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Studying the Key Factors in Successes of under Pressure Irrigation Systems (Case Study: ILAM, Iran)

Bagher Arayesh

Department of agriculture, Agriculture Education and extension,
ILAM Branch, Islamic Azad University, Ilam, Iran

Abstract: The purpose of the present paper is to study the key factors in successes of under pressure irrigation systems in Ilam Province. The research method is casual-Relative which is conducted in the form of a survey research. The statistical society of this study includes 440 exploiters who own farming or garden lands and the credits of agriculture bank are granted to them to execute the rain irrigation systems. The sampling method to conduct the study is proportional stratified sampling. To determine the sample size Kerjesy and Morgan table is used. According to the data of this table, a statistical sample of 250 persons is chosen. The basic tool used in collecting data of this study is questionnaire. The data analysis and processing conduct in two levels: descriptive (central and dispersion Tendency), analytic (spearman correlation coefficient and multi-variable regression in a step-wise form). The results of this study show that there is a meaningful relationship between the variables of economic, socio - cultural, technical, climatic and extension factors with the variable of successes of under pressure irrigation systems.

Key words: Under pressure irrigation · Success · Farmers

INTRODUCTION

Iran is located in the south of northern temperate zone between 25 to 40 degrees of latitude and 44 to 64 degrees of longitude. Due to the special geographical position and having disparate unevenness and the effect of the other factors, Iran is one of the dry zones of earth. The average amount of annual rain in Iran is lower than one-third of average annual rain of earth (86 mm) [1]. The number of the permanent and full of Water Rivers is very low and there is often no drop of water in the course of these rivers in dry seasons except in the north and west. A remarkable amount of river water is wasted especially in the rain seasons. Many rivers may yet be briny (briny) because of moving and passing from briny lands or pouring briny water in the river water [2]. From the some of the experts' perspective the first step to prevent the water crisis is increasing the water yielding. These experts believe that consuming water can be decreased 10 to 50% in agriculture section, 40 to 90% in industry section and to one-third in cities without decreasing the economical efficiency or the quality of life. This process can be viable by using modern technology and better methods [3] with regard to the low amount of rain and snow in Iran, it is considered one of the arid countries of the world to the extent that we can see a remarkable difference in the irrigated and non-irrigated cultivation in most parts of the country. The average annual rain of Iran compared to 850 mm of the world average annual rain is 250-mm. limitation of sweet recourses in Iran, non-standard exploitation of underground water, disability to control the flowing of surface water, increasing the pollution of water resources caused by home, agriculture, industry and sewage, lack of long term program for managing the water resources, the problems caused by economical and financial deficiency, lack of research, scientific and study centers of water resources and finally lack of precise data banks of the resources, reservoirs and consuming water may be considered the challenges toward stable management of Iran water resources [4]. Some influential ideas are popularized on modifying and improving the present state in rural and tribal societies. We can name of these ideas as follows: studying the ruling situation on water rights fro possible reforms when the water is scarce, establishing the water banks all over the country, enacting some laws to protect the related domestic issues, enacting some laws

Correspondent Authors: Bagher Arayesh, Address: P.O Box 447,Islamic Azad University, Daneshjo BLV, Ilam, Iran.
Tel/Fax: +988412223906, E-mail: barayesh@yahoo.com.

to supply and grant low interest guarantee loans to farmers, considering the limitations of urban development, boosting the water program in country, enacting some laws to force the water department to develop harmonious programs, encouraging the voluntary protection of water, clearing the law to simplify the water cycle, creating economical motives for investing in private sections to protect water, forcing consumers to lower their dependency upon underground water and executing protective actions, improving water consuming and transmission efficiency, issuing the emergency permissions for using water, supplying pumps and different types of pipe to distribute and disseminate water, suggesting to administer the renovation programs of reservoirs and exploitation under the capacity of designing, evaluating the level of vulnerability of water resources, decreasing the water system losses, changing the irrigation method from patch method to leakage [5]. Because of the climatic situation of the country, the warnings of experts about the excessive use of water in country, predicting the water crisis in fture, there are a lot of attention to the water issue and the extension of implementing suitable methods of irrigation especially under pressure irrigation methods in the country economical development program. Based on the timed program established by the government to the end of the first program 350 hectares and to the second program of development 2 millions hectares of farms and gardens must be covered by under pressure irrigation systems. The requisite credits for developing this technology are taken from credits of note number 3 and it was determined that 80% of bank interest should be paid by government. [6]. Credit facilities of bank and financial institutes and the most important one –agriculture bank and the allocated benefits granted to receivers of this technology from executive institutes leads to acceptance of this technology by a considerable number of farmers. Taking into consider all the above-mentioned explanation, the experience of using the under pressure irrigation systems in every corner of the country shows that there will be not enough ground and space to overcome the crisis of scarcity of water resourced in Iran only by introducing the system through in charge institutes, especially agriculture organization and allocating credits with the maximum helping custodians. A lot of researches and studies have been conducted on the causes of success of under pressure irrigation systems and we are going to mention some of them. In research [7], Water shortages, reducing production costs, increasing area under cultivation, increasing per hectare yield, improving product quality, increasing soil fertility and control of irrigation depth have been mentioned as the most important variables successfully pressurized irrigation systems. From the view point of[8], Simplicity and inexpensive irrigation systems, requires minimal labor for handling pipes in some other systems have been considered as the most important reasons for success of irrigation systems. In Research [9] variables explaining the success of irrigation system were: education level, amount of cultivated land, age, land cover, land slope, Futurism and number of pieces ground. Research Result of [10] showed that personal and social characteristics such as age, work experience, education, knowledge, financial and communications facilities, more relationship with extension agent have been effective on adoption of irrigation systems. [11] in their study concluded that Farm area, education level, occupation farmer as the main occupation, land slope, soil heterogeneity and access to credit facilities have a significant positive effect on the success of irrigation systems. The results [12] in choosing irrigation technologies in California shows that farmers use of groundwater resources, are likely to accept technologies to sprinkler irrigation. The results of the study [13] show that adoption of under pressure irrigation systems are increased crop yield. Studies [14] shows that the product increasing, increasing in water use were important factors affecting adoption of irrigation technology. Studies (Shah, 2005) indicate that excessive groundwater depletion is affecting the expansion rate of this technology [15] in their study the reasons people have considered the participatory technologies, including: knowledge exploitation, political factors, economic, managerial and cultural - social contacts. The main purpose of the present paper is to study the causes of successes of under pressure irrigation systems in Ilam province. The specific purposes are as follows:

Studying the personal characteristics of addressees, giving priority to the factors and variables that affect the successes of under pressure irrigation systems, studying the relationship between the variables.

MATERIALS AND METHODS

The research method is casual-Relative which is conducted in the form of a survey research. The statistical society of this study includes 440 exploiters who own farming or garden lands and the credits of agriculture bank are granted to them to execute the rain irrigation systems. The sampling method to conduct the study is proportional stratified sampling. To determine the sample

size Kerjsy and Morgan table is used. According to the data of this table, a statistical sample of 250 persons is chosen. The basic tool used in collecting data of this study is questionnaire. To ensure about the validity of questionnaire content, the experts' panel is used. To study the Reliability of research tools, 30 persons of rural exploiters who are inhabitants of Ilam Province are chosen by random. According to this, the Reliability coefficient of research tool is calculated 92% by using the alpha Kronbakh coefficient. The data analysis and processing conducted in two levels: descriptive (central and dispersion Tendency), analytic (spearman correlation coefficient and multi-variable regression in a step-wise form).

DISCUSSION AND CONCLUSION

Personal Characteristics: The average age of respondents is 45.11, the most frequency (48.8%) is in the age group of upper 45 and the lowest frequency (5.4%) is in the age group of under 25. 28.5 % (57 persons) of respondents have diploma and only 9.5% of them have B.A or higher education degrees. The average of lands under administration is 8.89 hectare. 135persons of farmers with the most frequent frequency have the land as their property and only 1.5% of them have the land as the ownership of agro-industry. The addressees have averagely job experience of 20.7 years. 50.2% of respondents used under pressure irrigation systems in order to irrigate the grains. The lowest degree of using these systems in citrus fruits is about 0.5%. About 35.45% of respondents announced that the river water is only recourse that supplies their needed water and 10.1% of them used joint well to supply water. The distance of water pump to the farm is about 1000 kilometers. Giving priority to the effective factors on successes of under pressure irrigation programs. To identify the effective factors on successes of under pressure irrigation systems 37 questions in the form of multiple choice questions (Likert spectrum) are applied in the questionnaires. Table 1 shows the effective factors on successes of under pressure irrigation systems.

Table 1: Prioritize the factors affecting the success of irrigation systems

The effective factors on successes of under pressure irrigation systems	Mean	Standard deviation	Coefficient of variation	Rank
Water shortages and the necessity of saving	3.62	1.35	.372	27
Reduce production costs	3.68	1.18	.320	17
Increasing level of under cultivation	3.79	1.07	.282	6
Conversion to dry land to irrigated land	3.82	1.11	.290.	11
Increasing yield per hectare	3.70	1.14	.308.	15
Improving product quality	3.88	1.10	.283.	8
Increase soil fertility	3.86	1.12	.290	12
Control of irrigation depth	3.79	1.08	.284	9
Having broad and interconnected lands	4.46	1.11	.20.	1
Utilization of credit facilities (loans)	3.86	1.09	.282	7
Safety equipment related to new methods of irrigation	3.85	1.11	.288.	10
Sufficient land	3.73	1.12	.305	12
Confidence to Projects executors	3.66	098	.267	2
Believed to be timely provided necessary equipment and supplies system	3.28	1.23	.353	25
Quick access to necessary inputs	3.64	1.21	.332.	18
Governmental subsidy	3.77	1.17	.310.	15
Hoping to earn higher	3.86	1.05	.272.	3
Type of land ownership	3.65	1.01	.276	4
Water quality	3.73	1.10	.294	13
Associated with agricultural advocates and their recommendations into action	3.46	1.08	.312	16
Membership in cooperative production	3.18	1.23	.386.	32
Very low= 1	Low= 2	Average= 3	High= 4	Very high= 5

The effective factors on successes of under pressure irrigation systems	Mean	Standard deviation	Coefficient of variation	Rank
Impact on neighbors and other decisions of individual farmers	3.42	1.25	.365	26
Belief system performance	3.51	1.23	.350	24
Responsibility of the designer and manufacturer Company	3.58	1.24	.345.	23
The effect of village leaders	3.30	1.24	.375	28
Impact of scientific and research centers	3.30	1.26	.381	29
Recommendations from relatives and acquaintances	3.37	1.16	.344	22
The effect of Islamic Councils	3.12	1.34	.429	35
Recommended private sector	3.30	1.27	.384	30
Providing services after sale of new irrigation systems	3.29	1.35	.386	31
easy to work with system	3.56	1.34	.376	28
Participate in educational classes	3.48	1.19	.341.	21
Visit from typical farms	3.42	1.35	.392	33
Promotional films	3.20	1.40	.437	37
Study publications	3.16	1.36	.430	36
Information via radio and television	3.48	1.17	.336	19
Proper management of farm	3.74	1.04	.278.	5
Skills of farmers in irrigation systems	3.66	1.25	.341	20
Very low= 1	Low= 2	Average= 3	High= 4	Very high= 5

Table 2: the relationships between the Research variables

	First variable	Second variable	r	p
1	Economic Factors	successes of under pressure irrigation systems	.71**	000.
2	Socio- Cultural Factors	successes of under pressure irrigation systems	.91**	000.
3	Technical Factors	successes of under pressure irrigation systems	.57**	000.
4	Training- Extension Factors	successes of under pressure irrigation systems	.79**	000.
5	Agricultural – Climate Factors	successes of under pressure irrigation systems	.63**	000.
6	Audience Age	successes of under pressure irrigation systems	.04	.64
7	Level of Education	successes of under pressure irrigation systems	.08	.39

**: it is meaningful at the level of 0.01

According to Table 1, the variables of having broad and interconnected lands, Confidence to Projects executors, hoping to earn higher, Type of land ownership are of top priority in successes of under pressure irrigation systems, respectively. In addition, the variables of, Promotional films, Study publications, the effect of Islamic Councils is a low priority in successes of under pressure irrigation systems, respectively.

The Correlation Study (The Relationships Between Variables): In order to study the relationships between the survey variables and the variable of successes of under pressure irrigation systems, the spearman ranking correlation factor is used. The results are shown in Table 2.

The result of this table shows that there is a considerable meaningful relationship between the variables of Economic, Socio- Cultural, Technical, Training – Education and Agricultural – Climate Factors with the variable of success of under pressure irrigation systems. The results of this survey confirm the result of [1, 2, 6, 8, 11, 19].

Conclusion and Suggestions: This paper accomplished with the purpose of studying the key factors in success of under pressure irrigation systems in Ilam Province. According to the done studies on respondents about the effective factors on success of under pressure irrigation systems, the variables of having broad and interconnected lands, Confidence to Projects executors, hoping to earn higher, Type of land ownership are of top priority in successes of under pressure irrigation systems, respectively. In addition, the variables of, Promotional films, Study publications, The effect of Islamic Councils are a low priority in successes of under pressure irrigation systems, respectively. Spearman correlation coefficient

was used to examine the relationship between variables and variable success of irrigation systems. In this paper, there is a meaningful relationship between the variables of the Economic, Socio- Cultural, Technical, Training – Education and Agricultural – Climate Factors with the variable of success of under pressure irrigation systems, but there is not meaningful relationship between the variables Age and Level of Education with Success of The under Pressure Irrigation Systems.

Recommendations: According to the acquired results from this survey, the following suggestions are presented to improve the situation and accelerate the success of under pressure irrigation systems. Based on information obtained in this study, nearly half of the study population had 45 years of age. This problem showed that the irrigation system is unable to create the necessary credibility among young people. Therefore recommended that, in the first step to be done by informing the various communication channels such as provincial and even national media. The next step will be in low-interest loans and long-term mortgages to farmers. This way is to accelerate the success of irrigation systems.

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