

The Role of Farm Advisors in Reducing Wastes in Wheat Production (Case Study, Qazvin Province, Iran)

VAHIDEH BIRJANDI

Islamic Azad University, Science and Research Branch, Tehran, Iran.

No.598, 212th Street, Parvin Square, Tehran Pars, Tehran, Iran.

I. R. IRAN

vahideh.birjandi@yahoo.com

Abstract: - Wheat was one of the first domesticated food crops and for 8000 years has been the basic staple food of the major civilizations of Europe, West Asia and North Africa. Today, wheat is grown on more land area than any other commercial crop and continues to be the most important food grain source for humans. Agricultural waste was considered as an irrational behaviour of agricultural man power, i.e., producers, processors and consumers. Due to the role of reducing wheat waste in increasing production of wheat, Iran's Ministry of Agriculture commenced a program to reduce the waste and increase production of wheat and hired university graduated students in field of agriculture to work as advisors to train farmers the methods to increase production and reduce wastes in the Wheat Self Sufficiency Plan (WSP). The major purpose of this study was investigating of the role's farm advisors in reducing wastes in wheat production in Qazvin Province. The population for the study was 112 advisors in Qazvin Province and data collected by using a questionnaire. The data was analyzed by using statistical methods in SPSS. The results of the study showed there was a meaningful and positive relation between farm advisors' role in reducing wastes in wheat production as dependent variable and number of farm advisors' contacts with extension experts in Ministry of Agriculture in cultivation, rate of attending of farm advisors in educational courses on reducing wastes, adaptability of farm advisors' educational courses on reducing wastes with their needs, applying farm advisors' advices by farmers to reduce waste in plantation period, awareness of farm advisors about methods of reducing wastes in plantation period, using educational tools by farm advisors in farmers' education on reducing wheat wastes as independent variables.

Key-Words: - Farm Advisors, Waste Reduction, Wheat, Iran, Qazvin Province.

1 Introduction

Wheat is the most widely grown cereal grain, occupying 17% of the total cultivated land in the world. An estimated one billion tons of grain will be needed annually by 2020 to feed a world population that is rising by at least one hundred million people every year. At the same time, the amount of farmland per capita is decreasing the world over due to soil erosion, encroaching human settlement, and industrialization [3]. The demand for quality wheat products like bread in developing countries is increasing with the rising population and urbanization but the farming systems impose major constraints on the environment and the future capacity to produce

[4]. Role of human factors in wheat waste are 65-70 percent and physical and mechanical factors are 30-35 percent. This is tragic in a world in which 840 million people remain undernourished and six million children under the age of five die of hunger and malnutrition each year [12]. The amounts of wheat wastes in Iran during cultivation period are over 10% [1]. It is estimated that the amount of wheat wastes during Plantation period are 22 percent [9]. Plantation period is a phase between cultivation period and harvesting period including: irrigation, thinning, earthing up, weeding, pest control, control of diseases, and weed control.

Also, the amounts of wheat wastes during harvest period are 2 percent of whole of Iran's wheat production [5]. Every year more than 30 percent of agricultural production is being wasted and a major reason could be methods of cultivation and harvest which is being used by farmers. Due to the role of reducing wheat waste in increasing production of wheat, Iran's Ministry of Agriculture began a plan to hire agricultural university graduates to work as supervisor engineers and train farmers the methods to reduce waste and increase production. The major purpose of "Wheat Self Sufficiency Plan" (WSP) is involving private sector as farm advisors to train farmers.

The advantage of decentralisation is that you reach many more farmers. When you look at the privatised or the decentralised extension system it promotes farmer empowerment. Farmers' capacity has been built to be able to make decisions on how to improve their own livelihoods and they are taking charge [9].

Advisory committees are a key component of true grassroots extension programming [16]. Agricultural extension is no longer just about improving yields and producing food - the bottom line is to make money. That is a necessary concept if large numbers of subsistence farmers have to break out of poverty. To be a successful farmer you have to be skilled, and you need an opportunity to actually make money in the countryside [15]. Effective advisory committees are the cornerstone of relevant, quality Extension programs. Also, by involving representative lay people, they accelerate educational change among the target clientele, result in "better" program decisions than those made by Extension agents on their own, and provide a beneficial learning experience. Advisory groups also have several useful functions: giving advice to Extension professionals regarding programs, analyzing and interpreting the local situation to identify needs and problems, and legitimizing and communicating program decisions among the community [2]. Extension services as a catalyst for development People must be helped to help themselves and should therefore be involved in their own decision-making processes. For the

participative approach to work, it is imperative that local leaders be trained [11]. Principal tasks of the Danish Agricultural Advisory service are including: Specialist advice involves being a know-how bank for the local advisers; communication of knowledge and information involves bridging the information gap between the agricultural research institutions and the local advisers who are supplied with results and information from the research institutions and other information sources; development activities involve the development of methods and tools for the advisory service and the farmers such as converting research findings into practical farming through the development; experiments and studies involve generating new know-how; education and training involve the development and coordination of the farmers' education and courses for local advisers, agricultural teachers and farmers; and service tasks involve a number of services which are most appropriately solved at national level. It includes tasks for farmers, the advisory service [7]. The Danish Agricultural Advisory Service (DAAS) is a partnership made up of 46 local advisory centres and a national centre. This unique two-level advisory system is both owned and used by Danish farmers. [5] The Lithuanian Agricultural Advisory service provides following services: Taking samples (grass, soil, grain, etc.); assessment of crop condition during plant vegetation; preparation of crop rotations, fertilization, plant protection plans; implementation of advanced technologies of plant production; making recipes of compound feeds and calculating rations; calculating feed needs; calculating production cost; preparation of animal movement, grazing management and feeding plans; carrying out productivity data analysis; diagnosing bee diseases; establishment of feeding influence on milk yield and composition; assessment of manure storages; calibration of agricultural machinery; investments into agricultural machinery; calculation of machinery costs; assessment of employees' health and safety conditions at work places and creation of risk assessment plans; supervision of

project implementation; measuring of crops by GPS receivers [17].

2 Methods

The research type was applied, descriptive and correlation method. In this study dependent variable was farm advisors' role in reducing wastes in wheat production. The population for the study was 112 advisors in Qazvin Province.

To indicate the validity of the questionnaire, it was edited by a panel of some experts in Ministry of Agriculture and Professors in Agricultural faculty of Islamic Azad University. The reliability of the questionnaire was measured by using Pilot Test and Cronbach Alpha method and the reliability for the overall instruments was estimated 0.89 and data collected by using a questionnaire. The data was analyzed by using statistical methods in SPSS.

3 Findings

Findings of research showed that average age of farm advisors was 28 years. More than 88 percent of farm advisors in this study had bachelor degree and 0.9 percent had master degree. Sixty percent of farm advisors had studied Agronomy and only 4.5 percent had studied Agricultural Extension and Education. The adaptability of training courses to improve farm advisors' skills was average. The number of farm advisors' contacts with the experts (Extension agents) in Centers of Agricultural Extension Services in the rural areas was high. The average number of farm advisors contacts with extension experts in Ministry of Agriculture during cultivation period was three times a week. The average rate of attending of farm advisors in educational courses on reducing wastes was high. In Farm advisors' opinion, their role in reducing wastes in wheat production in cultivation, plantation, and harvest periods was high. Also, in their opinion, Adaptability of farm advisors' educational courses on reducing wastes with their needs was average.

In order to prioritize the rate of using educational tools and teaching aids by farm advisors to inform farmers about reducing wastes in production of wheat by using Coefficient of Variation (CV), they declared the rate of using educational tools by using likert Scale. According to the results of the study as shown in table 1, Overhead projectors & transparencies were used most and Technical bulletins & pamphlets were used least by farm advisors.

Table 1. Prioritizing the rate of using educational tools by farm advisors

Educational Tools	Mean	Standard Deviation	CV	Priority
Overhead projectors & transparencies	2.19	1.114	0.508	1
Slide projector	2.88	1.315	0.456	2
Video cassettes	2.97	1.325	0.446	3
Extension publications	3.41	1.171	0.343	4
Poster	3.52	1.136	0.322	5
Technical bulletins & pamphlets	3.67	1.055	0.287	6

The results of study shown in table 2, indicated that there was relation between number of farm advisors' contacts with extension experts in Ministry of Agriculture during cultivation period as independent variable and farm advisors' role in reducing wastes in wheat production as dependent variable with 99% confidence interval ($r=0.251$, $p=0.009$). The findings of study showed that there was relation between number of farm advisors' contacts with the experts in Centers of Agricultural Extension Services (Extension agents) in the rural areas and farm advisors' role in reducing wastes in wheat production ($r=0.329$,

$p=0.000$). According to the results of study, there was relation between rates of attending of farm advisors in educational courses on reducing wastes and farm advisors' role in reducing wastes in wheat production ($r=0.306$, $p=0.004$). Also, the findings of study showed that there was relation between adaptability of training courses to improve skills of farm advisors and farm advisors' role in reducing wastes in wheat production with 95% confidence interval ($r=0.223$, $p=0.019$). The results of study showed that there was relation between awareness of farm advisors about methods of reducing wheat wastes in plantation period and farm advisors' role in reducing wastes in wheat production ($r=0.191$, $p=0.045$). According to the results of this research, there was relation between applying farm advisors' advices by farmers to reduce waste in plantation farm advisors' role in reducing wastes in wheat production ($r=0.195$, $p=0.043$).

The results of study showed that there was relation between awareness of farm advisors about methods of reducing wheat wastes in cultivation period and farm advisors' role in reducing wastes in wheat production ($r=0.212$, $p=0.026$). The results of study showed that there was relation between using educational tools by farm advisors in farmers' education on reducing wheat wastes and farm advisors' role in reducing wastes in wheat production ($r=0.529$, $P=0.000$). The results of this research showed that there was relation between adaptability of farm advisors' educational courses on reducing wastes with their needs and farm advisors' role in reducing wastes in wheat production ($r=0.037$, $p=0.004$).

Table 2. Correlation between independent variables and dependent variable

Independent variables	Correlation Coefficient	Significant
Number of farm advisors' contacts with extension experts in Ministry of Agriculture in cultivation	.251**	.009
Number of farm advisors' contacts with the experts in Centers of Agricultural Extension Services in the rural areas	.329**	.000
Rate of attending of farm advisors in educational courses on reducing wastes	.306**	.004
Adaptability of training courses to improve skills of farm advisors	.223*	.019
Adaptability of farm advisors' educational courses on reducing wastes with their needs	.198*	.037
Using educational tools by farm advisors in farmers' education on reducing wheat wastes	.223*	.019
Awareness of farm advisors about methods of reducing wastes in cultivation period	.212*	.026
Awareness of farm advisors about methods of reducing wastes in plantation period	.191*	.045
Applying farm advisors' advices by farmers to reduce waste in plantation period	.195*	.043

** Correlation is significant at the 0.01 level

* Correlation is significant at the 0.05 level

Independent variables with interval data or were coded by interval data, included using educational tools by farm advisors, Adaptability of farm advisors' educational courses on reducing wastes with their needs, awareness of farm advisors about methods of reducing wastes in cultivation period were used for a multivariate

linear regression analysis. The regression analysis showed that variables were statistically significant. The result indicated that 45.0% ($R^2_{Ad}=0.450$) of the variance in farm advisors' role in reducing wastes in wheat production could be explained by the above mentioned variables. The results are shown in table 3.

Table 3. Multivariate Regression Analysis

Variables	B	R^2_{Ad}	F
1 Using educational tools	0.169	0.261	21.813**
2 Using educational tools. Adaptability of educational courses for farm advisors on reducing wastes with their needs.	0.155 0.902	0.381	19.137**
3 Using educational tools. Adaptability of educational courses for farm advisors on reducing wastes with their needs. Awareness about methods of reducing wastes in cultivation.	0.136 1.159 0.145	0.450	17.066**

** Significant at the 0.01 level

In order to prioritize the level of farm advisors' awareness about factors caused wastes in production of wheat; they declared the level of their awareness about methods of reducing wastes in cultivation, plantation and harvest periods by using likert Scale. According to the results of the study as shown in tables 4-6, lack

of seeds disinfection and using unsterilized seeds in cultivation period, lack of knowledge about wheat's water needs in plantation period, and unleveled soil and unsteady motion of combines in harvesting period were the main factors caused wastes in wheat production.

Table 4. Prioritizing the level of awareness of farm advisors about factors caused wheat wastes in cultivation period by using Coefficient of Variation (CV)

Factors caused waste in cultivation period	Mean	Standard Deviation	CV	Priority
lack of seeds disinfection and using unsterilized seeds	4.06	1.043	0.256	1
soil preparation incorrectly & planting seeds in different depths of soil	3.95	0.932	0.235	2
Overusing seeds	3.94	0.783	0.198	3
Planting not in sowing time	4.19	0.772	0.184	4

Table 5. Prioritizing the level of awareness of farm advisors about factors caused wheat wastes in plantation period by using Coefficient of Variation (CV)

Factors caused waste in plantation period	Mean	Standard Deviation	CV	Priority
Lack of knowledge about wheat's water needs	3.94	0.994	0.252	1
Using ineffective methods of irrigation	4	0.980	0.245	2
Incomplete & imperfect irrigation due to incorrect soil preparation	4.15	0.756	0.182	3
Weeds	4.30	0.764	0.177	4

Table 6. Prioritizing the level of awareness of farm advisors about factors caused wheat wastes in harvest period by using Coefficient of Variation (CV)

Factors caused waste in harvest	Mean	Standard Deviation	CV	Priority
Unleveled soil & unsteady motion of combines	3.81	0.897	0.2354	1
Early harvesting	3.93	0.924	0.2351	2
Lack of knowledge about setting up the harvesting machines for different situations	4.27	0.718	0.168	3
Using out of date combines	4.30	0.701	0.163	4

Due to prioritize the level of farm advisors' awareness about methods of reducing wastes in production of wheat, they declared the level of their awareness about methods of reducing wastes in cultivation, plantation and harvest periods by using likert Scale, as well. The results

of this study showed that the respondents indicated seed treatment and threshing in cultivation period, using effective methods of irrigation in plantation period, and Soil leveling for steady motion of the combines in harvesting period was the main methods to reduce the wastes. The results are shown in tables 7-9.

Table 7. Prioritizing the level of awareness of farm advisors about methods of reducing wheat wastes in cultivation period by using Coefficient of Variation (CV)

Methods of reducing waste in cultivation	Mean	Standard Deviation	CV	Priority
Seed treatment and threshing	4.15	0.855	0.206	1
Leveling soil by levelers	4.04	0.706	0.174	2
Using pure seeds & high yield varieties	4.37	0.689	0.157	3
Planting in sowing time	4.35	0.656	0.150	4

Table 8. Prioritizing the level of awareness of farm advisors about methods of reducing wheat wastes in plantation period by using Coefficient of Variation (CV)

Methods of reducing waste in plantation	Mean	Standard Deviation	CV	Priority
Using effective methods of irrigation	4.13	0.836	0.202	1
Control of diseases	4.24	0.856	0.201	2
Rotation & fallow	4.21	0.746	0.1771	3
Pest control	4.31	0.754	0.174	4

Table 9. Prioritizing the level of awareness of farm advisors about methods of reducing wheat wastes in harvest period by using Coefficient of Variation (CV)

Methods of reducing waste in harvest	Mean	Standard Deviation	CV	Priority
Soil Leveling for steady motion of the combines	4.04	0.823	0.203	1
Setting up the harvesting machines for different situations	4.36	0.700	0.160	2
Using modern combines	4.49	0.674	0.150	3
Harvesting in exact time (timely harvest)	4.61	0.628	0.136	4

Also, to prioritize the level of applying farm advisors' advices by farmers to reduce wastes in production of wheat as shown in tables 10-12 farm advisors declared, using row crop planters

in cultivation period, using effective methods of irrigation in plantation period, and using modern combines in harvesting period were applied by farmers more than others.

Table 10. Prioritizing the level of applying farm advisors' advices by farmers to reduce wheat wastes in cultivation period by using Coefficient of Variation (CV)

Advices applied by farmers in cultivation	Mean	Standard Deviation	CV	Priority
Using row crop planters	3.28	1.066	0.325	1
Leveling the soil	3.90	0.935	0.239	2
Using pure seeds & high yield varieties	3.87	0.741	0.191	3
Planting modified varieties	4.17	0.730	0.175	4

Table 11. Prioritizing the level of applying farm advisors' advices by farmers to reduce wheat wastes in plantation period by using Coefficient of Variation (CV)

Advices applied by farmers in plantation	Mean	Standard Deviation	CV	Priority
Using effective methods of irrigation	3.31	1.089	0.329	1
Adding adequate amount of fertilizer	3.42	1.068	0.312	2
Pest control	3.97	0.867	0.218	3
Control of diseases	4.19	0.779	0.185	4

Table 12. Prioritizing the level of applying farm advisors' advices by farmers to reduce wheat wastes in harvest period by using Coefficient of Variation (CV)

Advices applied by farmers in harvest period	Mean	Standard Deviation	CV	Priority
Using modern combines	3.53	1.054	0.298	1
Setting up the harvesting machines for different situations	3.63	1.019	0.280	2
Levelling soil for steady motion of the combines	3.44	0.950	0.276	3
timely harvesting	4.09	0.792	0.193	4

4 Conclusions

The results of the study indicated that farm advisors have been effective in offering advisory services to the wheat farmers for reducing wheat wastes. The findings in this study is in accordance with studies by Motamed in 2004 and Ghiasvand in 2008 which showed there was relation between using educational tools by farm advisors and the effectiveness of performance of the advisors. The findings in a study by Keneshlou in 2002 and Ghiasvand in 2008 showed that there was relation between using formal methods of teaching by farm advisors and the effectiveness of performance of the advisors. The results of this study showed lack of seeds disinfection and using unsterilized seeds, lack of knowledge about wheat's water needs, and unlevelled soil & unsteady motion of combines were the main factors caused wastes in wheat production. Also, seed treatment and threshing, using effective methods of irrigation, and soil Leveling for steady motion of the combines were the main methods to reduce wastes in wheat production. The results showed that using row crop planter, using effective methods of irrigation, and using modern combines were most important advices applied by farmers. According to the findings of this research, overhead projectors and slide

projectors were the most important teaching aids used by farm advisors to inform farmers about reducing wheat waste in educational courses. Also, posters and technical pamphlets were the least important teaching aids used by farm advisors to inform farmers about reducing wheat waste in educational courses.

The results also indicated that 45.0% of the variance in farm advisors' role in reducing wastes in wheat production could be explained by using educational tools by farm advisors, Adaptability of farm advisors' educational courses on reducing wastes with their needs, awareness of farm advisors about methods of reducing wastes in cultivation period variables.

According to the findings of this study, it's suggested that farm advisors meet extension experts in Ministry of Agriculture for getting last information about methods of reducing wheat. In accordance with the results of this research, it's suggested that farm advisors use educational tools like poster and magazine for educating wheat farmers how to reduce wheat.

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