Research Paper

Extent of Techno-economic Empowerment among Farmers by using Digital Extension in Rewa District of Madhya Pradesh

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A B S T R A C T

The present paper attempts to examine the socio-economic and communication status of the respondents in Rewa district of Madhya Pradesh in the year of 2019-20. The study was conducted in 12 villages located at Rewa and Naigarhi block of Rewa district. Data for the study was collected from a sample of 120 respondents. The findings of the study revealed that 80.84 percent respondents were medium in techno-economic empowerment followed by 10.00 percent high in techno-economic empowerment. They aware of different agricultural technology aspect of the current digital age and they use different digital; platform such as online shopping of agricultural inputs, interest and join the agripreneur websites, online banking, negotiation among traders through digital platform. Association between Techno-economic empowerment and selected characteristics result found that age, landholding, annual family income, material possession, house type, Information Utilization time, information management behavior, decision making and achievement motivation showed a positive trend, the degree of relationship was low and the computed value of 'r' was found to be less than the table value 'r' with at 0.05 level of probability. Hence, the relationship was found to non-significant. Level of education and family type, had the significant relation with the techno-economic aspect of respondent at 0.05 level of probability and family size, social participation, farm power and communication had the significant relation with the economic aspect of respondent at 0.01 level of probability that indicates father occupation and family income influence the techno economical aspect by the farmers.

Key words: Techno-economic empowerment, Digital extension, Communication, Information, ICT tools

Agricultural services such as agricultural advisories, financial services, agricultural marketing and risk transfer are required for each Agricultural commodity Value System (AVS) of a farmer and India has been blessed with about 400 Agricultural commodities Value system. Many national level programmes, viz. Digital India 2015, Make. In India 2015, Skill India 2015, Startup India 2015 and Stand-up India 2015 have faced operational difficulties for its impact at farm level and farmer level, and that too at small and marginal farmers level [1]. Digital extension is the electronic extension services to agriculture. It is a network of institutions that provide a more efficient information to famers and traders for i.e. agriculture, fisheries and natural resources sectors. ICAR includes the provide farm advisories using ICT and other media on varied subjects of interest to farmers mandates in KVKs in India.

Digital network for farmers (DNF) - AGRISNET, FISHNET, APHNET, FETNET etc. visualized by the ISDA-

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95 conference held at Vigyan Bhavan (New Delhi), was viewed as a strength, wealth and prosperity for farming households in India, of which the Marginal scale farmers are about 18 per cent, the semi- medium scale farmers are about 10 per cent the medium scale farmers are about 4.3 per cent, and the large-scale farmers are about 0.7 per cent. The ISDA-95 Informatics Blueprint for Agricultural Sector has impacted Informatization of Agricultural System through the Government efforts very effectively in Farm sector (On-Farm and Off- Farm Input System, Production System, Output System) as well as Non- Farm Sector [2].

Digital Extension is component of Digital India. It is a flagship programme of Government of India with a vision to transform India into a digitally empowered farmer community and knowledge economy. Under this program various projects e.g. Open Data, Soil Health Card, mKisan (mFarmer), Farmer Portal, Agrimarket app, etc. have been launched for farmers. Other programs e.g. KisanSuvidha, e-PusaKrishi, AgriApp, KrishiGyan, agropedia, e-krishi, e-chaopal etc. based on digital information for farmers have been started in India (Digital India, 2018). Digital delivery of services has been strengthened with the help of 3.47 lakh Common services Centre's (CSCs), spread across 2.3 lakh Gram Panchayats in the country that provides digital access to over 350 services especially in rural areas at an affordable cost. These centers have also led to empowerment of marginalized sections of the society by creating jobs for over 12 lakh people and by promoting rural entrepreneurs including women VLEs. CSCs

have also undertaken streeSwabhiman initiative to create awareness about menstrual health and have set up over 204 sanitary pad units [3].

Empowerment is multi-dimensional, social, and a process. It is multi-dimensional in that it occurs within sociological, psychological, economic, and other dimensions. Empowerment also occurs at various levels, such as individual, group, and community. Empowerment, by definition, is a social process, since it occurs in relationship to others. Empowerment is a process that is similar to a path or journey, one that develops as we work through it. Other aspects of empowerment may vary according to the specific context and people involved, but these remain constant. In addition, one important implication of this definition of empowerment is that the individual and community are fundamentally connected. Empowerment is associated with more configurations than any other mode. By comparing 'configuration' with 'mode', we see that technologies most associated with interactivity in the earlier discourses – Websites, CD-ROMs, TV – are also most associated with Empowerment. There is also a correspondence between Empowerment and the configurations on the increase, such as Games and General digital applications. This trend is more pronounced among the most frequent configurations of 2014 where 72% of the General applications are associated with Empowerment. The most frequent newcomers are also most frequently coded as Empowerment – 70% of Apps and 82% of Social media references. However, other frequent configurations in 2014 like Games and Websites tend to be associated with other modes of interactivity.

These ICT tools are relatively easier to use and are gaining popularity in agriculture sector [4]. Through these tools farming community can learn and share information in multiple ways in form of texts, photos, pictures, audio, audio-visuals and web links. Social media gives opportunities to farmers for creating content and promotes co-learning among farmers [5]. Further, content creation is faster through social media than traditional mass media channels of extension communication [6]. Real time interaction through farmer clientele is easily possible through social media. Therefore, these tools help to communicate instantaneously and cheaply with stakeholders [7]. The benefits of social media goes beyond cost effective ways of communication to empowering social connections and long term engagement in extension programs [8]. For farming community, social media can be a good way of networking and gaining through social capital in form of trust, engagement and community involvement [9]. Moreover, the issues of physical distance and isolation in agriculture can be reduced through these tools [10]. Social media has been aptly called as one of the most participative extension tools of recent times. Social media tools range from Facebook, Whatsapp, Wechat, Twitter, Blogs, YouTube, Instagram, Wikis, Facebook messenger, Snap chat etc. Out of these, under Indian context, Facebook, WhatsApp and YouTube can be considered as three most popular social media tools. Though there are slight differences in approach of these three forms of social media. Specifically, Facebook is a social networking site that allows people to build personal webpages and then connect with friends to share content and information. Facebook remains most popular social media platform by agricultural research and extension professional in India [11]. WhatsApp specifically is an instant messaging platform that has made users much more connected. The nature of Facebook is more of a public platform and has higher viral content than WhatsApp which is a relatively closed medium. YouTube remains a content community in which videos are seen and shared.

The existing farm extension system needs to broad based problem oriented as depicted, to help farmers overcome their "point of no return "difficulties. ATMA and KVK are the two eyes of the present extension system which further require a "third eyes" for problem resolution, may be ICT enabled Agricultural Polytechnics for bridging the emerging gaps in development of human resources for farm level functionaries.

MATERIALS AND METHODS

Madhya Pradesh is known as "The heart of India". The state is bound on the north by Uttar Pradesh, the east by Chhattisgarh, the south by Maharashtra and the west by Gujarat and Rajasthan. The present study was confined with the farmers using digital inventions i.e. android application. Rewa district was selected for the present study as having presence of reputed institutions like Agriculture College, KVK and IFFCO. It comprises of nine blocks namely Rewa, Sirmour, Mauganj, Gangeo, Hanumana, Teonther, Naigarhi, Jawa and Raipur Karchuliyan. The research design adopted for the study was ex-post facto, because a pre-existing characteristic was used. For the study two blocks namely Rewa and Naigarhi were selected purposively on the basis of higher number of registered farmer's friend under ATMA, Farmer welfare and Agriculture Development Department. Sixty farmers were selected from each block for the study. Out of each block six villages were selected near by the block level administration office. From the Rewa block six villages namely Bajrangpur, Gadhwaha, Kanauja, Laxmanpur, dihi and khaur and from Naigarhi block six villages namely dubaha, chapgawan, tatihara khurd, purwa, devrisinger and barroha. Ten farmers from each village were selected purposively. Thus, the sample was consisted of 120 respondents. So, sample size was n=120. The technique involved in the analysis of data is very simple. For each item, responses given by the respondents regarding the question were recorded. These recorded data were counted in terms of frequency. After total counting of frequencies, the percentages were calculated for each selected variable. These percentages for each variable, under which survey was conducted, showed in tabular forms, which consist of frequencies and percentage calculated for that variable for the farmers. After the percentage and frequency calculation, mean, standard deviation and correlation were calculated. The data collected from respondent were manually processed. Each respondent was serialized and information received from him/her tabulated on a master table sheet. Weightage was given to different item with regard to their relative position in the scale and scoring was done accordingly. The data was analyzed and interpreted. For the present study determine the extent of techno-economic empowerment and their relationship among farmers in digital extension.

RESULTS AND DISCUSSION

Here 15 statements were made. Three point as high, medium and low are used. Technical statements like digital gadgets demand a lot of expenditure, I learn new technique from internet, I took trial from YouTube, I plan farming schedule according to weather forecast etc. Economic statements like there are fraud case in online activity, I like to get connected with agri entrepreneur, I like to buy inputs online, there is decrease of conversation between input dealers

etc. It has mean 50.27 with standard deviation 5.98. (Table 1) indicates that 80.84 percent respondents were medium in techno-economic empowerment followed by 10.00 percent high in techno-economic empowerment. They aware of different agricultural technology aspect of the current digital age and they use different digital; platform such as online shopping of agricultural inputs, interest and join the agripreneur websites, online banking, negotiation among traders through digital platform, getting the information about supply and demands of products by digital platform, it helps to making decision from different alternatives, learnt new agricultural technology and problems identification in field by internet through YouTube and planning of agricultural practices by weather forecasting but 09.16 percent had low level of techno-economic empowerment [12].

Table 1 On the basis of mean ±S.D. it was categorized into three categories as below

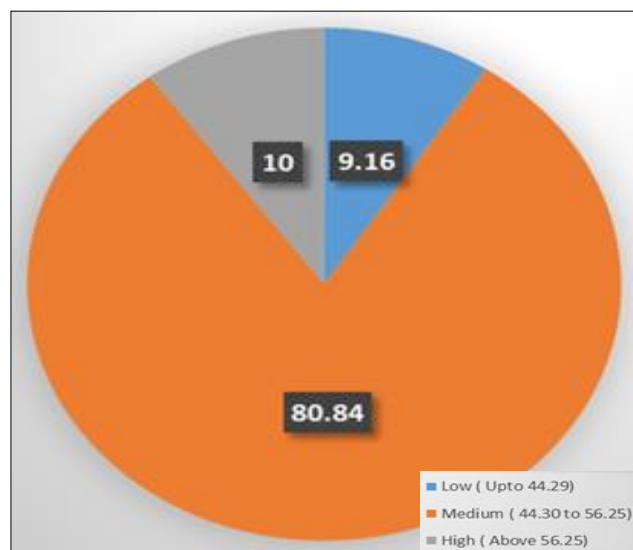| Category	Frequency	Percentage
Low (Upto 44.29)	11	09.16
Medium (44.30 to 56.25)	97	80.84
High (Above 56.25)	12	10.00
Total	120	100

Fig 1 Techno-economic empowerment among farmers in digital extension

Correlation coefficient

Correlation speaks about the relationship between the two attributes and the strength of relationship is measured in terms of correlation coefficient, whose limit range from minus unit to plus unit.

If the increase in one variable result in the increase of the other variable, the relationship is positive and if it result in decrease of other variable the relationship is negative. The two variables are not correlated if the increase or decreases of one variable do not affect the other variable. A hypothesis was rejected when the observed 'r' value was greater than the tabulated values of 'r' at 5% or 1% level of significance. As (Table 2) showed the correlation between techno-economical aspect and independent variables that indicates that age, landholding, annual family income, material possession, house type, Information Utilization time, information management behaviour, decision making and achievement motivation showed a positive trend, the degree of relationship was low and the computed value of 'r' was found to be less than the table value 'r' with at 0.05 level of probability. Hence, the

relationship was found to non-significant. Level of education and family type, had the significant relation with the techno-economic aspect of respondent at 0.05 level of probability and family size, social participation, farm power and communication had the significant relation with the economic aspect of respondent at 0.01 level of probability that indicates father occupation and family income influence the techno economical empowerment through digital empowerment aspect of the respondent.

Table 2 Correlation between techno-economic empowerment of farmers and independent variable

Independent Variables	'r' value
Age	0.0164NS
Gender	-
Level of Education	0.180*
Type of family	0.224*
Family Size	0.248**
Size of Landholding	0.010 NS
Family income	0.043 NS
Social participation	0.255**
Type of House	0.015NS
Farm power	0.353**
Material possession	0.0152NS
Handling of Android mobile	-
Information Utilization time	0.095NS
Information management Behavior	0.099 NS
Decision Making of farmers	0.066 NS
Level of aspiration	0.077 NS
Achievement motivation	0.015 NS
Communication behaviour	0.391**

*Significant at 5% level of probability
**Significant at 1% level of probability

Age and techno economical aspect of farmers

Following null hypothesis was formulated to test the relationship between the age of the farmers and their techno-economic empowerment through digital extension. "There is no relationship between the age of the respondents and techno-economic empowerment through digital extension". The co-efficient of correlation between the concerned variable was found to be 0.0164 N.S. Firstly, the relationship showed a positive trend. Secondly, the degree of relationship was low. Thirdly, the computed value of 'r' (0.164 N.S.) was found to be less than the table value 'r' (0.73) with at 0.05 levels of probability. Hence, the relationship was found to non-significant [13].

Level of education and techno economic aspect of farmers

Relationship between level of education of the farmers and their techno-economic empowerment through digital extension aspect was measured by testing the following null hypothesis:

"There is no relationship between level of education and techno-economic empowerment through digital extension". Computed value of co-efficient of correlation between the concerned level of education of the respondents and their attitude towards the economic aspect of respondents was found to be 0.180* as shown in (Table 2). The following observations were recorded regarding the relationship between these two variables on the basis of co-efficient of correlation. Firstly, relationship showed a tendency in the positive direction. Secondly, relationship between the concerned two variables was high. Thirdly, the computed value of 'r' (0.180*) was found to be greater than tabulated value 'r' (0.049) with at

0.05 level of probability. Hence, the relationship was significant with techno-economic empowerment through digital extension. Based on the above observations, the null hypothesis was rejected and hence it was concluded that level of education of respondents had significant relationship with their techno economic aspect of farmers [14].

Family type and techno economic aspect of farmers

Relationship between family type of the respondent and their techno-economic empowerment through digital extension aspect was measured by testing the following null hypothesis:

"There is no relationship between family type and techno-economic empowerment through digital extension". Computed value of co-efficient of correlation between the concerned family type of the respondents and their techno economic aspect of respondents was found to be 0.224*. Firstly, relationship showed a tendency in the positive direction. Secondly, relationship between the concerned two variables was high. Thirdly, the computed value of 'r' (0.224*) was found to be greater than tabulated value 'r' (0.014) with at 0.05 level of probability. Hence, the relationship was significant with techno-economic empowerment through digital extension. Based on the above observations, the null hypothesis was rejected and hence it was concluded that family type of respondents had significant relationship with their techno economical aspect of respondents [15].

Family size and techno economic aspect of farmers

Following null hypothesis was formulated to test the relationship between the family size and their techno-economic empowerment through digital extension:

"There is no relationship between the family size and techno-economic empowerment through digital extension". The co-efficient of correlation between the concerned variable was found to be 0.248**. Firstly, the relationship showed a positive trend. Secondly, the degree of relationship was low. Thirdly, the computed value of 'r' (0.248**) was found to be more than the table value 'r' (0.006) with at 0.01 level of probability. Hence, the relationship was found to significant. Based on the above observations, the null hypothesis was rejected and hence it was concluded that family size of respondents had significant relationship with their techno economical aspect of farmers [16].

Size of landholding and techno economic aspect of farmers

Following null hypothesis was formulated to test the relationship between the size of landholding and their techno-economic empowerment through digital extension:

"There is no relationship between the size of landholding and techno-economic empowerment through digital extension". The co-efficient of correlation between the concerned variable was found to be 0.010 NS. Firstly, the relationship showed a positive trend. Secondly, the degree of relationship was low. Thirdly, the computed value of 'r' (0.010 N.S.) was found to be less than the table value 'r' (0.913) with at 0.05 levels of probability. Hence, the relationship was found to non-significant. The above observation, therefore, led to acceptance of the concerned null hypothesis. It was thus proved that techno economical aspect of respondents was independent with the size of landholding. In other words, size of landholding was not play important role for use of techno-economic empowerment through digital extension.

Family income and techno economic aspect of farmers

Following null hypothesis was formulated to test the relationship between the family income and their techno-economic empowerment through digital extension:

"There is no relationship between the family income and techno-economic empowerment through digital extension". The co-efficient of correlation between the concerned variable was found to be 0.043 NS. Firstly, the relationship showed a positive trend. Secondly, the degree of relationship was low. Thirdly, the computed value of 'r' (0.043 N.S.) was found to be less than the table value 'r' (0.644) with at 0.05 levels of probability. Hence, the relationship was found to non-significant. The above observation, therefore, led to acceptance of the concerned null hypothesis. It was thus proved that techno-economic empowerment through digital extension aspect of respondents was independent with the family income.

Social participation and techno economic aspect of farmers

Following null hypothesis was formulated to test the relationship between the social participation and their techno-economic empowerment through digital extension:

"There is no relationship between the social participation and techno-economical empowerment through digital extension". The co-efficient of correlation between the concerned variable was found to be 0.255**. Firstly, the relationship showed a positive trend. Secondly, the degree of relationship was low. Thirdly, the computed value of 'r' (0.255**) was found to be more than the table value 'r' (0.05) with at 0.01 level of probability. Hence, the relationship was found to significant. The above observation, therefore, led to reject the concerned null hypothesis. It was thus proved that techno-economic empowerment through digital extension aspect of farmer was dependent with the social participation of the respondents. In other words social participation of the respondents was play important role for techno economic aspect [17].

Type of house and techno economic aspect of farmers

Following null hypothesis was formulated to test the relationship between the house type of the respondents and their techno-economic empowerment through digital extension.

"There is no relationship between the house type of the framers and techno-economic empowerment through digital extension". The co-efficient of correlation between the concerned variables was found to be 0.155 N.S. Firstly, the relationship showed a positive trend. Secondly, the degree of relationship was low. Thirdly, the computed value of 'r' (0.155 N.S.) was found to be less than the table value 'r' (0.75) with at 0.05 levels of probability. Hence, the relationship was found to non-significant.

Farm power and techno economic aspect of farmers

Following null hypothesis was formulated to test the relationship between the farm power and their techno-economic empowerment through digital extension:

"There is no relationship between the farm power and techno-economic empowerment through digital extension". The co-efficient of correlation between the concerned variable was found to be 0.353**. Firstly, the relationship showed a positive trend. Secondly, the degree of relationship was low. Thirdly, the computed value of 'r' (0.353**) was found to be more than the table value 'r' (0.05) with at 0.01 level of probability. Hence, the relationship was found to significant. The above observation, therefore, led to reject the concerned

null hypothesis. It was thus proved that economic aspect of farmer was dependent with the farm power of the farmers. In other words farm power of the respondents was play important role for techno-economic empowerment through digital extension.

Material possession and techno economic aspect of farmers

Following null hypothesis was formulated to test the relationship between the material possession and their techno-economic empowerment through digital extension:

"There is no relationship between the material possession and techno-economic empowerment through digital extension". The co-efficient of correlation between the concerned variable was found to be 0.0152 NS. Firstly, the relationship showed a positive trend. Secondly, the degree of relationship was low. Thirdly, the computed value of 'r' (0.0152 N.S.) was found to be less than the table value 'r' (0.098) with at 0.05 levels of probability. Hence, the relationship was found to non-significant. The above observation, therefore, led to acceptance of the concerned null hypothesis. It was thus proved that techno economic aspect of farmer was independent with the size of landholding. In other words size of landholding was not play important role for use of techno-economic empowerment through digital extension.

Information utilization time and techno economic aspect of farmers

Following null hypothesis was formulated to test the relationship between the information processing and their techno-economic empowerment through digital extension:

"There is no relationship between the Information utilization time and techno-economic empowerment through digital extension". The co-efficient of correlation between the concerned variables was found to be 0.095N.S. Firstly, the relationship showed a positive trend. Secondly, the degree of relationship was low. Thirdly, the computed value of 'r' (0.095 N.S.) was found to be less than the table value 'r' (0.150) with at 0.05 levels of probability. Hence, the relationship was found to non-significant. The above observation, therefore, led to acceptance of the concerned null hypothesis. It was thus proved that economical aspect of farmer was independent with the Information processing time of the respondents [18].

Information management behavior and techno economic aspect of farmers

Following null hypothesis was formulated to test the relationship between the information management behavior and their techno-economic empowerment through digital extension:

"There is no relationship between the information management behaviour and techno-economic empowerment through digital extension". The co-efficient of correlation between the concerned variable was found to be 0.099 N.S. Firstly, the relationship showed a positive trend. Secondly, the degree of relationship was low. Thirdly, the computed value of 'r' (0.099 N.S.) was found to be less than the table value 'r' (0.151) with at 0.05 levels of probability. Hence, the relationship was found to non-significant. The above observation, therefore, led to acceptance of the concerned null hypothesis. It was thus proved that economic aspect of farmer was independent with the information management behavior of the farmers [19].

Decision making and techno economic aspect of farmers

Following null hypothesis was formulated to test the relationship between the decision making and their techno-economic empowerment through digital extension:

"There is no relationship between the decision making and techno-economic empowerment through digital extension". The co-efficient of correlation between the concerned variable was found to be 0.066 N.S. Firstly, the relationship showed a positive trend. Secondly, the degree of relationship was low. Thirdly, the computed value of 'r' (0.066 N.S.) was found to be less than the table value 'r' (0.471) with at 0.05 levels of probability. Hence, the relationship was found to non-significant. The above observation, therefore, led to acceptance of the concerned null hypothesis. It was thus proved that techno economical aspect of respondents was independent with the decision making of the farmers. In other words decision making of the respondents was not play important role for techno-economic empowerment through digital extension.

Level of aspiration and techno economic aspect of farmers

Following null hypothesis was formulated to test the relationship between the level of aspiration and their techno-economic empowerment through digital extension:

"There is no relationship between the level of aspiration and techno-economic empowerment through digital extension". The co-efficient of correlation between the concerned variable was found to be 0.077 N.S. Firstly, the relationship showed a positive trend. Secondly, the degree of relationship was low. Thirdly, the computed value of 'r' (0.077 N.S.) was found to be less than the table value 'r' (0.402) with at 0.05 levels of probability. Hence, the relationship was found to non-significant. The above observation, therefore, led to acceptance of the concerned null hypothesis. It was thus proved that techno economical aspect of respondents was independent with the aspiration level of the respondents. In other words aspiration level of farmers was not play important role for techno-economic empowerment through digital extension.

Achievement motivation and techno economic aspect of farmers

Following null hypothesis was formulated to test the relationship between the achievement motivation and their techno-economic empowerment through digital extension:

"There is no relationship between the achievement motivation and techno-economic empowerment through digital extension". The co-efficient of correlation between the concerned variable was found to be 0.015 N.S. Firstly, the relationship showed a positive trend. Secondly, the degree of relationship was low. Thirdly, the computed value of 'r' (0.015 N.S.) was found to be less than the table value 'r' (0.090) with at 0.05 levels of probability. Hence, the relationship was found to non-significant. The above observation, therefore, led to acceptance of the concerned null hypothesis. It was thus proved that techno economical aspect of respondents was independent with the achievement motivation of the respondents. In other words achievement motivation of respondents was not play important role for techno economic aspect [20].

Communication behavior and techno economic aspect of farmers

Following null hypothesis was formulated to test the relationship between the communication behavior and their techno-economic empowerment through digital extension:

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"There is no relationship between the communication behavior and techno-economic empowerment through digital extension". The co-efficient of correlation between the concerned variables was found to be 0.391**. Firstly, the relationship showed a positive trend. Secondly, the degree of relationship was low. Thirdly, the computed value of 'r' (0.391**) was found to be more than the table value 'r' (0.000) with at 0.01 level of probability. Hence, the relationship was found to significant. Based on the above observations, the null hypothesis was rejected and hence it was concluded that communication behavior of respondents had significant relationship with their techno economical aspect of respondents [21].

CONCLUSIONS

This study is to identify the potential of techno economic aspect by examining the attitudes of farmers towards such alternative way of digital extension. It also investigated the relationships between attitude and behavioral intention to make a use of agricultural App and important to farmers welfare from digital sources. In addition, this study also examines whether social profile (age, gender, level of education, Type of family, Family size, Size of landholding, family income, Social participation, Social participation, Farm power and Material possession), Communicational profile (Handling of Android mobile, Information Utilization time and Information management behavior) and Psychological profile (Decision making of farmers, Level of aspiration, Achievement motivation and Communication behavior). The result of this study indicated that farmers showed positive intention to make a digital tool in future. From this present study it is clear that family income, education of father, father occupation, land holding, material possession and level of aspiration of the respondents had exerted influence over techno economic aspects of digital extension.

LITERATURE CITED

1. Moni M. 2019. ICT enabled farm centric agricultural services. *Yojna* 63: 45-49.
2. Khondokarhumayun K. 2015. Attitude and level of knowledge of farmers on ICT based farming. *European Academic Research* 10: 13177-13196.
3. Prasad RS. 2019. Empowering citizens through e-services. *Yojna* 63: 7-11.
4. Saravanan R, Bhattacharjee S. 2016. Social media policy guidelines for agricultural extension and advisory services GFRAS Interest Group on ICT4RAS.
5. Jackson C, Berdou E, Ngounoue V, Kreutz C, Clark L. 2009. Use of social media to share knowledge on agricultural impact, planning, assessment and learning. People Centred Performance, Working Paper, Agricultural Learning and Impacts Network ALINe, London, U.K.
6. Lucas CF. 2011. An analysis and recommendations of the use of social media within the co-operative extension system: Opportunities, Risks and Barriers. *Honors Thesis*, Presented to the College of Agriculture, Life Sciences, Social Sciences of Cornell University, USA.
7. Newbury E, Humphreys L, Fuess L. 2014. Over the hurdles: Barriers to social: Media use in extension offices. *Journal of Extension* 52(5): v52-5a1.
8. Neill OB, Zumwalt A and Bechman J. 2011. Social media use of cooperative extension family economics educators: Online.
9. Stanley S. 2013. Harnessing social media in agriculture: A report for the New Zealand Nuffield farming scholarship Trust. NZ Nuffield Scholar. State University Extension Service.
10. Varner J. 2012. Agriculture and social media, Information Sheet 1946, Mississippi. Survey Results and Implications. *Journal of Extension* 49(6).
11. Meena KC, Chand S, Meena NR. 2013. Impact of social media in sharing information on issues related to agriculture among researchers and extension professionals. *Adv. Appl. Res.* 5(2): 166-169.
12. Raghuprasad KP, Devaraja SC, Gopala YM. 2013.an analysis of knowledge level of farmers on utilization of ICT tools for farm communication. *Journal of Rural Development* 32(3): 301-310.
13. Hernandez B, Jiménez J, Jose MM. 2011. Age, gender and income: do they really moderate online shopping behavior? *Online Information Review* 35(1): 113-133.
14. Perie M, Moran R, Lutkus AD. 2005. NAEP 2004 trends in academic progress: Three decades of student performance in reading and mathematics. Washington, DC: US. Department of Education. *Educational Technology* 24(1): 108-122.
15. Daly A. 2007. 'The Diffusion of Technologies: Community Online Access Centres in Indigenous Communities in Australia', in L.E. Dyson, M. Hendriks and S. Grant (Eds) Information Technology and Indigenous People, Hershey, PA: Information Science Publishing. pp 272-85.
16. Digital India. 2018. Digital India initiatives. Accessed on April 15, 2018 from http://digitalindia.gov.in
17. Mains M, Jenkins-Howard B, Stephenson L. 2013. Effective use of Facebook for Extension professionals. *Journal of Extension* 51(5).
18. Srivastava A. 2018. Technology assisted knowledge agriculture for sustainable development goals. *Adv. Crop Sci. Tech.* 6(5): 391. DOI: 10.4172/2329-8863.1000391.
19. Aker JC. 2011. Dial "A" for agriculture: A review of information and communication technologies for agricultural extension in developing countries. *Agricultural Economics* 42: 631-647.
20. Dronkers J, Levels M. 2006.Social-economic and ethnic school-segregation in Europe and Australia and educational achievement of migrant-pupils coming from various regions of origins. Paper presented at the meeting of the ISA Research Committee on Social Stratification and Mobility "Intergenerational Transmissions: Cultural, Economic or Social Resources?" Nijmegen, Netherlands.
21. Dhaka BL, Chayal K. 2016. Farmers' experience with ICTs on transfer of technology in changing agri-rural environment. *Indian Research Journal of Extension Education* 10: 114-118.