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Stakeholders' Information needs, Information Searching and Sharing Behaviour about Rice related Information through Rice Knowledge Management Portal

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ABSTRACT

In this study an attempt was made to analyze the information need of various stakeholders and how Rice Knowledge Management Portal (RKMP) is capable enough in integrating with the information needs in purposively selected Nalgonda and West Godavari districts of Telangana and Andhra Pradesh states respectively. In total, 80 farmers along with 30 scientists and 30 extension personnel were selected as respondents for assessing their information need on rice cultivation and it was measured with modified Standardized Information Need Index (SINI) using *ex post* facto research design. The study revealed that the information on disease management was perceived most important by majority of farmers (index value =83) followed by local market price and pest management. Similarly, scientists perceived information on disease management was most important need for them (index value =83.3) followed by pest management and weather information. In case of extension personnel, information on price and source of input (index value 86.7) perceived highest rank whereas information on disease management and local market price were second and third rank respectively. In the study it was found that plant protection information was searched most by farmers, scientists and extension personnel. Furthermore, it was found that majority of the farmers were sharing information when they meet informally and majority of scientists sharing information when they meet either officially and non-officially, majority of extension personnel shared information when meeting with farmers in their field. The study implied that RKMP played a significant role in meeting the information needs of various stakeholders by providing relevant and timely information on rice cultivation through its various domains. Hence, such knowledge management portals are need of the hour in bridging the information gap/digital divide which exists between lab and land.

Keywords

Information need,
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Introduction

In this era of globalisation agriculture is changing fast. With rapid growth in technology day by day new opportunities has problems are arising for farmers. Agriculture is not only a medium of earning for farmer for sustaining livelihood but also a fast growing area for entrepreneurial activities. More complex technologies are proving lesser implementation by technically weak farmers. There is growing demand for rapid input, service and information delivery among the farmers although, fulfillment of these demands solely by public extension system is limited (Mukherjee *et al.*, 2012). The wide farmer extension workers ratio i.e. 2879:1 (Mukherjee and Maity, 2015), administrative and bureaucratic workload and financial limitations etc. have made the public extension services more supply driven rather than demand driven (Sulaiman *et al.*, 2005). Hence Knowledge management (KM) is considered to be very difficult task in Indian agriculture and become one of the foremost agendas in many research institutions and organizations (Alavi and Leidner, 2001; Tan and Wong, 2015). Knowledge is reflected as the fourth production aspect after labour, land and capital (AFAAS, 2011). Knowledge and information are the basic element of food security and are indispensable for enabling rural development and bringing socio-economic changes as well (Munyua, 2000). Oladele (2011) observed that lack of agricultural information is a key factor that has greatly limited agricultural advancement in developing countries. In order to avoid this type of problem, farmers should be in lined with growing technologies to compete and fulfil the information need for various farming activities. Information is an indispensable factor in farming practice and it is the basis of extension delivery (Agbamu, 2006). Information as a critical resource for socio-economic development enables people to

make informed choices towards improving their livelihoods (Matovelo, 2006). Information is an important tool used in the realization of any objective or goal set by individuals and it is a valuable resource required in any society, thus acquiring and using information are critical and important activities (Emmanuel, 2012). Information must be relevant and meaningful to farmers, in addition to being packaged and delivered in a way preferred by them (Diekmann *et al.*, 2009). Keeping in view the significance of ICTs in overall agricultural advancement, it is necessary to promote ICT based agricultural information dissemination to enhance agricultural productivity on one hand and also to provide sustainable agricultural information delivery mechanism (Atibioke *et al.*, 2012). ICT is an emerging tool for achieving meaningful societal transformation (Meera *et al.*, 2004). Further, the role of ICTs in accessing more information in order to enhance food security and support rural livelihoods has also been increasingly recognised and officially endorsed at the World Summit on the Information Society (IICD, 2007). ICT supports access to timely and relevant information, as well as empower the creation and sharing of knowledge of the farming community itself (Mathur and Goyal, 2014). The goal of Information and Communication Technology (ICT) is to provide the benefits of information revolution to the rural masses by enhancing farming efficiency, farm productivity and farmers' income (Sangeetha *et al.*, 2015). The information usually provided is reported to be focused mainly on policy makers, researchers, students and those who manage policy decisions with little or no attention paid to the information needs of farmers who are the targeted beneficiaries of the policy decisions (Omenesa, 2007). So there is a need to assess the information needs of all the stakeholders of agriculture, so that context-specific information could have higher impacts on the

adoption of technologies and increase farm productivity for marginal and small agricultural landholders (Sammadar, 2006). The term “information need” that ‘a function of extrinsic uncertainty produced by a perceived discrepancy between the individual’s current level of certainty about important environmental objects and a criterion state that he seeks to achieve’ (Atkin, 1973). Indian agriculture has predominately grown rice and wheat crops and rice is staple crop of India. There are number of sources for information on rice related information, but there is always all the related informations are not readily available. So to solve this problem an attempt was made by Indian rice research institute, Hyderabad to cater the information need of the farmers. So a portal namely, Rice knowledge management portal (RKMP) was developed with eight consortium partners. RKMP serves as an information highway for all rice related information. RKMP provides many specific queries for rice research and cultivation, related to variety selection, disease management, pest and site specific frequently asked questions (Das *et al.*, 2013). The vision is to realise higher productivity and production of rice through improved knowledge and skill sets. The efforts paved the way to reduce the gaps of the growing “digital information divide” specifically in the important cereal crop of the country namely the rice (Meera *et al.*, 2012). An attempt was made to analyze the information needs, searching and sharing behaviour of stakeholders of RKMP (farmer, scientist and extension personnel) in knowledge management and utilization of information.

Materials and Methods

The study was conducted in the state of Telangana and Andhra Pradesh. These states were selected purposively for the study location. Since, Indian Institute of Rice Research (IIRR) is the host institute of RKMP

and this project is being implemented in these states, rice bowls of India. Multi-stage random sampling technique has been adopted to select the respondents. From each selected state, one district has been selected purposively based on the criteria of RKMP project implementation. Nalgonda district from Telangana and West Godavari district in Andhra Pradesh were selected purposively as the project being implemented in these districts since its inception. For the detailed survey, 10 farmers from each village were selected and thus final sample comprises of 80 farmers from two districts. In case of scientists, 15 respondents were selected for the survey from two selected organizations such as Indian Institute of Rice Research (Hyderabad) and Andhra Pradesh Rice Research Institute and Regional Agricultural Research Station, (APRRI and RARS) Maruteru, West Godavari District, Andhra Pradesh (Acharya N.G. Ranga Agricultural University). Therefore, in total, 30 scientists were selected for the final survey. In case of extension personnel, 15 respondents were selected from each Nalgonda and West Godawari district and thus, 30 in total was selected for the survey. Therefore, the study was conducted among 140 stakeholders of RKMP portal, namely, 80 farmers, 30 scientists, and 30 extension professions. In this study, Information need has been studied for farmers, Scientists and Extension personnel. For assessing Rice related information need, schedules were developed separately. Information related to rice such as input availability, cultural practices, post-harvest practices, market related information and credit related informations were assessed. To assess the information need of respondents, they were asked to give responses on provided list of informations according to their priority. A *Likert* type scale was used for getting responses on a 5-point scale ranging from very important information to not important information. A score of 5 was given to very important information, 4 against somewhat

important information so on and so forth. To measure information need of the stakeholders on rice cultivation modified Standardized Information Need Index (SINI) developed by Kabir *et al.*, (2014) was used with following formula.

$$\text{INI} = \text{InVI} \times 5 + \text{InSI} \times 4 + \text{InN} \times 3 + \text{InLI} \times 2 + \text{InNI} \times 1 \text{ Where,}$$

INI = Information Need Index

InVI = Number of respondents with very important information need

InSI = Number of respondents with somewhat important information need

InN = Number of respondents with neutral information need

InLI= Number of respondents with less important information need

InNI= Number of respondents with not important information need

$$\text{Standard Information Need index (SINI)} = \frac{\text{Computed Information Need Index}}{\text{Possible Highest Information Need Index}} \times 100$$

Based on the index value information needs were priorities and highest value was arranged in descending order.

Results and Discussion

According to Parsad (1992), the information need is a factual situation in which, there exists an inseparable interconnection with 'information' and 'need'. The information originates and is generated because there exist a need or an interest.

The content of information is of primary concern. The basic objectives of studying information needs and use may be:

The explanation of observed phenomena of information use or expressed need;

The prediction of instances of information use and

The control, and thereby improvement of the utilization of information manipulation of essentials conditions

Farmers' needs and information requirements vary by the stages of production in agriculture. In general, all farmers seek to acquire complete, high quality and timely information to make decisions related to their crops, throughout the year. Farmers can reduce the probability and magnitude of losses, if they are able to access relevant and timely information. Evidence suggests that ICT has potential to minimize agriculture production risk due to pest and disease (Mittal, 2012). Farmers need both technical and awareness information corresponding to different farm activities. During the survey, farmers were asked to list the most important information needs related with rice cultivation, which has been listed under 26 major dimensions and ranked based on the standard information need index (SINI) value, using a *Likert* type scale on a five point continuum of importance from very important to not important. It reveals that information related with disease management has ranked one with SINI value 83.0, whereas information related with local market price (81.25) and pest management (80.5) have scored second and third rank respectively. These information needs were followed by weather information with the value of (79.0), best crop practices (78.5), seed variety (78.0), price and source of the input (77.5), credit (76.7), seed treatment with the value of (75.7), marketing and trade with (76.5), crop insurance (76.2) and fertilizer application (74.5). The least preferred information needs were harvesting (44.7), allied activities (37.7) and natural resource management (35.2).The

present study has also found that the information related with natural resource management was found to be less important (40.7), similarly harvesting (37.7) and allied activities (36.7) by the farmers (Table 1).

Different others studies have been done on the information needs of farmers. The needs were different for different stakeholders according to their position. Burman *et al.*, (2013) in their study reported that most of the farmers needed farm information related to areas such as pest and disease management, improved crop varieties. Saravanan *et al.*, (2009) in their study found that majority of the farmers wanted information on pest and disease management. This is in line with the present study, which found that information need of farmers related with disease management was highest with an index value of 83 followed by information need related with best crop practices (81.25) and weed management (80.5). Kabir *et al.*, (2014) in their study stated that information need related to crop protection, market, climate and credit found to be most needed, while crop production, processing and post-harvest related information found to be less needed information for the farmers. This is in line with the findings of the study by Meitei and Devi (2009) who reported that information related to seed varieties, pesticides and fertilizers were most needed by farmers in rural Manipur. Similarly some author also found the similar result for information needs of the farmers which is mainly information on seeds/input availability (what input to use, how much to use, when and from where to purchase inputs) (Mittal *et al.*, 2013), diseases and pest management (Salau *et al.*, 2013; Shanthasheela *et al.*, 2015), water conservation, post-harvest techniques, irrigation, manure and fertilizer management (Okwu *et al.*, (2009), modern cultivation practices, farmers training programmes, government schemes on agriculture, storage,

weather information, sources of farm credit and marketing information (Meera *et al.*, 2004; Tologbonse *et al.*, 2008; and Jalaja *et al.*, 2015).

Researchers in agricultural and biological sciences are interested in analyzing information and data on economic and demographic processes at micro and macro levels. Information needs of the scientists related with rice cultivation, which has again been listed under 26 major dimensions and ranked based on the standard information need index (SINI) value, and responses on different information were collected on five point continuum using *Likert* type scale. It was found that scientists needed information on disease management, pest management and weather related information, which scored first, second, third rank respectively with the SINI value 83, 81.3 and 80.6 respectively (Table 2). Whereas information related with seed variety (78.0), weed management (79.3), water management (78.6), best crop practices (80.0), soil health (80.0), natural resource management (80.0), crop rotation (80.0), pesticide application (78.6), fertilizer application (78.0), method of planting (77.3), seed treatment (77.3), time to plant (77.3), grading (77.3), machinery (76.0), local market price (74.6), crop insurance (74.0), marketing and trade (70.0), source of input (66.0), Government subsidies (64.0), credit (50.7) were the other important information needs. The least preferred information needs by scientists were harvesting (48.0), storage (44.7) and allied activities 40.7). The result of the study was found in harmony with Singh *et al.*, (2006) and Acheampong *et al.*, (2015).

The backbone of all agricultural extension endeavours is the transfer of agricultural information to enhance the productive capacity of farmers (Umali-Deininger *et al.*, 1994). The extension agents' job was to convince farmers of the potentials of the new

technology. Communities and the networks to which people belong play a more important role in influencing agricultural practices (Sani *et al.*, 2014). The major duty of agricultural extension workers is the providing of agricultural information to farmers, thereby assisting farmers in increasing their production and they are expected to make research findings available to farmers, who in turn, would bring their problems to the notice of agricultural extension workers for onward transmission to agricultural scientists (Aina, L. O. 1989). Information need of the extension personnel related with rice cultivation which has again been listed under 26 major dimensions and ranked based on the standard information need index (SINI) value, and responses on different information were collected on five point continuum using *Likert* type scale.. From the table 3, it is understood that extension personnel wanted information on price and source of input, disease management, local market price, Government subsidies and weather information, which has scored first, second, third, fourth and fifth rank respectively with the SINI value 86.7, 86.0, 85.3, 84.0 and 84.0 respectively. The information related to storing (48.0), marketing and trade (46.6), harvesting (44.6), natural resource management (41.3), machinery (40.6) and allied activities (36.0) were least preferred information by extension personnel.

Extension professional being a connective link between farmers and scientists community have to be more competent so that the information need of the farmers as well as the scientists can be fulfilled. To fulfil all these information needs of the extension professionals should possess exhaustive information about rice and its related information. The similar study was conducted by Aina (1989) in Nigeria and revealed that information needs of the extension workers were in the areas of control of major pests,

credit and co-operatives, proper handling of insecticides, marketing system of agricultural products. Study was also found in harmony with Alibeygi *et al.*, (2010).

Information sharing and searching behaviour of farmers

In this study, an attempt was made to know what kind of information is searched and shared by stakeholders who used RKMP portal

Table 4, revealed that plant protection related information is the most searched information by the farmers. Similarly other information search preferences were rice varieties, weather information and inputs. Least preferred was agronomic practices. Findings of the present investigation are in harmony with the similar study conducted by Babu *et al.*, (2012). Opara (2008) found that farmers were mostly searching information related to marketing, credit facilities, improved crop varieties, agrochemicals, agro- machinery, inputs and implements.

The information search preference of scientists was calculated by using mean rank. It revealed that most of the scientists searched rice varieties (5.83) and plant protection measures (5.10). Next to it was input information (2.93). Whereas least searched information was market (2.77) and weather information (1.33). Information search preference of extension professionals was assessed by calculating mean rank. The information which has highest mean score is the most shared information. According to this, most searched information among the extension professional was input information (5.87) and market information (5.10) plant protection measures followed by (3.30), weather information (3.23). But the least searched information was rice varieties (2.40) Agronomic practices (1.10).

Table.1 Information needs of farmers in context of rice cultivation n=80

S.N.	Information	Information needs based on the Importance						
		VI	SI	N	LI	NI	INI	SINI
1.	Disease management	43	18	10	6	3	332	83.0
2.	Local market price	38	23	9	6	4	325	81.2
3.	Pest management	40	19	9	7	5	322	80.5
4.	Pesticide application	36	24	9	7	4	321	80.2
5.	Weather	34	22	13	8	3	316	79.0
6.	Best crop practices	32	22	14	10	4	314	78.5
7.	Weed management	36	19	10	11	5	313	78.2
8.	Government. Subsidies	37	19	10	8	6	313	78.2
9.	Seed variety	36	20	10	8	6	312	78.0
10.	Price and source of input	38	10	18	12	2	310	77.5
11.	Credit	32	21	13	10	4	307	76.7
12.	Marketing and trade	32	23	10	9	6	306	76.5
13.	Crop insurance	32	21	13	8	6	305	76.2
14.	Seed treatment	33	20	11	9	7	303	75.7
15.	Crop rotation	33	18	13	9	7	301	75.2
16.	Water management	31	20	13	9	7	299	74.7
17.	Fertilizer application	31	20	12	10	7	298	74.5
18.	Machinery	31	14	15	12	8	288	72.0
19.	Method of planting	27	15	18	19	1	288	72.0
20.	Storage	26	15	23	9	4	281	70.2
21.	Grading	7	6	28	15	25	198	49.5
22.	Soil health	6	8	18	23	25	187	46.7
23.	Time to plant	4	7	16	27	26	176	44.0
24.	Harvesting	6	6	12	17	39	163	40.7
25.	Allied activities	9	4	3	17	47	151	37.7
26.	Natural resource management	4	2	14	11	49	141	35.2

VI=Very Important, SI=Somewhat Important, N=Neutral, LI=Less Important, NI=Not Important. INI= Information Need Index, SINI= Standard Information Need Index

Table.2 Information needs of the scientists in context of rice n=30

S.N.	Information	Information needs based on the Importance						
		VI	SI	N	LI	NI	INI	SINI
1.	Disease management	16	7	4	2	1	125	83.3
2.	Pest management	16	6	4	2	2	122	81.3
3.	Weather	13	9	5	2	1	121	80.6
4.	Seed variety	13	7	5	4	1	117	78.0
5.	Weed management	14	7	5	2	2	119	79.3
6.	Water management	15	5	5	3	2	118	78.6
7.	Best crop practices	14	6	7	2	1	120	80.0
8.	Soil health	13	8	6	2	1	120	80.0
9.	Natural resource management	14	8	4	2	2	120	80.0
10.	Crop rotation	13	8	6	2	1	120	80.0
11.	Pesticide application	13	8	5	2	2	118	78.6
12.	Fertilizer application	13	8	4	3	2	117	78.0
13.	Method of planting	15	6	3	2	4	116	77.3
14.	Seed treatment	13	6	6	4	1	116	77.3
15.	Time to plant	13	5	8	3	1	116	77.3
16.	Grading	13	7	5	3	2	116	77.3
17.	Machinery	13	6	5	4	2	114	76.0
18.	Local market price	14	5	4	3	4	112	74.6
19.	Crop insurance	13	5	5	4	3	111	74.0
20.	Marketing and trade	12	3	6	6	3	105	70.0
21.	Source of input	13	2	3	5	7	99	66.0
22.	Government subsidies	10	2	8	4	6	96	64.0
23.	Credit	6	2	4	8	10	76	50.7
24.	Harvesting	5	3	2	9	11	72	48.0
25.	Storage	2	2	7	9	10	67	44.7
26.	Allied activities	0	4	5	9	12	61	40.7

VI=Very Important, SI=Somewhat Important, N=Neutral, LI=Less Important, NI=Not Important. INI= Information Need Index, SINI= Standard Information Need Index

Table.3 Information need of extension professionals for rice cultivation n=30

S. No	Information	Information needs based on the Importance						
		VI	SI	N	LI	NI	INI	SINI
1.	Price and source of input	19	5	4	1	1	130	86.7
2.	Disease management	19	5	3	2	1	129	86.0
3.	Local market price	19	6	2	1	1	128	85.3
4.	Government subsidies	17	6	4	2	1	126	84.0
5.	Weather	16	8	3	2	1	126	84.0
6.	Pest management	18	5	3	2	2	125	83.3
7.	Credit	16	6	5	2	1	124	82.6
8.	Seed variety	16	7	3	2	2	123	82.0
9.	Soil health	17	5	4	2	2	123	82.0
10.	Weed management	15	7	3	2	3	119	79.3
11.	Seed treatment	14	6	6	3	1	119	79.3
12.	Water management	15	5	5	3	2	118	78.6
13.	Best crop practices	13	7	5	4	1	117	78.0
14.	Crop rotation	15	5	4	3	3	116	77.3
15.	Pesticide application	13	6	5	4	2	114	76.0
16.	Crop insurance	13	5	5	4	3	111	74.0
17.	Time to plant	12	3	6	6	3	105	70.0
18.	Method of planting	13	2	3	5	7	99	66.0
19.	Grading	10	2	8	4	6	96	64.0
20.	Fertilizer application	13	1	2	5	9	94	62.6
21.	Storage	5	3	2	9	11	72	48.0
22.	Marketing and trade	3	4	5	6	12	70	46.6
23.	Harvesting	2	2	7	9	10	67	44.6
24.	Natural resource management	2	2	4	10	12	62	41.3
25.	Machinery	0	4	5	9	12	61	40.6
26.	Allied activities	0	2	5	8	15	54	36.0

VI=Very Important, SI=Somewhat Important, N=Neutral, LI=Less Important, NI=Not Important. INI= Information Need Index, SINI= Standard Information Need Index

Table.4 Information search preference of stakeholders (in context of rice) n=140

S.N.	Categories of Information	Mean of ranks of stakeholders		
		Farmers (80)	Scientists (30)	Extension personnel (30)
1.	Plant Protection	5.950	5.10	3.30
2.	Rice Varieties	5.025	5.83	2.40
3.	Market	3.250	2.77	5.10
4.	Weather	3.063	1.33	3.23
5.	Input	2.538	2.93	5.87
6.	Agronomic Practices	1.175	3.03	1.10

Table.5 Information sharing pattern of the stakeholders n=140

S.N.	With whom you are sharing information	Stakeholders					
		Farmers (80)		Scientists (30)		Extension personnel (30)	
		<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
1.	Family members	11	13.75	3	10.00	5	16.67
2.	Friends	30	37.50	4	13.33	3	10.00
3.	Relatives	09	11.25	5	16.67	4	13.33
4.	Fellow farmers/scientists	13	16.25	16	53.33	15	50.00
5.	Neighbours	17	21.25	2	06.67	3	10.00

Table.6 Purpose of sharing information of the stakeholders n=140

S.N.	Purpose of sharing information	Stakeholders					
		Farmers (80)		Scientists (30)		Extension personnel (30)	
		<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
1.	To clear doubt	26	32	2	06.67	6	20.00
2.	To informs others	33	41	23	76.67	16	53.33
3.	To spread the benefits	21	27	5	16.67	8	26.67

Table.7 Periodicity of sharing information of the stakeholders n=140

S.N.	Periodicity of sharing information	Stakeholders					
		Farmers (80)		Scientists (30)		Extension personnel (30)	
		<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
1.	Just after getting information	18	22.7	6	20.00	3	10.00
2.	When meet at home	29	36	8	26.67	7	23.33
3.	When meet at any meeting	33	41.3	16	53.33	20	66.67

Table.8 Type of information shared by the stakeholders n=140

S.N.	Type of information shared	Stakeholders					
		Farmers (80)		Scientists (30)		Extension personnel (30)	
		<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
1.	Plant Protection	22	27.3	11	36.67	10	33.33
2.	Rice Varieties	13	16.0	5	16.67	7	23.33
3.	Market	09	11.7	5	16.67	4	13.33
4.	Weather	11	13.7	1	03.33	2	06.67
5.	Input	18	22.2	4	13.33	3	10.00
6.	Agronomic Practices	07	9.10	4	13.33	4	13.33

From Table 5, it was found that the information is mostly shared between friends (37.50%) followed by neighbours (21.257%) and fellow farmers (16.25%) and least to relatives. The study was supported by Karthikeyan (2008) where the farmers showed similar kind of information sharing behaviour about Kisan Call Centers at Tamil Nadu. A similar study was done by Yadav (2011) in Uttarakhand on agricultural portals and found that that majority of farmers had shared the information with neighbour followed by relatives (66.26 per cent each).provided through Agropedia and aAQUA respectively.

Further it was found that 53 per cent scientists were sharing the information with the fellow scientists and farmers whereas 13.3 per cent were shared with relatives. Among the extensional personnel, 50 per cent were sharing the information they got from RKMP portal with fellow farmers, and 16 per cent were shared with family members and similarly with friends and neighbours 10 percent.

Table 6 described the purpose for which information is shared by the farmers. It reveals that most of the RKMP user farmers 41.0 per cent shared information just for the sake of informing others. Whereas 32 per cent farmers shared the information to clear their

doubts followed by to spread the benefits what they get because of RKMP 27 per cent. The study was supported by Ansari *et al.*, (2014).

Further in case of scientists it revealed that most of the scientists 76 per cent shared information just for the sake of informing others. Whereas 6 per cent farmers shared the information to clear their doubts followed by to spread the benefits what they get because of RKMP 16 per cent. In case of extension personnel revealed that most of the Extension Personnel 53 per cent shared information just for the sake of informing others. Whereas 20 per cent farmers shared the information to clear their doubts followed by to spread the benefits what they get because of RKMP 26 per cent.

Table 7 showed that most of the RKMP user farmers 41 per cent shared the information whenever they used to meet at their common meeting point followed by whenever they used to meet at home 36 per cent and just after getting the information 22.7 per cent.

It also showed that most of the scientists 53 per cent shared the information whenever they used to meet at their common meeting point followed by whenever they used to meet at office 26 per cent and just after getting the information 20 per cent. Most of the

extension personnel (67 %) were sharing the information with the farmers when they meet them at their field followed by when the farmers come to their office (24 %) and just after getting the information by calling them (9.3 %)

Table 8 depicted the type of information shared related to rice cultivation by the RKMP user farmers. It reveals that most shared information by the farmers was plant protection measures 27.3 per cent. And subsequently input information 22.2, rice varieties (16%) and weather information (13.7%). It also reveals that least shared information was agronomic practices (9.1%). the present study was supported by Diekmann *et al.*, (2009).

It showed that most shared information by scientists was plant protection measures 36.67 per cent Next to it was information related to rice varieties 16.67 per cent. Whereas the least shared information was market 16.67 per cent and weather information 3.33 per cent. Most shared information by extension personnel was plant protection measures (33.3 %). Next to it was information related to rice varieties (23.8 %). Whereas the least shared information was weather information (4.8 %).

Information is a vital and crucial input in agriculture for sustainable agriculture in modern day technologies/ agriculture. Any knowledge management model will lose the sustainability if it has limitations in technology dissemination part. For a successful knowledge management model, information needs, information searching preference of stakeholders needs to be taken care. The ICT based knowledge management models must take into account the importance of information needs of the all the stakeholders, access and utilization of same in order to meet the demand in changing agricultural scenario and for a robust

agriculture based economy. For effective dissemination of information, we must ensure that stakeholders should utilize all the available and accessible ICT tools and up-gradation in technologies, support of state department of agriculture and extension personnel in effective way.

Tomorrow's society will be more of virtual than physical. Hence, the emerging social media tools need to be integrated well in knowledge management models. Hence information needs, sharing pattern and searching preference of all the stakeholders needs to be taken care while formulating any knowledge management strategies for its effective utilization and necessary redesigning and modification should be adopted. Hence, such knowledge management portals are need of the hour in bridging the information gap/digital divide which exists between lab and land.

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