare, area under cultivation, access rate to machinery required in the planting stage, access to needed machines at harvesting stage, awareness rate, education, credit, type of culture and gender, 69% of the variability of dependent variables. The variables of farmers' awareness rate had the highest effect in reducing wheat crop losses, and the education levels had also the highest influence of wheat waste management.

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Introduction

Wheat as one of the basic agricultural products, is of particular importance, and providing such a product for societies like Iran, where wheat has a special role in the nutrition pattern, represents the creation of food security, while the poor and middle class welfare is extremely affected by this product (Clafferty, 2000). Food security and universal access to adequate and favorable food is as main axes of economic development. The proportion of herbal products of this is 90% that the cereal comprises 60% of this contribution, and the wheat forms 47% of it alone (Ministry of Agriculture, 2003). Such wastes and losses may harm the economy in several aspects, including reduced production rates, increased need for imports and wasting the inputs required for the production (Shadan, 2008). Reducing waste is a key factor in increasing the production and reducing the imports, which in addition to increasing yield play an important role in employment, development of non-oil exports and creating food security (Institute of Agricultural Economics and Planning, 2005).

Wheat is the dominant crop in Ilam province. The rate of wheat waste in the city of Ilam is equal to 13%, which is higher than the mean waste rate out of the country. The reasons for the highest wheat losses in the city of Ilam include: improper ground slope, use of inappropriate seed varieties, worn combines, lack of administrative levers for vehicle fleet management, lack of facilities for measuring the wastes, skyrocketing prices of harvesting crops (Ilam Agricultural Organization, 2014). So far, The present study was performed to investigate factors affecting wheat crop waste management in the city of Ilam.

In case of having a systematic program and appropriate mechanisms for planning as well as proper management, providing appropriate solutions, achievement of modern technologies and organizing the current facilities, there would be hope to reduce such agricultural waste to improve the economy of farmers and the agriculture. Thus, conducting studies in the field of waste management of this strategic crop is highly important. So far, some studies have been done in this area. Omid Najafabadi & Hossein Poor

(2013) studied the factors affecting the wheat farmers' skills regarding waste management of wheat and concluded that there is a positive and significant relationship between educational level and skills of farmers regarding waste management of wheat with 99% of confidence. Also, there is a negative and significant relationship between the independent variable of age, wheat cultivation history and the farmers' skills and waste management of wheat. Also, there is a positive and significant relationship between area planted and farmers' skills towards waste management in wheat. Birjandi (2011) examined the role of supervising engineers in reducing wheat crop losses and concluded that there is a significant positive relationship between two variables of using educational aids for training wheat growers in the field of reducing wheat losses and the role of supervising engineers in reducing wheat wastes. This study was carried out aimed at examining the factors affecting wheat waste management by wheat growers in the city of Ilam.

Materials and methods

Methodology

The present study was conducted aimed at examining the factors affecting wheat waste management by wheat growers in the city of Ilam in 2013-2014. This is an applied study regarding the objective, a quantitative study regarding numerical analysis of data and a descriptive – correlative study in terms of methodology and data collection, which was conducted using a survey strategy.

Statistical population & sample size

The statistical population of the study consisted of wheat growers in the city of Ilam (N=400) that the sample size was estimated as 350 subjects. They were selected using Krejcie and Morgan formula by stratified randomized sampling method with proportionate contribution. Finally, due to inaccuracies of wheat growers in answering the questions, the data related to 300 samples were analyzed.

Data collection & Data analysis tool

A questionnaire was designed to collect required data that included the following: Personal and professional characteristics (8 items) , social factors (8 items) , economic factors (11 items) , technical factors (4 items), the level of awareness of wheat waste management (29 items) , farmers' attitude towards wheat waste (29 items) and wheat waste management (29 items) . The validity and reliability of the questionnaire were confirmed through panel of experts and using Cronbach's alpha (0.95) , respectively. Data analysis was performed using SPSS 19 software.

Results and discussion

In this study, 300 wheat farmers of the city of Ilam were studied that their mean age was equal to 45.05 years, and 45% of them were in the age group of 30 – 49 years. In terms of education level, the highest frequency (69 subjects) was related to the farmers with education level higher than diploma. Most of the respondents (87.7%) with frequency of 263 subjects were men. Regarding marital status, 81% of the respondents were married. The mean work experience of them in farming was 20.53 years, and their mean experience in the field of wheat cultivation was equal to 16.44 years with a SD of 14.73.

Table 1. Regression analysis results of the independent variables impact on waste management in wheat.

<i>Variables</i>	<i>B</i>	<i>Std. Error</i>	<i>Standard B</i>	<i>T</i>	<i>Sig</i>
Constant	1.470**	0.321	-	4.585	0.000
Age	-0.127*	0.029	0.179	2.343	0.020
History of wheat planting	0.128	0.165	0.143	1.291	0.240
Number of family workforce	0.276*	0.135	0.172	2.041	0.039
Wheat crop production per hectare in the last year	0.154	0.123	0.066	1.25	0.213
Dry land wheat cultivation	0.319	0.20	0.044	0.594	0.067
Availability of machines needed in the planting stage	0.119*	0.054	0.060	2.201	0.028
Access to machinery needed at harvest time	0.023*	0.011	0.067	2.091	0.038
Farmers' awareness on grounds of wheat losses	0.127*	0.064	0.071	2.041	0.040
Farmers' awareness of effective factors in reducing wheat crop losses	0.871**	0.280	0.809	3.11	0.000
Education Level	0.577*	0.248	0.280	2.32	0.015
Use of bank facilities	0.466**	0.117	0.178	3.98	0.000
Type of culture	0.22*	0.079	0.118	2.78	0.015
Gender	-0.179	0.100	-0.098	-1.794	0.074
R = 0.752 R ² = 0.693 ADJUSTED R ² = 0.667 F = 8.217 (Sig = 0.0000.					

Source: research findings Levels of significance: **: Significance at the 1%; *: Significance at 5% level.

Regarding the use of information resources, classes and training courses with the lowest coefficient of variation of 0.3 were in the first ranking, while broadcasting with coefficient of variation of 0.412 and communication with the advocates with coefficient of variation of 0.440 were at second and third rankings, respectively. In other words, these three items were as the most important communication channels used by the farmers. For further understanding of factors affecting wheat waste management and due to the validity of different regression techniques, the simultaneous regression method was used. The purpose of performing regression was to examine the effect of independent variables on the dependent variable, predict the changes of dependent variable

and to determine the contribution of each independent variable in explaining the variance of the dependent variable.

Therefore, in this study, based on multiple regression analysis model, the following independent variables were included in the model as contributing structures in explaining waste management of wheat: age, history of wheat planting, the number of family labor, crop production rate in the last year, the area under wheat farming, access to needed machines at planting stage, the availability of machines needed at harvest time, farmers' awareness about the causes of wheat losses, farmers' awareness of effective factors in reducing wheat waste, gender, education level, type of

production technology, and the use of banking facilities. The results of this analysis showed that the regression equation with $F= 8.217$ and $P = 0.000$ was significant at 1% error and 99% confidence levels. The findings suggest that the variables of farmers' age, farmers' awareness of the causes of wheat losses, access to machinery required in the planting stage, access to needed machines at harvesting time, education level and the type of culture were significant at 5% error and 95% confidence levels. Furthermore, the findings suggest that the variables of farmers' awareness regarding effective factors in reducing wastes in wheat and use of banking facilities were significant at 1% error and 99% confidence levels. Thus, these variables had the greatest impact on waste management of wheat. There is a negative and significant correlation between the age of wheat growers and wheat waste management by the farmers. This means the older farmers have a less efficient management on wheat waste, and vice versa. The studies results of Omid Najaf Abadi & HosseinPoor (2013) and Alibeigi (2009) are consistent with this conclusion. In this regard, it is recommended to hold training - promoting classes on waste management in wheat to justify the elderly wheat growers. There is a significant positive relationship between the history of wheat cultivation and wheat waste management. In other words, with more experience in wheat cultivation, the waste management of wheat would be more effective. The research results of Beranvand (2003) , Rahimi & Khoshnoodifar (2011) and Omid Najafubadi & HosseinPoor (2013) are inconsistent with this result.

There is a significant positive relationship between the number of family labor and wheat crop waste management. There is a significant relationship between wheat crop production in the last year and wheat waste management. Thus, it is recommended to provide the ground for more production by creating incentives of motivations of farmers. There is a significant positive relationship between farmers' knowledge on the causes of wheat crop waste and waste management of wheat. Thus, it is recommended to do appropriate measures regarding

the farmers training to apply the correct principles of waste management of wheat. There is a significant positive relationship between farmers' knowledge on solutions of wheat crop waste reduction and wheat waste management.

Conclusion

Due to particular climate situation, Iran has a very low yield per unit area compared to many European and American countries, while the per capita consumption of wheat in Iran is higher than in most countries in the world. The wheat losses comprise a high percentage of production, which can affect the GDP and level of self-sufficiency of this crop (Pouratashi, 2011) . In this regard, it is recommended that the Agricultural Jihad will provide the required information on wheat and the ways to reduce wheat waste for the farmers through more communication channels, including radio and television, holding training workshops and attending in demonstration farms. There is a significant positive relationship between the level of access to needed machines at planting and harvest stages and wheat waste management. Thus, it is suggested that Agricultural Jihad will provide mechanized farm machinery in a timely pattern with a large number for the farmers as a step to reduce wheat waste. There is a significant positive relationship between wheat waste management by male and female farmers and wheat waste management.

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