



# Study the Affective Components in the Wheat Decrement (case study mahabad township)

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## Abstract

population growth increases and need to provide food day-to-day were increasing. The main purpose of this research was to analyze effective components to reduce the wheat decrement reduction. The study in terms of objective was an applied one and in terms of method was casual and communicative. A questionnaire was used to collect data. Cronbach alpha coefficient of questionnaire was obtained 83%. The statistical population of this study consisted of all wheat farmers of Mahabad city with a population equivalent to N= 6200 that by using stratified sampling, simple random and the general formula of Cochran 210 wheat farmers were selected. In this study, effective factors in reducing the wheat losses were agricultural, social, extension-educational, political, economic and technical Components. Also in this research in each component investigated the main options influence on wheat decrement.

**Keywords:** wheat, decrement, affective, components, Mahabad city.

## Introduction

Population growth increases the need to provide food day-to-day. There are many different ways to increase production and meet human needs such as increasing the cultivated area, increasing yield per unit area, accessing to superior varieties, managing cultivation practices which including excretion of pest and disease, irrigation, nutrition and so on. In this regard, a strategy that has been forgotten and less considered is waste reduction (Azizi, 2004). This is because the level of waste impact on Gross Domestic Product (GDP) and national income unfortunately is very worrying (Shadan, 2007). Despite all the technological developments, the most advanced industrial countries not only consider the development of the agricultural sector as complementary of industry sector but also evaluate the importance of the food in relation to their

national security. In our country, industry development not only has no relation with the process that occurs in the world, but also its relationship with the agricultural sector has been neglected. The wide possibilities of Iran like the enjoyment of a variety of weather conditions and the possibility of producing almost all kinds of goods in temperate, subtropical and tropical area as well as the high quality of its products make it as one of five countries of major producers in production of about 20 agricultural products. However, all facilities (cultivable land and extractable water) are not used (Rahmani, 2003).

In Iran the wheat production rate in 2018 is about 12.3 million (FAO, 2018). In West Azarbaijan province with 887,187 hectares of land under cultivation of agricultural products has a fifth place in the country and

Mahabad city by producing more than 50 thousand tons of wheat from total 47 thousand hectares under cultivation of this product statistically is in third place of the province in terms of planting wheat (statistical Yearbook of West Azerbaijan, 2011). According to the high value about 30% of product losses in the agricultural sector, conducting study in this regard is essential. Results Birjandi et al (2014) research's shows that five factors including knowledge-skill factors (lack of attention of farmers to plant nutrition based on soil test results, incorrect irrigation due to the lack of farmers' skills in proper preparation of land, farmers' inability to identify appropriate type of fertilizer at every stage of wheat growth, lack of awareness of farmers about consumption rate and appropriate concentrations of fertilizer, neglect of farmers to fallow and crop rotation, difficulty in combine moving due to cross borders on the farm to facilitate irrigation, farmers' lack of knowledge of proper time of fertilization or spraying), protective factors (delay in harvest due to the unavailability of a sufficient number of combine, inadequate number of combines for timely access to them, lack of timely and proper combat wheat diseases, the rush in the harvest, traditional methods of irrigation, lack of accurate and timely combat with wheat diseases, the rush in the harvest, traditional methods of irrigation, lack of timely and proper combat with pests of wheat, low capacity of existing combines), managerial factors (winnowing and disinfection of the seed, inappropriate time of planting, poor land leveling and lack of leveler, lack of proper management of weeds within the

farm), farming factors (extra consumption of seed in brassica napa or seeding method with basic equipment, high density of products because of excessive use of seed in napa method by original equipment, different planting depth and failure to simultaneous harvest of products in brassica napa or seeding method by early machines), and mechanization factors (failure to adjust the different parts of the combine in different condition by driver, using old combine with low technology) explain more than 51% of the variance of factors creating wheat losses from planting to harvest.

Khodabakhshi Parizi et al (2014) in his research entitled "the impact of waste of agricultural products on various economic aspects" concluded that the policy of macro policies, practical strategies to prevent losses from the government and raising public awareness in waste reduction should be considered more. They also concluded that given the strategic importance of agriculture sector in the GDP of the country and the value of non-oil exports and employment in the country, the waste reduction could increase crop and garden yields as well as creating employment, development of non-oil exports and creating food security. Izadi and hayati (2013) in a study examined the future of agricultural extension approach in reducing waste and concluded that the process of losses associated with different elements that the extension to influence and change these elements should be identified and worked on them and instead of applying the potential to increase the under cultivation area and production, with an emphasis on the development of complementary and productive industries,



the losses in agricultural products should be prevented. The study results of Mousavi et al (2013) entitled "the prioritization of risk factors in the production of vegetable waste from the perspective of producers" indicated that from the perspective of the vegetable farmers and growers the ability to purchase the required resistant seeds according to the region's condition the most important economic factor is inefficient of organizations and governmental commercial agencies regarding the appropriate marketing products the most policy factor refers to the lack of information, about the ways to prevent the losses the most important educational-promotional factor is the microbial and biological damages of insects, rodents, pests, etc. and the most important factor in crop farming is non-compliance of storages with existing standards is the most important technical factor causing losses. Furthermore, respondents believe that among the causes of losses, economic factors were the most important compared to the other factors.

Eskandarzadeh et al (2013) conducted a study entitled "investigating the importance of management skills necessary for the application of precision farming in sustainable agricultural development process in West Azerbaijan province". Their study results showed significant difference between the skills available in the alpha level of 0.01%. Also, factor analysis results showed that accounting skills, agricultural skills, skills of diagnosis of variability, information-seeking skills, determining goals and decision-making skills, economic skills in using agricultural machinery, and technical skills in using agricultural

machinery, totally explain 61.27% of skills necessary for precision farming in sustainable agricultural development process and among them accounting skills with explanation of 23.91% of total variance has had more role.

The study results of Kazemi et al (2012) entitled "The assessment of knowledge and skills of wheat farmers of Meydavoud sector of the Baghmalek city as the factors affecting wheat waste reduction at farm level" showed that the knowledge and skills of half of farmers are excellent. There is a significant inverse relationship between age and work experience in agriculture and farmers' technical knowledge rate compared to the factors affecting waste reduction at level of 5%. Between respondents' level of education, level of service centers, the use of media such as television, radio and direct relationship between the level of their technical knowledge is significant at 1%. The participation in educational programs and technical knowledge of farmers there was a significant relationship at 5% level. There is a significant direct relation between the variables of education level of respondents, visiting the service centers, the use of media such as television, radio, etc. and the level of their technical knowledge at 1% level. There is a meaningful relationship between the participation in educational classes and the technical knowledge of farmers at 5% level. Also, there is a significant inverse relationship between independent variable of the distance of farm of respondents from agricultural services centers and the dependent variable of their skill at 1% level. Abbasian and colleagues (2012) in a study which aimed to determine

the role of agricultural extension and education on productivity and waste of agricultural products and wastes found that according to official figures the agricultural efficiency and waste status of products in our country is not good position and unfortunately is in a state of turmoil. Therefore, the agricultural efficiency and waste status in Iran caused Iran to be independent in many products but could not sustain in this independency. On the other hand, given that the quality of human resources has the greatest impact on the enhancement of productivity of agricultural sector, thus, providing agricultural extension and education, especially training of manpower in agriculture and natural resources sector in order to increase labor productivity will follow more percentage of productivity compared with an increase of existence of land and natural resources and technology and this indicate the vital role of agricultural extension and education well. Also, consumption culture, knowledge of production and conversion and processing of agricultural products and knowledge of correct utilization of agricultural machinery and facilities, all in some ways directly or indirectly connected to the reduction of agricultural wastes. Therefore, training manufacturers in this field could have an important role in reducing agricultural waste. But what now seems important is this that why waste is considered as the fundamental issue of most countries and states think about what measures to prevent the rising trend of food waste? What is the importance of two issues of food security and food waste in the economic policies? How can the waste be avoided?

According to the above questions and high share of products' losses in the agricultural sector and the lack of accurate statistics relating to losses of agriculture sector and the need to respond to them, the need to fulfill the study in this regard is essential. In fact, the role and impact of waste of agricultural products should be determined in agriculture and food security sector as well as the impact of waste on the price of agricultural products. Factors influencing waste of agricultural products are other parameters that can affect that are determined in terms of quality and quantity during the investigation.

### **Materials and Methods**

Regarding the purpose of the study, this study was an applied research. Also, considering the amount and degree of control of the variables, it was a non-experimental study. Besides, considering the data analysis, the study was descriptive, correlation study. In order to collect the data, in the fieldwork stage, a questionnaire was used as the main means of the data collection. To measure its validity, the necessary amendments were made after getting the professors and experts' opinions. Also, in order to measure the reliability of the questionnaire, thirty questionnaires were completed by the experts and Cronbach alpha coefficient ( $\alpha = 0.83$ ) was calculated. The sample of this research involved all wheat farmers in Mahabad township in west Azerbaijan province who were about 6200 staffs. The number of the sample was computed 210 through Cochran formula. The collected data through the questionnaires was analyzed by SPSS version 21. In the descriptive statistical



section, distribution, percentage, and mean were used. In the inferential statistics inferential statistics (Friedman) was employed.

## Findings

### The respondent's characteristics

Describing the age frequency of studied population showed that the average of age of respondents was 42, maximum age of respondents was 78, and minimum age of them was 16 in which men constituted the majority of respondents (95%) and women constituted 5% of them. In relation to the work experience of the respondents, the average work experience of the respondents was 18 years old and most of respondents with the number of 61 subjects (29%) had more than 21 years of work experience. In relation to background information about

cropping, number of farm plots of the respondents to the questionnaire was 3 plots and most of respondents about 50% had 1 or 2 plots that 28% of them use rainfed way, 12% of them utilize irrigated way, and 59% of them use both irrigated and rainfed methods to produce their products.

### Prioritizing agricultural components affecting wheat decrement reduction

Results of Table 2 show that among the agricultural components influencing the wheat decrement reduction, the item of using appropriate machinery, Lack of attention to the right time of harvesting and Fight against Eurygaster integrates pest were the main agricultural components affecting wheat decrement reduction in this study. Also other findings showed in table 2.

Table 1. The respondent's characteristics

Group	Frequency	%	Mean	SD	Minimum	Maximum
Less than 30	33	15.7				
31 to 40	63	30	42.26	11.37	16	78
More than 41	114	54.3				
Total						
Less than 5 years	24	11.4				
6 to 10	38	18.1	18.87	1.37	1	45
11 to 15	39	18.6				
16 to 20	48	22.9				
Over 21	61	29				
irrigated	26	12.4				
rainfed	59	28.1				
irrigated and rainfed	125	59.5				

(Source: Findings derived from questionnaire of research)

Table 2. Prioritizing agricultural factors affecting wheat decrement reduction

Items	Mean	SD	CV	Rank
Using suitable machinery	4.02	0.90	0.223	1
Lack of attention to the right time of harvesting	3.84	0.92	0.239	2
Fight against Eurygaster integrates pest	3.90	1	0.256	3
Preventing wheat waste by preventing the loss of combine	3.79	1.01	0.266	4
Deep and shallow planting of seeds leads to the seeds' loss	3.60	0.97	0.269	5
Using modern methods of plant breeding to improve performance	3.77	1.04	0.275	6
Seed sterilization	3.71	1.08	0.291	7
Proper land preparation before planting	3.43	1.07	0.311	8

(Source: Findings derived from questionnaire of research)

### Prioritizing the social components affecting in wheat decrement reduction

According to the Table 3, among the social components in wheat decrement reduction, item of communication with other farmers, Trust on technical advice and consultancy services of supervisors and The

communicate with agricultural extension service center were the important components influencing the social factors in wheat decrement reduction from the respondents viewpoints. Other findings are shown in the table 3.

**Table 3. Prioritizing the social components affecting in wheat decrement reduction**

Items	Mean	SD	CV	Rank
The amount of communicate with other farmers	3.64	0.84	0.230	1
Trust on technical advice and consultancy services of supervisors	3.75	1	0.266	2
The communicate with agricultural extension service center	3.56	0.99	0.271	3
Creating a culture of good work in relation to the production of wheat	3.66	1.04	0.284	4
Encouraging other farmers to join the scheme of wheat	3.62	1.04	0.287	5
Motivating farmers to enhance the management skills of farm	3.43	1.07	0.311	6
Empowering smallholder farmers to increase cultivation levels	3.19	1.20	0.349	7
The amount of communicate with cooperatives of production	3.02	1.17	0.387	8
Forming cooperative enterprises	2.94	1.17	0.397	9

(Source: Findings derived from questionnaire of research)

### Prioritizing extension-educational components influencing on wheat decrement reduction

According to the Table 3, among the extension-educational components in wheat decrement reduction, item of Contact with experts of the companies of consulting services, Visiting

exemplary fields and Contact with governmental extension agents and agricultural experts were the important extension-educational components in wheat decrement reduction from the respondents viewpoints. Other findings are shown in the table 4.

**Table 4. Prioritizing extension-educational components influencing wheat decrement reduction**

Items	Mean	SD	CV	Rank
Contact with experts of the companies of consulting services	3.62	0.95	0.262	1
Visiting exemplary fields	3.79	1.03	0.271	2
Contact with governmental extension agents and agricultural experts	3.76	1.02	0.281	3
Listening to agricultural radio programs associated with wheat losses	3.75	1.06	0.282	4
Participating in educational workshop	3.58	1.12	0.312	5
Viewing educational-promotional videos related to wheat losses	3.62	1.14	0.314	6
Participating in educational-promotional classes	3.58	1.21	0.337	7

(Source: Findings derived from questionnaire of research)



### Prioritizing political components effective to reduce wheat decrement

According to the Table 5, among the political components in wheat decrement reduction, item Policies to reduce transaction

costs, Crop insurance and the use of guaranteed price policy were the important political components in wheat decrement reduction from the respondents viewpoints. Other findings are shown in the table 5.

Table 5. Prioritizing political components to wheat decrement reduction

Items	Mean	SD	CV	Rank
Policies to reduce transaction costs	3.24	1.01	0.311	1
Crop insurance	3.65	1.19	0.326	2
The use of guaranteed price policy	3.72	1.23	0.330	3
Crops withdrawal program	3.20	1.09	0.340	4
Reducing subsidies of some food products	3.17	1.14	0.359	5

(Source: Findings derived from questionnaire of research)

### Prioritizing economic components affecting the wheat decrement reduction

According to the Table 6, among the economic components in wheat decrement reduction, item Development and dissemination of farm management tools, testing

new methods of agriculture in farm and Reform of the guaranteed purchase system of essential agricultural products were the important economic components in wheat decrement reduction from the respondents viewpoints. Other findings are shown in the table 6.

Table 6. Prioritizing economic components affecting the wheat decrement reduction

Items	Mean	SD	CV	Rank
Development and dissemination of farm management tools	3.59	1.03	0.286	1
Testing new methods of agriculture in farm	3.66	1.16	0.316	2
Reform of the guaranteed purchase system of essential agricultural products	3.68	1.18	0.320	3
Development of conversion industries	3.40	1.10	0.323	4
Supporting farmers to increase crop productivity	3.49	1.26	0.361	5
Improving marketing and the quality of packaging	3.32	1.22	0.376	6

(Source: Findings derived from questionnaire of research)

### Prioritizing technical components affecting the wheat waste reduction

among the technical components in wheat decrement reduction, item teaching the applied technical force in machines, Familiarity with how applied machines work and Familiarity with how to adjust the applied machines were the important technical components in wheat decrement reduction from the respondents viewpoints. Other findings are shown in the table 7.

### Prioritizing farm management components affecting wheat decrement reduction

According to the Table 8, among the management components in wheat decrement reduction, item Specific schedule for work season, using new method of plant breeding to improve performance And Familiarity with new methods of harvesting were the important management components in wheat decrement reduction from the respondents viewpoints. Other findings are shown in the table 8.

**Table 7. Prioritizing technical components affecting the wheat decrement reduction**

Items	Mean	SD	CV	Rank
Teaching the applied technical force in machines	3.77	1.02	0.270	1
Familiarity with how applied machines work	3.77	1.06	0.281	2
Familiarity with how to adjust the applied machines	3.56	1.08	0.282	3
Determining the appropriate technology according to working conditions	3.66	1.08	0.299	4
Evaluation of agricultural machinery	3.65	1.12	0.300	5
Familiarity with how to repair the applied machines	3.66	1.10	0.300	6
Limiting machine variation according to climate	3.50	1.06	0.302	7

(Source: Findings derived from questionnaire of research)

**Table 8. Prioritizing farm management factors affecting wheat decrement reduction**

Items	Mean	SD	CV	Rank
Specific schedule for work season	3.67	1.05	0.265	1
Using new method of plant breeding to improve performance	3.73	1.02	0.273	2
Familiarity with new methods of harvesting	3.79	1.05	0.277	3
The end of the planting at the certain time	3.65	1.04	0.284	4
The analysis of demand, supply and price of wheat	3.66	1.07	0.292	5
Selecting the best marketable cultivar for cultivation	3.74	1.09	0.291	6
Conducting necessary studies and research before making a decision	3.58	1.07	0.298	7
Determining the machinery and equipment needed for the purpose	3.61	1.10	0.304	8
Whole purchase of agricultural inputs for a discount on the price	3.46	1.08	0.312	9

(Source: Findings derived from questionnaire of research)

### Conclusion and recommendations

In the prioritization of agricultural components affecting the wheat decrement reduction from the respondents' view the results showed that the items of lack of attention to proper time of harvesting and using appropriate machinery were identified as the most important factors. Wheat allocates the high percentage of agricultural products and is considered as the most important agricultural product in most of countries. Given the importance of wheat cultivation in the country, it is necessary to create a comprehensive system by utilizing the management science and engineering and based on experiences and experiments of relevant experts to resolve issues which aim to select the most suitable equipment from several different machines with similar

performance. Applying the Analytic Hierarchy Process as one of the best approaches to decision-making is based on logical relationships and using experiences of skillful experts. The results of the study are in line with the research results of Mirtorabi and colleagues (2011), Eskandarzadeh and colleagues (2013), and Abbasi et al (2011).

In prioritizing social components influencing wheat decrement reduction from the perspective of respondents, the research results indicated that the item of relationship with other farmers and confidence in the technical advice and consultancy services of supervisors were identified as the most important factor. If the promotion and training of better and more services to be taught to farmers who have an important



role in food production, this in addition to the responsibility for their care that provides the growing needs of their families and given their interest to the talent of space and time of encouragement for activating in agricultural affairs could increase productivity and makes possible the availability of new productive resources by using agricultural waste reduction and as a result raises the income level and quality of life. The initial and starting point in this way is to prepare the job description by authorities to promote information and skills necessary to increase productivity and reduce waste. If promotion had not have a general and national policy, it could not contribute to the rural agricultural development affairs. Effort to institutionalize this issue refers to the promotional activities that should be developed and spread with a dense and intensive program that meets their needs. The study results are consistent with the results of Onyuma and colleagues (2006) and Rasouliazar and colleagues (2008).

Results of prioritizing extension-educational components influencing wheat decrement reduction from the standpoint of respondents indicated that the items of contacts with experts from consulting services companies and visiting exemplary farms were regarded as the most important factor. Today, global changes have encountered developing countries with the challenge of structural adjustment and reform of development organizations. Hence, organizational dominant approach about the agricultural extension in these countries is the movement towards privatization of the agricultural sector (outsourcing affairs and advisory services) and developing the share of private sector in this field. Since the extension of agriculture has an important role in the effectiveness of training activities, it is recommended to use the promoters and advisors who have individual, social and

effective communicative characteristics to enhance professional capabilities of wheat farmers and also those who enjoy the sufficient knowledge and skill in all stages of wheat production with the power to transfer findings to the wheat farmers. The results of research are in line with studies of Niknami (2012) and Birjandi and Hussaini (2009).

In prioritizing political components to reduce wheat decrement from the standpoint of respondents, the results showed that the item of "policy to reduce transaction costs" is the most important factor. One of the problems in developing and underdeveloped countries that increases losses is very high transaction costs in the agricultural sector, namely, the exchange issue should spend a long process since the product picked up until it is delivered to the final consumer. This issue creates two problems: First, the existence of various intermediaries, road transportation, inappropriate storage, lack of refrigeration, etc. caused some of products to be lost. Secondly, the various stages of product sending from harvest to consumption stage lead to high transaction costs which is a fundamental problem for farmer and he to get rid of this cost keeps his products in storage for a while. Due to the improper storage ways and various pests, the product gradually decayed. Farmers to prevent further decaying, send their products to the market that unfortunately are faced with reluctance of intermediaries. Farmers have two choices, they have to offer their products with low cost, or see their products' decay. Therefore, in this context, it is recommended that by forming farmers' Cooperative Unions take an action to deliver the product without intermediaries to relevant cooperative union. The research results are in line with the study results of Khodabakhshi et al (2014).

In prioritizing the economic components affecting wheat decrement reduction from

the respondents' view, the results showed that the item of "development and dissemination of farm management tools" were identified as the most important factor. Numerous changes observed during the harvest at farm level can have a variety of reasons. These changes are mostly controllable factors that prevent the utilization with maximum efficiency from a farm. An optimal level in agriculture is that the yields of other units can reach to this level of product. All the factors that are causing this difference can be controlled. But since these factors are not uniformly distributed on the farm, management skills are necessary to manage these factors. For shaping management in the farm in this state, generally, it is necessary to change the shape of management in the farm and apply different and new operations and tools on the farm. Therefore, in this context, it is recommended that the government with advanced technology and tools among farmers pave the way for farmers to use new agricultural systems. The results are in line with the study results of Chita (2006).

Regarding the results of prioritizing the technical components affecting the wheat decrement reduction from the standpoint of respondents, the item of "training the technical factors used in car" was as the most important factor. In micromanagement most of tasks is executable and technical management is dominant. In this dimension the director deals with work and workers. Therefore, work experience and technical and practical knowledge contribute to the success in this state. Actually, technical director is the farmer who owns land or an agricultural technician who monitors how to do things and division of work and sometimes even mentions some practical tips to workers and so on. According to the progress of science and the need to meet human needs, the need to get out of traditional agriculture and tendency to

agricultural mechanization is felt more every day. But now the problem is that in order to achieve a real mechanization to achieve the above objectives, what infrastructures and requirements should be followed to meet the main goals of machinery agriculture. Since our country has not yet achieved the complete mechanization stages and there are various problems in the development of this concept, farmers will not buy a new agricultural machine based on scientific calculations and even farmer with the same machine again purchases and replacement of new equipment instead of old equipment is not analyzed exactly and in addition to the enhancement of specific costs including fixed and variable are added to the production costs and finally, not only benefit is not included in production, but also in some cases be affected. According to the results, it is recommended that applying mechanization and training experts in this field will increase the coefficient of productivity of resources, institutions of equipment, and quality and quantity of products. Given the pre-determined targets, it is necessary to join more efficient force to the mechanization cycle and circulating it faster. The results of this study are in line with the research results of Yaghoubi and colleagues (2009), Eskandarzadeh and colleagues (2013), and Bourdbar and Mousavi (2011). In prioritizing farm management factors affecting wheat waste reduction from the respondents' view results showed that the items of specific timetable for the work season and using modern methods of plant breeding to improve performance were identified as the most important factors. Planning for the cultivation of crops and the use of modern methods of plant breeding to improve the performance is one of the most important events of agriculture in the New World. The overall goal of plant breeding is to increase yield per unit area, improve the quality of



agricultural products and produce the raw materials for human societies. Modified varieties and cultivars of crops and garden plants each year is transferred from one country to another. Thereby, the quality and quantity of agricultural products are increased and agricultural products' needs are resolved. In this context, it is suggested to take necessary actions to increase knowledge and create positive attitude and high motivation and effective communication among farmers and experts to produce organic crop and reform the healthy crop planting practices. The results of the research are consistent with study results of Yaghoubi and colleagues (2009).

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