

**KNOWLEDGE LEVEL OF VEGETABLE GROWERS ABOUT DRIP IRRIGATION****Rakesh Natwadia<sup>1</sup>, R.N. Sharma<sup>2</sup> and Pramod<sup>3</sup>**

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E-mail: [crakeshchoudhary1@gmail.com](mailto:crakeshchoudhary1@gmail.com)**ABSTRACT**

*Water is the most precious, crucial and limiting natural resource, mainly important for agricultural production and day-to-day living of human beings. Drip irrigation is precise and regulated application of water and plant nutrients at frequent intervals and low pressure through emitters/drippers into the root zone of the plant with the help of close network of pipes. The present study was conducted in four adopted villages of SKNAU, Jobner. The total of 120 farmer respondents were selected from four selected villages by using of random sampling through proportional allocation method. The study revealed that majority (63.33 per cent) of vegetable growers belonged to middle aged group, 21.66 per cent were educated up to primary level, 71.67 per cent were doing Agriculture, 83.33 per cent belonged to medium income group, 39.17 per cent were medium land holding farmers and (73.34%) were member of one organization. It may be concluded that the majority of the vegetable growers (70.83%) were medium level of knowledge on drip system of irrigation. the age was found negatively and size of land holding' was positively non-significant, furthermore, the independent variables like, Education, Occupation, Annual Income and Social participation were found in positive and significant relationship with the knowledge drip system of irrigation by the vegetable growers.*

**Keywords:** vegetable growers, drip system of irrigation, knowledge level, relationship and adopted villages

**INTRODUCTION**

Drip irrigation is highly efficient irrigation method well suited to many fruit, vegetables or row crops. Drip tubing discharge water to the soil through emitters positioned close to the plant. The drip tubing can be placed uncovered on the soil surface, under plastic mulch buried in the soil or suspended about the ground e.g. on a trellis system). water application rate in relatively low and irrigation are usually frequent. Properly designed and maintained drip irrigation system can have benefits that help increase the profitability of crop production (maughn et al, 2017). in drip irrigation technique, the water is applied to the root area of plant drip by drip because of which large amount of water can be saved (Tupe et al., 2015; Rathwa et al., 2020). Micro irrigation, earlier known as drip or trickle irrigation is a more potent method of irrigation. It is the application of controlled amounts of water to plants root zone at needed intervals.

Drip irrigation helps in growing agricultural crops in limited water available and maintaining landscapes during periods of less than average rainfall (Mishra et al., 2018). Drip irrigation is precise and regulated application of water and plant nutrients at frequent intervals and low pressure through drippers into the root zone of the plant with the help of close network of pipes. Drip system of irrigation is more

profitable as it saves 50-70% water as compared to surface irrigation method and minimize labour cost, minimize plant diseases by reducing humidity in atmosphere.

Rajasthan is the biggest state of India in terms of area and it covers about 10.4 per cent of the total area of India but only 1.04 per cent of the water resources. There are 295 blocks in Rajasthan state, out of which 185 blocks were under dark zone. In Jaipur district out of 15 blocks, 14 blocks were under dark zone. Because of arid and semi-arid climate i.e. poor soil quality, negative moisture index and use of traditional agriculture practices the available water is depleting day by day. The source of irrigation water in the state are wells and tube wells.

Rajasthan state ranks 7<sup>th</sup> in terms of coverage of area under drip system of irrigation. Rajasthan covers an area of 2,45,301 hectares under drip irrigation after Andhra Pradesh (12,95,658 ha), Maharashtra (11,99,963 ha), Gujarat (7,23,222 ha), Karnataka (65,81,171 ha), Tamil Nadu (4,87,511 ha) and Madhya Pradesh (3,13,887 ha) (Anonymous, 2019).

Crop yield can increase through improved water and fertility management and reduced disease and weed. When drip irrigation used with polythene mulch, yield can increase even further. (Anonymous et al., 2016).

## OBJECTIVE

To determine the relationship between knowledge level of vegetable growers about drip system of irrigation with their personal characteristics

## METHODOLOGY

The present study was undertaken in four adopted villages of S.K.N. Agriculture University, Jobner. The villages were., Pachar, Idan ka Bas, Khejrawas and Dhani Boraj. A total of 120 farmers were selected using of random sampling through proportional allocation method. Knowledge level of farmers about drip system of irrigation was measured with the help of knowledge test developed by Jitarwal (2007) which was used with slight modification. Five major aspects were included in the knowledge test viz. suitability of drip system of irrigation, installation of drip system of irrigation, operational aspects, technical aspects and maintenance aspects of drip system of irrigation. Each aspect was divided into several questions and sub-questions for knowledge assessment. Thus, this test included five major aspects and 27 knowledge-based questions. The questions were dichotomized type. The respondents were awarded one score for each right answer and zero for each wrong answer. Therefore, the possible maximum obtainable knowledge score was forty-four and minimum score was zero

The mean and standard deviation of the entire respondent's knowledge scores were computed for classifying the knowledge in to different categories. Based on these, the respondents were classified under three knowledge categories namely low, medium and high level as follows:

Low knowledge = Score below (mean knowledge – S.D.)

Medium knowledge = Score from (mean knowledge – S.D. to mean knowledge + S.D.)

High knowledge = Score above (mean knowledge + S.D.)

Where S.D. = Standard Deviation

Frequency and percentage of respondents in each category *i.e.* low, medium and high was calculated. The knowledge index for each respondent was calculated by using the following formula:

$$K.I. = \frac{K}{P} \times 100$$

Where,

KI = Knowledge Index

K = Knowledge score obtained

P = Possible maximum score

To find out the relationship between knowledge level of drip system of irrigation of vegetable growers and selected personal variables viz age, education level, occupation, annual income, size of land holding and social participation were measured by computing "Coefficient of correlation (r)".

## RESULTS AND DISCUSSION

### Age

**Table 1: Distribution of vegetable growers according to age** (n=120)

Sr. No.	Age categories	Frequency	Per cent
1	<b>Young</b> (below 35 years)	17	14.17
2	<b>Middle</b> (from 35 to 49 years)	76	63.33
3	<b>Old</b> (above 49 years)	27	22.50

Mean = 42, SD = 7

The data given in Table 1 show that majority of vegetable growers belonged to middle age group (63.33%) followed by young and old age group with 14.17 per cent and 22.50 per cent, respectively. It was concluded that majority of vegetable growers were above 35 years *i.e.* (85.83%).

The findings of this study support the findings of Kumawat (2015) Patel and Vinaya (2022) and Vegad *et al.* (2021).

### Education

**Table 2: Distribution of vegetable growers according to education** (n=120)

Sr. No.	Education Categories	Frequency	Per cent
1	<b>Illiterate</b>	17	14.17
2	<b>Can read only</b>	15	12.50
3	<b>Can read and write only</b>	14	11.67
4	<b>Primary school</b>	26	21.66
5	<b>Middle school</b>	14	11.67
6	<b>High school</b>	20	16.66
7	<b>Graduate</b>	09	07.50
8	<b>Above graduate</b>	05	04.17

The data incorporated in Table explained that maximum of vegetable growers, 21.66 per cent were educated up to primary school, 16.66 per cent high school, 14.17 per cent were illiterate, 12.50 per cent can read only, 11.67 per cent were can read and write only, 11.67 per cent were educated up to middle school, 7.50 per cent were graduate and 4.17 per cent were above graduate.

The findings are supported by Badhala *et al.* (2014).

**Occupation level**

**Table 3: Distribution of vegetable growers according to occupation** (n=120)

Sr. No.	Category	Frequency	Per cent
1	None	0	0.00
2	Labour	06	05.00
3	Caste occupation	04	03.33
4	Business	11	09.17
5	Independent profession	03	02.50
6	Cultivation/Agriculture	86	71.67
7	Service	10	08.33

The data given in Table 4.1.3. explained that majority of vegetable growers were having cultivation as the main occupation (71.67%), followed by business (9.17%), service (8.33%), labourer (5.00%), cast occupation (3.33%) and independent profession (2.50%), respectively.

Similar finding were obtained by of Miah *et al.* (2015).

**Annual income**

**Table 4: Distribution of vegetable growers according to annual income**

(n=120)

Sr. No.	Annual income categories	Frequency	Per cent
1	Low income (below ₹ 373489)	07	5.83
2	Medium income (from ₹ 373489 to 611595)	100	83.33
3	High income (above ₹ 611595)	13	10.84

Mean = 492542, SD = 119053

Table 4 shows that majority of vegetable growers *i.e.* 83.33 per cent had medium level. Whereas, 5.83 per cent of vegetable growers had low level, followed by 10.84 per cent with high level of annual income of vegetable growers. The majority of vegetable growers (94.17%) had their income above 373489.

The findings of this study are well supported by the findings of Verma (2010).

**Land holding**

**Table 5: Distribution of vegetable growers according to size of land holding** (n=120)

Sr. No.	Land holding categories	Frequency	Per cent
1	Landless (0 ha)	0	0
2	Marginal farmers (up to 1.00 ha)	10	08.33
3	Small farmers (from 1.0 to 2.0 ha)	29	24.17
4	Semi-Medium farmers (from 2.0 to 4.0 ha)	31	25.83
5	Medium farmers (from 4.0 to 10.0 ha)	47	39.17
6	Large farmers (above 10.0 ha)	03	02.50

The data given in Table indicated that out of 120 vegetable growers, 39.17 per cent were medium, while 25.83 per cent, 24.17 per cent, 8.33 per cent and 2.50 per cent were semi-medium vegetable growers, small vegetable growers, marginal farmer and large category. The finding of the study concluded that majority of vegetable growers (67.50%) had land holding above 2.0 ha.

The findings of this study support the findings of Rathod (2014), Kumawat (2015) and Todkar (2020)

**Social participation**

**Table 6: Distribution of vegetable growers on the basis of social participation** (n=120)

Sr. No.	Social participation	Frequency	Per cent
1	None	32	26.66
2	Member of one organization	42	35.00
3	Member of more than one organization	30	25.00
4	Office bearer in such an organization	10	08.34
5	Wide public leader	06	05.00

The data given in Table 6 indicate that out of 120 vegetable growers 35.00 per cent respondents belonged to the category of members of one organization under social participation followed by none member of organizations category 26.66 per cent, member of more than one organization category 25.00 per cent, office holder in such an organization 8.34 per cent and only 5.00 per cent vegetable growers were belong to wide public leader. The finding of the study concluded that majority of vegetable growers (73.34%) were member of one organization to wide public leader.

The findings of this study support the findings of Meena (2010), Biradar *et al.* (2013), Ahire and kapse (2017) and Jakkawad *et al.* (2020).

The data in Table 7 revealed that 11.67 per cent vegetable growers had low, 70.83 % had medium and 17.50 per cent vegetable growers fell under high level of knowledge about drip system of irrigation, respectively.

It may be concluded from the above narration that majority of the vegetable growers (88.33%) were having medium level to high level of knowledge regarding drip system of irrigation. These results are in conformity with the finding of (Swetha *et.al* 2019).

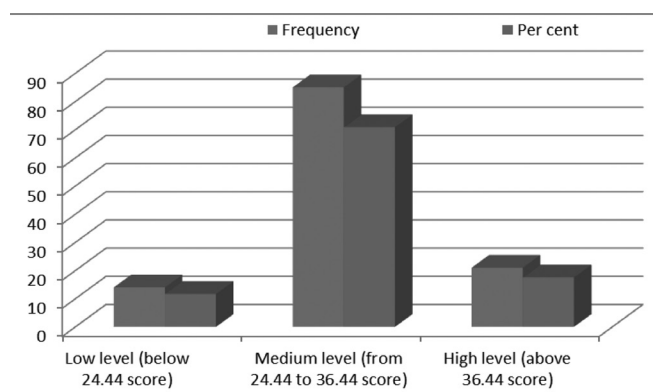
**Table 7: Distribution of vegetable growers according to knowledge about drip system of irrigation**

(n=120)

Sr. No.	Knowledge level	Frequency	Per cent
1	<b>Low level</b> (below 24.44 score)	14	11.67
2	<b>Medium level</b> (from 24.44 to 36.44 score)	85	70.83
3	<b>High level</b> (above 36.44 score)	21	17.50

Mean=30.44, S.D=6.0

Furthermore, the different aspect wise knowledge level of vegetable growers about drip system of irrigation was also analyzed separately. The relative importance of all the five aspects of knowledge levels about drip system of irrigation were highlighted by ranking them in descending order on the basis of mean per cent scores of knowledge levels. The data have been presented in Table 2 and depicted diagrammatically in Fig:-1.



**Fig 1: Distribution of vegetable growers according to knowledge level about drip system of irrigation**

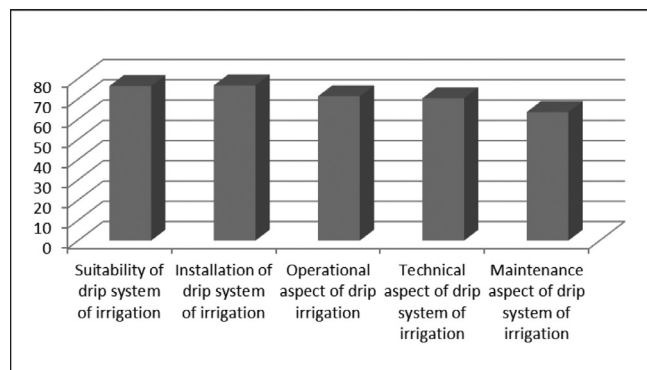
**Table 8: Aspect wise knowledge level of vegetable growers about drip system of irrigation**

(n=120)

Sr. No.	Knowledge aspects	MPS	Rank
1	<b>Suitability of drip system</b>	76.38	II
2	<b>Installation of drip system</b>	76.66	I
3	<b>Operational aspect of drip system</b>	71.33	III
4	<b>Technical aspect of drip system</b>	70.30	IV
5	<b>Maintenance aspect of drip system</b>	63.50	V

MPS= Mean Per cent Score

The figures contained in Table 8 revealed that the vegetable growers had highest knowledge about “installation of drip system” (76.66 MPS) and this aspect was assigned rank first. The second highest rank was accorded to “suitability of drip system” (76.38 MPS), followed by “Operational aspect of drip system” (71.33 MPS) and “Technical aspect of drip system of irrigation” (70.30 MPS) which were assigned rank third and fourth and “Maintenance aspect of drip system” (63.50 MPS) was found of last position of knowledge level of vegetable growers about drip system of irrigation.



**Fig 2: Aspect wise knowledge level of vegetable growers about drip system of irrigation**

The results of this study are in line with the findings of Bunker *et al.* (2012), Gauttam *et al.* (2014), Patel *et al.* (2018), Jayasankar *et al.* (2020) and Darling *et al.* (2020) who observed that most of vegetable growers had medium level of knowledge about drip system of irrigation. the reason might be low literacy rate and low awareness about drip system in the adopted villages. Majority of members (48% ) had medium level (48.87-56.38) of knowledge while non members (82.66%) were found to possess low (below 48.87) of knowledge reported by (Surinder Singh and B.S. Hansara 2018)

**Table 9: Relationship between knowledge of drip system of irrigation of vegetable growers and their personal characteristics**

(n=120)

Sr. No.	Independent variables	Correlation of coefficient
X <sub>1</sub>	Age	-0.0233NS
X <sub>2</sub>	Occupation	0.255*
X <sub>3</sub>	Education	0.205*
X <sub>4</sub>	Income	0.210*
X <sub>5</sub>	Land holding	0.140NS
X <sub>6</sub>	Social participation	0.198*

\* Significant at 5 per cent level of significance

NS = Non-significant

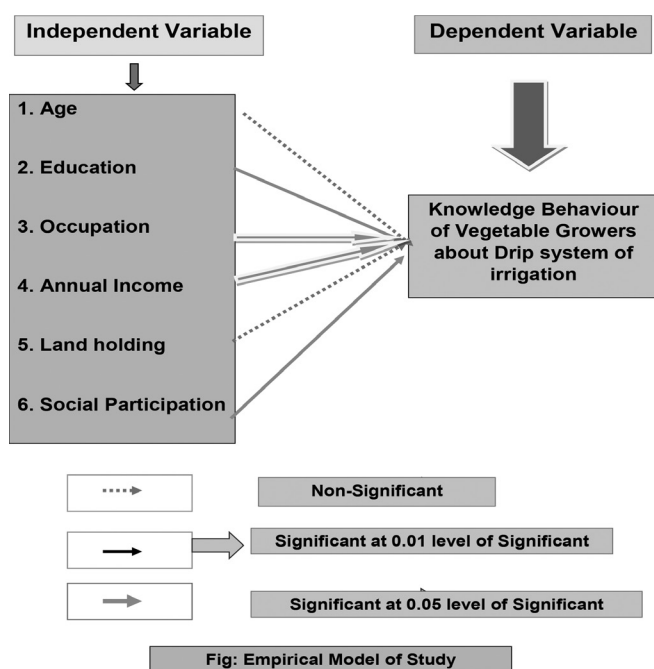


Fig: Empirical Model of Study

### Age

The data given in Table 9 revealed that the age was negatively and non-significantly related with knowledge of drip system of irrigation of vegetable growers.

It means that no any relationship between knowledge of drip system of irrigation of vegetable growers and their age. Might be due to fact that knowledge of drip system of irrigation on vegetable growers irrespective to their age.

### Occupation

The data given in Table 9 revealed that the occupation was positively and significantly related with the knowledge of drip system of irrigation of vegetable growers and their occupation at 5 per cent level of significance.

### Education

Table 9 it is evident from the data in that education was positively and significantly relation with the knowledge of drip system of irrigation of vegetable growers at 5% level of significance.

It means that higher educated vegetable growers subjected to adopt drip system of irrigation more. It depicted that education play important role in knowledge of drip system of irrigation of vegetable growers.

In the present study mainly education in the form of writing, reading and schooling was taken by the vegetable growers. The results so arrived may be due to the fact that educated respondent can read farm publication and literature of agriculture and have more exposure about different important technologies of agriculture.

### Annual income

A perusal of data in table 9 revealed that annual income of the vegetable growers was positively and significantly related with their knowledge of drip system of irrigation of vegetable growers at 5% level of significance.

It means when increasing of annual income of vegetable growers causes increase in the knowledge of drip system of irrigation, because extra expenditure in the knowledge of new innovation can be done with higher income of vegetable growers. It might be due to the fact that the vegetable growers take more interest to adopt productive technology *i.e.* drip system of irrigation, who were having good source of income.

### Size of land holding

It is apparent from table 9 that the size of land holding was non significantly relation with the knowledge of drip system of irrigation of vegetable growers.

It means that the size of land holding of vegetable growers did not make any significant difference in knowledge of drip system of irrigation. The finding seemed to be that as the large size of land holding became difficult to manage by the vegetable growers it efficiently due to lack of resources.

### Social participation

The data in table 9 reported that social participation was positively and significantly relation with the knowledge of drip system of irrigation of vegetable growers at 5% level of significance.

It means that the vegetable growers participating in different social activities might be discussing the various

developments activities in respect to exchange of new ideas in the field of agriculture.

## CONCLUSION

It was concluded that majority of the vegetable growers (88.33%) were in medium to high knowledge level about drip system of irrigation. Regarding knowledge aspects of drip system of irrigation, it was observed that the vegetable growers possessed highest knowledge of drip system about the aspect “installation of drip system of irrigation” (76.66 per cent) whereas, they had least knowledge about aspect of “Maintenance aspect of drip system of Irrigation” (63.50 per cent). the age was found negatively and size of land holding’ was positively non-significant, furthermore, the independent variables like, Education, Occupation, Annual Income and Social participation were found in positive and significant relationship with the adoption of drip system of irrigation by the vegetable grower

## POLICY IMPLICATION

Best on the finding of the study it can be recommended that there is vast scope of improve knowledge of vegetable growers about drip system of irrigation. Government should focused on training program, demonstration, campus, radio, TV and using other ICT tools at grass root level.

## CONFLICT OF INTEREST

No conflict of interest among researchers.

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