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Indian Journal of Extension Education and Rural Development

FROM EDITOR'S DESK

It is indeed a matter of immense pleasure for me to put forward before you the current issue of IJEE & RD for the year 2020. In the present issue some 29 research papers on areas pertaining to significant contemporary issues of rural development and agricultural extension are included. The issues related to Agriculture, Home Science, Management, Veterinary and Animal Husbandry, Development and Rural Development in general forms the major content of this volume. I am highly grateful to the Editorial board and Executive Editor Prof. Dhriti Solanki for her untiring and painstaking efforts in bringing out this issue in time. Prof. F.L. Sharma on Editorial Board deserves special thanks for his commendable work and shouldering the responsibility of bringing this task to reality. I put on record the sincerity, hard work and initiative taken by Dr. Sharma without whose help and cooperation, it would not have been possible to get this issue published in time. He has always been instrumental in pooling efforts of editiorial boards memebers to complite the work in time keeping in view the non-impact points of NAAS. We appreciate the cooperation and help extended by the President of the society Prof. P.N. Kalla and Vice-presidents Prof. Archna Raj Singh & Prof. B.S. Bhimawat for their continious guidance and help in this regard. We are grateful to Prof. N.K. Panjabi, Secretary of the society for his continuous help, guidance and free hand in completing the task well in time. The contributors of research papers are precious and highly valued members of the society, we are heartly thankful to them for their trust in the society and sharing their research work through this platform and we expect the similar type of cooperation in future too. We assure the contributors and members to come up to their expectations in the years to come. We are grateful to Prof. S.N. Ojha, Head, and Prof. S.S. Sisodia, Department of Extension Education, RCA for their cooperation and help. Thanks are also due to Prof. Rajshree Upadhyay, Dept. of EECM, College of Community and Applied Sciences for her cooperation and concern in all matters related to this journal. Last but not the least Image Print Media deserves special appreciation and thanks for printing the journal in time.

Warm regards

S.K. Sharma
Chief Editor

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CONTENTS

PROBLEMS FACED BY THE GUAVA PRODUCERS IN SAWAI MADHOPUR DISTRICT OF RAJASTHAN

K.C. Meena*, B.L. Meena, C.B. Meena*** and Nupur Sharma******

ABSTRACT

The study was conducted to findout the production, processing, and marketing-related problems faced by guava growers in Sawaimadhopur district of Rajasthan. The Sawaimadhopur block of the district was selected purposively because it is the main guava producing block in the district. In all, 200 guava producers were considered for the study. In production aspect,high cost of saplings/ grafts, followed bythe high infestation of nematode, unavailability of quality saplings/grafts, unavailability skill labour locally, lack of capital, lack of suitable option for intercropping, unavailability of organic inputs, nutrient deficiency in guava orchards, lack of technical know-how of guava production, an infestation of fruit fly and sucking pests were the major production-related constraints. Absence of processing plant /units followed by lack of storage facilities,absence of storage facilities near production areas, lack of awareness about small scale processing,andabsence of agencies to support guava processing were the major guava processing related problems. In marketing aspects, lack of competition among contractors, lack of registered buyers/contractors, delay in payment, absence of regulated markets, absence of identity of Barfkhan Guava, lower prices due to seasonal gluts, lack of farmer's organizations were the major marketing constraints of guava cultivation.The study emphasized the need to develop the proper marketing and processing facilities before its cultivation is to be popularized on a large scale in the area.The results of the study can call for policies aimed at encouraging new entrants especially the youths who are agile and stronger to grow guava and the experienced ones to remain in guava farming.The State Government should be included Barfkhan (Gola) variety under subsidy schemes, the majority of farmers were using this variety for its marketing quality but due to unregistered variety, farmers are not able to use subsidy under govt.schemes.

INTRODUCTION

Guava (*Psidium guajava* L) is one of the important fruits of India; it is considered to be the poor man's apple. The guava treeis quite hardy, has a prolific bearing habit, gives satisfactory returns without much care and can withstand adverse climate conditions. According to the Indian Horticulture Database, 2014, the production share of Guava in India was 4.1%.Guava is cultivated in 264.9 thousand hectares, with a production of 4053.5 thousand MT all over the country (Horticultural Statistics at a glance, Government of India 2018). Uttar Pradesh is the largest producer of guava followed by Madhya Pradesh, Bihar, and Andhra Pradesh. The guava fruit can be used both for processing and fresh eating. It is also a very good source of pectin. Therefore, guava is used for commercial extraction of pectin. Guava is preeminently used for making jelly, jam, guava cheese, guava nectar, and other culinary products. It is also a good source of carbohydrates and has a delicious taste.

In Rajasthan, the area under guava cultivation was 4.33 thousand ha with the production of 55.13 thousand MT in 2017-18(Horticulture statistics at a glance, 2018, Govt. of India). The major guava producing district is Sawai Madhopur, Dausa, Tonk, Dholpur, and Bundi district. Sawai Madhopur district

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is the main guava growers with an area 5000 ha (Singh et al., 2016) and among the different blocks in the district, Sawai Madhopur block has more than 4000 ha area under guava cultivation. Sawaimadhopur district of Rajasthan is known for its guava production and emerging main economic source of farmers.Barfkhan Gola variety got spurt in the district. it appeared that Barfkhan Gola is better over L-49 and Allahabad Safeda concerning fruit weight, size, the thickness of flesh, weight of pure flesh excluding seed cavity, soft texture of seeds, ascorbic acid contents and TSS content which are marketing traits for the guava varieties. In this variety of maximum fruit weight (375.87g) and equatorial diameter (82.89 mm) was recorded. This variety had a maximum yield of 1.0-1.5 q/tree which was 0.80 and 0.60 q/tree in the case of L-49 and Allahabad Safeda, respectively. Barfkhan Gola variety's fruit was crunchy in texture with soft seeds. Spreading growth behaviour, compact canopy, green leaf luster, and solitary bearing habitswere other features of this variety (Singh et al., 2016). This variety is replacing all other old varieties of guava in the district. The area and production of guava have been increased from 5000 ha (2014-15) to 7200 ha (2017-18) and production from 126000MT (2014-15) to 190'400MT in 2017-18 (Department of Agriculture, Sawaimadhopur). Guava is also known as "Super Fruit" because it has high nutritive value with many health benefits (Singh et. al. 2017). Several factors are affecting the productivity and production, but the most important factor is damage due to pest and disease, lack of irrigation facilities, lack of credit availability, lack of good seedling, desirable packaging of inputs/ pesticide, insecticide and unfavorable conditions a sound knowledge of the improved technology and full-scale use of the recommended practices for successful results. Marketing had a vital role to play in Guava production as this crop was the highly perishable crop. Hence quick and good marketing facilities were needed for selling Guava fruits immediately after they were harvested. Most of the cultivators used to selltheir produce either through the trade agents at the village level or through the commission agents in the Market.The main marketing problems are unorganized marketing, poor post-harvest management, market information intelligence, storage, market finance, price fluctuation, etc. Since guava is considered a poor man's apple and can easily be grown everywhere, there is a need to identify and overcome the various problems faced by the guava growers.Hence study on constraints of production, processing, and marketing of guava aspects may provide some guidelines to study the production and marketing constraints of guava orchard in the Sawai Madhopur district of Rajasthan.

RESEARCH METHODOLOGY

The present study was carried out in Sawai Madhopur district of Rajasthan. Sawai Madhopur is famous for its guava production and the farmers are doing profitable business through it. This crop was introduced there in 1990 and gradually guava from Sawai Madhopur started being exported across the nation. TheSawaimadhopur block of the districtwas selected purposively because more thaneighty percent guava producing block in the district. A list of guava growing villages of Sawai Madhopur block were prepared and out of which 10 villages were randomly selected with the help of Assistant Director, (Horticulture), Sawai Madhopur.A list of Guava producing farmers of each selected village was prepared with the help of Krishak Mitra and Agriculture Supervisors. Guava growers were selected by using a proportionate random sampling method. The total number of selected farmers were 200. It refers to impediments or obstacles in following a particular way. Problems for the present study have been operationalized as obstacles or hurdles experienced by the guava growers in improved production, processing and marketing. The respondents were asked to rank each of the problems relevant to them according to the degree of importance as perceived by them. As all the items were not ranked same by all the respondents the method of combining of incomplete order of merit ratings as suggested by Garret (1981) was followed. The formula for percent position suggested by Garret (1981) is:

Per cent position = 100 (R-0.5) / N

Where, R is the rank of the individual item in the series and N is the number of individual items ranked.

RESULTS AND DISCUSSION

Problems faced by guava growers concerning the production: Various problems of guava producers are displayed in Table 1 which reveals that major production-related problems were the high cost of saplings/grafts with garret score (78.39) faced by the guava growers followed byan infestation of nematode in orchards(Garret score 70.78),unavailability of quality saplings/grafts with garret score (70.04) faced 2nd and 3rd constraintsby guava farmers respectively. The reason might be that the guava root-stock and sapling are beingbrought from Maliabad, Uttar Pradesh by local commission agents which is so far from the Sawai Madhopur and nematode affected rootstock or sapling are being transported from Uttar Pradesh.Unavailability skilled labour locally rank 4th with garret score (66.37) that might be farmers are not being trained in different operations of guava orchard which are being performed by hired skilled labours from Uttar Pradesh followed bylack of capital rank 5th with garret score (63.15) that constraint may be due to the farmers economically dependent on Rabi and Kharif crops so they do not get money from over the year and borrowing the loan procedure may complicated or

Table 1: Problems faced by guava growers in relation to the production

S.No.	Production related problems	Garret Score	Rank
1	Shortage of irrigation water during summer	41.96	XI
2	High cost of pesticides	28.36	XV
3	Unavailability of organic inputs	50.30	VII
4	Unavailabilty of quality saplings/grafts	70.04	III
5	High cost of saplings/grafts	78.39	I
6	Wilt and other diseases of guava	35.83	XII
7	Lack of technical know-how of farmers	43.87	IX
8	Nutrient deficiency in guava orchards	47.57	VIII
9	Unfavorable weather condition during fruiting	32.73	XIV
10	Infestation of nematode disease	70.78	II
11	Infestation of fruit fly and sucking pests	42.28	X
12	Lack of capital	63.15	V
13	Unavailability skilled labour	66.37	IV
14	Lack of suitable option for intercropping	52.79	VI
15	Unregistered of “Barfkhan Gola” variety	35.39	XIII

Source: Primary Data

lengthy in financial institutions, Lack of suitable option for intercropping rank 6th withgarret score (52.79) that may be farmers are not havingthe better option for intercropping in guava orchard till fruiting, unavailability of organic inputs rank 7th withgarret score (50.30) that might be unavailable of manures, vermicompost andpheromone traps for controlling insects etc at farmers fields.Nutrient deficiencyin guava orchards was 8th ranked with garret score (47.57), Lack of technical know-how of guava production rank9th withgarret score (43.87) that may be farmers were not competent in guava production technical skills followed by Infestation of fruit fly and sucking pests was 10th ranked with garret score (42.28), Shortage of irrigation water during summer was 11thranked with garret score (41.96) that might be due tothe groundwater of soil goes down to earth day by day recent one decade and maximum exploration of water, Wilt and other diseases of guavaranked 12thwith garret score (35.83), unregistered of "Barfkhan Gola" variety was 13th ranked with garret score (35.39) that constraint might be most of the farmers are using this variety for its marketing quality and other parameters but due to unregistered variety, farmers were not able to use subsidies under govt.schemes, unfavourable weather conditions during fruiting was 14th ranked with garret score (32.73) and high cost of pesticides was 15th ranked with garret score (35.39)in constraints faced by the guava growersabout production aspects.All these problems exist only because opportunities available in this direction are not utilized to its maximum.

Problems faced by guava growers in the processing of guava: Table 2 shows that the absence of processing plant /units was the first major problems in the processing of guava with garret score (67.04) the reason might be that the food processing industries are not interested to run the processing units due to lack of demand of processed guava products by the Indian customersfollowed by an absence of storage facilities near production areas was a second major problem faced by growers with garret score (58.38),lack of awareness about small scale processingwas the third problem with garret score (51.91),absence of agencies to support guava processing was the fourth problem with garret score (42.28),lack of awareness about grading and packing was the fifth problem with garret score (41.96), and non-availability of good packing material was the sixth problem with garret score (35.83).

Problems faced by guava growers in the marketing of guava fruits: Table 3 indicats that lack of competition among contractors was the first major problem faced by farmers with garret score (68.46) thatmay be due to the contractors are united & monopolized at the time pre-harvesting auctions of orchards. Lack of registered buyers/contractors was the second important problem faced by the growers with garret score (68.39) that may be guava

Table 2: Problems faced by the guava growers in relation to the processing

S.No.	Problems related processing of guava	Garret Score	Rank
1	Absence of storage facilities near production areas	58.38	II
2	Lack of awareness about grading and packing	41.96	VI
3	Absence of processing plant / units	67.04	I
4	Non-availability of good packing material	42.28	V
5	Absence of agencies to support guava processing	51.91	IV
6	Lack of awareness about small scale processing	56.23	III

Source: Primary Data

Table 3: Marketing related problems faced by Guava growers

S.No.	Marketing related problems	Garret Score	Rank
1	Absence of Regulated Markets	66.09	IV
2	Delay in payment by contractors	67.70	III
3	Lack of competition among contractors	68.46	I
4	Lack of registered buyers/contractors	68.39	II
5	Lower prices due to seasonal gluts	57.79	VI
6	Exploitation by commission agents	41.67	IX
7	Lack of Farmare's organizations	51.40	VII
8	Absence of agencies to support marketing	35.52	X
9	Lack of marketing intelligence	45.87	VIII
10	Absence of identity of Barfkhan Gola Guava	55.81	V

Source: Primary Data

contractors were not registered by the government and generally, they were mainly from Uttar Pradesh state who are cheated, farmers. Delay in payment was third major constraints with garret score (67.70) followed byan absence of regulated markets ranked fourth with garret score (66.09),absence of identity of Barfkhan Gola guava ranked fifth with garret score (55.81), lower prices due to seasonal gluts was sixth major constraints in marketing with garret score (57.79). lack of farmer's organizations was the seventh problem faced by farmers with garret score (51.40). Lack of market intelligence was the eighth major problem faced by guavagrowers with garret score (45.87) the problem may due to not properly getting information regarding marketing surveys. Exploitation by commission agents was the ninth major problem with garret score (41.67) andthe absence of agencies to support marketing ranked tenth with garret score (35.52) was a major problem faced by respondents in the marketing of guava fruits. The above constraints are similarly stated in past studies conducted by Shrestha 2005; Mathi and Pandey 2008; Pervaiz et al 2008; Imtiyaz and Soni 2013; Mishra et al. 2013; Sain et al. 2013;Upadhyay et al.2018.

CONCLUSIONS

In view of globalization and liberalization,there is an emergent need to integrate production, processing, and marketing of agricultural products.Based on the findings of this study, it could be concluded that guava production in the study area is profitable but there are many constraints like;high cost of saplings/ grafts, followed by the high infestation of nematode,unavailability of quality saplings/grafts, unavailability skilled labour at locally, lack of capital, lack of suitable option for intercropping, unavailability of organic inputs, nutrient deficiencyin guava orchards, Lack of technical know-how of guava production,an infestation of fruit fly and sucking pest were the major production-related constraints. In guava processing, the absence of processing plant /units followed by lack of storage facilities near production areas,lack of demand for processed guava productsand lack of awareness about small/home scale processingwere the major problems. Lack of competition among contractors, lack of registered buyers/contractors, delay in

payment, absence of regulated markets, absence of identity of Barfkhan Golaguava, lower prices due to seasonal gluts, lack of Farmare's organizations were the major marketing-related constraints of guava. Establishing linkages between farmers and consumers is an important aspect of any agri-business. To increase the value addition of guava, small-scale processing units should be promotedand imparting production, processing and marketing skills to the rural youth as well as guava growers.There should be a greater emphasis on investment in research and development and product innovation so, the solutions of the various issues related to guava production overcome in time.Market infrastructure should be improved through setting up storage facilities, cold-chain facilities in public-private partnership and pre-harvesting contractors/buyers should be registered or authorized at the department level.The group approach is the cornerstone of the restructured extension mechanism. A major component of extension services will be the mobilization of the community into farmers groups - FIGs, FOs, and SHGs, etc. The State Govt should be included Barf khan Gola variety under the subsidy schemes, the majority of farmers were using this varietyfor its marketing quality but due to unregistered variety, farmers are not able to use subsidy under govt. schemes.

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WEATHER PREDICTION THROUGH AVIFAUNA INDICATORS - INDIGENOUS TECHNICAL KNOWLEDGE

Bindu Podikunju* and Suma Mathew**

ABSTRACT

The study focused on how birds' related traditional knowledge is used to forecast weather. The purpose of this study is to show how Indigenous technical knowledge (ITK) has been used by aborigines or rural people to predict weather and seasonal changes in their environment. A descriptive survey was conducted using open ended questionnaires and interviews to collect information in order to assess peoples' understanding, attitudes and beliefs on the value of indigenous knowledge on weather prediction. Purposive sampling was applied to collect data from people purported to be rich in indigenous knowledge. The successful application of the forecasting knowledge is based on comparison with past events, observation and thorough understanding of the local environment. The study concludes that both modern and traditional methods have got some positives and weaknesses and can be used together to produce more comprehensive reports of weather forecasts for end users. The information on ITK is useful for end users including farmers, planners, educators, weather forecasters and Non Governmental Organizations [NGO's]. Traditional leaders need to be empowered to assist in the conservation of resources in their communities.

INTRODUCTION

Indigenous Traditional Knowledge (ITK) is an integral part of the culture and history of a local community. It is evolved through many years of regular experimentation on the day to day life and available resources surrounded by the community. It is the unique, traditional, local knowledge existing within and developed around specific condition of men and women indigenous to a particular geographical area. Indigenous Traditional Knowledge is the actual knowledge of a given population that reflects the experiences based on tradition and includes more recent experiences with modern technologies. It is anticipated that knowledge on the interpretation of the behaviours or symptoms from biotic indicators will be documented, so that the indigenous weather forecasting system also improve its precision.

RESEARCH METHODOLOGY

The knowledge related to indigenous traditions are depleting day by day because of lack of awareness about its value and impact, as well as proper documentation. There is an urgent need of effort to document such valuable information for the welfare and betterment of society. There are sources of ITK hidden in our village, communities and countryside. The main sources are respondents, community leaders, elders, ancient records, extension agencies etc. The aim of the paper was to document this traditional knowledge of the people in Kollam district, Kerala.

Kollam District is situated on the South West coast of Kerala. The District has a tropical humid climate with an oppressive summer and plentiful seasonal rainfall. The hot season, lasting from March to May, is followed by the South West Monsoon from June to September. A total of 250 respondents were purposively selected based on age factor, where all people of the age group 50 years and above were eligible to participate in the interviews and discussions. There is no fixed method for collection of ITK. The study is based solely on data collected from the primary sources. Participants' observations were also used in data collection. Questionnaires were administered to different

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groups of elders, where a checklist that included issues on conventional climatic forecasts knowledge, seasonal rainfall predictions, knowledge on traditional indicators and past climatic events guided the interviews. Along with interview method, group discussions with local leaders, personal interaction and telephone communications were also adopted to collect information from the respondents. Local indicators and local knowledge systems cannot be replaced with scientific knowledge, because they are holistic and specific to local situations.

RESULTS AND DISCUSSION

Crow pheasant (*Centropus sinensis*) Stephens, 1815 : The Greater Coucal or Crow Pheasant (*Centropus sinensis*) is a terrestrial bird and large non-parasitic member of the order Cuculidae and family Cuculiformes. *Centropus sinensis*, although its call is to be heard at all hours of the day, prefers to indulge in its vocal exercises in the early morning or at the sunset hour. The unusual chirping sound of Crow pheasant is observed for the upcoming rain. It is a deep "coop-coop-coop", low-pitched sound. Out of the 250 respondents, 115 of them depended on this factor for predicting the weather.

House crow (*Corvus splendens*) Vieillot, 1817: House Crow (*Corvus splendrens*) is a widespread resident in India. It comes under order Passeriformes and family Corvidae. They are wholly dependent on human habitation consequently found in villages, towns, and cities throughout its range. The forehead, crown, throat and upper breast are richly glossed black, whilst the neck and breast are a lighter grey-brown in colour. Crows feed largely on refuse around human habitations, small reptiles and other animals such as insects and other small invertebrates, eggs, nestlings, grain, fruits and domestic wastes. Crows scavenging food during rain is observed as the onset of rainy season and means that the rain will continue for a long time. Out of 250 respondents 230 of them depended on this factor for predicting the continuity of rain.

Hen (*Gallus gallus domesticus*) Linnaeus, 1758 : *Gallus gallus* are used mainly for eggs and meat production. The domestic chicken is descended primarily from the Red Jungle fowl (*Gallus gallus*) and is scientifically classified as the same species. It comes under order Galliformes and family Phasianidae. They are capable of short range flight. Gallus spp. is generalist feeders on a wide range of invertebrates and vertebrates as well as plants and seeds. Their unusual clucks and spreading of wings in soil is observed as the onset of dry season. Out of 250 respondents 125 of them depended on this factor for predicting the continuity of rain.

Pond heron (*Ardeola grayii*) Sykes, 1832 : Ardeola grayii or Paddy Bird is an abundant and familiar species, found wherever there is water in any form - river, inundated paddy field, puddle or ditch, seashore, tidal creek or mangrove swamp. It comes under order Pelecaniformes and family Ardaidae. The birds stand hunched up and inert on the squelchy mud or in the shallow water at the edge, head drawn in between the shoulders. When alarmed, the bird rises up with a harsh croak and a sudden flash of its snow-white wings, and flies off with steady strokes in the typical heron style10. They are usually solitary foragers but numbers of them may sometimes feed in close proximity during the dry seasons when small wetlands have a high concentration of prey. During dry seasons, they sometimes take to foraging on well watered lawns or even dry grassland. The respondents observed their presence as the onset of dry season. Out of 250 respondents, 120 of them depended on this factor for predicting the continuity of rain.

Pariah kite (*Milvus migrans*) Boddaert, 1783: Milvus migrans comes under order Accipitriformes and family accipitridae. They have dark plumage with distinctive forked tail, and legs with black claws. It shows large seasonal fluctuation with the highest numbers seen from July to October, after the Monsoons, and it has been suggested that they make local movements in response to high rainfall. They are most often seen gliding and soaring on thermals as they search for food. The flight is buoyant and the bird glides with ease, changing directions easily and unusual chirping sound is observed for the upcoming rain. Out of 250 respondents, 182 of them

depended on this factor for predicting the rain.

Ashy drongo (*Dicrurus leucophaeus*) Vieillot, 1817: Ashy Drongos are migratory birds which are seen in Kerala from September to April. It comes under the order Passeriformes and the family Dicuridae. The adult Ashy Drongo is mainly dark grey, and the tail is long and deeply forked. The Ashy Drongo has short legs and sits very upright while perched prominently, often high on a tree. The respondents observed that the presence of Ashy Drongo is the end of south-west monsoon season and the disappearance is observed as the starting of south west monsoon season. Out of 250 respondents, 182 of them depended on this factor for predicting the rain.

Lesser whistling duck (*Dendrocygna javanica*) Horsfield, 1821: The Lesser Whistling Duck (*Dendrocygna javanica*), is also known as Indian Whistling Duck or Lesser Whistling Teal and comes under the order Anseriformes and the family Anatidae. This species has a long grey bill, long head and longish legs. It has a buff head, neck and a darker crown. The back and wings are darkish grey, and there are chestnut patches on the wings and tail. They feed mainly on aquatic plants as well as grains from cultivated rice apart from small fish, frogs and invertebrates such as molluscs and worms. They breed during the monsoon or rainy season. The respondents observed the whistling sound of the flock is the indicator of upcoming rainy season. Out of 250 respondents, 134 of them depended on this factor for predicting the rain.

Asian palm swift (*Cypsiurus balasiensis*) Gray, JE, 1829 : *Cypsiurus balasiensis* comes under the order Apodiformes and family Apodidae . The feather nest is glued to the underside of palm leaf with saliva, which is also used to secure eggs. The body is slender, and the tail is long and deeply forked, although it is usually held closed8. The elders observed that the loud shrill scream call of palm swift is an indicator of upcoming rain. Out of 250 respondents 234 of them depended on this factor for predicting the rain.

Malabar grey hornbill (*Ocyceros griseus*) Latham, 1790 : The Malabar Grey Hornbill (*Ocyceros griseus*) is a Western Ghats endemic avian fauna and comes under the order Coraciiformes and family Bucerotidae. The Malabar Grey Hornbill is a large bird with a long tail and a pale or yellowish to orange long curved bill. It has a grey back, and a cinnamon vent. The tail is blackish with a white tip, and the underparts are grey with white streaks. Being secondary cavity nesters (incapable of excavating their own nests), they find trees with large cavities. The respondents observed the loud cackling and laughing call of Malabar Grey Hornbill indicates the onset of rain. Out of 250 respondents, 244 of them depended on this factor for predicting the rain.

King fisher (*Halcyon smyrnensis*) Linnaeus, 1758: The White-throated Kingfisher (*Halcyon smyrnensis*), also known as the White-breasted Kingfisher or Smyrna Kingfisher, and comes under the order Coraciiformes and family Alcedinidae. They are particularly noisy in the breeding season. The White-throated Kingfisher begins breeding at the onset of the Monsoon. The nest is a tunnel (50 cms long) and has been noted in an earth bank. The nest building begins with both male and female birds flying into a suitable mud wall until an indentation is made where they can find a perch hold. They subsequently perch and continue digging the nest with their bills. The respondents observed that the white-throated kingfisher lays eggs during the end of summer and this can be used as an indicator for the prediction of onset of monsoon season within 19-22 days. Out of 250 respondents, 192 of them depended on this factor for predicting the rain.

CONCLUSION

The present paper deals with the biotic and abiotic condition at those very moments when nature prepares to take necessary precautions against upcoming climate change. Thus, it can be applied to short, medium and long range forecasting. Indigenous Technical knowledge may be applied not only for the benefit of the people, but also for maintaining agricultural sustainability and ecosystem integrity. Now is the time to integrate data from

Table 1. Derivation of weather forecasts from Avifauna

Local Name	Scientific Name	Behaviour	Family	Forecast
Crow pheasant	*Centropus sinensis*	Unusual chirping sound	Cuculidae	Upcoming Rain
House crow	*Corvus splendens*	Scavenging food during rain	Corvidae	Onset of rainy season and means the rain will continue
Hen	*Gallus gallus*	Unusual clucks and spreading of wings	Phasianidae	Onset of dry season
Pond Heron	*Ardeola grayii*	Found in abundance	Ardaidae	Onset of dry season
Pariah Kite	*Milvus migrans*	Unusual chirping	Accipitridae	Upcoming rain
Ashy Drongo	*Dicrurus leucophaeus*	Presence	Dicruridae	End of SW Monsoon
		Absence		Starting of SW Monsoon
Lesser Whistling Duck	*Dendrocygna javanica*	Whistling sound of the flock	Anatidae	Onset of Rainy Season
Asian Palm Swift	*Cypsiurus balasiensis*	Presence and Loud Shrill scream call	Apodidae	Upcoming Rain
Malabar Grey Hornbill	*Ocyceros griseus*	Loud cackling and Laughing call	Bucerotidae	Upcoming Rain
King Fisher	*Halcyon smyrnensis*	Lays eggs	Alcedinidae	Rain will come within 19-22 days

modern techniques of weather forecasting with presage biological evidence from traditional knowledge to support the extra demands for local weather prediction at specific times and in particular regions. Majority of the documented ITKs were effective, as perceived by the respondents.

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COMMUNICATION FIDELITY OF DAIRY FARMERS OF JAMMU REGION

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ABSTRACT

The present study was conducted in purposively selected Jammu district of Jammu and Kashmir to study communication fidelity of dairy farmers of Jammu region. The study revealed that majority of the respondents (66.00 per cent) had medium level of communication fidelity. It was followed by 38 (19.00 per cent) respondents possessing high level of communication fidelity. However, only 30 (15.00 per cent) respondents fell under the category of low level of communication fidelity. It was found that there was a significant difference in communication fidelity between different groups of respondents regarding improved dairy farming practices.

INTRODUCTION

The pace of dairy development in our country largely depends on the access of the dairy farmers to accurate and reliable information. A steady flow of accurate, understandable and factual information in shape of specific dairy technology based message should reach the dairy farmers as quickly as possible so that there is a significant difference in the extent of knowledge, development of right type of attitude towards the dairy technology, skill imbibement and ultimately the behavioural adoption of the dairy technology by the dairy farmers. So far in the researches in extension, the success of the communication process had mostly been studied with reference to the adoption of an innovation. However, in the present investigation an attempt has been made by the investigator to develop a composite measure of communication fidelity which could take into account all the four components i.e., receiver's knowledge of, attitude towards and adoption of the message of improved dairy farming practices as well as communication sensitivity. According to Jha (1968) communication fidelity was operationalised as the amount of knowledge gained, kind of attitude formed and extent of adoption, each for a unit of communication sensitivity as a result of communication of the messages. Stated still simply, communication fidelity is the farmer's existing knowledge about, attitude towards and extent of adoption of the technology recommended by the scientists for getting higher returns. In the present study, in order to determine the communication fidelity with reference to improved dairy farming practices, three behavioural components were measured i.e., receiver's knowledge of, attitude towards and adoption of the messages of improved dairy farming practices as well as communication sensitivity. Thus, in order to measure communication fidelity, it was deemed essential to select the package of practices recommended for practicing dairy enterprise and then, these improved practices were taken as the message for practicing dairy enterprise. The recommended dairy farming practices that were considered for this study are Breeds and Breeding, Feeding, Housing, Milking and Health Care and Hygiene. Keeping the above facts in view, the present study was undertaken with the specific objective to study the communication fidelity of dairy farmers of Jammu region.

RESEARCH METHODOLOGY

The present study was conducted in purposively selected Jammu district of Jammu and Kashmir as it had maximum milch bovine population. Jammu

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district consists of twenty blocks; out of which two blocks viz., R.S. Pura and Akhnoor were selected based on maximum milch bovine population. Then from each of the selected block, five villages which fall within the radius of 15 km from the block headquarters were selected on the basis of possessing highest milch bovine population

Thus in all, 10 villages were taken up for the study. After knowing the actual number of dairy owners in each village, a proportionate random sample of 200 respondents was selected from these villages. Further, on the basis of number of milch animals (bovine) possessed by them, the respondents were divided into three categories of small, medium and large dairy farmers.

RESULTS AND DISCUSSION

Distribution of respondents on the basis of their knowledge about improved dairy farming practices: To get an overview of the respondents regarding their knowledge about improved dairy farming practices, they were classified into three categories viz., high, medium and low levels of knowledge. These categories were formed on the basis of calculated mean and standard deviation of the knowledge scores obtained by the respondents.

A perusal of data in Table 1 vividly corroborate that majority of the respondents (61.50 per cent) were from medium knowledge category, while 22.00 per cent could be placed under high knowledge category. The proportion of respondents reported in the low knowledge category was 16.50 per cent in the study area.

The analyzed data contained in Table 1 divulge that 63.75 per cent small, 60.30 per cent medium and 59.62 per cent large dairy farmers had medium level of knowledge. Likewise, exactly one-fifth of the small (20.00 per cent), 29.41 per cent medium and 15.38 per cent large dairy farmers possessed high level of knowledge. However, higher percentage of large dairy farmers (25.00 per cent) fell under the category of low level of knowledge than small (16.25 per cent) and medium (10.29 per cent) dairy farmers.

Thus, it could be concluded from the table that majority of the dairy farmers had medium to high level of knowledge about improved dairy farming practices. Good educational status, experience in dairying and greater access to facilities and resources might have paved the way for dairy farmers to possess medium to high level of knowledge. However, those who were still practicing dairying on traditional lines and those who were recently associated with the dairy vocation might have gained proportionately low level of knowledge regarding improved dairy farming practices.

Table 1: Distribution of respondents on the basis of their knowledge regarding improved dairy farming practices

n = 200

S. No.	Level of knowledge	Small dairy farmers		Medium dairy farmers		Large dairy farmers		Total	
		F	%	F	%	F	%	F	%
1.	High (> 37.62)	16	20.00	20	29.41	8	15.38	44	22.00
2.	Medium (31.02 to 37.62)	51	63.75	41	60.30	31	59.62	123	61.50
3.	Low (< 31.02)	13	16.25	7	10.29	13	25.00	33	16.50
	Total	80	100	68	100	52	100	200	100

F = Frequency, % = Per cent

These findings are in agreement with those of Sandhu and Sharma (1976), Kherde *et al*. (1986), Rakshe *et al*. (1998), Shinde *et al*. (1998), Talukdar *et al*. (1998), Sharma and Kalla (1999), Chaudhary and Singh (2000), Awasthi *et al*. (2002), Pyasi *et al*. (2002), Paul *et al*. (2003), Verma and Sharma (2003) and Yadav *et al*. (2004) who reported that majority of the respondents possessed medium level of knowledge.

Distribution of respondents on the basis of their attitude towards dairy enterprise: To get an overview of the respondents regarding their attitude towards dairy enterprise, they were classified into three categories i.e., most favourable, favourable and least favourable on the basis of calculated mean and standard deviation of the attitude scores obtained by them.

Data given in Table 2 reveal that nearly three-fourth of the respondents (71.50 per cent) had favourable attitude towards dairy enterprise followed by 15.50 per cent of them who had expressed most favourable attitude. However, only 13.00 per cent of dairy farmers expressed least favourable attitude towards dairy enterprise.

A critical look at Table 2 brings to focus that 58 (72.50 per cent) small, 48 (70.59 per cent) medium and 37 (71.15 per cent) large dairy farmers had favourable attitude towards dairy enterprise. Besides, 9 (11.25 per cent) small, 12 (17.64 per cent) medium and 10 (19.23 per cent) large dairy farmers possessed most favourable attitude towards dairy enterprise. However, 13 (16.25 per cent) small, 8 (11.77 per cent) medium and 5 (9.62 per cent) large dairy farmers showed least favourable attitude towards dairy enterprise.

Dairy farmers considered dairying as a viable and profitable enterprise. High milk producing capacity of crossbreds, remunerative price for milk and availability of feeds and fodder and irrigation facilities for raising fodder crops might have possibly led the dairy farmers to possess high degree of favourable attitude towards dairy enterprise. However, the least favourable attitude of dairy farmers might be due to costly veterinary aid, repeated breeding through A.I., non-existence of cooperatives in the village and lack of marketing facilities for selling of milk in the immediate vicinity.

These findings are in agreement with those of Goswami (1993), Sharma and Singh (1998), Khajuria *et al*. (2001) and Rathore *et al*. (2001) who reported that majority of the respondents had favourable attitude towards dairy enterprise.

Distribution of respondents on the basis of their extent of adoption of improved dairy farming practices: To get an overview of the respondents regarding their extent of adoption of

Table 2: Distribution of respondents on the basis of their attitude towards dairy enterprise

n = 200

S. No.	Attitude category	Small dairy farmers		Medium dairy farmers		Large dairy farmers		Total	
		F	%	F	%	F	%	F	%
1.	Most favourable (> 82.05)	9	11.25	12	17.64	10	19.23	31	15.50
2.	Favourable (76.32 to 82.05)	58	72.50	48	70.59	37	71.15	143	71.50
3.	Least favourable (< 76.32)	13	16.25	8	11.77	5	9.62	26	13.00
	Total	80	100	68	100	52	100	200	100

F = Frequency, % = Per cent

improved dairy farming practices, they were classified into three strata i.e., high, medium and low levels of adoption. These categories were formed on the basis of calculated mean and standard deviation of the adoption scores obtained by the respondents.

The data given in Table 3 bring to focus that majority of the respondents (62.00 per cent) had medium level of adoption followed by 20.00 per cent of them having high level of adoption. However, 18.00 per cent of the respondents had low level of adoption of advocated dairy farming practices.

A critical analysis of data presented in Table 3 reveal that 63.75 per cent small, 64.70 per cent medium and 55.77 per cent large dairy farmers had medium level of adoption. Besides, 17.50 per cent small, 27.95 per cent medium and 13.46 per cent large dairy farmers had high level of adoption. However, more number of large dairy farmers i.e., 16(30.77 per cent) fell under the category of low level of adoption than small i.e., 15 (18.75 per cent) and medium i.e., 5 (7.35 per cent) dairy farmers.

Thus, it could be concluded that majority of the respondents (82.00 per cent) had medium to high level of adoption of advocated dairy farming practices. This might be due to the reason that the respondents had better extension contacts and more concentration on maximizing profits. However, those having low level of adoption might have lesser access to facilities and resources.

These findings are in concordance with those of Sohi and Kherde (1980), Rakshe *et al*. (1998), Sah and Chand (1999), Podikunju *et al*. (2000) and Agarwal and Chowdhary (2003) who reported that majority of the respondents had medium level of adoption.

Distribution of respondents on the basis of their communication sensitivity: To get an overview of communication sensitivity of the respondents, they were ramified into three categories i.e., high, medium and low levels of communication sensitivity. This stratification was based on calculated mean (X) and standard deviation ( ) of the communication sensitivity scores obtained by them.

It is evident from the data presented in Table 4 that majority of the respondents i.e., 134 (67.00 per cent) had medium level of communication sensitivity, while 36 (18.00 per cent) respondents were having high level of communication sensitivity. The remaining 30 (15.00 per cent) respondents possessed low level of communication sensitivity.

A deep glance at the data incorporated in Table 4 bring to focus that 52 (65.00 per cent) small, 46 (67.65 per cent) medium and 36 (69.23 per cent) large dairy farmers were in medium level of communication sensitivity, while 15 (18.75 per cent)

Table 3: Distribution of respondents on the basis of their extent of adoption of improved dairy farming practices

n = 200

S. No.	Category	Small dairy farmers		Medium dairy farmers		Large dairy farmers		Total	
		F	%	F	%	F	%	F	%
1.	High (> 55.13)	14	17.50	19	27.95	7	13.46	40	20.00
2.	Medium (47.01 to 55.13)	51	63.75	44	64.70	29	55.77	124	62.00
3.	Low (< 47.01)	15	18.75	5	7.35	16	30.77	36	18.00
	Total	80	100	68	100	52	100	200	100

F = Frequency, % = Per cent

small, 14 (20.59 per cent) medium and 7 (13.47 per cent) large dairy farmers fell under the category of high level of communication sensitivity. However, only 13 (16.25 per cent) small, 8 (11.76 per cent) medium and 9 (17.30 per cent) large dairy farmers were in low communication sensitivity category.

As stated earlier, majority of the respondents had medium to high level of knowledge about improved dairy farming practices. This might have paved the way for majority of them to possess medium to high level of communication sensitivity. However, those who had poor knowledge regarding improved dairy farming practices might have possessed proportionately low level of communication sensitivity.

Distribution of respondents based on communication fidelity: To frame a continuum of the respondents pertaining to communication fidelity with reference to improved dairy farming practices, they were ramified into three strata i.e., high, medium and low levels of communication fidelity. These categories were formed on the basis of calculated mean (X) and standard deviation ( ) of the communication fidelity scores obtained by the respondents.

The data incorporated in Table 5 reveal that majority of the respondents i.e., 132 (66.00 per cent) had medium level of communication fidelity with reference to improved dairy farming practices. It was followed by 38 (19.00 per cent) respondents possessing high level of communication fidelity. However, only 30 (15.00 per cent) respondents fell under the category of low level of communication fidelity.

In case of small dairy farmers, majority of the respondents (66.25 per cent) possessed medium

Table 4: Distribution of respondents on the basis of their communication sensitivity

n= 200

S. No.	Category	Small dairy farmers		Medium dairy farmers		Large dairy farmers		Total	
		F	%	F	%	F	%	F	%
1.	High (> 15)	15	18.75	14	20.59	7	13.47	36	18.00
2.	Medium (9 to 15)	52	65.00	46	67.65	36	69.23	134	67.00
3.	Low (< 9)	13	16.25	8	11.76	9	17.30	30	15.00
	Total	80	100	68	100	52	100	200	100

F = Frequency, % = Per cent

Table 5: Distribution of respondents on the basis of their communication fidelity

n = 200

S. No.	Category	Small dairy farmers		Medium dairy farmers		Large dairy farmers		Total	
		F	%	F	%	F	%	F	%
1.	High (> 144.40)	14	17.50	16	23.53	8	15.38	38	19.00
2.	Medium (78.16 to 144.40)	53	66.25	45	66.18	34	65.39	132	66.00
3.	Low (< 78.16)	13	16.25	7	10.29	10	19.23	30	15.00
	Total	80	100	68	100	52	100	200	100

F = Frequency, % = Per cent

level of communication fidelity. Moreover, small dairy farmers who possessed high and low level of communication fidelity with reference to improved dairy farming practices were 14 (17.50 per cent) and 13 (16.25 per cent), respectively.

Further, in case of medium dairy farmers, 66.18 per cent of the respondents had medium level of communication fidelity followed by 23.53 per cent having high and only 10.29 per cent having low level of communication fidelity with reference to improved dairy farming practices.

Moreover, in case of large dairy farmers, majority (65.39 per cent) of the respondents had medium level of communication fidelity. It was followed by almost one-fifth (19.23 per cent) of the respondents possessing low level of communication fidelity. However, large dairy farmers who possessed high level of communication fidelity with reference to improved dairy farming practices were only 8 (15.38 per cent).

In general, the dairy farmers securing high score on knowledge test, attitude scale, adoption scale and communication sensitivity test could also invariably get higher score on communication fidelity index. Since, 15.00 per cent of the respondents belonged to low communication fidelity group, it could be inferred that these farmers might have secured low scores on knowledge test, attitude scale, adoption scale and communication sensitivity test.

So, the communication efforts of the extension agency in the study area have to be vigorously intensified and a better communication strategy has to be evolved for the complete success of improved dairy farming technology.

These findings are in agreement with those of Pathak and Sasmal (1990) who reported that majority of the respondents had medium level of communication fidelity.

Comparison of communication fidelity of the respondents in different groups regarding improved dairy farming practices:

H_{01} : There is no significant difference in communication fidelity between different groups of respondents regarding improved dairy farming practices.

H_1 : There is a significant difference in communication fidelity between different groups of respondents regarding improved dairy farming practices.

To find out the significance of difference in communication fidelity between different groups of respondents regarding improved dairy farming practices, F-test was applied. The calculated F-value came to be 30.36 (Table 6) which is significant at 5 per cent level of significance. It led to the rejection of null hypothesis (H_{01}) and acceptance of alternative hypothesis (H_1). Thus, it is concluded that there was a significant difference in communication fidelity between different groups of respondents regarding improved dairy farming practices.

Further, by comparing mean value with C.D. value, it was found that there was a significant difference between small and medium, small and

Table 6: ANOVA for variation in communication fidelity of respondents in different groups regarding improved dairy farming practices

Source of variation	d.f.	S.S.	M.S.	F-value
Between groups	2	995.43	497.71	30.36*
Within groups (Error)	197	3230.20	16.39	
Total	199	4225.63		

* Significant at 0.05 level of probability.

Mean Table

Groups	Mean value
Small dairy farmers	110.97
Medium dairy farmers	113.48
Large dairy farmers	107.67

Groups	S.Ed	C.D. at 5%
Small and Medium	0.66	1.29
Small and Large	0.72	1.41
Medium and Large	0.74	1.45

% = Per cent

large and medium and large dairy farmers, respectively. Also, medium dairy farmers had higher mean communication fidelity value (113.48) than small (110.97) and large (107.67) dairy farmers.

CONCLUSION

The study revealed that medium dairy farmers had a significantly higher communication fidelity index than the small and large dairy farmers with regard to improved practices of dairy farming. This might be due to various reasons. The medium dairy farmers were those progressive farmers who had better contacts with outside information sources like extension agencies. They were users of radio, T.V. and newspapers. They had better farm resources and agricultural infrastructure facilities. Besides, they had better entrepreneurial behaviour and active social participation. All these factors might have helped them to acquire more information for the use and adoption of recommended dairy farming practices earlier than the small and large dairy farmers. To achieve high communication fidelity, the dairy farmers' knowledge, attitude and adoption of improved dairy farming practices have to be increased. So, more efforts on the part of the extension personnel are required to use both interpersonal and mass communication media for educating the farmers about improved dairy farming practices.

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IMPACT OF MPOWER'S AGRICULTURAL INTERVENTIONS ON LIVELIHOOD GENERATION OF THE FARMING COMMUNITY IN WESTERN RAJASTHAN OF INDIA

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ABSTRACT

Rajasthan is geographically biggest state of India wich consist 6.86 crores (5.5 percent) population. These environmental harsh concerns influence to poor people more adversely. The Mitigating Poverty in Western Rajasthan (MPOWER) was a poverty reduction Programme which implemented on pilot basis in eight blocks of Western Rajasthan to to improve living standard of the rural poor's. The impact of project was assessed by Agriculture University; Jodhpur through analyzing collected the primary informations on agriculture intervention. Out of the 5250 beneficiaries, 525 beneficiaries (10% of the total) were selected by the lottery method for the study. The collected data was converted into soft copy by coding and decoding. Further, processed and analyzed by using simple mathematical tools like average, percentage, frequency and the pivot tables according to the objectives of the study. It was revealed from the study that the Production technologies disseminated through organizing demonstration at beneficiaries' fields had enhanced income of kharif and Rabi crops ranged from 17.6% to 102 % in comparison to non-beneficiary farmers. Pressurized irrigated systems (drip or sprinkler) are being followed in Sanchor, Bali and Abu Road blocks for raising cash crops, vegetables and fruit plants to save irrigation water. Looking at the encouraging impacts of Agriculture interventions in the selected blocks of Western Rajasthan, same may be replicated in remaining blocks in these six districts of this region. Models of livelihood (farm based) executed by MPOWER in western Rajasthan can be proved as catalyst for doubling farmers income by integrating them with non-farm activities of the rural areas.

INTRODUCTION

Rajasthan has 342239 square kilometers area of India with the contribution of 10.4 percent. The state accounts for 6.86 crores (5.5 percent) population of India, where 1.70 (24.87 per cent) and 5.15 (75.13 per cent) population live in urban and rural areas, respectively. (Census of India, 2011). The below poverty line (BPL) population accounts 152.80 lakhs in which 15.01 per cent and 24.36 per cent population are resident in rural and urban areas, respectively of the state. The share of agricultural and allied activities in state GDP is less than 24 per cent. The scarcity of water resources (high erratic and low rainfall) accompanied by variability creates water stress conditions in the region and is responsible for droughts in Western Rajasthan. Drought is a regular phenomenon in this region with varying range (100 to 400 mm) of rainfall. Ground water has been over exploited all over the State. High degree of salinity of land in some parts of the State including the project area poses a challenge to agriculture-based development. Even though with irrigation facilities, prevent people from realizing full benefits due to high salinity level of soil. These environmental harsh concerns influence to poor people more adversely. The floristic indication is poor in the western region of Rajasthan. The sparse vegetation of desert districtsis largely dominated by Israeli Babul (*Acacia tortilis*), Khejri

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(*Prosopis cineraria*), Ker (*Capparis decidua*), the bushes like Aak (*Calotropis procera*), Murali (*Lycium barbarum*), and the grasses like Sevan (*Lasiurus sindicus*), Dhaman (*Cenhcrus ciliaris*), Neem (*Azadirachta indic*a), Rohida (*Tecomella undulate*), Jaal (*Salvadora persica*, *S. oleoides*), Babul (*Acacia nilotica*), Kumath (*Acacia senegal*), Vilayati Babul (*Prosopis juliflora*), Ber (*Zizypus nummularia*) etc. However, this vegetation is utilized by cattle for their fodder and men for their fuel wood, thatching material, vegetable, medicines and food.

Background of MPOWER: The Mitigating Poverty in Western Rajasthan (MPOWER) is a poverty reduction programme. It is implemented on pilot basis in eight blocks *viz*., Baap, Balesar (Jodhpur), Abu Road (Sirohi), Bali (Pali), Sanchor (Jalore), Baitu (Barmer) and Sankara (Jaisalmer) of Western Rajasthan. It is supported by the International Fund for Agricultural Development (IFAD) within its framework of the current Country Strategic Opportunities Paper (COSOP), Sir Ratan Tata Trust (SRTT) and the Government of Rajasthan. The lead implementing agency is the Department of Rural Development (DRD), Government of Rajasthan, through it umbrella society for all livelihood projects in the State-Rajasthan Grameen Ajeevika Parishad (RGAVP). The Centre for Micro Finance (CMF) is the nodal agency as well as the Lead Resource Agency for the project. The project with an estimated investment of US Dollar 62.54 million is being implemented over a six-year period. The Project Management Unit has been set up at Jodhpur. The project areas of MPOWER fall in the hot & arid and semi-arid districts of Rajasthan. The main focus the project is to improve the quality of life and create sustainable livelihood opportunities for vulnerable and marginalized groups in the project area through strengthening capacity, improved livelihood, sustainable enterprises, natural resources management and increased access to credit and markets. The project targets to all the Below Poverty Line (BPL) category households and focuses on organizing women for empowerment and sustainable livelihoods. The project is mandated to increase the incomes through the development of marketing organization and linkages for produce and improve productivity through transfer of technology and creating institutional environment for savings, group lending and credit for micro-enterprises. The supports activities also include building grass-root institutions, promoting and securing access of marginalized groups to resources, and promoting the diversification of on-farm and off-farm livelihood opportunities. The present study has been undertaken to analyse the impact of the MPOWER project on livelihood generation through agriculture interventions in the western part of Rajasthan, with special appearance to the change in economic benefits.

RESEARCH METHODOLOGY

The present study is carried out by Agriculture University Jodhpur in the six districts of western (MPOWER programme implemented area) of Rajasthan during the year of 2017-18.

Method of sampling & Data Collection: A questionier was developed to collect the primary information on agriculture interventions. The information as metioned in questionaire was recorded by the team members after interacting with the respondents.

Selection of District: The study was conducted in six districts viz., Sirohi, Pali, Jodhpur, Jalore, Barmer and Jaisalmer adopted under the MPOWER project in the Rajasthan State of India. Further, randomly seven blocks namely Bap, Balesar (Jodhpur), Abu Road (Sirohi), Bali (Pali), Sanchor (Jalore), Baitu (Barmer) and Sankara (Jaisalmer) of targeted districts were selected to collect the primary data on agricultural intervention. Three districts (Barmer, Jodhpur &Jaisalmer) out of six in the North-Western part of the State are arid remaining three districts (Pali, Sirohi & Jalore) in the South-Western part are semi-arid. Rainfed agriculture is practised in these districts. The groundwater and canal based irrigation agricultural operations are also possible in Pali, Sirohi and Jalore districts.

Selection of Clusters: The MPOWER project is being implemented in 150 clusters of six adopted districts with the help of eleven partner agencies. One cluster comprises of 250- 350 households, hence around 50,000 households has been covered under the project. By lottery method, 15 (10 per cent) clusters out of 150 clusters have been selected from the adopted six districts proportionally.

Selection of Respondents: The study was conducted in the purposely-selected seven blocks. The MPOWER project benefited to about 300-350 households in one cluster; hence the total number of beneficiaries in15 clusters were about 5250. Out of the 5250 beneficiaries, 525 beneficiaries (10% of the total beneficiaries in 15 Clusters) were selected by the lottery method for the study. Here, we assessed the impact of the project's agriculture based livelihood interventions on the beneficiaries compared to non-beneficiary respondents; therefore, both beneficiary and non-beneficiary respondents were selected for the study in an equal proportion. Though keeping the need of the study in mind, total 1050 respondents were selected from both beneficiary and non-beneficiary respondents (525 beneficiaries & 525 non-beneficiaries) from 15 clusters. Data were collected from the respondents, through focus group discussion.

RESULTS AND DISCUSSION

Socio-economic profile of respondents: The socio-economic profiles of respondents and non-respondents were presented in table 1. It focused on comparative understanding and documentation among the surveyed beneficiary and non-beneficiary respondents. About 14, 31, 50 and 5 per cent farmers belonged to the Schedule Castes (SC), Schedule Tribes (ST), Other Backward Classes (OBC) and General caste, respectively across the blocks. Similar trend was also observed with respect to non-beneficiary respondents. About 25% beneficiary respondents have kachcha houses with thatched roofs, whereas 39 per cent pakka tiled houses were either made up of mud wall or walls made by using locally available vegetative materials covered with thatched material. 32 per cent houses of beneficiary respondents were made up of stone or brick walls while hardly 4 per cent were pakka with RCC roof across the blocks. Across the blocks, about 34 per cent non-beneficiary respondents had kachcha houses with thatched roofs or pakka tiled houses which are either made up of mud wall or walls of using locally available vegetative materials covered with thatched materials. About 28 per cent houses of beneficiary respondents were made of stone or brick walls while hardly 4 per cent in these seven blocks are pakka with RCC roof. On average, beneficiary respondents have a larger number of marginal, small and medium land holdings compared to medium and landless farmers, where as a higher strength of small, medium and marginal categories is recorded under non-beneficiary respondents. In case of family types, beneficiary respondents had higher nuclear families as compared to non-beneficiary farmers. Majority of the beneficiary respondents (64%) belonged to the joint family and remaining 36% beneficiary families belong to the nuclear family. While as far as non-beneficiary farmers are concerned, 56% respondents belong to joint families and 35% respondents belong to nuclear families.

About 99% beneficiary and 98% non-beneficiary respondents are engaged in agriculture occupation across the blocks (Table 1). Other occupations include labour work in MGNREGA and MPOWER programmes, private jobs (teaching, mining, anganwadi making, tailoring etc.), animals rearing and selling, shop keeping, government service, unskilled labour, agriculture labour, skilled labour, work incites and factories etc.

In the total beneficiary respondents' surveyed, average families involved in agriculture as the dominant occupation is 99.9% in the studied area. It ranges from 100% in Baitu, Sankara, Sanchor, Baap, Bali and Abu Roadblocks. While in Balesar block, 97% farmers are engaged in agriculture farming and 3% are involved in other occupations in addition to agriculture.

As regards non-beneficiary respondents, 1.5 %

Table 1: Socio-economic profile of respondents

S. No.	Personal variables	Beneficiary		Non-Beneficiary		Total	
		Number	Percentage	Number	Percentage	Number	Percentage
1.	**Caste**						
(a)	Schedule Caste	72	14	65	12	137	13
(b)	Schedule Tribe	162	31	156	30	318	30
(c)	OBC	265	50	277	53	542	52
(d)	General	26	5	27	5	53	5
	Total	**525**	**100**	**525**	**100**	**1050**	**100**
2.	**Type of Houses**						
(a)	Kachcha houses with thatched roofs	131	25	180	34	311	30
(b)	Kachcha Tiled	206	39	178	34	384	36
(c)	Pakka Thatched	168	32	149	28	317	30
(d)	Pakka RCC Roof	20	4	18	4	38	4
	Total	**525**	**100**	**525**	**100**	**1050**	**100**
3.	**Land Holding**						
(a)	Landless	4	0.8	19	4	23	2
(b)	Marginal	160	30.5	154	29	314	30
(c)	Small	167	31.8	180	34	347	33
(d)	Medium	81	15.4	162	31	243	23
(e)	Large	113	21.5	10	2	123	12
	Total	**525**	**100**	**525**	**100**	**1050**	**100**
4.	**Family Type**						
(a)	Nuclear	205	39	235	45	440	42
(b)	Joint	320	61	290	55	610	58
	Total	**525**	**100**	**525**	**100**	**1050**	**100**
5.	**Occupation**						
(a)	Labour	1	0.19	5	0.95	6	0.57
(b)	Agriculture	524	99.81	517	98.48	1041	99.14
(c)	Business	0	0.00	2	0.38	2	0.19
(d)	Caste occupation	0	0.00	1	0.19	1	0.10
	Total	**525**	**100**	**525**	**100**	**1050**	**100**
6.	**Participation in Social organization**						
(a)	No participation	10	1.9	483	92	493	47
(b)	Member of one organization	515	98.1	36	6.9	551	52.5
(c)	Member of >1 organization	0	0.00	4	0.8	4	0.4
(d)	Officer Holder	0	0.00	2	0.4	2	0.2
	Total	**525**	**100**	**525**	**100**	**1050**	**100**
7.	**Annual income (Rs.)**						
	UP to Rs. 1.0 Lacs	454	86.48	72	13.71	526	50.10
	Rs, 1.1 -2 .0 Lacs	67	12.76	390	74.29	457	43.52
	Rs. 2.1 to 3.0 Lacs	4	0.76	44	8.38	48	4.57
	3.1 to 4.0 Lac	-	-	11	2.10	11	1.05
	4.1 to 5.0 Lac	-	-	7	1.33	7	0.67
	> 5.0 lac	-	-	1	0.19	1	0.10
	Total	**525**	**100**	**525**	**100.00**	**1050**	**100.00**

Source: Author's own computation based on surveyed data.

farmers in each block like Baitu, Sanchor &Abu Road and 5.8% in Sankara are engaged as labour, own caste profession/job and business (mainly shop keeping) while rest of the respondents are engaged in agriculture occupation (94.2 to 98.5%).

Social participation of the surveyed area was recorded in terms of number of participants, member of an organization, member of more than one organization and office holder/s. About 98% of the beneficiary respondents are members of any one organization at the village level organization (SHG) whereas hardly 8% of non-beneficiary respondents were members of any one organization like cooperative societies, banks etc. (Table 1). Only two respondents were office bearers in one organization.

The block wise distribution of respondents showed that all beneficiary members were members of SHG, while the non-beneficiary respondents were only 5-10% respondents who have participation in social organizations. Nobody from non-beneficiary respondents is an office bearer in any social organization.

It seems that beneficiary farmers have been motivated by the MPOWER project staff through NGOs to associate with local level organization to gain advantages/ benefits of on-going development schemes of Govt. (Central/State sponsored).

Across the blocks, about 97% beneficiary respondents have annual income of less than 1.0 lakh from all the sources, whereas 87% of non-beneficiary respondents were getting annual income from 1.0-2.0 lakh. Further, 12% of non-beneficiary farmers were fetching higher income from 2.0 -5.0 lakhs annually.

Linkage with Agriculture Extension Workers

Agriculture Supervisor (VEW), Assistant Agriculture Officer (AAO) and facilitators from NGOs have established good liaison with beneficiary respondents compared to non-beneficiary respondents across the blocks. On an average, 88% village level agriculture extension workers/officers had developed ideal contact with beneficiary respondents for transfer of technology while 62% of non-beneficiary respondents were having contact with village extension worker only. Agriculture Officers and scientists from SAUs and ICAR institutes had hardly visited Balesar, Sanchor, Abu Road and Bali areas. However, their visits to Sankara and Baap blocks were limited in number. Thus, Agriculture Officers and scientists from SAUs and ICAR institutes have poor linkage with both the categories of the respondents in these selected blocks pertaining to transfer of technology. It is evident from the information obtained from the survey and FGD that field functionaries from the NGOs have established perfect linkage (Table 1).

All beneficiary respondents had to compulsorily contact with NGOs while only 4% non-beneficiary respondents contacted with NGOs. About 44 % respondents from beneficiary and 12% of non-beneficiary respondents contacted with private agencies for seeking technical knowledge, training and acquiring agricultural inputs. Apart from this, 23.6% beneficiary and only 1% non-beneficiary respondents avail benefit from other organizations.

Table 2. Extension Contact of Beneficiary & Non-Beneficiary Respondents in the Surveyed Areas of MPOWER blocks

Extension Officer	Total	
	Beneficiaries	Non- Beneficiaries
VEW	**463**	**326**
AAO	**307**	**129**
AO	**17**	**1**
Scientist	**45**	**5**
NGO	**525**	**20**
Private	**229**	**63**
others	**124**	**6**

Impact assessment of MPOWER'S Interventions: Large number of demonstrations on major crops of the area during kharif and rabi seasons in the selected blocks on the fields of beneficiary respondents were undertaken with the objective of assessing the impact of improved production technologies for enhancement in productivity of crops and monetary returns there of which were compared with that obtained from non-beneficiary farmers. The results so obtained from the beneficiary are described in the following

paragraphs.

Impact of improved Technologies and Contribution of Individual Component: Field demonstrations on improved production technologies in major crops of the area during kharif under trained conditions and rabi seasons under irrigated situations in the selected blocks were undertaken with the objective of popularizing the improved production technologies for enhancement in productivity of these crops and monetary return, thereof, which was compared to that obtained by non-beneficiary farmers. During the survey, beneficiary respondents were also interacted with for assessing the contribution of individual component on increasing its productivity.

Field demonstrations in more than 500 hectares area on pearl millet were conducted in six blocks. Pearl millet is a prominent kharif cereal crop having about 40% of the country acreage in Western Rajasthan. In addition to being a staple food crop of this region, its fodder value is also equally important for the livestock based farming system in this region. On an average, it was revealed that beneficiary respondents recorded 26.3 per cent higher net return compared to non- beneficiary farmers (Table 3). In case of moth bean field demonstrations were conducted (322 ha area) in three blocks. Across the blocks, it was revealed that beneficiary respondents recorded 25.06% higher net return compared to non- beneficiary farmers. These areas seem suitable for moth bean cultivation due to light texture soils. Same demonstrations on green gram were conducted in 556 ha area in five blocks. Across the blocks, it was revealed that beneficiary respondents recorded about 16 per cent higher net returns compared to non- beneficiary farmers. The selected area does not seem suitable for green gram cultivation due to sand dunes and light texture soils. Whereas, the field demonstrations on improved production technologies on black gram were conducted for enhancing higher return in Bali block under rainfed conditions.

Black gram is an important kharif pulses crops of this area. It was observed that beneficiaries obtained nearly double net returns (102%) compared to non-beneficiary farmers. In case of maize, it was observed that rainfed conditions of this region are most suited for this crop. Maize is an important kharif cereal crop in this area, whereas beneficiary respondents were got nearly 25.4 per cent higher net return over to non-beneficiary farmers. Field demonstrations on wheat were conducted in three blocks. Across the blocks, it was revealed that beneficiary respondents recorded about 18.4 per cent higher net return than non-beneficiary farmers. It was revealed that beneficiary respondents recorded about 18.6 per cent higher net return compared to non-beneficiary farmers in mustard cultivation. Cumin is one of the seed spice crop of Western Rajasthan which occupies more than 60% of the country. It was found that beneficiary respondents recorded about 19.3 per cent higher net return compared to non-beneficiary farmers in cumin cultivation.

Majority of the beneficiary respondents opined that up-gradation of knowledge through training, field visits etc. by the MPOWER staff, facilitators of NGO and field functionaries from the Department of Agriculture was found to be conducive for obtaining higher grain yields. Amongst the production technologies, use of improved hybrid of pearl millet (RHB 173, RHB 177, MPMH 17) followed by line sowing through seeding device rather than broadcasting with harrowing are important components for enhancing productivity of this crop in the surveyed areas.

Intercultural operation for weeding and as well as in situ moisture conservation also played important role for minimizing the risk of crop failure due to soil water stress (Table 4) which, in turn, increased productivity and fetched a higher return. Most of the beneficiary respondents of moth been studied area were of the opinion that the up-gradation of knowledge is responsible for obtaining higher seed yields. Amongst the production technologies, use of improved seed of cultivars (RMO 257, CAZRI M 2) followed by sole cropping of moth bean instead of mixed one (passed

Table 3. Effect of Improved Technologies in major kharif and rabi crops on the Income of Beneficiary & Non- Beneficiary Respondents in the Surveyed area

	Kharif										Rabi					
	Pearl Millet		Moth bean		Moongbean		Black gram		Maize		Wheat		Mustard		Cumin	
Income/ha	B	NB	B	NB	B	NB	B	NB	B	NB	B	NB	B	NB	B	NB
Area of Cultivation (ha)	101.2	91.2	107.3	100.7	111.2	94.0	17.2	7.5	16.6	20.3	19.6	22.4	9.2	16.3	2.0	3.0
Input cost (Rs. In lakh)	2.2	2.4	2.4	1.8	2.6	2.2	1.6	0.7	2.0	1.4	4.5	4.1	1.3	1.9	0.50	0.30
Total Production (q)	602	477.4	492.0	358.3	677.0	517.4	201	49	251.3	259.0	661.0	546.0	138.0	226.7	8.0	8.0
Gross Income (Rs. in lakh)	10.1	8.17	24.6	17.9	26.9	19.9	10.1	2.5	4.0	3.5	10.1	9.5	4.8	8.4	1.28	1.28
Net income (Rs. in lakh)	7.9	5.77	22.2	16.1	24.3	17.6	8.4	1.8	2.1	2.1	5.7	5.4	3.5	6.5	-	-
Net Income /ha(Rs)	8201.6	6495	20341.7	16265.3	23753.8	20508.0	48955	24161	12915.5	10297.0	28522.7	24087.7	34591.3	29159.0	39000	32667
% increase	**26.3**	-	**25.1**	-	**15.8**	-	**102.0**	-	**25.4**	-	**18.4**	-	**18.6**	-	**19.3**	-

Table 4: Contribution of Intervention on Yield Variation in Kharif and Rabi crop in selected area

	Kharif					Rabi		
Component	Pearl Millet	Moth bean	Moongbean	Black gram	Maize	Wheat	Mustard	Cumin
Knowledge Up-gradation	369	232	369	35	110	104	77	18
Seed Replacement	367	232	367	35	65	104	50	18
Plant Protection measures used	160	88	160	27	23	15	12	16
Fertilizer Management	191	87	184	20	60	91	49	5
Intercultural operation	254	144	222	-	88	89	42	14
Line Sowing Method	338	186	332	24	71	104	73	8
Irrigation Management	110	197	-	-	-	104	73	18
Sole v/s Mixed cropping	281	118	336	20	110	19	19	7
Harvesting	238	107	222	14	85	100	13	6
Threshing	255	232	235	7	91	93	13	6

practice) and line sowing through seeding device rather than broadcasting with harrowing are important components for enhancing productivity of this crop in the surveyed blocks. Amongst the production technologies, use of improved seed of cultivars (GM 4, SML 668, IPM 2-3, Meha 2) followed by sole cropping of green gram and line sowing through seeding device are important components for enhancing productivity of this crop in the surveyed blocks. On the basis of the survey, it was observed that upgradation of knowledge is helpful in obtaining higher productivity of blackgram. Amongst the production technologies, uses of improved cultivars of black gram (T-9) followed by one dusting at 20 kg/ha of methyl parathion dust and line sowing through seeding device are the important components for increasing production per unit area in the studied block.

Upgradation of knowledge was found responsible for obtaining higher grain yield as viewed by the majority of beneficiary respondents for maize cultivation. Amongst the production technologies, seed replacement of local cultivars by improved hybrid of maize (Pratap, Pioneer, PHEM 5) followed by line sowing through seeding device were important components for enhancing the productivity of this crop in the surveyed blocks. Intercultural operation for weeding as well as in-situ moisture conservation also played important role for enhancing productivity and obtaining higher net return. The opinion of the majority of respondents were reviewed that up-gradation of knowledge is due to use of high yielding varieties (HD 2968, KRL 213), line sowing by seeding device and irrigation scheduling at critical stages are found conducive for obtaining higher grain yields.

Majority of the beneficiary respondents opined that up-gradation of knowledge is accountable for obtaining higher yield in mustard farming. Amongst the effect of individual intervention, line sowing by seed drill and irrigation scheduling at critical stages were important components for increasing the productivity of mustard crop followed by seed replacement by use of high yielding varieties (NRCHB 101, RNG 73, PM 26, PM 27, CS 52, CS 54, CS 56) and fertilizer application. Seed replacement by use of wilt tolerant high yielding variety (GC 4) and irrigation scheduling at critical stages and adoption of plant protection measures were found beneficial for obtaining higher seed yield of cumin in the surveyed blocks.

CONCLUSIONS

Looking at the encouraging impacts of Agriculture interventions in the selected blocks of Western Rajasthan, same may be replicated in remaining blocks in these six districts of this region. Models of livelihood (farm based) executed by MPOWER in western Rajasthan can be proved as catalyst for doubling farmers income by integrating them with non-farm activities of the rural areas.

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EXTENT OF ADOPTION OF PEST AND DISEASE MANAGEMENT PRACTICES BY THE SAPOTA GROWERS OF THANE DISTRICT IN MAHARASHTRA

P.A. Sawant* and R.P. Mahadik**

ABSTRACT

The study was conducted in Thane district to know the adoption and constraints faced by the sapota growers. Less than half of the respondents had 'high' and 'medium' adoption of pest and diseases management practices of sapota. Very less sapota growers had 'low' adoption of pest and diseases management practices. It has been observed that the sapota growers are using mechanical control measures for pest and disease management. Hence, awareness programmes and demonstrations should be organized by the extension agencies to provide timely guidance to the sapota growers. Present orchards of sapota growers are old and overgrown which makes it difficult to follow the recommended practices. It is recommended that the extension agencies should organize the plant protection campaign in the study area alongwith block demonstrations of rejuvenation technique.

INTRODUCTION

In konkan region, sapota is one of the major and important fruit crops. The area under sapota in Thane district is more in Maharashtra and increasing day by day. Dr. B.S. KonkanKrishiVidyapeeth, Dapoli had standardized and recommended cultivation practices of sapota and extension agencies are transferring these technologies among farming community since last four decades. With a view to generate data on this aspects, the present study entitled 'Extent of adoption of pest and disease management practices by the sapota growers of Thane district in Maharashtra' was undertaken with the following objectives.

1. To study the extent of adoption of pest and disease management practices by the sapota growers.
2. To understand the constraints faced by the sapota growers in adoption of pest and disease management practices.
3. To seek the suggestions of the sapota growers to overcome the constraints in adoption of pest and disease management practices.

RESEARCH METHODOLOGY

Thane district comprises thirteen tahsils in which two tahisils namely Dahanu and Palghar having maximum area under sapota were considered for the present study. The list of the sapota growing villages was obtained from the Taluka Agriculture Officer of Dahanu and Palghar. From the list ten villages were selected randomly from each tahsil. A farmer who possessed a minimum 20 bearing sapota trees and growing the crop commercially was considered as 'sapota grower'. The list of sapota growers from both the tahsils was obtained from Agriculture Assistant of Department of Agriculture. From the list six sapota growers were selected randomly. Thus, the total sample constituted of 120 sapota growers. Data were collected by personally interviewing the respondents with the help of structured schedule. Collected data were analyzed by using suitable statistical tools and tests.

FINDINGS AND DISCUSSION

The findings of the present study are presented here under.

1. Extent of adoption of pest and disease

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management practices of sapota by the sapota growers.

The data with respect to overall adoption of the respondents are presented in Table1.

Table 1. Extent of adoption of pest and disease management practices of sapota

Sl. No.	Adoption level (score)	Respondent (N = 120)	
		Number	Percentage
1.	Low (Up to 4)	10	8.33
2.	Medium (5 to 11)	54	45.00
3.	High (12 and above)	56	46.67
	Average (score) : 7.52	**120**	**100.00**

It is seen from Table 1 that less than half (46.67 per cent, 45.00 per cent) of the respondents had the 'high' and 'medium' adoption of pest and diseases management practices of sapota. Very less (8.33 per cent) sapota growers had 'low' adoption of pest and diseases management practices. The average adoption score was 7.52.

1.1 Practice wise adoption of recommended pest and disease management practices.

The information with regard to adoption of each of the recommended pest and disease management practices for sapota crop was compiled. This information has been presented in Table 2.

It is observed from Table 2 that mechanical control measures were followed by majority of the respondents than chemical control measures for control of pests and diseases of sapota.

2. Constraints faced by the sapota growers in adoption of pest and disease management practices

The constraints faced by the sapota growers in adoption of pest and disease management practices are presented in Table 3.

The major constraints faced by the sapota growers in adoption of pest and diseases management practices were 'nonavailability of labour in time' (63.33 per cent), 'lack of technical guidance on plant protection measures as and when needed' (52.50 per cent), 'cost of insecticides and pesticides is very high' (50.83 per cent), 'high labour charges' (47.50 per cent) and 'old and over grown orchards' (46.67 per cent).

3. Suggestions of the sapota growers to overcome the constrains in adoption of pest and disease management practices

The suggestions of the sapota growers to overcome the constrains in adoption of pest and disease management practices are given in Table 4.

It is seen from Table 4 that the major suggestions were like 'timely technical guidance be provided by the extension agencies' (50.83 per cent), 'block demonstration on rejuvenation techniques in sapota be organized in the area' (45.00 per cent), and 'programmes on value addition of sapota fruits be organized' (42.50 per cent).

CONCLUSION

1. It has been observed that the sapota growers are using mechanical control measures for pest and disease management. Hence, awareness programmes and demonstrations should be organized by the extension agencies to provide timely guidance to the sapota growers.
2. Present orchards of sapota growers are old and overgrown which makes it difficult to follow the recommended practices. Hence Block demonstrations on rejuvenation technique in sapotabe organized in the area.

It is recommended that the extension agencies should organize the plant protection campaign in the study area alongwith block demonstrations of rejuvenation technique.

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Table 2. Practice wise adoption of recommended pest and disease management practices of sapota

S. No.	Practices	Adoption (N=120)		
		Full	**Partial**	**No**
I	**Pest**			
A.	**Leaf eating caterpillar**			
1.	Destroyed infested leaves and caterpillar	74 (61.67)	46 (38.33)	-
2.	Use of 20gm 50 % Carbaryl in 10 lit. water or Spray DDVP 76 %, 10 ml/ 10 lit. water	29 (24.17)	35(29.17)	56 (46.67)
B.	**Sapota seed borer**			
	Spraying of 5 EC lambda cyhalothrin or 2.8 EC deltamethrine @ 1 ml/ lit. of water or 40 EC Profenphos @ 1 ml/ lit. water. First spray at the end of rainy season and three spray at monthly interval. Destroy the fallen leaves, fruits etc. If possible ploughing of field is done	28 (23.33)	56 (46.67)	36 (30.00)
C.	**Sapota bud borer**			
	Spray Emamectine Benzoate 5 SG 0.45 gm/lit or lambda cyhalothrin 5 EC or 2.8 Deltamethrin @ 1 ml/lit. water. First spray at 50 % flowering and two spray at one month interval. Harvesting should be done before spraying	29(24.17)	43 (33.83)	48 (40.00)
II.	**Disease**			
A.	**Leaf spot**			
1.	Destruction of dead and diseased branches	81 (67.50)	38 (31.67)	1 (0.83)
2.	Application of Bordeaux paste at cut portion	39 (32.50)	60 (50.00)	21 (17.50)
3.	Spraying 1 % Bordeaux mixture before rainy season and two sprays at one month interval after rainy season	22 (18.33)	37 (30.83)	61 (50.83)
B.	**Fruit drop**			
1.	Cutting of infested branches and application of Bordeaux paste	78 (65.00)	38 (31.67)	4 (3.33)
2.	Bordeaux paste be applied on the infested branches	44 (36.67)	62 (51.67)	14 (11.67)
3.	Spray 1% Bordeaux mixture before monsoon followed by two sprays with 15 to 20 days interval. Add Biroda or Sandovit in solution as sticker	18 (15.00)	43 (35.83)	59 (49.17)
4.	Three sprays of Ridomil (Metalaxyl 8 % + Mancozeb 64 %) is used for control of fruit drop. First spray at onset of monsoon followed by two sprays at monthly interval	17 (14.17)	27 (22.50)	76 (63.33)

Table 3. Constraints faced by the sapota growers in adoption of post and disease managment practices

S. No.	Constraints	Respondent (N=120)	
		Number	Percentage
1.	Non availability of labour in time	76	63.33
2.	Lack of technical guidance on plant protection measure as and when needed	63	52.50
3.	Cost of insecticides and pesticides is very high	61	50.83
4.	High labour charges	57	47.50
5.	Old and over grown orchards	56	46.67

Table 4. Suggestions of the sapota growers to overcome the constrains

S. No.	Suggestions	Respondent (N=120)	
		Number	Percentage
1.	Timely technical guidance be provided by the extension agencies	61	50.83
2.	Block demonstration on rejuvenation techniques in sapota be organized in the area.	54	45.00
3.	Programmes on value addition of sapota fruits be organized	51	42.50

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EXTENT OF WRITTEN AND VERBAL COMMUNICATION SKILLS AMONG THE POSTGRADUATE STUDENTS

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ABSTRACT

Soft skills are interpersonal skills which are used to describe the approach to life, work and relationship with others people. It's made up of personal characteristics, behaviors, disposition and social graces that make one a good employee and work compatible with. Therefore, the present study was conducted by selected 120 postgraduate students of Maharana Pratap University of Agriculture and Technology, Udaipur. The finding of the study revealed that I develop the information in summarize form and I can analyze, arrange and gathers information in logical way were the most important written communication skills as perceived by the students. Whereas, I like to accept new ideas and I express a good individual image among the audience were the most important statements expressed by postgraduate students in written and verbal communication skills.

INTRODUCTION

People communicate using various methods, such as sending an email, talking over the phone and putting print advertisements in some instances. Communication in the sending and receiving of messages between two people, one person and one person to a group or groups. Everyday written and oral communication is used in seminars, lecture halls and examinations. Written and revised oral communication is special in that every work used must have a particular purpose, otherwise it may lead to illustrations. Over 70 per cent of our time is spent interacting with others, and that is every person's one contact it must. They all need to express their desires and ideas. Each company has to report its products and services. Unfortunately, there are many people in this area having trouble. Some just don't have the professional influence they need to carry on today the world of companies. Technically, communication is characterized as the process by which information is contained in a package and imparted to the receiver through a medium from the sender. Looking to the importance of the communication, the present study was undertaken with aim to find out the extent of return and verbal communication skills among post graduate students of MPUAT, Udaipur.

RESEARCH METHODOLOGY

The present study was conducted in Maharana Pratap University of Agriculture and Technology, Udaipur. The MPUAT comprises six colleges, out of which three colleges namely; Rajasthan College of Agriculture, Udaipur, College of Technology and Engineering, Udaipur and College of Community and Applied Sciences, Udaipur were selected on the basis of postgraduate programmes are running in these colleges with appropriate number of students. From these selected colleges, 120 postgraduate students were taken by using proportionate random sampling technique as a sample of study. Data were collected from the respondents through distributed questionnaire technique thereafter, data were analyzed, tabulated and results were discussed in the light of objective of study.

RESULTS AND DISCUSSION

Written communication skills perceived by the respondents: Written communication skills related to the students' ability to effectively and efficiently

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convey information to another person. Good writing skills allow us to convey our message to a much larger public with clarity and easy than face-to-face communication with people. The data about the written communication skills collected from PG students are presented in Table 1.

Data incorporated in Table 1 reveal that "I develop the information in summarize form" was known as most important skill by PG students of RCA, CTAE and CCAS, Udaipur with the extent of 79.01 per cent and ranked first. While, the statement namely "I can analyze, arrange and gather information in logical way" was next important written communication skill take place among the PG students. Likewise, the statement of "In overall, I use the right words in writing" (77.78 MPS) was ranked on third by the PG students.

Further analysis of Table 1 shows that "I possess good knowledge about e-mail writing", "I make presentation material to transfer idea/information

Table 1: Extent of written communication skills among the PG students

[n = 120]

S. No.	Statements	RCA		CTAE		CCSA		Total	
		MPS	Rank	MPS	Rank	MPS	Rank	MPS	Rank
1.	I can share my thoughts easily through writing	81.02	I	81.19	III	64.58	VII	75.60	VII
2.	I think in advance about what I want to writing	76.41	VII	77.77	V	64.58	VII	72.92	IX
3.	I can analyze, arrange and gathers information in logical way	80.51	II	81.19	III	75.00	II	78.90	II
4.	I do my arguments in a systematic form	78.97	IV	77.77	V	66.66	VI	74.47	VIII
5.	I develop the information in summarize form	80.00	III	82.05	II	75.00	II	79.01	I
6.	I use different styles of writing for different readers	73.33	IX	68.37	VII	70.83	IV	70.84	XI
7.	I can provide my ideas easily in writing	78.46	V	82.90	I	68.75	V	76.70	VI
8.	In overall, I use the right words in writing	76.41	VII	77.77	V	79.16	I	77.78	III
9.	I am good in technical reports and papers writing	68.71	X	73.50	VI	72.91	III	71.71	X
10.	I make presentation material to transfer idea/information effectively	77.94	VI	79.48	IV	72.91	III	76.78	V
11.	I possess good knowledge about e-mail writing	75.89	VIII	77.77	V	79.16	I	77.61	IV

MPS = Mean Percent Score

effectively", "I can provide my ideas easily in writing", "I can share my thoughts easily through writing" and "I do my arguments in a systematic form" were also important written skills expressed by PG students with the extent of 77.61, 76.78, 76.70, 75.60 and 74.47 percent and these were ranked as IV, V, VI,VII and VIII, respectively. In addition, the statements namely "I think in advance about what I want to writing" (72.92 MPS), "I am good in technical reports and papers writing" (71.71 MPS) and "I use different styles of writing for different readers" (70.84 MPS)were also considered as least

Table 2. Extent of verbal communication skills among the PG scholars

[n = 120]

S. No.	Statements	RCA		CTAE		CCAS		Total	
		MPS	Rank	MPS	Rank	MPS	Rank	MPS	Rank
1.	I deliver my idea clearly and efficiently in presentation	78.46	V	79.48	V	83.33	IV	80.42	VI
2.	I keep eye-to -eye contact with my audience	78.97	IV	80.34	IV	83.33	IV	80.88	V
3.	I am sure in my own articulation	74.87	X	76.06	IX	72.91	VII	74.61	XII
4.	I quickly sensitive about the reaction of audience	73.33	XI	77.77	VII	70.83	VIII	73.98	XIII
5.	I can analyze and clarify that communicating by others	76.41	IX	84.61	I	77.08	VI	79.36	VII
6.	I cooperate with others to express their difficulties	81.02	III	78.63	VI	70.83	VIII	76.83	VIII
7.	I mention business telephone calls to the item	66.66	XII	69.23	XI	60.41	X	65.43	XV
8.	I put up message in interesting way to groups	77.43	VII	79.48	V	68.75	IX	75.22	XI
9.	I possess the quality to make rapport with the audience	78.97	IV	74.35	X	72.91	VII	75.41	X
10.	I like to accept new ideas	83.58	II	81.19	III	91.66	I	85.48	I
11.	I commit to being truthful and reliable	84.10	I	84.61	I	79.16	V	82.62	III
12.	I regard others in communication process	76.92	VIII	79.48	V	87.50	II	81.30	IV
13.	I express a good individual image among the audience	81.02	III	82.05	II	85.41	III	82.83	II
14.	I smile when communicate among the audience	77.94	VI	76.92	VIII	72.91	VII	75.92	IX
15.	I manage disagreement tactfully	74.87	X	77.77	VII	68.75	IX	73.79	XIV

MPS = Mean Per cent Score

important skills by PG student of RCA, CTAE and CCAS, Udaipur and these were observed in IX, X and XI position, respectively.

The above findings about the written communication skills are similar with findings of Mishra (2016) and Tanwar (2018).

Verbal communication skills expressed by the students: Verbal communication skills mention the ability to effectively and efficiently deliver the verbal message to the intended recipients. The data of verbal communication skills were collected from PG students and presented in Table 2.

Table 2 exposes that "I like to accept new ideas" as most important skill expressed by PG students of RCA, CTAE and CCAS, Udaipur with the extent of 85.48 MPS and ranked first. The skill about "I express a good individual image among the audience" was also considered as important with the extent of 82.83 MPS by the respondents. While, the statement "I commit to being truthful and reliable" was putted on third rank with the extent of 82.62 percent by the PG students.

Analysis of Table 2 reveals that "I regard others in communication process", "I keep eye- to-eye contact with my audience", "I deliver my idea clearly and efficiently in presentation", "I can analyze and clarify that communicating by others", "I cooperate with others to express their difficulties", "I smile when communicate among the audience" , "I possess the quality to make rapport with the audience" and "I put up message in interesting way to groups" were considered as important liking skills by the PG scholars with the extent of 81.30, 80.88, 80.42, 79.36, 76.83, 75.92, 75.41 and 75.22 MPS and ranked IV, V, VI,VII, VIII,IX, X and XI, respectively. Likewise, the statements namely "I am sure in my own articulation" (74.61 MPS), " I quickly sensitive about the reaction of audience" (73.98 MPS), "I manage disagreement tactfully" (73.79 MPS) and "I mention business telephone calls to the item" (65.43 MPS) which were ranked XII, XIII, XIV and XV by the respondents respectively.

The above findings about the verbal communication skills are in agreement with the findings of Thakur (2015) and Tanwar (2018).

CONCLUSION

From the above discussion it can be conluded that the extent of return communication skills was from 70.84 to 79.01 per cent among the PG students in all aspects. While, in verbal communication skills it was from 65.43-85.48 mps in all aspects in the study area. It means all the students had good return and verbal communication skills which helps in their future career development.

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ADOPTION OF IMPROVED PEARL MILLET CULTIVATION PRACTICES IN ARID REGION

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ABSTRACT

The data on body weights and physiological parameter i.body temperature (rectal temperature) and respiration rate of 6208 registered Sonadi sheep maintained by 147 shepherds of eight tehsils of four districts of Sonadi breeding tract were recorded. The least-squares analysis of variance was employed to study the effect of the body weightand physiological parameter. The overall least- squares mean for body weight at different ages was non significant was 2.21± 0.059 kg which reached to 30.91 ± 0.30kg during birth to fifth and above lactation in sheep without structure and 1.89 ± 0.76 kg which reached to29.55 ± 0.34 kg in sheep with structure. The results of physiological parameters indicated that body temperature ranged between 37.96 to 38.42ºC and respiration rate from 24.00 to 28.13/ minute during different stages of life in young stock of Sonadi sheep.

INTRODUCTION

Pearl millet (Pennisetumglaucum) is the most widely grown millet in arid regions. It has been grown in Africa and the Indian subcontinent since prehistoric times. The centre of diversity, and suggested area of domestication, for the crop in the Sahel zone of West Africa. The arid regions of India, spread over 3.2 lakh sq. km, account for 12% area of the country. Western Rajasthan alone occupies nearly 62 % of the arid area. Farming is almost entirely rainfed. The annual rainfall in the area is precarious (150 - 400 mm) besides being too aberrant, having coefficient of variability between 40 - 70%. The agriculture practiced here is dynamic and the farming practices change continually.Despite all this, pearl millet has continued to be the singular predominant crop widely grown in these regions. This crop has amazing qualities to withstand longer period of drought as well as to extract moisture from comparatively deep soil profile.

Changes in natural conditions, resource availability, and market development also present various challenges and difficulties to the farmers. Farmers build on their own experience gained throughout their life while cultivating this crop. In addition, farmers also take interest to learn about new pearl millet production technologies from various SAUs, ICAR institutes and organizations, programs, and projects dedicated to pearl millet improvement. These organizations develop and promote new varieties, inputs, and management practices. It is essential for that organizations to get the feedback about the introduced varieties in to the system as well as it is equally important to study, whether the introduced variety fit into the existing agro-eco system or not. Agricultural productivity and performance show wide variations across different regions of the country (Chand, 2008). The variation is mainly due to large differences occurred not only in the level of adoption of latest agricultural technologies but also with number of determinant factors, which could play a dominant role in the farming system.

The Eleventh Plan draft shows serious concerns towards reducing rural-urban divide to achieve the goal of inclusive growth. Further, meeting food and nutritional requirements of the growing population are possible only if the rate of agricultural development is accelerated through adoption of improved agricultural technologies and formulating

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policies favoring appropriate institutional and infrastructural changes. Agricultural technologies include all kinds of improved techniques and practices which affect the growth of agricultural output. By virtue of improved input/output relationships, new technology tends to raise output and reduces average cost of production, which in turn results in substantial gains in farm income. Adopters of improved production technologies normally tend to gain more productions, leading to constant socio-economic development. On the other hand, non-adopters can hardly maintain their marginal livelihood with socio-economic stagnation leading to deprivation. There is a plethora of studies related to adoption of different agricultural technologies but these are crop-specific, input-specific or location-specific. Studies by Feder *et al*. (1985) provide a comprehensive survey of adoption studies in developing countries. They have concluded that most adoption studies view the adoption decision in dichotomous terms, but there is a need for the adoption study covering the intensity of use, e.g. how much area is under high-yielding varieties (HYVs). They supported the need for proper accounting of varied range of responses employing suitable statistical techniques.

A recent study by Bhalla (2006) has brought out adoption of improved seeds, fertilizers, manures, pesticides and veterinary services on the basis of dichotomous response of farmers. The dichotomous response reflects the status of awareness of improved technology rather than the actual adoption.There are several reasons to invest in studying the adoption of agricultural technology. Keeping in view the above facts, the present study was conducted to assess the extent of adoption of recommended improved production practices among the pearl millet growers.

RESEARCH METHODOLOGY

The study was conducted in the Jodhpur district of Rajasthan. Ujalia, an adapted village of ICAR-CAZRIwas purposively selected. This village comes under Baori tehsil of Jodhpur. For selection of respondents, comprehensive list of pearl millet growers was prepared. Out of which 30 respondents were selected randomly from the village. Semi- structured interview schedule was prepared for the data collection. Farmer's responses were documented through interview method. The collected data were analyzed with descriptive statistics, percentage and frequency.

RESULTS AND DISCUSSION

Awareness is essential to adoption and it provides individual to learn the existence of the new idea. Adoption of improved production technologies depend on many factors like awareness and knowledge of adopters, innovativeness, characterisation of an innovation, relative advantage of technology, compatibility etc.

To get an overall view of adoption level, the respondents were divided into three groups' viz., (i) low level of adoption (<37), (ii) medium level of adoption (37 to 59) and (iii) high level of adoption (>59). The groups were based on the calculated mean and standard deviation obtained by the respondents. The results of the same were presented in Table no 1.

Table 1. Distribution of respondents on the basis of their level of adoption of improved pearl millet production technology (n=30)

S. No.	Category	f	%
1	Low (<37)	9	30.00
2	Medium (37-59)	17	56.66
3	High (>59)	4	13.33
	Total	30	100.00

Mean= 48, S. D. =11

Data presented in Table 1 depicts that the majority of respondents (56.66 per cent) were in the medium adoption group, whereas, 30.00 per cent respondents were in low adoption group and remaining 13.33 per cent pearl millet growers were observed in the high level of adoption about pearl millet production technology.These findings are in line with (Vijay Avinashilingam, 2013; Meena, 2011

and Bareth, 1991), who reported for pigeon pea growers, cluster bean growers and gram growers, respectively.

Practice - wise extent of adoption of pearl millet production technology

Practice-wise individually the extent of adoption of pearl millet growers was worked out. For this mean per cent score were calculated. The results of the same have been presented in Table 2.

In order to understand the extent of adoption of production practices of pearl millet growers a set of improved production practices list was prepared and the respondents were asked to express extent of adoption of a new technology.

It is clear from the data presented in Table 2 that adoption of recommended time of sowing, using recommended seed rate, maintaining proper irrigation management, intercultural operation adoption of high yielding varieties were the preferred production practices with MPS 92.14, 89.24, 74.38, 67.49 and59.16, respectively. Using recommended method and time of harvesting, applying FYM as per recommendations, using recommended machines/tools for sowing, maintaining recommended spacing, using recommended seed treatment occupied sixth, seventh, eighth, ninth, & tenth positions. Further, adoption of useful method of sowing, using recommended depth of sowing, using recommended machines for harvesting, recommended soil treatment, using recommended dose of nitrogen, using recommended dose of phosphate fertilizers, using recommended improved storage structures, using improved seed cum ferti-drill for application, using recommended chemicals for diseases control, using recommended insecticides for insect pest control practices placed on last ten positions in rank order,

It was also observed that those practices which does not require much specialized skills by the farmers were highly adopted among the production practices of pearl millet crop. Whereas, it was also found that due to lack of knowledge about

Table 2. Extent of adoption of production practices by pearl millet growers (n=30)

Sr. No.	Production Practices	MPS	Rank
1	Adoption of high yielding varieties	59.16	V
2	Recommended Soil treatment	42.33	XIV
3	Recommended time of Sowing	92.14	I
4	Adoption of useful method of Sowing	46.23	XI
5	Using Recommended Seed Rate	89.24	II
6	Using Recommended Seed treatment	47.13	X
7	Using recommended machines/tools for sowing	51.23	VIII
8	Maintaining Recommended spacing	49.83	IX
9	Using Recommended depth of sowing	45.84	XII
10	Applying FYM as per recommendations	51.24	VII
11	Using improved seed cum ferti-drill for application	37.14	XVIII
12	Using Recommended dose of Nitrogen	41.95	XV
13	Using Recommended dose of phosphate fertilizers	39.53	XVI
14	Timely intercultural operations	67.49	IV
15	Proper irrigation management	74.38	III
16	Using Recommended chemicals for diseases control	36.83	XIX
17	Using Recommended insecticides for insect pest control	35.17	XX
18	Using Recommended method and time of harvesting	57.32	VI
19	Using Recommended machines for harvesting	43.38	XIII
20	Using Recommended improved storage structures	38.17	XVII

recommended insecticides and pesticides for insect pest and disease control, lack of knowledge of soil treatment chemicals, high cost of insecticides and pesticides, lack of knowledge about high yielding varieties and high cost of seed material may cause less adoption of these recommended practices by the pearl millet growers.The present findings are in line with the findings of Vijay Avinashilingam, 2013 &Singh, 1999, who revealed that farmers had very poor adoption of improved practices of pigeon pea i.e., inoculation of seed with rhizobium culture, seed treatment &soil treatment and about pigeon pea production technology.

CONCLUSION

All institutions that are involved in generating agricultural technology should have the capacity to carry out studies that document the degree of adoption and help explain the rationale for farmers' decisions. Adoption studies can be useful for several purposes, and a decision about the audience for the study must be taken before the study is designed.Adoption is a mental process. In the present study, majority of the respondents (56.66 per cent) were in the medium adoption group, whereas, 30.00 per cent respondents were in low adoption group and remaining 13.33 per cent pearl millet growers were observed in the high level of adoption about pearl millet production technology.Extent of adoption revealed that the adoption of recommended time of sowing was ranked first by the respondents with MPS 92.14 likewise, using recommended seed rate with MPS 89.24 maintaining proper irrigation management with MPS 74.38, intercultural operation with MPS 67.49 and adoption of high yielding varieties with MPS 59.16, were ranked second, third, fourth and fifth respectively in adoption by the pearl millet cultivars.

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ECONOMIC EMPOWERMENT OF TRIBAL WOMEN THROUGH VERMICOMPOST PRODUCTION IN SOUTHERN RAJASTHAN

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ABSTRACT

Krishi Vigyan Kendra (KVK) is one of the leading institution devoted to the welfare of the farming community. The present study was undertaken to find out the Economic empowerment of tribal women through vermicompost production as an entrepreneurial activity promoted by KVKs of Southern Rajasthan. The study was conducted in three districts of southern Rajasthan i.e. Banswara, Dungarpur and Udaipur which were selected on the basis of highest concentration of tribal population. Random sampling was used to select respondents of KVKs. Economic empowerment in the present study refers to the income earned by tribal women through the adoption of vermicompost production as an entrepreneurial activity and their involvement in decisions regarding economic matters.

INTRODUCTION

Earthworms are known to consume large quantities of organic litter or waste and convert them into manure, which is used as compost, known as 'vermicompost'. Vermicompost is the potential alternative to chemical fertilizer because of significant change in the crop production system, reasonable cost, and environmental soundness. It is helpful for the proliferation and survival of beneficial micro-organisms in the soil. Vermicompost technology is affordable for farmers because of its low cost and marketing of its available plant nutrients like nitrogen and phosphorus. Vermicompost improves soil structure, moisture retention capacity, and soil fertility. The farm produce are better in taste and quality and lower in toxic residuals. It is commercially viable as it has growing demand and fetches higher prices.

RESEARCH METHODOLOGY

Present study was conducted in three districts i.e. Banswara, Dungarpur and Udaipur of southern Rajasthan which were selected on the basis of major concentration of tribal population. A list of goat farmers were obtained from KVKs of selected districts. 15 tribal women were randomly selected from each KVK. Thus, 45 tribal women were selected for sample. An interview schedule was used to collect information from tribal women regarding economic empowerment through vermicompost production practices. Respondents were contacted individually and interviewed in the local dialect at their work place or home using interview schedule. Frequency, Percentage and Adoption Index were used to quantify the adoption behavior of the respondents.

RESULTS AND DISCUSSION

Vermicompost is the major component of organic farming and one of the best alternatives among organic manures as a soil amendment input, as it may fulfill all the requirements with respect to production and protection of crop plants. The vermicompost may also be used as a tool for income

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generation, organic farming, environment protection, maintaining the soil health and sustaining agricultural production.

i. Duration, time devoted and initial investment in the enterprise: Data presented in the Table 1 depict that all the respondents had taken this enterprise as an entrepreneurial activity since more than 2 years. Further all of the respondents spent 1-3 hours daily in their vermicompost units to collect dung at one place, watering beds, tillage in beds, transportation and marketing works. Vermicompost enterprise does not require high amount to invest before starting the enterprise with small unit. Data further show that majority of the respondents (86.60%) invested less than Rs. 5,000 to start the enterprise followed by 8.88 per cent of the respondents who invested Rs. 5,000-10,000 and only 2.20 per cent of the respondents invested more than Rs 10,000 as initial investment to start the enterprise.

ii. Possession of vermicompost pits by the respondents: Regarding possession of vermicompost pits data presented in the Table 2 show that majority of the respondents (80%) possessed 1-3 vermicompost pits and about one third of the respondents (33.33%) possessed 4-6 pits, while more than 6 pits were found by 6.66 per cent of the respondents. It was observed that all of the respondents had special variety (Eisenia Fetida) of earthworms in their pits for preparation of vermicompost.

iii. Income earned by the respondents from sale of earthworms and vermicompost: The results furnished in the Table 3 indicate that respondents earned Rs. 2,16,250 as annual profit by sale of worms. Likewise, all the respondents sold vermicompost round the year and earned annual profit of Rs. 8,99,500. Respondents reported that income generation by this enterprise was easy for them as technology was easy to adopt.

iv. Average annual profit earned by the respondents by vermicompost production: Data in Table 4 shows the average annual profit earned by the respondents of selected KVKs through vermicompost production. Maximum profit of Rs. 31,483.33 was earned by the respondents of Banswara followed by Udaipur (Rs. 21,650) and Dungarpur (Rs. 21,250).

v. Income earned by the respondents before and after starting vermicompost production: Regarding income earned before and after starting the enterprise, it was found that before training no one among the respondents was the earning member of the family but after training all of the respondents had earned income from the sale of vermicompost and worms. It can be seen from Table 5 that after starting the enterprise 40 per cent of the respondents

Table 1: Distribution of the respondents on the basis of duration of running the enterprise and time devoted

S. No.	Particulars	f (%)			
		Banswara (n=15)	Dungarpur (n=15)	Udaipur (n=15)	Total (n=45)
1.	**Duration** More than 2 years	15 (100)	15 (100)	15 (100)	45 (100)
2.	**Time devoted** 1-3hrs	15 (100)	15 (100)	15 (100)	45 (100)
3	**Initial investment (Rs.)**				
i.	Less than 5,000	13 (86.60)	13 (86.60)	13 (86.60)	39 (86.60)
ii.	5,001- 10,000	1 (6.66)	2 (13.30)	1 (6.66)	4 (8.80)
iii.	More than 10,000	1 (6.66)	0 (0.00)	0 (0.00)	1 (2.20)

Table 2: Distribution of the respondents by the possession of vermicompost pits

S. No.	Variety	f (%)							
		Banswara (n=15)		Dungarpur (n=15)		Udaipur (n=15)		Total (n=45)	
		No. of respondent	No. of pits	No. of respondents	No. of pits	No. of respondent	No. of pits	No. of respondents	No. of pits
1.	*Eisenia Fetida*	15 (100)	46	15 (100)	42	15 (100)	41	45 (100)	129
	Number of vermicompost pits								
i.	Below 3	12 (80.0)		12 (80.0)		12 (80.0)		36 (80.0)	
ii.	4-6	2 (33.33)		3 (20.0)		3 (20.0)		8 (17.77)	
iii.	6 above	1 (6.66)		0 (0.00)		0 (0.00)		1 (6.66)	

Table 3: Income earned by the respondents by sale of vermicompost and earthworms

Items	Average quantity sold (kg.)	Rate (Rs.)	Average annual income (Rs.)	Average annual expenditure (Rs.)	Average annual profit (Rs.)	Per capita annual profit (Rs.)
Sale of vermicompost						
BSW (n=15)	70,000	5	3,50,000	14,500	3,35,500	22,366.67
DGR (n=15)	56,000		2,80,000	5,500	2,74,500	18,300
UDR (n=15)	59,000		2,95,000	5,500	2,89,500	19,300
Total (n=45)	**1,85,000**	**-**	**9,25,000**	**25,500**	**8,99,500**	**19,988.89**
Sale of worms						
BSW (n=13)	547	250	1,36,750	0	1,36,750	10,519.23
DGR (n= 6)	177		44,250	0	44,250	7,375.00
UDR (n=4)	141		35,250	0	35,250	8,813
Total (n=23)	**865**		**2,16,250**	**0**	**2,16,250**	**9,402.174**

Table 4: Average annual profit earned by the respondents by vermicompost production

KVK	Sale of Worms (in Rs.)	Sale of vermicompost (in Rs.)	Total (in Rs.)	Average annual profit (in Rs.)
Banswara (n=15)	1,36,750	3,35,500	4,72,250	31,483.33
Dungarpur (n=15)	44,250	2,74,500	3,18,750	21,250
Udaipur (n=15)	35,250	2,89,500	3,24,750	21,650
Total	**2,16,250**	**8,99,500**	**11,15,750**	**24,794.44**

earned Rs. 1,500-2,000 per month, while 28.88 per cent of the respondents earned Rs. 1,000-1,500 per month. Few of the respondents also earned between Rs. 2,000-5,000 per month. It was also observed that they took indirect advantage not in monetary form but in production form by using vermicompost in their own fields. Further mean monetary gain by the respondents through vermicompost was worked out by calculating the difference in average income of the respondents

Table 5: Distribution of respondents by income earned before and after starting the vermicompost production

Monthly Income Range (Rs.)	Banswara (n=15) f (%)		Dungarpur (n=15) f (%)		Udaipur (n=15) f (%)		Total (n= 45) f (%)	
	Before	**After**	**Before**	**After**	**Before**	**After**	**Before**	**After**
Nil	15 (100)	0 (0.00)	15 (100)	0 (0.00)	15 (100)	0 (0.00)	45 (100)	0 (0.00)
500-1,000	0 (0.00)	0 (0.00)	0 (0.00)	1 (6.66)	0 (0.00)	0 (0.00)	0 (0.00)	1 (2.22)
1,001-1,500	0 (0.00)	3 (20)	0 (0.00)	2 (13.33)	0 (0.00)	8 (53.33)	0 (0.00)	13 (28.88)
1,501-2,000	0 (0.00)	6 (40)	0 (0.00)	9 (60)	0 (0.00)	3 (20)	0 (0.00)	18 (40)
2,001-2,500	0 (0.00)	1 (6.66)	0 (0.00)	2 (13.33)	0 (0.00)	1 (6.66)	0 (0.00)	4 (8.88)
2,501-3,000	0 (0.00)	2 (13.33)	0 (0.00)	0 (0.00)	0 (0.00)	1 (6.66)	0 (0.00)	3 (6.66)
3,001-3,500	0 (0.00)	0 (0.00)	0 (0.00)	1 (6.66)	0 (0.00)	2 (13.33)	0 (0.00)	3 (6.66)
3,501-4,000	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)
4,001-4,500	0 (0.00)	1 (6.66)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	1 (2.22)
4,501-5,000	0 (0.00)	1 (6.66)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	1 (2.22)
Above 5,000	0 (0.00)	1 (6.66)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	1 (2.22)
Mean income (Rs.)	**0**	**2566.66**	**0**	**1833.33**	**0**	**1766.66**	**0**	**2256.09**
Mean income gain (Rs.)	**2566.66**		**1833.33**		**1766.66**		**2256.09**	
t value	**4.15****		**4.98****		**4.29****		**7.67****	

** Significant at 1% level of significance

before and after starting the enterprise. Mean monetary gain was found to be Rs. 2566.66, 1833.33 and 1766.66 for the vermicompost producer of Banswara, Dungarpur and Udaipur, respectively which was highly significant as indicated by the 't' values.

CONCLUSION

It can be concluded that through adoption of vermicompost production practices promoted by Krishi Vigyan Kendras for tribal women of southern Rajasthan had made them self reliance and enhanced the income also empowered them socially and economically. Respondents found better economic condition of their family after starting the entrepreneurial activity

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BODY WEIGHT ACCORDING TO PHYSICAL STRUCTURE ON EAR OF SONADI SHEEP IN FILD CONDITION

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ABSTRACT

The data on body weights and physiological parameter i.body temperature (rectal temperature) and respiration rate of 6208 registered Sonadi sheep maintained by 147 shepherds of eight tehsils of four districts of Sonadi breeding tract were recorded. The least-squares analysis of variance was employed to study the effect of the body weightand physiological parameter. The overall least- squares mean for body weight at different ages was non-significant was 2.21± 0.059 kg which reached to 30.91 ± 0.30kg during birth to fifth and above lactation in sheep without structure and 1.89 ± 0.76 kg which reached to 29.55 ± 0.34 kg in sheep with structure. The results of physiological parameters indicated that body temperature ranged between 37.96 to 38.42ºC and respiration rate from 24.00 to 28.13/ minute during different stages of life in young stock of Sonadi sheep.

INTRODUCTION

The livestock sector alone contributes nearly 25.6% of value of output at current prices of total value of output in Agriculture, Fishing & Forestry sector. The overall contribution of Livestock Sector in total GDP is nearly 4.11% at current prices during 2012-13. The total sheep in the country is 65.06 million numbers in 2012, declined by about 9.07% over census 2007 (Livestock Census 19th).

Sheep provide much needed livelihood support to the landless and weaker sections of the society. Sonadi sheep is known for milk, meat and carpet wool. It is fairly well built with long legs comparatively smaller than Malpura. Tail is long and thin, face is light brown in colour, which extends to the middle of the neck, ears are large flate and drooping. The climatic factors greatly influences the behavior of animal due to neuroendocrine response to climatic elements and consequently production and health of animals (Baumgard *et al.*, 2012). The information with respect to body weight and physiological parameter during different ages of Sonadi sheep reared in their breeding tract is scanty. Therefore, the present investigation was undertaken to record information on body weight according to physical structure on ear and physiological parameter of sonadi sheep of different ages in field condition.

RESEARCH METHODOLOGY

The major tract of Sonadi breed consists of Udaipur, Chittorgarh, Rajsamand and Dungarpur districts of Rajasthan, while the minor breeding tract consists of Bhilwara district of Rajasthan and part of north Gujarat (Acharya, 1982). The present study was conducted in four districts i.e. three districts namely Udaipur, Chittorgarh, Rajsamand from major and one Bhilwara from minor breeding tract of Sonadi sheep.

The data on body weights of 6208 registered Sonadi sheep maintained by 147 shepherds of eight tehsils of four districts of Sonadi breeding tract were recorded monthly in the ad-hoc project entitled "Performance evaluation and characterization of Sonadi sheep in their native tract". The body weight were recorded by weighing balance to the nearest of 100 gm. The physiological parameters like body temperature (rectal temperature) and respiration rate was recorded during the young stock on all the registered Sonadi animals.

The data being non-orthogonal were subjected

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to least - square and maximum livelihood computer programme (Harvey, 1990). The statistical model for analysis of body weights and measurements, included fixed effects due to districts (location). The new multiple range test (DMRT) was employed to compare the sub class means.

RESULTS AND DISCUSSION

The data related to the body weight were classified according to presence or absence of physical structure on outside of ear. Due to less number of animals with structure, the growth performance of animals with different structure was not estimated. The least squares means of body weight at different ages across phenotypic structure are presented in Table 1. The effect of phenotypic structure on body weight at different ages was found to be non significant. Contradiction to this the farmers were of the opinion that animals with structure have better growth rate than animals without structure. These studies were compared reported by Dass and Prasad (2007) and Dinesh Kumar *et al.* (2006) reported higher estimates of body length, height at withers and chest girth in adult Muzaffarnagari Sheep.

The results of physiological parameters indicated that body temperature and respiration rate was recorded on all the registered sonadi animals. The overall least squares means for physiological parameters like that body temperature and respiration rate was 38.54 ± 0.39^{o}C and 28.13 ± 0.74 per minute at birth, 38.40 ± 0.09^{o}C and 26.69± 0.26/ minute at 3 months, 37.96 ± 0.12^{o}C and 25.97 ± 0.33/ minute at 6 months, 38.42 ± 0.12^{o}C and 24.60 ± 0.34/ minute at 9 months, 38.40 ± 0.12^{o}C and 24.26 ± 0.35/minute at 12 months, 38.18± 0.18^{o}C and 25.23± 0.38/ minute at 15 months, 38.14 ± 0.14^{o}C and 24.00 0.43/ minute at 18 months, 38.36 ± 0.07^{o}C and 25.29 ±0.18/minute at more than 18 months of age. The variation due to districts and sexes were non-significant on both physiological parameters at almost all the ages in young stock.

CONCLUSION

From the above discussion it was concluded that the body tempreture ranged between 37.96^{o}C to 38.42^{o}C and respiration rate from 24.00 to 28.13/ minute during different stages of life in young stock of sonadi sheep.

Table-1 Least-squares means for body weight at different ages across phenotypic structure on outside ear

Age	Mean ± SE (kg)			
	N	Sheep without structure	N	Sheep with structure
At birth	222	2.21± 0.059	36	1.89 ± 0.76
3 months	938	10.86 ± 0.06	114	10.48 ± 0.84
6 months	755	16.36 ± 0.10	105	16.42± 0.55
9 months	555	20.08 ± 0.13	90	20.06 ±0.43
12 months	639	23.45 ±0.19	83	22.17 ±0.48
15 months	586	26.31 ± 0.27	72	24.93± 0.64
18 months	512	28.82 ± 0.33	68	28.14± 0.89
>18 months	3214	34.43 ± 0.22	467	34.49± 0.31
At lambing	903	29.88 ± 0.14	140	25.86 ± 0.48
First laction	5093	29.59 ± 0.13	715	30.15 ± 0.27
Second lactation	5369	30.80 ± 0.11	839	30.48 ± 0.27
Third lactation	4581	31.13 ± 0.12	811	30.43 ± 0.61
Fourth lactaction	2199	31.25 ± 0.18	428	28.19± 0.22
Fifth & above lactation	1129	30.91 ± 0.30	164	29.55 ± 0.34

Mean with different superscript differed significantly
*NS- Non significant, *=P<0.05, **=P<0.01*

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USE OF DRUDGERY REDUCTION TOOLS BY FARM WOMEN IN AGRICULTURE

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ABSTRACT

The present study was carried out in Alwar district of Rajasthan to investigate the problems and obstacles faced by farm women in the use of drudgery reduction tools. The study was conducted in two villages of one randomly selected garmpanchyat from panchyatsamitiLaxmangaarh. From each village, 25 farm women were selected randomly. Thus the sample of the study comprised of 50 farm women. Five drudgery reduction tools i.e. serrated sickle, wheel hoe, fertilizer broadcaster, maize sheller and kudali were selected for study. The results of the study demonstrate that a large number of farm women never used serrated sickle and nearby two-third of the farm women never used wheel hoe for farming. Majority of the respondents never used fertilizer broadcaster for fertilizer application and "maize seller" for separating grains from cob. Almost half of the respondents never used "kudaali" which is very simple drudgery reducing equipment. Majority of the farm women did not use drudgery reduction tools due to lack of knowledge followed by high cost and poor awareness about using method.

INTRODUCTION

Agriculture is the single largest production sector contributing more than 15 percent of GDP for India economy. Therefore, agriculture is important sector for all strategic planning for socio-economic development of the country. Rapid growth of agriculture is essential not only to achieve self reliance at national level but also for household food security and to bring about equity in distribution of income and wealth resulting in rapid reduction in poverty line (Shrivastava et al 2010). Agriculture is considered as the biggest unorganized sector where large numbers of women are working for their livelihood. According to the international labour organization (ILO, 2009) women constitutes a high percentage of the labour force, about 428 million women are working in agricultural sector around the world. Rural women form the most productive work force in the economy of majority of the developing countries like India. They are playing an important role in most of the farm operation like land preparation, seed treatment, sowing, planting, weeding, intercultural operation, irrigation of crop, application of manures and fertilizers, protection of crop, harvesting, threshing, storage etc.

Most of these tasks performed by women are tedious as well as time consuming. As most of these operations are done manually (using foot or hand) or by using traditional tools, they are slow and cause considerable fatigue and drudgery. Many of these operations are traditionally done in varying body posture some of which if done for long duration are not only inconvenient but also cause body pain. The farm women put in hard physical labour beyond their capacity. All these factors result in physical and mental fatigue, monotony hardship, exploitation, pain, economic stress etc. The plight of the women in this regard is alarming as they are constrained by illiteracy, poor health, unemployment and low technical knowhow and skill. The result is that women's needs for comfortable work participation remain neglected. Drudgery reduction is possible outcome that makes women work with improved productivity capacity and health. A desired change in the life of rural women, which is full of drudgery, can be brought by the use of application of simple,

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scientific and appropriate technologies.

Therefore it is necessary that women become technologically empowered in agriculture sectors. It is possible to achieve this by up-gradation of their knowledge and skills about these technologies. Few selected and useful technologies and tools are serrated sickle, Wheel hoe, Fertilizer broadcaster, Maize Sheller, Kudali.Keeping in mind minimal use of equipments in agriculture, this study was carried out to find out extent of use of improved equipments by farm women.

RESEARCH METHODOLOGY

The present study was conducted in Alwar district of Rajasthan. Alwar district was selected purposively and due to reasons that the student researcher is well acquainted with the local dialect of Alwar district which was facilitated in collecting reliable and correct information from the respondents. Administratively the district is divided into fourteen panchayatsamities, out of which one panchyatsamitiLaxmangaarh was selected purposively. From the selected panchyatsamiti one village panchayatKhohara-Malawali was selected randomly, out of this selected village panchayat two villages namely khohara and malawali was selected randomly. From each selected village, 25 farm women were selected randomly. Thus the sample of the study comprised of 50 farm women. Random sampling technique was used for selection of the farm women from selected villages.

RESULTS AND DISCUSSION

As mentioned above women are key contributor for the agricultural and allied sectors; right from sowing to harvesting they work long hours in the farm and fields. Due to insufficient level of knowledge about improved agricultural tools &technologies they are using traditional methods of agricultural operations. Since long back efforts are being made by government and non-government organizations to increase the use the improved agriculture equipments by the farm women. To know the extent of use of these equipments this study was undertaken with the objective to investigate the use of selected drudgery reducing tools by the farm women. The result of the investigation have been presented in following tables and discussed to draw conclusion about the same.

The data presented in the table 01 indicating the use of different drudgery reducing technologyby farm women. The frequency and percent use of serrated sickle clearly shows that 38 percent of the respondents use sickle on higher level whereas 18 percent of the respondent used serrated sickle sometimes. But it is cause of concern that a large number of farm women 44 percent never used this improved equipment for field and farm. Notwithstanding a simple to use and cheap to purchase and available even in villages, not used by nearly half of the respondents is really alarming to farm women.

In case of wheel hoe, it was reported that only few respondents (06%) used it frequently for weeding and intercultural operations in the fields followed by 24 percent farm women who used wheel hoe sometimes. It is very important to mention here that 70 percent of the farm women never used this technology for their agricultural operations.

Table 1: Use of drudgery reducing tools by farm women

n=50

S. No.	Tools	Always (High)		Sometimes (Medium)		Never (Low)	
		f	%	f	%	f	%
1.	Serrated Sickle	19	38.00	9	18.00	22	44.00
2.	Wheel hoe	3	6.00	12	24.00	35	70.00
3.	Fertilizer Board Caster	1	2.00	22	44.00	27	54.00
4.	Maize Seller	8	16.00	14	28.00	28	56.00
5.	Kudaali	19	38.00	7	14.00	24	48.00

Table 2: Distribution of respondents according to reason for not using the equipment

S. No.	Tools	Lack of knowledge		High Cost		Unaware about using methods		Unavailability	
		f	%	f	%	f	%	f	%
1.	Serrated Sickle	19	38.00	1	2.00	1	2.00	1	2.00
2.	Wheel hoe	31	62.00	3	6.00	0	0.00	1	2.00
3.	Ferti. Boardcaster	20	40.00	7	14.00	0	0.00	0	0.00
4.	Maize Seller	24	48.00	2	4.00	0	0.00	2	4.00
5.	Kudaali	15	30.00	5	10.00	0	0.00	4	8.00

Therefore, it is very important to investigate the reasons for not using the technology.

Further the results displayed in the table also indicate that only 02 percent of the respondents always used fertilizer broadcaster for application of fertilizer in the fields. Whereas a considerable number of respondents (44%) used this drudgery reducing tool occasionally. Majority of the respondents in the study area never used fertilizer broadcaster for fertilizer application despite having several benefits on the traditional method of fertilizers application.

It was also found that majority of respondents (56%) never used maize seller for separating grains from cob. Only 16 percent of the respondents used this tool always followed by 28 percent who used maize seller sometimes as and when needed. These data indicate poor use of the tool by farm women in the study area.

The figures depicted in above table also show that 38 percent of the respondents always used kudaali for their agricultural operations followed by 14 percent respondents who used kudaali occasionally. It is really interesting to note that 48 percent of the farm women never used this drudgery reducing equipment. It can be concluded from the above discussion that the use of selected drudgery reducing tool not satisfactory and needs to be increased.

The results of the study are similar to the results of SundheshaSumitra et al. (2018) who reported that a high majority (85.00%) of farm women had low level of adoption of drudgery reducing tools and equipment. Only 12.50 percent of respondents had medium level of adoption of drudgery reducing equipment. Only few (2.50 %) respondents had high level of adoption of drudgery reducing tools and equipment. It can be inferred from above findings that majority of farm women had low level of adoption of drudgery reducing tools and equipment.

An analysis was made to investigate the reasons for the respondents who did not use the selected drudgery reduction technology. The results of the study depicted in table 02 shows that 38 percent of the respondents did not use serrated sickle because they were not aware about the equipment. The cost of tool, method of use and availability in the market was considered other reason for not using the tool but found negligible.

The reason for not using wheel hoe was also examined and it was found that 62 percent of farm women did not use this equipment due to lack of knowledge about availability of tool. Few farm women (06%) found this tool costly to purchase and use. Other reason for not using the tool was found insignificant.

The analysis of reason for not using fertilizer broadcaster shows that 40 percent of the nonuser respondents did not have knowledge about existence of this kind of equipment whereas 14 percent of the farm women considered it costly as hand broadcasting method.

The major reason behind not using maize seller was again lack of knowledge about the equipment. It was reported that out of nonuser respondents 48 percent did not use maize seller as they did not listen earlier about this tool. Only 04 percent farm women

fount it costly and unavailability of the tool in the market.

The figures further indicate that 30 percent of the nonuser respondent was not aware about the kudali equipment therefore did not use. Only 10 percent of the nonuser farm women responded as costly tool and unavailable in the market.

Finally from the above analysis it was concluded that lack of knowledge of drudgery reducing technologies was the major reason behind not using of these equipments.

CONCLUSION

It was concluded that despite a simple to use, cheap to purchase and available even in villages,a large number of farm women never used this improved equipment"serrated sickle"for farming. It is really alarming to farm women. On the same way nearby two-third of the farm women never used weeding and intercultural operationequipment "wheel hoe"for farming. Majority of the respondents in the study area never used "fertilizer broadcaster" for fertilizer application and"maize seller" for separating grains from cob.It is really interesting to conclude that almost half of the respondents never used "kudaali"which is very simple drudgery reducing equipment. Majority of the farm women did not use"wheel hoe" equipment due to lack of knowledge about the tool over and above a large number of respondents did not use "serrated sickle" because they were not aware about the equipment. A considerable number of respondents did not have knowledge about existence of "fertilizer broadcaster" and "Kudali" equipment;at the same way reason behind not using "maize seller" was again lack of knowledge about the equipment.

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BENEFICIARIES' OPINION TOWARDS PRADHAN MANTRI KISAN SAMMAN NIDHI (PM-KISAN)

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ABSTRACT

The present study was conducted with 120 beneficiaries of Pradhan Mantri Kisan Samman Nidhi(PM-KISAN) selected from 12 villages of Agriculture Sub-Division, Miran Sahib(RS Pura), Jammuto study their opinion towards the scheme and constraints encountered by them in availing the cash benefits. It has been found that the micro-credit assistance of Rs 6000 to the farmers in three equal installments of Rs 2000 each under this scheme had significantly contributed in promotion of agriculture enterprises of the beneficiaries especially marginal and resource poor farmers. Farmers reported utilization of the assistance forfulfilling their farming related seasonal input needs and it also accelerated the adoption of agricultural technologies. The major constraints encountered in availing its benefit wasthe time consuming procedureof obtaining the land record from revenue department and concerned authorities also take too much time in clearing objections if any in transferring the cash incentive into individual bank accounts.

INTRODUCTION

Pradhan Mantri Kisan Samman Nidhi popularly known as PM-KISAN is a central sector scheme with 100 percent funding from the Ministry of Agriculture and Farmers Welfare, Government of India.This social security scheme is in operation since 01.12.2018. Initially under this scheme, an economic support of Rs 6,000/- per year in three equal installments of Rs 2000 each was provided to small and marginal farmer families having combined land holding/ownership up to 2 hectares but later on in June, 2019 central government decided to cover all categories of farmers irrespective of their land holding under this scheme and excluded certain categories of farmers having higher socioeconomic statusunder certain guidelines.The eligibility of farmers to join PM-KISAN is determined by the respective state governments on the basis of operational guidelines of the Scheme.Payments under the scheme started in February 2019. (www.pmkisan.gov.in).Under this scheme financial incentive is transferred directly to the beneficiary's bank account. About 86.20 percent of totalfarmers in India have marginal and small size of land holding(Naik,2020) and this scheme is an excellent income support to these categories of farmers for meeting out their farming related input needs. This scheme holds great significance especially during lockdown due to ongoing COVID-19 pandemic when almost all sort of economic activities came to stand still not only in urban but also in rural areas.

Among the constraints to technology adoption, the most common are the lack of information and lack of credit. In India, more than half of farming households do not have access to formal credit. In such a situation, the introduction of this cash transfer scheme to ease the liquidity constraints of Indian farmers for procuring inputs is quite salient (Varshney et al, 2020).In this scheme cash transfer is not linked to the size of the farmer's land, unlike Telangana's Rythu Bandhu scheme, under which farmers receive 8,000 per annum for every acre owned. While landless tenants have been left out in both the schemes, the link with land size makes the support provided by the Telangana scheme more substantial. PM-Kisan also falls short of Odisha's Krushak Assistance for Livelihood and Income Augmentation

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(KALIA) scheme, which includes even poor rural households that do not own land (Reddy and Shaw,2019).

The scheme had reached 85 million farmers nationwide by August, 12, 2020. The highest number of beneficiaries comes from Uttar Pradesh (28 percent, 17 million farmers), followed by Maharashtra (10 percent), Andhra Pradesh (9 percent), and Gujarat (7 percent).In J&Ktotal registered farmers are 1,024,262 and out which 930,559 have received benefit of this scheme. 5,79,111 have received the sixth installmentso far of this scheme with a success rate of 9 percent. (PM-KISAN portal, 2020www.pmkisan.gov.in).

Keeping in view the relevance of this scheme for farming community, the presentstudy was conducted with the objective tostudy the opinion of beneficiary farmers towards Pradhan Mantri Kisan Samman Nidhi(PM-KISAN) and their constraints in registering them for obtaining the benefits of this scheme.

RESEARCH METHODOLOGY

Nationwide, this scheme was launched in December,2018 and initially it included only small and marginal farmers but later on it was extended to all categories of farmers. For the present investigation, the selection of beneficiary farmers was not so difficult. However, for this study a sample of 120 beneficiary farmers was selected from 10 different villages falling under Miran Sahib Agriculture Sub-Division (RS Pura) of Jammu district of Union Territory of Jammu & Kashmir. 12 beneficiary farmers comprising of all categories of farmers were selected randomly from each village thereby constituting a sample of 120 beneficiary farmers for primary data collection. Secondary data was collected from various online sources related to Ministry of Agriculture and Farmers Welfare, Government of India. Primary data was collected from sampled farmers in the month of July-August,2020.Suitable statistical techniques were applied for analysis and interpretation of the data. The results have been presented hereunder.

RESULTS AND DISCUSSION

i) Socio-personal profile of beneficiary farmers

The data presented in the table 1 reveals that average age of beneficiary farmers was 49.10 years (±11.20).Average number of formal schooling years completed was 9.30 years(±4.07). Average family size of beneficiary farmers was 06(±3.12). Average operational land holding was 1.60 hectare (±1.30). As this scheme is open for all categories of farmers so vast majority of farmers having different size of land holding availing the benefits of this cash incentive scheme who have the land ownership in their name in revenue record. Farming experience of the beneficiaries was found to be 28 years (±10.30).

ii) Opinion of the beneficiaries towards Pradhan Mantri Kisan Samman Nidhi (PM-KISAN)

An opinion is a belief or judgment or feelings about something that isn't necessarily based on fact and also cannot be proven. People have lots of different opinions and in many cases; people can have differing opinions on the same issue.Data incorporated in Table 2 reveals opinion of beneficiary farmers towards PM KISAN Yojana.It is ostensible that all the sampled beneficiaries expressed their opinion that cash incentive under this scheme should be enhanced and they were also of the opinion that that there is no selection bias for

Table 1: Socio-personal profile of beneficiary farmers

S.No.	Characteristics	Statistics (N=120)
1	Average age (years)	49.10 (±11.20)
2	Average education (formal no. of schooling years completed)	9.30 (±4.07)
3	Average family size	06 (±3.12)
4	Average operational land holding (ha)	1.60 (±1.30)
5	Average farming experience (years)	28.00 (±10.30)

availing the benefits of this scheme and bank accounts opened under Pradhan Mantri Jan Dhan Yojana helped in quickly availing the benefits of this scheme and also Direct Benefit Transfer (DBT) of cash in accounts is very good step of this scheme respectively. 92 percent of the sampled farmers opined that access to Kisan Credit Card (KCC) scheme became easy due to PM-KISAN Yojana. Likewise, 83 percent of the farmers expressed that cash incentive received under this scheme is helping in purchasing farming inputs (fertilizers, pesticides etc.) timely and same percentage of farmers reported that this scheme is more helpful for those families whose livelihood is solely dependent upon agriculture. These findings are also supported by those of Varshney *et al.*, 2020 who also revealed similar findings in their study on PM-KISAN scheme.Same percentage of farmers expressed that there is no fixed pattern of spending money received under PM-KISAN Yojana and field functionaries of agriculture department and Panchayat members were very co-operative in helping them to avail the benefits of this scheme respectively.

Further analysis of Data presented in Table 2 reveals that 3/4th of the sampled beneficiaries were of the opinion that income support received under this scheme is helpful in meeting farming and personal needs (Health, Educational etc.) of marginal, small and especially old age resource poor farmers who have no access to credit and same percentage of farmers opined that due to cash incentive of this scheme adoption of modern agriculture technologies accelerated to some extent to provide stability to agriculture production. Similarly, 71 percent of

Table 2: Opinion of the beneficiaries towards Pradhan Mantri Kisan Samman Nidhi (PM-KISAN)

N=120

S. No.	Opinion statements	F	%
1.	Helpful in timely purchase of purchasing farm inputs (fertilizers, pesticides etc.)	100	83
2.	Cash incentive under this scheme should be enhanced.	120	100
3.	Helpful in meeting farming and personal needs (Health, Educational etc.) of marginal, small and especially old age resource poor farmers who have no access to credit.	90	75
4.	More helpful for those families whose livelihood solely dependent upon agriculture.	100	83
5.	Cash incentive is very helpful during lean farming period.	85	71
6.	Due to cash incentive adoption of modern agriculture technologies accelerated to some extent to provide stability to agriculture production.	90	75
7.	Helpful in increasing the income from farm sector.	70	58
8.	Helpful in increasing the risk taking capacity of farmers	75	63
9.	There is no selection bias for availing the benefits of this scheme	120	100
10.	There is no fixed pattern of spending money received under PM KISAN.	100	83
11.	Bank accounts opened under Pradhan Mantri Jan Dhan Yojana helped in quickly availing the benefits of this scheme	120	100
12.	Field functionaries of agriculture department and Panchayat members are very co-operative in availing the benefits of this scheme.	100	83
13.	Access to Kisan Credit Card (KCC) scheme became easy due to PM-KISAN.	110	92
14.	Helpful in moving out from the clutches of poverty to some extent	80	67
15.	Direct transfer of cash in accounts is very good step of this scheme.	120	100

F: Frequency, %: Percentage

sampled farmers stated that cash incentive is very helpful during lean farming period when there is no income from farm sector. Besides, 67 percent of the respondents also opined that whatever the financial help they are receiving due to this scheme; it is helping them to move out of the debt trap. While, 63 percent of the respondents were of the opinion that due to this scheme there risk taking capacity has increased and now they are spending freely on less costly relevant agriculture technologies to increase their farm production.Last but not the least, 58 percent of the respondentsopined that whatever little monetary support they are receiving from this scheme it is helping them to increase their income from farm sector because now they are spending timely to purchase critical agriculture inputs such as fertilizers, pesticides etc. and nutritional feed for the dairy animals. The findings are obvious as with the direct financial support, the farmers take their farming related decisions independently and timely which is very crucial in agriculture.

iii) Constraints encountered by the beneficiaries of Pradhan Mantri Kisan Samman Nidhi (PM-KISAN)

Data incorporated in Table 3 enlists some of the prime constraints faced by the beneficiary farmers in obtaining the cash benefit of this scheme. 92 percent of the beneficiaries covered under the study reported thatthe concerned authorities take too much time in clearing objections if any in transferring cash incentive into individual bank accounts. Similarly, 83 percent of the beneficiariesdisclosed that the officials of revenue department take too much time in issuing copies of their land ownership record which is mandatory for availing the benefit of this scheme. Besides, 75 percent of the sampled farmers reported that it takes too much time for the installments to credit into their accounts if there is any mistake or wrong entry during their registration for this scheme. Lastly, 67 percent of the sampled beneficiaries expressed that activation of frozen bank account is also time consuming which also results in delayed payment. However, they all reported that apart from these constraints, there is no other major constraint associate with PM-KISAN.

CONCLUSION

On the basis of above results, it is concluded that Pradhan Mantri Kisan Samman Nidhi(PM-KISAN) is proving very beneficial especially to the small and marginal farmers. If incentive under this scheme increases, it will definitely act as catalyst to increase the production of farm sector due to enhanced adoption of modern agriculture technologies and then agriculture sector can contribute with higher growth rate in the country's economy. Appropriate steps also need to be taken by the concerned authorities to minimize the constraints faced by the leftover farmers in availing the benefits of this cash incentive scheme. Digitalization of land record need to be accelerated so that eligible farmers may quickly register themselves for this scheme and may become economically empowered. Panchayat members should come forward actively in their respective wards to help farmers to register for this unique cash scheme.Last but not the least it is also concluded

Table 3: Constraints encountered by the beneficiaries in availing the benefits of this scheme

N=120

S.No.	Constraints	F	%
1.	Getting landownership recordcopy from revenue officials is very time consuming.	100	83
2.	Delayed payment due to wrong entries while registration.	90	75
3.	Concerned authorities take too much time in clearing objections if any in transferring cash incentive into individual bank accounts.	110	92
4.	Activation of frozen bank account istime consuming.	80	67

F: Frequency, %: Percentage

that during nationwide lockdown due to COVID-19 pandemic, this scheme helped the farmers a lot in meeting their daily needs of the family especially in case of resource poor households.The scheme has significantly helped those farmers who are relatively more dependent on agriculture and have poor access to credit. It has proven to be boon for resource poor farmers to meet their seasonal agriculture needs.

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OPINION OF THE PG STUDENTS TOWARDS USEFULNESS OF SOFT SKILLS IN TEACHING AND LEARNING PROCESS

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ABSTRACT

Soft skills are a cluster of productive personality traits that characterize one's relationships in a milieu. These skills can include social graces communication abilities language skills, personal habits, cognitive or emotional empathy, time management, teamwork and leadership traits. Therefore, the present study was conducted by selected 120 PG students of Maharana Pratap University of Agriculture and Technology, Udaipur. The findings of the study revealed that majority of the PG students had medium level of opinion about soft skills about usefulness in teaching and learning process. It was also noted that learning of soft skills is boon to students, and learning of soft skills is interesting and usefulness in their career were most important favourable and positive statements as perceived by the respondents.

INTRODUCTION

Soft skills are interpersonal skills which are used to describe the approach to life, work and relationship with other people. It's made up of personal characteristics, behavior, disposition and social graces that make one a good employee and work compatible with others.Soft skills are personal traits which enhance the interactions of the lecturer, employment performance, and career perspectives. Soft skills such as personality traits, social gracefulness, language fluency, personal habits, friendliness and optimism to varying degrees, soft skills should be taken as an ordinary feature in the collection of community skills and character traits by a lecturer.Teaching is a multifaceted task that involves a wide variety of expertise and abilities that include hard and soft skills to achieve the responsibilities of classroom successfully.Looking to the importance of soft skills the present study was undertaken by selecting PG students of MPUAT, Udaipur with aimed to know the opinion of PG students towards usefulness of soft skills in teaching and learning process.

RESEARCH METHODOLOGY

The present study was conducted in Maharana Pratap University of Agriculture and Technology, Udaipur. The MPUAT comprises of colleges, out of which three colleges namely; Rajasthan Colleges of Agriculture, Udaipur, College of Technology and Agriculture Engineering, Udaipur and College of Community and Applied Sciences, Udaipur were selected on the basis of post graduate programmes running in these colleges with appropriate number of students. From these selected colleges, 120 post graduate students were taken by using proportionate sampling technique as a sample of study. Data were collected from the respondents through distributed questionnaire technique thereafter, data were analyzed, tabulated and results were discussed in the light of objective of study.

RESULTS AND DISCUSSION

In this study an effort was also made to know the opinion of PG scholars towards usefulness of soft skills in teaching and learning process. Data were gathered and results are presented under the following heads:

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*** Professor, Department of Extension Education, RCA, Udaipur
**** Professor, Department of Statistics, RCA, Udaipur

1. **Level of opinion of PG scholars about soft skills:** In this part PG students were classified into three group viz., low (< 36 score), medium (36 to 48 score) and high (> 48 score) on the basis of mean and standard deviation. The results are presented in theTable 1.

Table 1 shows that 50.83 per cent of the PG students had medium level of opinion about usefulness of soft skills in teaching and learning, while, 27.50 per cent of them had high level and 21.67 per cent of the PG students possessed low level of the opinion about usefulness of soft skills in teaching and learning process.

Table further reveals that 29(44.62%), 22(56.42%) and 10(62.50%) PG students of RCA, CTAE and CCAS, Udaipur found in medium level of opinion on usefulness of soft skills in teaching and learning, respectively. While, 22(33.85%), 08(20.51%) and 03(18.75%) PG students of RCA, CTAE and CCAS, Udaipur were in the group of high level of opinion about soft skills, respectively. Additionally, 14(21.54%), 09(23.07%) and 03(18.75%) PG students of RCA, CTAE and CCAS, Udaipur had low level of opinion on usefulness of soft skills in teaching and learning, respectively. As a result, that more than 77.50 per cent of PG students were in the high and medium level of the opinion towards the usefulness of soft skills in teaching and learning in research area.

Similar findings are supported by Rasto *et al*. (2016) who observed that there were soft skills can be built through the teaching and learning phase in the classroom. The teaching and learning are the element expected to affect the soft skills of the students. The results further indicated that the teaching and learning process had a positive and important impact on the soft skills of the students, both partially and concurrently. Therefore, soft skills can be strengthened by enhancing the method of teaching and learning.

2. **Extent of opinion of PG students towards usefulness of soft skills in teaching andlearning:** For assessing the opinion of PG scholars about usefulness of soft skills in teaching and learning, as suitable scale was constructed. The scale was consisting of 18 statements and data were gathered. The mean percent score was calculated and results are mentioned in Table 2.

Table 2exposes that the positive statement "learning of soft skills is boon to students" was strongly agreed by PG students with MPS of 94.79 and ranked first. This aspect was followed by positive statements namely "learning of soft skills is interesting and usefulness" and "soft skills can be developed by providing better training to the students" with the extent of 91.73 and 91.29 per cent, which ranked second and third, respectively by the PG scholars.

Table further indicates that the positive statements namely "learning soft skills is applicable to learning

Table 1: Level of opinion of the PG students towards usefulness of soft skills in teaching and learning process

[n = 120]

S. No.	Level of Opinion	RCA		CTAE		CCAS		Total	
		f	%	f	%	f	%	f	%
1.	**Low (36)**	14	21.53	9	23.07	3	18.75	26	21.67
2.	**Medium (36 to 48)**	29	44.62	22	56.42	10	62.50	61	50.83
3.	**High (48)**	22	33.85	8	20.51	3	18.75	33	27.50
	Total	65	100	39	100	16	100	120	100

f = frequency, % = per cent

education", "learning soft skills is really useful on the education degree", "learning soft skills has helped me to respect my colleague and teachers", "soft skills are critical for career development", "soft skills are highly sought after by good teachers" and "soft skills are difficult as compared to professional knowledge" were also agreed by the respondents and considered as important in teaching and learning with the extent of 88.26, 87.59, 87.31, 85.42 and 83.10 MPS and same were assigned fourth, fifth, sixth, seventh and eighth ranks, respectively.

Further analysis of Table 2 shows that the statements namely "soft skills are not important as professional knowledge", "soft skills are not

Table 2: Opinion of PG students towards soft skills in teaching and learning

[n =120]

S. No.	Statements	RCA		CTAE		CCAS		Total	
		MPS	Rank	MPS	Rank	MPS	Rank	MPS	Rank
1.	Learning of soft skills is boon to students	95.38	I	93.16	I	95.83	I	94.79	I
2.	Soft skills are not important for getting a better job	71.79	XI	66.66	XIII	83.33	V	73.93	XI
3.	Soft skills are highly sought after by good teachers	89.23	V	87.17	VI	72.91	IX	83.10	VIII
4.	Soft skills cannot be enhanced through practice	74.35	X	65.81	XIV	72.91	IX	71.02	XIII
5.	Soft skills are difficult to learn as compared to professional knowledge	71.28	XII	76.92	IX	58.33	XIII	68.84	XVI
6.	Soft skills are not as important as professional knowledge	78.46	VI	74.35	X	79.16	VII	77.32	IX
7.	Soft skills are critical for career development	90.76	III	86.32	VII	79.16	VII	85.42	VII
8.	Soft skills do not develop the leadership traits among the students	74.35	X	68.37	XII	70.83	X	71.18	XII
9.	Learning soft skills is interesting and usefulness	95.38	I	92.30	II	87.50	IV	91.73	II
10.	Learning soft skills is too easy	53.84	XIV	58.97	XVI	64.58	XII	59.13	XVIII
11.	Learning soft skills has helped me to respect my colleague and teachers	91.79	II	88.88	V	81.25	VI	87.31	VI
12.	Learning soft skills is only fun	69.23	XIII	66.66	XIII	75.00	VIII	70.29	XV
13.	Learning soft skills is applicable to learning education	89.74	IV	85.47	VIII	89.58	III	88.26	IV
14.	Soft skills are not necessary for development of communication skills among the students	76.92	VII	70.08	XI	79.16	VII	75.39	X
15.	Learning soft skills is really useful on the education degree	91.79	II	89.74	IV	81.25	VI	87.59	V
16.	Soft skills are not helpful for recognizing students' rights in the college	74.87	IX	63.24	XV	75.00	VIII	71.02	XIV
17.	Soft skills can be developed by providing better training to the students	90.76	III	91.45	III	91.66	II	91.29	III
18.	Learning soft skills not requires good knowledge of ICTs	75.38	VIII	57.26	XVII	68.75	XI	67.13	XVII

MPS = Mean Per cent Score

necessary for developmentof communication skills among the students", "soft skills are not important for getting a better job" , "soft skills do not develop the leadership traits among the students", "soft skills cannot be enhanced through practice" "soft skills are not helpful for recognizing students' rights in the college", " learning of soft skills is only fun", "learning of soft skills not requires good knowledge of ICTs" and "learning soft skills is too easy" were negatively viewed by the PG scholars with 77.32, 75.39, 73.93, 70.29, 71.02, 70.29, 67.13 and 59.13 MPS and these statements were ranked ninth, tenth, eleventh, twelve, thirteenth, fourteenth, sixteenth, seventeenth and eighteenth, respectively.

From the above results, it can safely be concluded that majority of the PG students possessed positive and favourable opinion towards usefulness of soft skills in teaching, learning and research activities. It was also found that university must take initiation for development of soft skills right through under graduated level so that students, may be perfect and fully developed about various soft skills.

3. **Comparison of the PG student's opinion towards usefulness of soft skills in teaching and learning:** Analysis of variance test was used to know the significance difference among the PG students of selected colleges RCA, CTAE and CCAS, Udaipur about opinion towards usefulness of soft skills in teaching and learning. The results about 'F' test is presented in Table 3.

NH01: There is no significant difference in the opinion among PG students ofselected colleges towards usefulness of soft skills in teaching and learning.

RH_1: There is significant difference in the opinion among PG students of selected colleges towards usefulness of soft skills in teaching and learning.

Table 3 reveals that the calculated value of 'F' (1.765) is less than tabulated value at two degree of freedom, thus the null hypothesis (NH01) is accepted and the research hypothesis is rejected. Consequently, it is concluded that there was non-significant difference among PG students about their opinion towards usefulness of soft skills in teaching and learning. It means that PG students of all three colleges were having similar type of opinion towards various aspects of soft skills and they also perceived that soft skills are very much useful for their life as wells as career development.

CONCLUSION

It may be concluded that 50.00 per cent of the PG students had medium level of opinion on the usefulness of soft skills in teaching and learning, while, 27.50 per cent of them had high level and 21.67 per cent of the PG students possessed low level of the opinion about usefulness of soft skills in teaching and learning.It was also explained that learning of soft skills is boon to students, learning soft skills is interesting and usefulness, soft skills can be developed by providing better training to the students and learning soft skills is applicable to learning education were most favourable statements as viewed by PG students. Also, Findings revealed that there was non-significant difference among PG students about their opinion towards usefulness of

Table 3: Comparison of opinion of PG students towards usefulness soft skills in teaching and learning

[n = 120]

Source of variation	d.f	S.S	M.S. S	"F" value
Between colleges	2	121.26	60.63	1.765^{NS}
Error	117	4018.73	34.35	
Total	119	4139.99		

NS = Non-Significant

soft skills in teaching and learning.

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DEVELOPMENT AND STANDARDIZATION OF A TEST TO MEASURE KNOWLEDGE OF RAJMASH (*PHASEOLUS VULGARIS* L.) GROWERS

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ABSTRACT

A study was conducted to develop and standardize a test to measure knowledge level of Rajmash growers about different recommended cultivation practices.Adequate knowledge about different recommended cultivation practices is must on the part of growers to increase its productivity.46 items were initially collected. Finally 40 items were screened and administered to 120 rajmash growers (60 each from Doda and Kishtwar districts) and later on subjected to item analysis for calculation of difficulty and discrimination indices.Split half method was employed for working out the reliability of the test. Final test consists of 20 items with reliability coefficient of 0.80that can be administered to rajmash growers in study area for finding out their knowledge level.

INTRODUCTION

Knowledge is generally understood as an intimate acquaintance of an individual with facts. Knowledge is the body of understood information possessed by an individual or by a culture (English and English, 1961).Knowledge is one of the important components of behaviour and as such plays an important role in overt and covert behavior of an individual. Knowledge includes those behaviour and test situations which emphasized the remembering either by recognition or recall of ideas, material or phenomenon (Bloom and others, 1956). Rajmash is an important pulse crop grown in the district Doda and Ramban and in the Kishtwar Districts of Jammu division. The area to the extent of 6000 ha under rajmash is covered by Doda district of Jammu division.It is niche and valuable crop and popular not only in the state even popular at national level for taste, texture, aroma and palate(Anonymous, 2017). Therefore, knowledge about different recommended cultivation practices of rajmash crop on the part of farmers is must for increasing its production and productivity. Evidently this knowledge assessment requires an appropriate measurement tool such as a cognitive scale. (Raj Kamal, 2001).Therefore in the present paper an attempt has been made to develop and standardize a test to measure knowledge of the rajmash growers of Doda and Kishtwar Districts of Jammu Division. This was imminent as to find out the knowledge level and find out the knowledge gaps for planning training programmes for them.

METHODOLOGY

The present knowledge test was developed and standardized from the farmers of Doda and Kishtwar Districts of Jammu Division of Jammu and Kashmir.A test is a set of questions, each of which has a correct answer, to which the people respond (Ray and Mondal, 1999).Initially items were collected from the available literature relating to the content of the rajmash production technology or cultivation practices followed by the initial selection of items followed by item analysis using calculation of difficulty and discrimination indices,testing the validity and reliability.

RESULTS AND DISCUSSION

Item collection: The content of knowledge test is composed of questions called items. In order to develop the test on rajmash growers, 46 raw items for the test were collected from different sources, such as literature, field extension personnel, relevant specialists and the researcher's own experience. The 46 items were collected in relation to the major

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production and protection practices of cultivation technology of rajmash like land preparation, fertilizer requirements agronomic practices, pest and diseases management practices.

Initial selection of items: Initial selection of items was done on the basis of criterion that the items should promote thinking rather than rote memorization. The items should differentiate the well informed respondents from the poorly informed ones and should have certain difficulty value. It means that items which are not well understood by the people and the items which can be correctly replied by all or none are not suitable for knowledge test. That is the items should be able to discriminate the well informed people from poorly informed ones.

Initially, the researcher may find it difficult to differentiate knowledge from an attitude item. A knowledge item is matter of fact statement, whereas, an attitude item refers to a favourable or unfavourable feeling of the respondent. Based on the above criterion 40 items out of 46 were initially selected encompassing major areas of cultivation of rajmash like land preparation, seed and sowing, agronomic practices, plant protection measures etc.

The items selected were according to the level of knowledge and understanding of the respondents and level of technology of the area. A schedule was prepared withthese 40 items for administering them to the farmers for item analysis and screen out non-relevant and weak items. Correct replies for the items were ascertained in consultation with specialists and experts and incorporated in the schedule against each item. The items were open ended questions seeking reply from the respondents.

Item analysis: The item analysis of a test usually yields two kinds of information i.e. item difficulty and item discrimination. The index of item difficulty reveals how difficult an item is whereas, item discrimination indicates the extent to which an item discriminates the well informed individuals from the poorly informed ones. The items were checked and modified on the basis of pretesting and administered to 120 rajmash growers from (60 from Doda and 60 from the Kishtwar Districts of J&K) for item analysis. The farmers were randomly selected from the lists of rajmash growers from boththe districts and were different from the sample for the final study. Nevertheless, these 120 respondents were representative of the farming community in which the final study was to be conducted.

Each one of the 120 rajmash growers, to whom the test was administered was given a score 1 or 0 for each item, according to whether the answer was right or wrong. The total number of correct answers given by a respondent out of 40 items was the knowledge score of the individual. After calculating the knowledge score of 120 rajmash growers (respondents) the scores were arranged from highest to lowest in the order of magnitude.

These 120 respondents were then divided into six equal groups, each having 20 respondents and were arranged in descending order of total scores obtained by them. These groups were named as S1, S2, S3, S4, S5 and S6 respectively. For item analysis, the middle groups i.e. S3 and S4 were eliminated. Only four extreme groups with high and low scores were considered for computation of item difficulty and item discrimination indices.

Calculation of Difficulty Index (Pi): The difficulty index of an item was defined as the proportion of the farmers giving correct answers to a particular item. This was calculated using the formula

$$P_i = \frac{n_i}{N_i} \times 100$$

Pi = Difficulty index in percentage of ith item

ni=Number of respondents giving correct answer to theithitem

Ni = Total number of respondents to whom the ithitem was administered i.e. 120 in the present case

Calculation of Discrimination Index (E1/3): The discrimination index was obtained by calculating phi-coefficient as formulated by Perry and Michael (1951). However, Mehta (1958) suggested E1/3method to find out item discrimination and emphasized that this method was analogus to and

hence a convenient substitute for phi-coefficient. The E1/3formula was used in the present study.

$$E^{1/3} = \frac{(F_1 + F_2) - (F_5 + F_6)}{N/3}$$

Where, F1, F2, F3 and F4 were the frequencies of correct answers in groups S1, S2, S3 and S4respectively

N = Total number of respondents in the sample of item analysis, here it was 120

The difficulty and discrimination indices of all the

Table 1: Final test for measuring the Knowledge of the Rajmash growers

S. No.	Items of Knowledge test about rajmash cultivation	Difficulty Index (P_i)	Discrimination Index ($E^{1/3}$)
1.	What is the seed rate for sowing rajmash in one *Kanal* of land? (1 Ha= 20 *Kanal*)	22	0.20
2.	Please let me know the name of the fungicide used for the seed treatment before sowing	77	0.66
3.	What is the dose of fungicide used for the seed treatment in Rajmash?	78	0.33
4.	Please let me know the spacing i.e. plant to plant and row to row distance for sowing rajmash.	72	0.50
5.	Please let me know the time of sowing of Rajmash crop.	32	0.33
6.	What is the fertilizer requirement of Rajmash crop?	28	0.63
7.	Please let me know the number of irrigations mash crop require during its crop cycle.	60	0.50
8.	Name common weeds of Rajmash crop in the area.	24	0.32
9.	Please name the chemical used for management of weeds in mash crop.	78	0.62
10.	What is the time of application of herbicide in Rajmash crop?	68	0.58
11.	Please let me know the time of intercultural operations in Rajmash crop.	50	0.20
12.	What is the appropriate method of harvesting of Rajmash crop?	26	0.18
13.	Name the major diseases of Rajmash crop in the area.	72	0.44
14.	What are the methods of management of diseases in Rajmash crop?	56	0.66
15.	Name the chemicals used for the chemical management of diseases in Rajmash crop.	70	0.58
16.	Please let me know the important insect pests of Rajmash crop in your area.	72	0.50
17.	Name the insecticides used for the management of insect pests of Rajmash.	66	0.62
18.	Please let me know the dose of the insecticide used in Rajmash crop.	78	0.68
19.	Please let me know the appropriate time of harvesting of Rajmash crop.	30	0.24
20.	Please let me know about post harvest management storage of Rajmash	66	0.50

40 items were calculated by the procedure mentioned above.

Selection of items for the final test: Two criterionviz, item difficulty index and item discrimination index were considered for selection of items in the final format of knowledge test. The underlying assumption was that the difficulty was linearly related to the level of level of an individual's knowledge about the subject. When a respondent answered an item correctly, it was assumed as Coombs (1950) that item was less difficult than his ability to cope with it.The item with index of difficulty ranges from 20 to 80 and index of discrimination 0.20 and 0.68 were selected for the knowledge test.

Validity of the scale: Validity of the test in terms ofcontent validity was judged. Content validity is the representativeness or sampling adequacy of the content the substance, the matter, the topics of a measuring instrument (Kerlinger, 2004).Content validity of the test was found satisfactory since it was based on various literatures and subjected to different expert's judgments. It was assumed that the test measured what it was intended to measure and hence valid.

Reliability of the scale: Reliability is the accuracy or precision of a measuring instrument (Kerlinger, 2004). A test is reliable only when it gives consistently the same results when applied to the same sample. There are various methods to determine the reliability of the test but here split-half method was used for this purpose. The final test was administered to 20 respondents and was divided into two halves based on odd and even numbers of statements. The total score obtained for odd and even numbered items were subjected for the calculation of correlation coefficient (r). The resulting value of r =0.68 is considered as split half reliability. To adjust the reliability into full test reliability, Spearman Browns prophecy formula (Kerlinger, 1973) was used .The full test reliability was found to be 0.80 thus; the test was considered to be reliable.

CONCLUSION

A knowledge test was developed by using appropriate technique from item collection to calculation of discrimination index. Total 20 items/ questions were finalized for majoring the knowledge of the Rajmash growers.

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PROBLEMS PERCEIVED BY AGRIGRADUATES IN ADOPTION OF AGRIPRENEURSHIP IN RAJASTHAN

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ABSTRACT

Entrepreneurship is requirement of time and people, only entrepreneurship have potential to overcome the problems like unemployment, unstable economy and rising inflation. After this much importance also entrepreneurship is not practiced by people. This represent that there are some problems in adoption of entrepreneurship. The present study is focused on problems in adoption of agripreneurship. The study was carried out on agrigraduates of three universities of Rajasthan namely MPUAT, Udaipur, SKRAU, Bikaner and SKNAU, Jobner which are oldest and well established universities of Rajasthan and students of these universities are well aware and with full knowledge about each and every aspect of agripreneurship. The results of study represents that parents pressurising for job not for agripreneurship, most of products of agripreneurship are perishable, non availability of required facilities like cold storage, transportation etc., shortage of water and corruption was the main problems perceived by agrigraduates of Rajasthan in adoption of agripreneurship.

INTRODUCTION

At present India is facing problem of not only population explosion but also of food, cloths, shelter and employment for this increasing population.Employment is not available in India easily, according to a report of CMIE "Matters get worse for educated youth" before three year unemployment rate was 6.0 per cent and 79.7 lakh youth were unemployed, in the present scenario this figure has doubled with 1.5 crore unemployed youth and 7.5 per cent unemployment rate (CMIE (Center for Monitoring Indian Economy), Dec. 2019) (www.cmie.com). Several studies showed that even educated youths are not getting employment; it means that providing only education is not a solution to unemployment because jobs are not available even for educated and eligible candidates. So there is a viable option to solve this problem through self-employment or entrepreneurship development. Government of India also realized the situation and promoting entrepreneurship development through different schemes and programmes. Agriculture is the area with lots of opportunity and great potential for entrepreneurship, Youth educated in agriculture subject and others also can perform many entrepreneurial activities in this sector. Agripreneurship is a process of initiating action in agriculture by individual to reach ultimate goal of establishing agriculture based production, processing or marketing enterprise or other supporting services and mange it successfully to earn profit. Agripreneurship is a business oriented activity with different options and sectors for developing entrepreneurship and commercial business (Verhees *et al.*, 2011). But adopting and practicing agripreneurship is not so easy; there are many personal, social, economic, political and other barriers that hinder a fresher to adopt agripreneurship at different stages of agripreneurship.The present investigation represents the problems which hinders the adoption of agripreneurship by agriculture graduates.

RESEARCH METHODOLOGY

To study the constraints in adoption of

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agripreneurship especially in Rajasthan, the unemployed agriculture graduates having good knowledge and skills about every aspects of agriculture sector were purposively selected as respondents. A sample consisting of 180 agriculture graduates was purposively selected from all graduates passed out during last three years from three oldest and well established agriculture colleges in Rajasthan; these are R.C.A. of M.P.U.A.T., Udaipur, S.K.N.COA of S.K.N.A.U., Jobner and COA Bikaner of S.K.R.A.U, Bikaner. To study all the possible constraints a complete and integrated schedule was developed and reliability of which was ensured by calculating reliability co-efficient (0.73) and content validity was examined through evaluation of schedule by subject experts of R.C.A., Udaipur. The data were collected through personal interview of agriculture graduates and analysed by appropriate and required statistical parameters.

RESULTS AND DISCUSSION

Every successful individual faced challenges and obstacles and worked hard to convert that in opportunities and advantages. In agripreneurship also agripreneur face many challenges and obstacles. To study the level of problems perceived by agriculture graduates in the field of agripreneurship all agriculture graduates were categorised into three categories on the basis of calculated mean and standard deviation.

Data in table 1 represents that 18.39 per cent of agriculture graduate are perceiving high level problems in starting agripreneurship activities and 22.22 per cent agriculture graduates perceived low level of problems. Majority of agriculture graduates (58.89 %) perceived that agripreneurship involve medium level of problems which is a clear indication towards moderate risk taking capacity in the field of agripreneurship.

For better understanding of all possible problems were deeply studied and classified on the basis of their characteristics and belongingness to different groups and finally all those problems were arranged into five groups namely socio-personal, management and technical, financial and infra-structure facility, marketing problems and remaining were grouped under miscellaneous problems related to agripreneurship.

1. **Socio-personal problems perceived by agriculture graduates in starting agri-preneurship:** Agripreneurship is a social activity, which is carried out within society along with members of society in the form of staff and workers. An agripreneurs with capital for starting enterprise depends on social system for inputs, raw materials, human resources and for which some rules, regulations, norms, mores, taboos and social responsibilities have to fulfil by agripreneurs and some time it includes or act as challenge for agripreneurs.

Systematic analysis of data collected from agriculture graduates about all the possible social problems related to agripreneurship revealed that "Family is pressurising for job not for agripreneurship" was the top most socio-personal

Table 1: Distribution of agriculture graduates according to level of problem perceived in starting agripreneurship

n =180

S. No.	Problem level	Value	*f*	%
1	**High** (> Mean + S.D.)	>113.10	34	18.89
2	**Medium** (Mean + S.D. to Mean – S.D.)	113.10 to 72.06	106	58.89
3	**Low** (< Mean – S.D.)	<72.06	40	22.22
Total			**180**	**100**

Mean = 92.58 S.D.(Standard Deviation) = 20.52 f - frequency

Table 2: Socio-personal problems perceived by agriculture graduates in starting agripreneurship

n = 180

S.No.	Social-personal problems in starting agripreneurship	MPS	Rank
1	Family is pressurising for job not for agripreneurship	75.00	I
2	Relative not considering agripreneurship as carrier option	61.11	III
3	Socio-cultural rigidity do not support to establish agri enterprise	50.93	IV
4	Agripreneurship is considered as low socio economic status in our society	45.37	VII
5	Regional sentiments does not allow outsiders to establish and run agri enterprise	45.56	VI
6	Locality and endemic problem related with raw material, inputs and outputs	49.26	V
7	Social politics	72.22	II

MPS - Mean Per cent Score

problem perceived by almost all graduates and assigned first rank with 75.00 MPS, It may be because the parents of majority of graduates engaged in agriculture and business so they were very well aware about risk and uncertainty of business but job gives security and safety of occupation. The next problem perceived by graduates was "Social politics"(means Influential people of society interfere in establishing and running agri enterprise) with MPS 72.22 that may be because bad and negative social politics and corruption that expose ugly face of social system.

The ranks III, IV, V and VI were assigned, respectively according to decreasing order of MPS that represent the decreasing number of graduates perceived that problem, to "Relative not considering agripreneurship as carrier option", "Socio-cultural rigidity do not support to establish agri enterprise", "Locality and endemic problem related with raw material, inputs and outputs" because some special agriculture products or inputs are produced only at some particular places and emotion or feelings or local rights of local people related with those products or inputs become a problem for outside agripreneurs and to convince the society members for establishing agri enterprise is not possible sometime and "Regional sentiments does not allow outsiders to establish and run agri enterprise" with MPS 61.11, 50.93, 49.26, and 45.56, respectively. Last rank was assigned to "Agripreneurship is considered as low socio economic status in our society" with MPS 45.37.

2. **Management and technical problems perceived by agriculture graduates in starting agripreneurship:** Management is the main function of entrepreneurs, only effective and efficient management of input, resources, staff workers, marketing and post marketing activities leads to success.Management include overcoming all the issues related to acquisition of inputs, technical now-how, marketing problems and relationship with dealers and customers, that all responsibilities of agripreneurs should be fulfilled efficiently for success of enterprise.

Technical problems are important in successful running, production, processing and value addition in every agri enterprises where technical work should be manage efficiently for production of good quality of products.

Analysis of results represented in table 3 shows that "Most of the inputs and products of agri-enterprise are perishable in nature so require cold storage, efficient transportation and other facilities" with MPS 86.67 was the mostly perceived

management and technical problem because of non-availability of cold storage and cold warehouses nearby villages or rural area and refrigerated transportation facilities also not up to the level and take more time in transportation, followed by "Lack of knowledge about different aspects of agripreneurship" with MPS 85.93 and ranked II.

Rank III, IV, V, VI, VII and VIII were respectively assigned to "Non-availability of specialized technical support to center for agri-enterprise" with MPS 84.44, because non-availability of technical support center or government or private institution to solve technical problem, "Less numbers of visit or tour to various enterprises for exposure" with MPS 69.63, "Quick transportation and legal formalities required for perishable agri products and by-products" with MPS 66.30, "Non availability of trained staff" with MPS 58.33 which is resultant to less number of training institutes, "Less utilization of capacity of staff" with MPS 57.41 means actual production of plant is not up to the capacity of enterprise plant and "Workers have lack of dedication in achieving enterprise goal" with MPS 54.07. The problem of "Inefficient management of staff and workers" with MPS 53.33 ranked last means this problem was perceived by very less agriculture graduates in starting agripreneurship activities.

3. Financial and infrastructure facility related problems perceived by agriculture graduates in starting agripreneurship: Finance and infrastructure facilities are the main important and basic requirements for establishment and running of any business or enterprise. Although agripreneurship require less capital and small infra-structure even then agriculture graduates perceived some problems related to financial and infrastructure issues, therefore, information about that were collected, statistically analysed and results of which indicated that "Shortage of water" and "Irregular supply of electricity" were the top first and second problems perceived by agriculture graduates because water and electricity are the main basic input required to rum an enterprise or business and these are mostly remain un-available or less available in rural areas.

The rank III was assigned to "Agripreneurship involve high risk" with MPS 77.41, "High wages or

Table 3: Management and technical problems perceived by agriculture graduates in starting agripreneurship

n = 180

S.No.	Management and Technical problems	MPS	Rank
1	Lack of knowledge about different aspects of agripreneurship	85.93	II
2	Non-availability of specialized technical support center for agri-enterprise	84.44	III
3	Less utilization of capacity of staff	57.41	VII
4	Inefficient management of staff and workers	53.33	IX
5	Workers have lack of dedication in achieving enterprise goal	54.07	VIII
6	Non availability of trained staff	58.33	VI
7	Less numbers of visit or tour to various enterprises for exposure	69.63	IV
8	Most of the inputs and products of agri-enterprise are perishable in nature so require cold storage, transportation and other facilities	86.67	I
9	Quick transportation and legal formalities required for perishable agri products and by-products	66.30	V

MPS - Mean Per cent Score

Table 4: Financial and infrastructure facility related problems perceived by agriculture graduates in starting agripreneurship

n = 180

S.No.	Financial and Infrastructure facility related problems	MPS	Rank
1	Agripreneurship involve high risk	77.41	III
2	Agripreneurship has no income security	62.41	IX
3	Unfriendly credit policies	61.85	X
4	Complicated and difficult loaning procedure	60.19	XI
5	Non-availability of own money with entrepreneur	55.93	XIII
6	Less number of financial institutions for agri-enterprise	52.78	XIV
7	Lack of faith of financial institutions for agri-enterprise	51.11	XV
8	High cost of land for establishing agri-enterprise	68.89	VIII
9	High cost of infrastructures facilities	73.33	VI
10	High cost of raw materials and inputs	74.81	V
11	High cost of packaging material	72.04	VII
12	High wages or cost of labour	75.19	IV
13	Non-availability of infrastructure facilities like road etc.	56.30	XII
14	Irregular supply of electricity	91.11	II
15	Shortage of water	93.33	I

MPS - Mean Per cent Score

cost of labour" assigned with IV rank for MPS 75.19 and represent non-availability or less availability of labourer and less availability of trained and skilled labourer so high wages have to pay, rank V was assigned for MPS 74.81 to "High cost of raw materials and inputs", VI for MPS 73.33 to "High cost of infrastructures facilities", VII for MPS 72.04 to "High cost of packaging material", VIII for MPS 68.89 to "High cost of land for establishing agri-enterprise", IX for MPS 62.41 to "Agripreneurship has no income security" and X for MPS 61.85 to "Unfriendly credit policies" that includes problems like malpractices at different levels and delayed credit release, Less number of loans sanctioned for agripreneurship, Inappropriate amount of loans and subsidies available for agri-enterprise and High rate of interest of loan, etc..

Remaining ranks XI, XII, XIII, and XIV were respectively assigned to"Complicated and difficult loaning procedure", "Non-availability of infrastructure facilities like road etc.", "Non-availability of own money with entrepreneur" and "Less number of financial institutions available for agri-enterprise" with MPS 60.19, 56.30, 55.93 and 52.78. Last rank was assigned to problem which was perceived with MPS 51.11 in initiating agripreneurship was "Lack of faith of financial institutions for agri-enterprises".

4. Marketing problems perceived by agriculture graduates in starting agripreneurship: Marketing is most important activity of business, any business cannot be complete or successful without proper marketing and selling of products developed or manufactured or processed in plant.

Analysis of all problems perceived by agriculture graduates represents that"Product certification is a time consuming process" agencies like Agmark, FPO, fssai, ISO FSSC 22000 etc. taking more time in certification of product, "Exploitation of entrepreneurs by middle man" represents the irregularity, not-cooperation and corruption at

concerned government offices and "Marketing problems due to seasonal products" means products are available at a particular time and for a small time period due to less self-life of products, were top three problems ranked I, II and III with MPS 92.96, 90.93 and 79.63, respectively.

Ranks IV, V, VI, VII, VIII, IX and X were respectively assigned to "High cost of product promotion", "High competition" because of large numbers of branded products is available in market, low sale of local products as compare to branded products, bulk quantity of products available in market for a small period and high competition between emerging entrepreneurs and well established entrepreneurs, "Fluctuation in demand of product", "Fluctuation in supply of raw material", "Less number of distributor are available", "Less knowledge about demand area" and "Inefficient market information about price signal and forecasting" with MPS 64.63, 61.85, 61.30, 61.11, 55.74, 52.59 and 50.19, respectively.

Successive ranks were assigned in decreasing order of MPS of each problem, the last ranks XI and XII were assigned for MPS value 45.37 and 44.44, respectively to "Limited reach to mandies and markets" and "Rigid rules and regulations for marketing and business".

5. **Miscellaneous problems perceived by agriculture graduates in starting agripreneurship:** Miscellaneous problems includes problems related to various ambiguous issues related to agripreneurship, information about that collected, statistically analysed and result of that represents that problem of "Corruption at every stage in agripreneurship" with MPS 86.85 was expressed by majority of agriculture graduates and ranked first, no doubt corruption is the main problem not only for agripreneurs or business man but also for common man of the country. Corruption within enterprise or outside of enterprise is dangerous not only for success but also for existence of agriculture enterprise.

The II rank was assigned to "Lengthy procedure for getting pollution clearance certificates and other formalities" with MPS 62.96 and III rank was assigned to "Complex legal formalities involve in setting-up of an agri-enterprise" with MPS 49.81, both depicts unhealthy government procedures in promotion of agripreneurship. Rank IV was assigned to "Problems related to labour union" with 45.74 MPS which is a common problem of all

Table 5: Marketing problems in starting agripreneurship by agriculture graduates

n = 180

S. No.	Marketing problems	MPS	Rank
1	Product certification is a time consuming process	92.96	I
2	Less numbers of distributors are available	55.74	VIII
3	Less knowledge about demand area	52.59	IX
4	High cost of product promotion	64.63	IV
5	High competition	61.85	V
6	Fluctuation in demand of product	61.30	VI
7	Fluctuation in supply of raw material	61.11	VII
8	Marketing problems due to seasonal products	79.63	III
9	Exploitation of entrepreneurs by middle man	90.93	II
10	Inefficient market information about price signals and forecasting	50.19	X
11	Limited reach to mandies and markets	45.37	XI
12	Rigid rules and regulations for marketing and business	44.44	XII

MPS - Mean Per cent Score

Table 6: Miscellaneous problems perceived by agriculture graduates in starting agripreneurship

n = 180

S.No.	Miscellaneous problems	MPS	Rank
1	Problems of obsolesce of indigenous technologies	37.78	V
2	Problems related to labour union	45.74	IV
3	Complex legal formalities involve in setting-up of an agri-enterprise	49.81	III
4	Lengthy procedure for getting pollution clearance certificates and other formalities	62.96	II
5	Corruption at every stage in agripreneurship	86.85	I

MPS - Mean Per cent Score

Table 7: Overall problems perceived by agriculture graduate in starting agripreneurship

n = 180

S.No.	Problems in starting agripreneurship	MPS	Rank
1	Socio-personal problems	57.06	IV
2	Management and Technical problems	68.46	I
3	Financial and Infrastructure facility related problems	68.44	II
4	Marketing problems	63.40	III
5	Miscellaneous problems	56.63	V

MPS - Mean Per cent Score

business and last rank was assigned to "Problems of obsolesce of indigenous technologies" with 37.78 MPS.

For overall scenario the data were also calculated for all major category or groups of problems which represent that "Management and Technical problems", "Financial and Infrastructure facility related problems" were the perceived problems by agriculture graduates and assigned with first and second rank with MPS value 66.46 and 68.44, respectively. "Marketing problems" with MPS 63.40 assigned with third rank and "Socio-personal problems" were at the fourth rank with 57.06 MPS, the last rank was assigned to "Miscellaneous problems" with MPS 56.63.

CONCLUSION

Challenges or problems are the important part of journey of success, after solve and overcome problems individual can enjoy success, likewise in entrepreneurship also some problems are there which have to face and solve to be a successful agripreneur. To conclude the study of all the problems related to agripreneurship, in the light of available data "Shortage of water" was the highly perceived problem because in most of the geographical areas of Rajasthan shortage of water is a common problem as most of the geographical area in Rajasthan is dry area and rainfall also below average so shortage of water is commonly faced problem by most of the enterprises, next "Product certification is a more time consuming process" that represents inappropriate working pattern and procedure of government departments like Agmark, FPO, fssai, ISO FSSC 22000 etc..The "Irregular supply of electricity" was the main problem perceived by agriculture graduates as it is essential to run essential sectors of production chain. Irregular electricity supply delays production, increase production cost and interprets marketing channels. Both "Exploitation of entrepreneurs by middle man" and "Corruption at every stage in agripreneurship"

are inter related problems which is because of corruption which is a main problem in India not only in agripreneurship but everywhere. "Most of the inputs and products of agri-enterprise are perishable in nature so require cold storage, refrigerated transportation and other facilities" was the problem specifically related and also characteristic of agripreneurship, which will always be their but can be easily overcome by simple efforts. The problem of "Lack of knowledge about different aspects of agripreneurship" is due to less exposure to the enterprises and less practical and real situation based education system, "Non-availability of specialized technical support center for agri-enterprise" was due to lack of infrastructure and support facilities by government and lack of support centers in local area of enterprise, "Marketing problems due to seasonal products" which is a characteristic feature of agriculture that product production as well as complete agriculture is depend on season and "Agripreneurship involve high risk" is a problem in entrepreneurship and also nature or quality or feature of any enterprise or business that risk is always associated with high level of profit but that can be manage by taking calculated risk are the highly perceived problems out of all problems perceived by agriculture graduates of Rajasthan.

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ADOPTION & PROBLEMS IN USING FACE-MASK AS NEW NORMAL IN COVID-19 PANDEMIC

Aligina Anvitha Sudheshna* and Meenu Srivastava**

ABSTRACT

In view of the pandemic situation an online survey was conducted to assess the knowledge, adaptation and problems. A total of 400 respondents from all over India have participated. From the results obtained most of the respondents are well aware about the face mask usage material to be used and handling processes. But in some areas like how to remove and handle the soiled face mask people are still lacking knowledge and need to be educated. It is observed that with the wide spread of pandemic situation still about 1% of the respondents are still not using face masks. From the data obtained it is observed that some of the respondents are facing problems like uneasiness, problem in breathing, headache etc. so there is need to make the masses aware about the ways to reduce these discomforts. Majority of the respondents are comfortable and most of the respondents are feeling safe because they think that face mask helps them protect from corona virus.

INTRODUCTION

The primary mode of transmission of Corona virus is through respiratory droplets that are emitted while talking, sneezing, coughing and sharing food. The most common size of droplet threshold is a minimum of 5µm to 10µm (Duguid, 1946). As there is much argument about the inactive carrier keys and main reason for covid spread is through infected droplets. Most of the patients are asymptomatic and are undergoing through the incubation process of 2- 15 days with median length of about 5.1 days (Lauer *et al*., 2020). In SARS-CoV patients are more infectious during the initial days of infection showing respiratory disorders, in contrast to this SARS-CoV-2 the infection is mostly related to high fever and is found in saliva of the patients(To *et al*., 2020). World Health Organization and Indian government is repeatedly going for the awareness of the individuals for wearing masks in public areas, maintaining social distancing, sanitizing etc. for the wellbeing of both the individual and the country. Strict measures for wearing face mask is not only the only means but educating the masses about its use is the first step of success in preventing the spread of the corona virus.

Filtering Capacity of Mask:

Face masks can be made using wide variety of materials and designs based upon the aesthetic appeal of the user, whereas material is the main aspect which will influence the filtering capacity. There are different standard test measures and evaluation measures been used by the healthcare personnel's, as focus have been shifted towards the Personal Protective Equipment and the heightened ability of the mask to protect the wearer from the infectious conditions(Howard *et al*., 2020). This situation have drawn attention to every individuals input as if everyone is wearing mask everyone will be protected and an end will be put to the pandemic situation. Different studies have depicted the filtration capacity of cloth mask in relation to surgical mask. Particle size is about 1µm (Asadi *et al*., 2019). General fabrics or materials available in home have filtration capacity from 49% to 86% with filtration rate of 0.02µm.whereas surgical mask will have a filtration capacity of 89% of all the particles(Davies *et al*., 2013). Laboratory tests have concluded that household material have a filtration capacity of 3% to 660% for particles of relevant size ranges when compared to surgical masks(Rengasamy *et al*.,

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2010). Teacloth have a filtration capacity of 60% for particle size of 0.02µm to 1µm, in comparison to this surgical mask filters upto 75%(van der Sande *et al*., 2008). Following this a group of researchers have explored the quality parameters of the home made mask, by making a mask from heavyweight t-shirts and found out that depending on the good fit minimum leakage is found and offering a substantial protection from the aerosols (Dato *et al*., 2006). Many government and non-government organizations have been recommending cloth mask for the masses, to improve the efficiency of the cloth mask layers of paper towel, tea and coffee filters are introduced in the middle layers of the mask to act as a filter. This filters could also increase the PPE effectiveness, but the only drawback is that the filter does not necessarily block the droplet emission(Anfinrud *et al*., 2020; Consumer Council, n.d.).

Fischer *et al*., (2020) conducted a study to know the efficacy of face mask filtering capacity for expelling of droplets during speaking with the help of a laser beam in dark enclosure. A total of 14 different types of masks were tested. Findings of the study have showed that fitted non-valved N95 mask is most effective in controlling the droplet spread followed by three layered surgical mask. From third position to sixth position different types of materials like polypropylene, cotton polypropylene and layers of cotton masks were seen with seven position obtained by valved N95 mask. Bandana and fleece mask are found to be in the 13th and 14th position with very low capacity. As these are very fitted to the wearers face this type of face coverings are making the droplets to break into relatively smaller size, smaller the size lighter the particle and more easily it can travel through air. So this type of material is to be avoided. Figure 1 represents the type of masks been used for the experimentation and the end results of droplet scattering capacity.

RESEARCH METHODOLOGY

A simple Google quiz questionnaire was developed to know about the basic knowledge of the individuals regarding the usage of the face mask and their experience regarding the mask they are using. This was circulated all over India to have a wide variety of sample.

RESULTS AND DISCUSSION

Total number of respondents for the present study is 400, after removing the duplicated entries. As we can see in the figure 2 female population is more dominant (69.8%) than male respondents with 30.3%.

Knowledge regarding face mask:

When enquired about the different aspects in

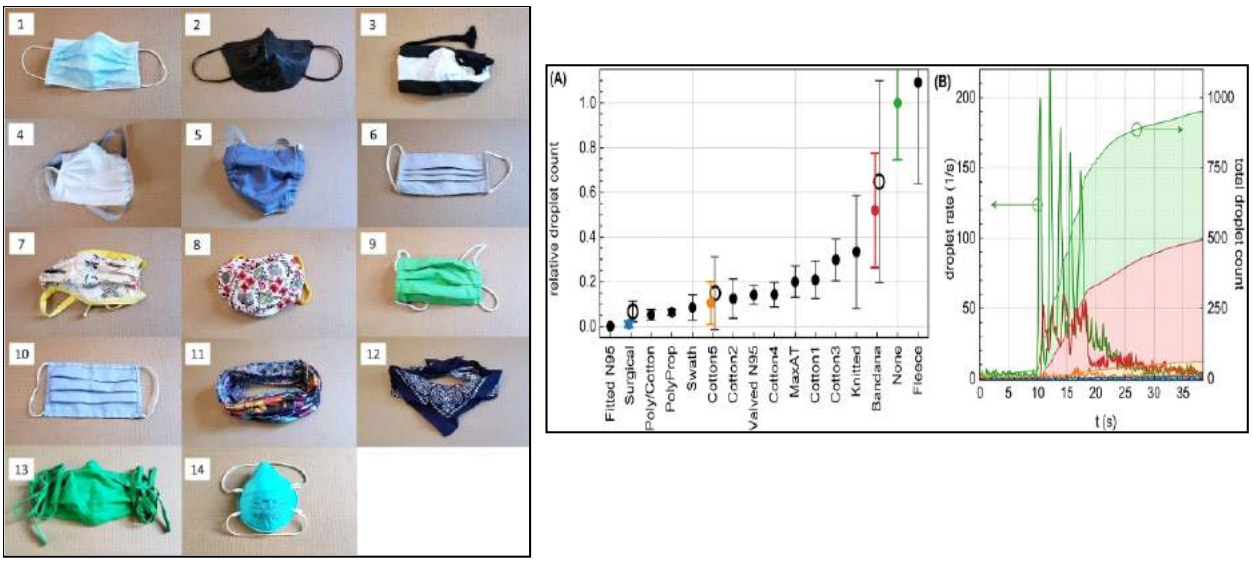

Figure 1. Different types of masks tested and their relative efficiency towards the emission of droplets

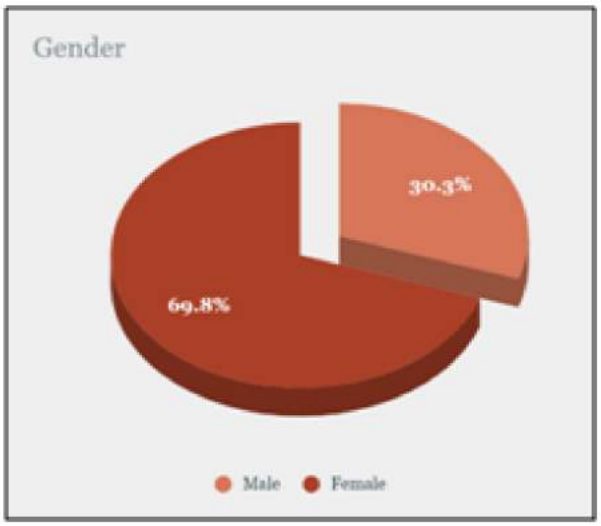

Figure 2. The gender

relation to the face mask regarding the present pandemic situation, most of them responded face mask as the vital accessory for the current situation.

From figure 3 we can see that majority of the respondents which are 232 people have opted the correct answer that face mask will help to limit the spread of the disease, close to the mark 133 people think that wearing a face mask will help them to prevent the disease which is a wrong notion which shows the lack of comprehension or miss interpretation of the ideation. Whereas, only a minimum amount of respondents think that it is for aesthetic appeal and will help catch illness which is 15 and 20, respectively.

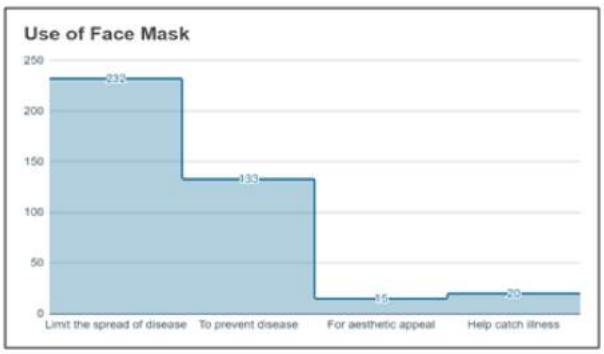

Figure 3. Choices of respondents regarding the use of face mask

When respondents are asked about when to use the face mask, peak curve is noted which represents that face mask should be worn when around people which shows that they have knowledge about the situation, which can be seen in the figure 4.

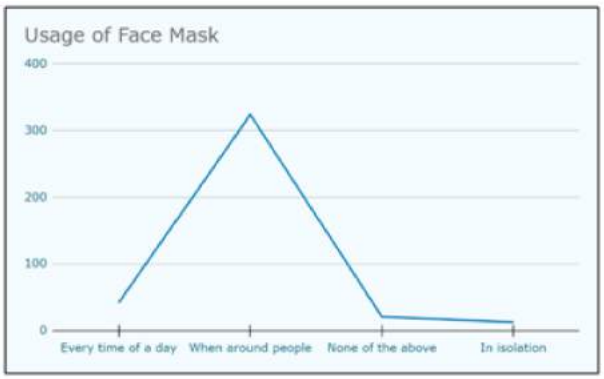

Figure 4. When to use face mask

As we can see different scenarios where there are lots of people wearing surgical mask for daily use, a question related to the disposing of the surgical mask was asked which can be seen in figure 5. 87.5% of the respondents gave the correct choice that surgical masks need to be disposed after single use whereas 6.5% of the respondents think they can be used multiple times and 3.8% opted that they can be disposed off anywhere.

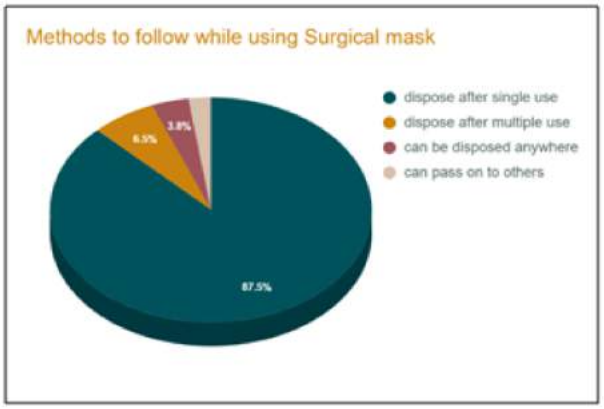

Figure 5. Disposing methods of surgical mask

Figure 6 shows the correlation between the knowledge assessment of face mask and effectiveness of the filter. In this correlation is can be observed that with the most effective the filter the more effective the mask. From this we can observe that non-woven mesh in N95 mask, laboratory mask, cloth mask and surgical face mask have the heightened level of responses as 35.50% which shows the correlation of most affective filters

to incorporate in the pandemic situation. Whereas close to this is the most effective combination is found with the charcoal filter which is 34.25%. Followed by sponge filter which is 16.00% and least effective as carbon filter which is 13.50%. without an effective filter face mask worn is of limited use for capturing or restricting the spread of the droplets infection into air.

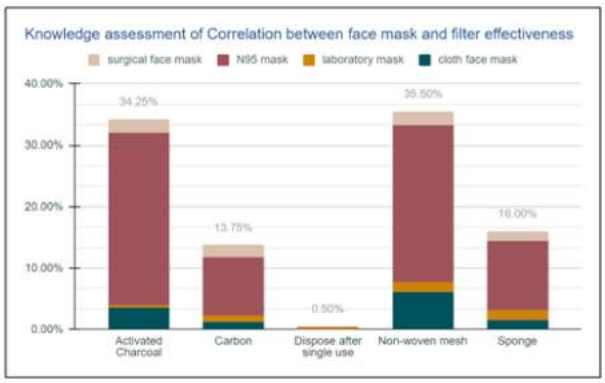

Figure 6. Knowledge assessment of correlation between face mask and filter effectiveness

Self-contamination is the major source of contamination in now a days as people are not aware of the correct ways of putting on off of the face mask or the protective gear which is been used as a part of daily life when enquired about the proper way of removing a face mask 237 people have chosen the option unhooking or untie the ear loops, whereas 114 respondents have opted for all the above which are unhooking the ears, removing by pulling above head and pulling the front side of mask which highlights the grave mistake of self-contamination.

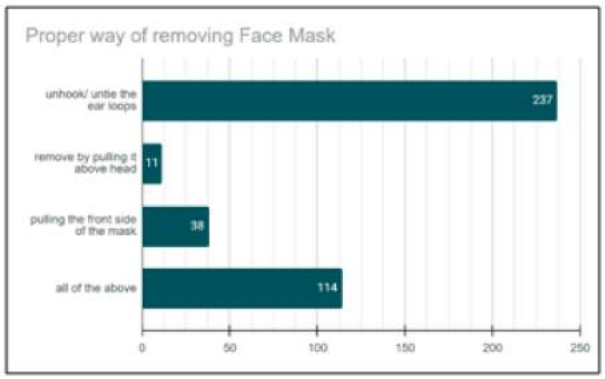

Figure 7. Proper ways of removing face mask

With the increase in the awareness and heightened use of the face masks, a question is posed regarding the best fabric for the home made face mask. Majority of the respondents have voted for 100% cotton and with 3 layers as the best for the daily use.

Center for Disease Control and Prevention have given that cloth masks are as competence as other medical masks and should be worn by the individuals, provided that they should maintain social distancing and should follow all the measures without compromising. They have given the complete guide for how to make face mask for different age groups for better fit and ways to clean and sanitize the masks (Debra rose wilson, n.d.).

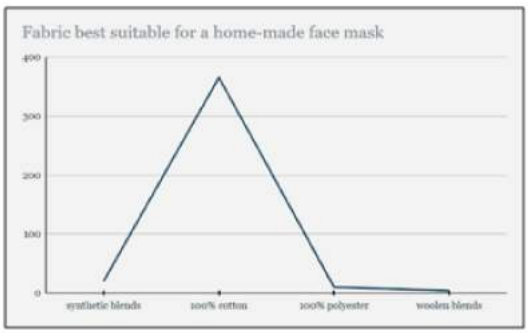

Figure 8. Best fabric for home-made face mask

Following are the different types of material and masks which are been used by them majority or 24% of the respondents are using cotton cloth masks, followed by 22.1% using cloth face masks and 20.1% N95 mask and 17.4% are using surgical mask. But the alarming fact is that about 1% of the respondents are still not using face mask amidst the pandemic.

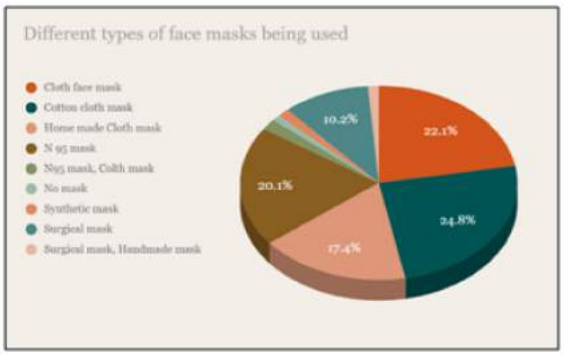

Figure 9. Different types of masks which are been used by the respondents

While enquired about the experiences they are facing while using face masks 40.2% of the respondents are feeling comfortable while using mask, whereas 23.5% of the respondents feel safe or protected because of the psychological feeling related to the mask that wearing a mask will reduce the risk of spread of the disease. 10.1% of the respondents have the problem of over sweating which will create the uneasy feeling while wearing a mask. 10.3% of the respondents have faced both over-sweating combined with discomfort. Whereas 7.8% of the respondents have breathlessness or unable to breathe after sometime while wearing a face mask resulting in mild headaches.

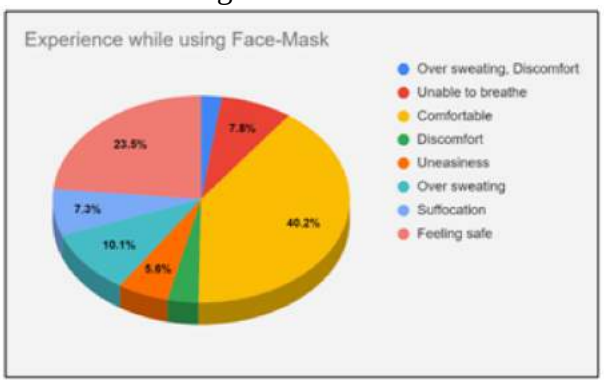

Figure 10. Experience of respondents while using face-mask

CONCLUSION

As we can see from the data obtained regarding different aspects of the face mask there is still a slight need for educating the people regarding the usage of face mask and remedies to follow if feeling discomfort and over sweating. But most of the respondents are being aware of the facts and etiquettes to follow in the covid pandemic situation which will help them to reduce contamination as well as stop them from getting infected.

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ADOPTION OF GOOD MANAGEMENT PRACTICES BY GAUSHALAS [COW-SHED] IN KARNATAKA STATE

Kalyan Mandi*

ABSTRACT

Gaushalas play a vital role in safeguarding the cattle wealth of our country. It is primarily occupied with providing shelter to cows and is catering mostly the needs of non-lactating, weak, unproductive and stray cattle. However, a few fore front Gaushalas also maintain nucleus herd for in-situ conservation of indigenous purebred cows and produce quality males so as to enhance productivity of indigenous breeds. With this view, present study was undertaken with the objective of understanding the level of adoption of good management practices by the Gaushalas. The study was conducted in Karnataka State in forty Gaushalas selected randomly out of eighty registered Gaushalas. The forty selected Gaushalas were categorized as small (12), medium (18) and large size (10) Gaushalas based on the herd size. Good management practices play an important role in improving the production performances of cattle, enhancing efficiency of animals in Gaushalas. In the present study 'adoption' was operationalised as the degree to which the good management practices viz., breeding, feeding, healthcare, general management and clean milk production were adopted in the Gaushalas.

INTRODUCTION

The Gaushalas symbolize our cultural heritage for the animal welfare and is synonymous with the protection of cows and cattle wealth of the country. It is an institution established for the purpose of keeping, breeding, rearing and maintaining cattle or for the purpose of reception, protection and treatment of infirm, aged or diseased cattle. It is primarily focused on providing shelter to cows and caters mostly to the needs of non-lactating, weak, unproductive, and stray cattle (Yadav, D.K., 2007). As per the 20th Livestock Census, India is having about 192 million cattle population, 74% of which are indigenous and the rest 26% constituted as crossbred/exotic (Livestock Census, 2019). India being a vast reservoir of cattle genetic resources represented by 43 recognized indigenous cattle breeds (NBAGR, 2019). A last half decade (2012-19) has seen decline in the total indigenous cattle population to a tune of 6.00 percent. The major factors for decrease in indigenous cattle population are attributed to uneconomical returns due to low productivity and replacement of draft power in agriculture by mechanization. This has led to extra burden on the farmers' to take care of feeding, breeding and healthcare needs of the cattle. As a result, majority of this category of cattle population find shelter in the Gaushalas instead of individual households. At present, India is having more than 4,500 Gaushalas registered under Animal Welfare Board of India (AWBI) and different State Gaushala Act that provide grant in aid for the sustenance and development of Gaushala all over the country. However, due to growing consensus for protection and conservation of our cattle resources, institutions like Gaushalas have gained significant importance over the time .But, still the potential of Gaushalas are yet to be tapped by its stakeholders especially in India. Therefore, by adoption of good management practices and addressing the key constraint areas in Gaushala, we can enhance the potential of productivity of cattle by many folds. According to Rashtriya Gokul Mission (RGM), (2014) development of Integrated Indigenous Cattle Centers - "Gaushalas" envisages for enhancement of productivity of indigenous breeds through optimization of modern farm management practices and promotion of common resource management.

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Present paper attempts to study the level of adoption of good management practices by gaushalas.

RESEARCH METHODOLOGY

The study was conducted in Karnataka State during the year 2017-18 in forty (40) Gaushalas, selected randomly out of total eighty (80) registered Gaushalas present throughout the State. The forty selected Gaushalas were further categorized as small (12), medium (18) and large size (10) Gaushalas based on the herd size i.e small (below 50), medium (51-150) and large (above 150) animals respectively. The primary data were collected from the concerned individuals/stakeholders involved in maintaining the Gaushalas through well developed interview schedule. Good Management Practice was operationally defined as the degree to which a respondent actually adopt a practice for the purpose of measurement of extent of adoption of Good Management Practices in their Gaushalas at the time of investigation and it was determined by a simple adoption schedule developed by the investigator. The practices were classified into five categories namely, breeding, feeding healthcare, general management and clean milking practices. The schedule contained 29 practices, from each of the areas as mentioned above. Against each of the practices, there were two columns representing 'adopted', and 'not adopted' with score of 1and 0 respectively. The adoption score were then converted into adoption index by applying following formula,

Adoption index= Obtained Adoption score/ Maximum Obtainable Adoption score x 100

According to the final scores values obtained, the Gaushalas were categorized into three groups namely, 'Low', 'Medium' and 'High' adopter categories considering the mean and standard deviation. The total score obtained by Gaushalas was calculated and with the help of following formula their adoption level for various practices and overall adoption level was calculated.

RESULTS AND DISCUSSION

The effective functioning of Gaushalas can be studied through assessing the level of Good Management Practices (GMPs) adopted by the selected Gaushalas. Hence, effort has been undertaken to study the adoption level of GMPs by the selected Gaushalas in the study area. The GMPs play an important role in improving the production performances of cattle, enhancing efficiency of managing animal welfare practices in Gaushalas. . In the present study 'adoption' was operationalised as the degree to which the good management

Table 1. Distribution of Gaushalas according to their adoption level in breeding practices

Sl. No.	Breeding Practices	Small		Medium		Large	
		Adopted f (%)	Not Adopted f (%)	Adopted f (%)	Not Adopted f (%)	Adopted f (%)	Not Adopted f (%)
1	Detection of heat	3 (25)	9 (75)	5 (28)	13 (72)	6 (60)	4 (40)
2	Breeding through N.S/A.I.	8 (67)	4 (33)	11 (61)	7 (39)	7 (70)	3 (30)
3	Insemination of dairy cattle within 12-18 hrs of onset of estrus.	4 (33)	8 (67)	6 (33)	12 (67)	3 (30)	7 (70)
4	Pregnancy diagnosis by veterinarian.	10 (83)	2 (17)	12 (67)	6 (33)	6 (60)	4 (40)
5	Pregnancy detection by external signs.	2 (17)	10 (83)	6 (33)	12 (67)	4 (40)	6 (60)

Note: f- Frequency (Figures in parenthesis indicates percentages)

practices viz. breeding, feeding, healthcare, general management, clean milk production and animal welfare practices were adopted in the Gaushalas.

1. Breeding Practices: From the Table-1 it could be inferred that, a majority (60.00%) in case of large sized Gaushalas, followed by 28.00% in medium and 25.00% in small sized Gaushalas could identify 'the cows in heat', as detection of heat symptoms in cows on time, which requires experience and skilled technical manpower and hence majority of large sized Gaushalas could detect the heat symptoms better than medium and small sized Gaushalas. Majority (70.00%) in case of large Gaushalas, followed by 61.00 per cent of medium sized Gaushalas and 67.00 per cent of small sized Gaushalas adopted 'Breeding through 'Artificial Insemination/Natural Services'. However, majority of the Gaushalas preferred Natural Service to Artificial Insemination as bulls were maintained in the Gaushala herd. A large majority (83.00%) of small sized Gaushalas adopted 'pregnancy diagnosis by veterinarian' as compared to 67.00 per cent in medium and 60.00 per cent by large sized Gaushalas. This could be due to 'inadequate knowledge and experience in case of small sized Gaushalas about pregnancy diagnoses therefore Veterinarians were preferred for such services. The findings of the present study are in line with the findings of Cheke (2015), Singh (2015) and Gupta (2017).

2. Feeding Practices: It is found from the Table-2 that a large majority (80.00%) in large sized Gaushalas, followed by a significant (44.00%) in medium and 33.00 percent in small sized Gaushalas adopted 'Green fodder cultivation' as majority of the large sized Gaushalas possessed adequate land for fodder cultivation. All the large sized Gaushalas (100.00%), followed by majority (78.00%) in medium sized Gaushalas and small sized Gaushalas (75.00%) adopted 'stall-feeding or semi-stall feeding' for equitable supply of balanced ration of feed and fodder to the cattle. Majority (80.00%) in large sized Gaushalas, followed by 67.00 percent in medium sized Gaushalas and 58.00 percent in small sized Gaushalas were 'fed extra ration during pregnancy' so as to supplement extra calories

Table 2. Distribution of Gaushalas according to their adoption level in feeding practices

Sl. No.	Feeding Practices	Small		Medium		Large	
		Adopted f (%)	Not Adopted f (%)	Adopted f (%)	Not Adopted f (%)	Adopted f (%)	Not Adopted f (%)
1	Cultivation of green fodder crops	4 (33)	8 (67)	8 (44)	10 (56)	8 (80)	2 (20)
2	Stall feeding or semi-stall feeding	9 (75)	2 (25)	14 (78)	4 (22)	10 (1)	0 (0)
3	Feeding of extra ration during pregnancy	7 (58)	5 (42)	12 (67)	6 (33)	8 (80)	2 (20)
4	Preparation and feeding of silage	2 (17)	10 (83)	4 (22)	14 (78)	5 (50)	5 (50)
5	Dipping of concentrate feed in water one hour before feeding	6 (50)	6 (50)	8 (44)	10 (56)	6 (60)	4 (40)
6	Provision for mineral mixture powder	6 (50)	6 (50)	10 (56)	8 (44)	8 (80)	2 (20)
7	Milch animals fed with extra concentrate feed @ 1kg to 2.5kg	6 (50)	6 (50)	10 (56)	8 (44)	7 (70)	3 (30)

Note: F- Frequency (Figures in parenthesis indicates percentages)

required and to maintain the health during the time of pregnancy. This might be due to the fact that importance of the feeding has been well known, and prioritized in the Gaushalas under study. The results are in accordance with the findings of Cheke (2015), Singh (2015) and Gupta (2017).

3. Healthcare: Data present in Table-3 indicated that a large majority (90.00%) in large sized Gaushalas, followed by equal majority in small (83.00%) and medium sized (83.00%) Gaushalas adopted 'vaccination against HS/FMD/BQ diseases before onset of monsoon' as majority of the Gaushalas were aware about the vaccination schedule and timely vaccination services were provided by Department of Animal Husbandry & Veterinary Services against these common diseases. A large majority (90.00%) in large sized Gaushalas, followed by medium (72.00%) and small sized Gaushalas (67.00%) adopted 'treatment of sick animals by veterinarian' as most of the large sized Gaushalas could afford as well as access to veterinary services as compared to small sized Gaushalas. Majority (70.00%) in large Gaushalas, followed by 67.00 percent in medium and exactly half in small sized Gaushalas (50.00%) adopted 'isolation of sick animal from the herd' in order to avoid outbreak of disease and to keep close supervision on the diseased cattle. Similar findings were observed by Cheke (2015), Singh (2015) and Gupta (2017) which supported the following observations.

4. General Management Practices: A perusal of Table-4 reveals that a large majority in medium sized (89.00%) and in large sized Gaushalas (80.00%) and most of the small sized Gaushalas (67.00%) adopted 'Provision of sufficient ventilation in cattle shed'. This is due to the fact that, majority of large sized Gaushalas provided sufficient space for ventilation for fresh air circulation in Gaushalas which directly impacts animal health and its performance. Further, large majority (90.00%) in large sized Gaushalas, followed by medium (78.00%) and 67.00 per cent in small sized Gaushalas adopted' daily cleaning of cattle shed before milking' .This might be due to the reason that the care and concern for the cattle and clean milk production under hygiene condition by majority of large sized was more as compared to small and medium sized Gaushalas. All the Gaushalas (100.00%) adopted 'proper maintenance of record' as all the Gaushalas are registered under different organizations thus it becomes mandatory for Gaushalas to maintain proper records. Equal large majority (90.00%) of large sized Gaushalas, followed by medium(89.00%) and 83.00 per cent in small sized Gaushalas provided 'sufficient and clean water' to cattle as majority of the Gaushalas had access to water source. The observations were

Table 3. Distribution of Gaushalas according to their adoption level in healthcare practices

Sl. No.	Healthcare Practices	Small		Medium		Large	
		Adopted f (%)	Not Adopted f (%)	Adopted f (%)	Not Adopted f (%)	Adopted f (%)	Not Adopted f (%)
1	Vaccination against HS/FMD/BQ disease before onset of monsoon.	10 (83)	2 (17)	15 (83)	3 (17)	9 (90)	1 (10)
2	Treatment of sick animal by veterinarian	8 (67)	4 (33)	13 (72)	5 (28)	9 (90)	1 (10)
3	Isolation of sick animal from the herd	6 (50)	6 (50)	12 (67)	6 (33)	7 (70)	3 (30)
4	Deworming of cattle	7 (58)	5 (`42)	12 (67)	4 (22)	7 (70)	3 (30)

Note: F- Frequency (Figures in parenthesis indicates percentages)

Table 4. Distribution of Gaushalas according to their adoption level in general management practices

Sl. No.	GM Practices	Small		Medium		Large	
		Adopted f (%)	Not Adopted f (%)	Adopted f (%)	Not Adopted f (%)	Adopted f (%)	Not Adopted f (%)
1	Provision of sufficient ventilation in cattle shed	8 (67)	4 (33)	16 (89)	2 (11)	8 (80)	2 (20)
2	Weaning of calf	7 (58)	5 (42)	16 (89)	2 (11)	9 (90)	1 (10)
3	Daily cleaning of cattle shed before milking	8 (67)	4 (33)	14 (78)	4 (22)	9 (90)	1 (10)
4	Record maintenance	12 (100)	0 (0)	18 (100)	0 (0)	10 (100)	0 (0)
5	Milking of dairy cattle at fixed time	10 (83)	2 (17)	15 (83)	3 (17)	8 (80)	2 (20)
6	Provide sufficient clean and fresh water to cattle.	10 (83)	2 (17)	16 (89)	2 (11)	9 (90)	1 (10)
7	Disinfection of animal shed every week by disinfectant	6 (50)	6 (50)	12 (67)	6 (33)	7 (70)	3 (30)
8	Care of new born calf	12 (100)	0 (0)	18 (100)	0 (0)	10 (100)	0 (0)

Note: F- Frequency (Figures in parenthesis indicates percentages)

fairly supported by the observations of Cheke (2015), Singh (2015) and Gupta (2017)

5. Clean Milking Practices: It is found from the Table-5 that, majority (80.00%) in large sized Gaushalas, followed by 67.00 per cent in medium and 58.00 per cent in small sized Gaushalas adopted 'cleaning of udder with clean water & antiseptic solution before milking', as it prevented harmful germs to contaminate with milk. Almost 100.00 per cent in large sized Gaushalas, followed by majority 94.00 per cent in medium and 67.00 per cent in small sized Gaushalas practiced adoption of 'full hand method of milking' as it was perceived and recommended as the right method of milking by majority of large sized Gaushalas. Further, large majority (90.00%) of large sized Gaushala, followed by 83.00% in medium and three-fourth in small sized Gaushalas adopted 'using of clean utensils for milking'. This might be due to the reason that majority of the large sized Gaushalas had better awareness and concern, attached more importance to the clean milk production practices. The findings were in accordance with the study of Cheke (2015), Singh (2015) and Gupta (2017).

6. Overall adoption level of Gaushalas in Good Management Practices: Data presented in Table 6 indicate that the distribution of Gaushalas according to their overall adoption of good management practices revealed that in case of large sized Gaushalas majority of 60.00 per cent belonged to 'high adopter categories' and 40.00 per cent belonged to 'medium adopter categories'. In medium sized Gaushalas, a majority (56.00 %) of them belonged to 'medium adopter category' and equal percent belonged to small (22.00%) and high adopter category (22.00%). Among small sized Gaushalas exactly half (50.00%) of the Gaushalas belonged to 'medium adopter category', another 33.00 percent and 17.00 per cent belonged to 'low and high adopter category', respectively. This clearly indicates that majority of the small and medium sized Gaushalas were not completely aware of the Good Management Practices (GMPs).It may be due to few major reasons like lack of resources and

Table-5. Distribution of Gaushalas according to their adoption level in clean milking practices

Sl. No.	Practices	Small		Medium		Large	
		Adopted f (%)	Not Adopted f (%)	Adopted f (%)	Not Adopted f (%)	Adopted f (%)	Not Adopted f (%)
1	Cleaning of udder with clean water & antiseptic solution before milking	7 (58)	5 (42)	12 (67)	6 (33)	8 (80)	2 (20)
2	Practicing full hand method of milking	8 (67)	4 (33)	17 (94)	1 (06)	10 (100)	0 (0)
3	Using of clean utensils for milking	9 (75)	3 (25)	15 (83)	3 (17)	9 (90)	1 (10)
4	Washing of milker hand with soap/antiseptic solution before milking	7 (58)	5 (42)	12 (67)	6 (33)	8 (80)	2 (20)
5	Personal hygiene while milking	9 (75)	3 (25)	16 (89)	2 (11)	9 (90)	1 (10)

Note: F- Frequency (Figures in parenthesis indicates percentages)

Table-6. Distribution of Gaushalas according to their overall adoption level in good management practices

(n=40)

Sl.No.	Adoption categories	Small		Medium		Large	
		Frequency	Percent	Frequency	Percent	Frequency	Percent
1	Low (upto 9)	4	33	4	22	0	0
2	Medium (10 to 21)	6	50	10	56	4	40
3	High (above 21)	2	17	4	22	6	60
	Total	**12**	**100**	**18**	**100**	**10**	**100**

inadequate training were the major reasons for non-adoption of GMPs in Gaushalas. The findings were in line with the findings of Cheke (2015), Singh (2015) and Gupta (2017).

CONCLUSION

In case of overall adoption of Good Management Practices (GMPs), most of the large sized Gaushalas performed better than medium and small sized Gaushala. The non- adoption of GMPs in small and medium Gaushalas was attributed to lack of resources and adequate training facilities.The major constraints of Gaushalas were, 'inferior quality of bulls',' limited access to veterinary services' and 'inadequate funds/capital and training'.The identified perceived important factors affecting the performance of Gaushalas were, 'regular financial support', 'good infrastructural facilities' and 'Government support for training and development'. The present study concludes that there is a strong need to sensitize and train the Gaushalas management about the GMPs through adequate extension, policy and financial support for holistic development of Gaushalas in the country.

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SOCIO-ECONOMIC CONSTRAINTS IN ADOPTION OF ECO-FRIENDLY MANAGEMENT PRACTICES OF MANGO IN KONKAN

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ABSTRACT

The present study was conducted in Ratnagiri&Sindhudurg districts of south Konkan in Maharashtra to study the socioeconomic constraints and suggestions offered by mango growers to overcome the socio-economic constraints in adoption of eco-friendly management practices of mango.The number of socio economic constraints are quite high. Major Suggestions for improving the existing level of knowledge and adoption of eco-friendly management practices of mango offered by respondents were 'bio fertilizers should be made available at low cost' (98.17 %), "supportive role of the govt. in marketing, subsidy and loan for eco-friendly mango' (87.67 %), 'transport should be done on co-operative basis' (80.50 %) and 'special encouragement for eco-friendly mango products by way of adequate premium price incentives' (80.50%). It is therefore recommended that the concern agencies should consider them according to severity. Since mango commodity is foreign exchange earner, the government should release separate funds to overcome the problems contorting to orchardists in a potential area.

INTRODUCTION

In present era, agriculture is revolves around the social and economic aspects. Social and economical constraints are the impediments and obstacles in the adoption of eco-friendly management practices of mango. Mango occupies 37.5 per cent of the total area under fruits comprising 2.31 million hectares with a total production of 15.18 million tonnes. The average productivity of mango in the country is 6.61 t/ha. Social and economic constraints and suggestions offered by mango growers for improving the present status of eco-friendly management practices will be a valuable feedback to scientists, administrators, policy makers and public representatives to revise the strategies for implementation of eco-friendly technology of mango in the state. As a whole, it will help to improve socio-economic conditions of mango growers.

Looking into above consideration the study entitled 'socio-economic constraints in adoption of eco-friendly management practices of mango in Konkan was conducted with following objectives.

1. To study the social and economic constraints in adoption of eco-friendly management practices of mango.
2. To obtain the suggestions offered by mango growers to overcome the socio-economic constraints in adoption of eco-friendly management practices of mango.

RESEARCH METHODOLOGY

The present study was conducted in Ratnagiri&Sindhudurg districts of south Konkan in Maharashtra. These districts were selected purposively on the basis of maximum area under mango cultivation in the Southern Konkan. For the selection of tehsils, a complete list of all the tehsils of both the identified districts where the mango fruit is being grown extensively was prepared. From the list so prepared, Ratnagiri and Rajapur tehsils of Ratnagiri district and Deogad and Malvan tehsils of

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SCIENTIFIC TOOL FOR MEASUREMENT OF ICT KNOWLEDGE OF EXTENSION PROFESSIONALS

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ABSTRACT

The present era is rightly termed as an "Information era". In this 'Age of Knowledge' information and wide access to it is considered as wealth. People want adequate and authentic information as early as possible. In recent years, there is visible shift from the old ways to the modern ways of information delivery system. ICTs are increasingly being adopted as effective tool for reaching rural communities. Yet the benefits of the information revolution are still much debated, particularly, in case of developing countries like India.

INTRODUCTION

Information and Communications Technology (ICT) is a global term that includes all technologies for the manipulation and communication of informationencompassing: computers, internet, cell phones, and network hardware and software, satellite systems and so on, as well as the various services and applications associated with them. ICTs in fact encompass any medium for recording and broadcasting information like magnetic disk, optical disk, CD/ DVD, flash memory etc. Information and Communication Technologies are defined as electronic and digital technologies for storing, processing, transferring of information and communication. They are enabling technologies that allow quicker and more efficient exchange and processing of information.These new technologies are based on the silicon chips, the laser, fiber optics and a set of varying and diversified technologies. These include a wide variety of computing hardware (PCs, servers, mainframes, networked storage), personal hardware comprising mobile phones, personal devices, MP3 players, and much more; the full gamut of application software ranges from the smallest home developed spreadsheet to the largest enterprise packages and online software services; and the hardware and software needed to operate networks for transmission of information, again range from a home network to the largest global private networks operated by major commercial enterprises and of course, the internet.

Over the last three decades, remarkable developments have taken place in information and communication technology. The ICTs like desktop and laptop computers, tablet PCs, internet enabled technologies like e-mail, e-commerce, e-learning, e-conferencing, MIS, and other online services, cell phones, smart phones, tablet phone and mobile enabled services like SMS, MMS, GPRS, Mass messaging, Interactive voice response services, multimedia devices like web camera, digital camera, handy cam, data card, blue-tooth, pen drive, CD-ROMs & DVDs, various types of call centers, information kiosks, touch screen systems, expert systems, teleconferencing, video conferencing, computer assessed services, print media, electronic media, wireless application protocol (WAP), points of presence (pops), mixed media, satellite phone, FM radio, community radio, web based GIS and remote sensing have become fairly common among people.

The relevance of ICTs for agricultural development in general and for agricultural extension in particular is extremely high for a country like India. Agricultural extensionists act as direct link between the researchers and the farmers. In order to perform their role effectively and efficiently, they must havesteady access to updated agricultural information. The basic problems in attaining access to updated information are lack of awareness,

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knowledge and attitude of the extension personnel. Thus,there is a need to assess the knowledge of extension personnel on advanced ICTtools and its role in agriculture.

Therefore, it is need of time to construct and develop such tools which can accurately measure the knowledge level of extension professionals about ICT tools and techniques. Keeping in mind the above background, Scientific Tool for Measurement of ICT Knowledge of extension professionals was developed and tested for enabling future researchers in the area of ICT application in agriculture.

RESEARCH METHODOLOGY

Knowledge may be defined as a body of understood information possessed by an individual or by a culture. Knowledge was operationalized as extent of information known or possessed by the extension professionals on selected ICT tools. In the present study knowledge level of extension personnel on ICT refers to the level of knowledge possess by an individual on different ICT tools, their utility and applications in agriculture. For that purpose a test was developed. A test is a set of questions, each of which has a correct answer, to which the people respond (Ray and Mondal, 1999). For standardizing the selected items, the procedure suggested by Anastasi (1961) and followed by Srinivas et al. (2014) and Naveen kumar and Sendil kumar (2015) was adopted.

Steps for construction of knowledge test:With the help of following steps the researcher has developed the entire tool.

Item Collection: The content of knowledge test is composed of questions called items. In the entire study all the items are related to information & communication technologies. The items for the test were collected from different sources. All the statements related to knowledge of information & communication technologies were prepared with the help of relevant literature available, experts of ICT and experience of the researcher. To ensure that no important aspects have been left out, these items were again discussed with the concerned subject matter specialists and extension workers.

Initial Selection of Items: Following criteria was taken into consideration for initial selection of item.

i. The item which was able to discriminate the well informed people from poorly informed people was selected.

ii. The items which were not understandable by people and the items which can be correctly answered by all or none were not included for the knowledge test.

iii. Knowledge item is the matter of fact and statement. So the items related to the fact and statements were selected.

iv. Item that motivate thinking rather than simple memorization were selected.

On the basis of above criteria 83 items were initially selected out of total 90 items collected for the test.

Administration & scoring of knowledge test items: For purpose of study, 60 agricultural extension personnel of grass root level and middle level agricultural officers were selected randomly from Bundi and Kota district of Rajasthan state. Bundi and Kota districts were selected purposively. All the 83 knowledge items were administered to randomly selected 60 agricultural extension personnel and their responses were recorded and used for calculating the difficulty index and discrimination index of each item.

Scoring Pattern: The respondents were asked to indicate their responses to each item in the knowledge test, and the correct answers were assigned score of 1, 2, 3 & 4 and incorrect answers a score of '0'. The total knowledge score for each item was calculated by summing up the scores given by all the respondents to the item.

Item Analysis: The item analysis yields two indices i.e. difficulty index and discrimination index which was computed by following steps.

i. The items were checked and modified

before administering as per necessity.

ii. The schedule was administered to the randomly selected respondent (60 respondents) for item analysis. These respondents will not be included in the sample for final study.

iii. The knowledge score of the individual respondent was calculated. The number of correct answer given by the respondent out of total items was the knowledge score.

iv. The knowledge score was arranged from highest to lowest order of magnitude or arranged in descending order.

v. The respondent were divided in to six groups (G1, G2, G3, G4, G5, G6) and arranged in descending order of the knowledge score.

vi. For the item analysis two middle groups G3, G4 were eliminated. Only four group with high and low score were considered for computation of difficulty index and discrimination index.

Calculation of Difficulty Index: On the basis of below given formula Pi was calculated which is shown in the following table.

$$P_i = n_i \div N_i \times 100$$

Where:

Pi = Difficulty index in % of ithitem.

ni = Number of respondent given correct answer to the ith item.

Ni = Total number of respondents to whom the ith item was administered.

Calculation of Discrimination Index: On the basis of below given formula discrimination index was calculated which is depicted in the following table.

$$E^{1/3} = (S_1 + S_2) - (S_5 + S_6) \div N/3$$

Where:

S1 ,S2 , S5 , S6: Were the frequencies of correct answers in group G1, G2, G5, G6

N = Total number of respondent in the sample of item analysis.

RESULTS AND DISCUSSION

Initial attempt was to prepare knowledge items that were found suitable for measuring the knowledge of agricultural extension personnel on ICT tools. For assuring the content validity, thorough review of relevant literature and discussion with experts were carried out for the purpose. Accordingly, 90 knowledge items were prepared. After making necessary modifications, a total of 83 items were screened out.

Final selection of items for test:

i. The final selection of the items was done on the basis of difficulty index & discrimination index.

ii. The range of the difficulty index was 8.33 to 93.33

iii. The range of the discrimination index was 0.10 to 0.92

iv. These values of indices were fixed on the basis of calculated value depicted in the table.

v. On the basis of difficulty index the 03 items were deleted.

vi. On the basis of discrimination index the 05 items were deleted.

vii. On the basis of both indices the total 08 items were selected out of 83 and 75 items were selected for final scale.These selected items are presented in the table.

Reliability of the test: According to Karlinger (1967) "Reliability is the accuracy or precision of measuring instrument". Here test-retest method was used for measuring the reliability of knowledge test. The test was administered to the same group of respondents numbering 30 at an interval of 15 days. The agreement between the scores was obtained from the two applications of same scale by means of correlation coefficient (rtt), which is called coefficient of dependability. The correlation

S. No.	Item/Statement	Difficulty Index	Discrimination Index
1.	What is computer?	91.66	0.25
2.	What is PC?	70.0	0.18
3.	What are the advantages of computer?	67.08	0.52
4.	Name the major manufacturer companies of computer.	54.16	0.60
5.	What is approximate cost of computer (PC)?	93.33	0.35
6.	Name the major parts of the computer.	62.91	0.85
7.	What is brain of the computer?	63.33	0.75
8.	Name the important input devices of computer	42.5	0.80
9.	What is the nature of printer as device?	42.33	0.35
10.	Name the important hardware of the computer.	52.08	0.35
11.	Name the software commonly used for computer application in agriculture.	29.16	0.90
12.	What is the latest version of operating system?	13.33	0.36
13.	What is the function of RAM in computer?	40.0	0.32
14.	What is the function of ROM?	8.33	0.65
15.	Give names of storage devices.	49.58	0.25
16.	What for saveas option in computer?	23.33	0.85
17.	What is the function of following shortcut keys	45.41	0.89
18.	What is use of sort option in computer?	11.66	0.78
19.	How do you create a new folder?	61.66	0.80
20.	How will you close the files, documents and programmes?	90.33	0.22
21.	Name commonly use font type for English typing.	60.0	0.92
22.	What is byte?	20.0	0.88
23.	What is Internet?	85.0	0.55
24.	Name the important internet service providers.	72.08	0.72
25.	What are the advantages of the Internet?	50.83	0.43
26.	What is WWW?	35.0	0.45
27.	What is high speed internet service?	43.33	0.85
28.	What is WiFy?	51.66	0.90
29.	What is data card?	56.66	0.30
30.	Name the essential devices for Internet conferencing (Audio and video).	32.50	0.80
31.	State the uses of Internet.	45.41	0.65
32.	What is mail ID?	61.66	0.60
33.	Give major search engines for searching desired information.	43.88	0.70
34.	Name the important websites for getting agriculture informations.	56.33	0.78
35.	What is LAN?	50.0	0.88
36.	What is WAN?	16.66	0.90
37.	What is mobile phone?	92.00	0.22
38.	Name the important manufacturer companies of mobile phone.	83.75	0.30
39.	Name the different types of cell phones.	43.75	0.45
40.	What is sim card?	92.0	0.26

41.	What are the basic requirements to buy a sim card?	79.16	0.15
42.	What is memory card?	83.33	0.54
43.	What are the advantages of mobile phone?	77.91	0.58
44.	State the name of mobile phone service provider	80.83	0.65
45.	Which type of mobile is useful for internet browsing?	60.0	0.70
46.	What are the uses of mobile phone?	71.25	0.84
47.	What is GPRS service?	43.33	0.92
48.	What type of agriculture information can be accessed through cell phone?	71.11	0.91
49.	What is Bluetooth service?	45.83	0.50
50.	What is IFFCO Kisan Sanchar Limited (IKSL)?	58.33	0.10
51.	What is 3 G service?	55.0	0.42
52.	What is Kisan Call Center?	92.0	0.32
53.	What is dialing number of Kisan call center?	90.00	0.15
54.	What are the timings for calling Kisan call center?	55.0	0.64
55.	What are the advantages of Kisan Call Center?	67.5	0.60
56.	What is the language used by experts for farmer's quarry?	60.0	0.60
57.	Name the mode of service to the farmers by Kisan Call Center.	31.66	0.55
58.	Name the fields in which Kisan Call Center provides the informations.	75.11	0.44
59.	Name the location of nodal office for Kisan call center in Rajasthan.	31.66	0.70
60.	Who is nodal officer of Kisan Call Center in Rajasthan?	19.66	0.80
61.	What is toll free number of CFCL agro services "Hello Uttam".	15.0	0.86
62.	What is toll free number of Mahindra KrishiMitra agro-advisory services?	20.0	0.82
63.	At how many levels information can be had through Kisan Call Center	42.22	0.75
64.	What is information kiosk?	48.33	0.85
65.	What kind of informations can be obtained from information kiosks?	21.66	0.78
66.	In which year Common Service Center (CSC) was started	26.66	0.86
67.	Who establish the Common service centers (CSCs)?	18.0	0.90
68.	What are the advantages of the information kiosk?	37.91	0.85
69.	What is common structure of information kiosk?	20.0	0.75
70.	Who is responsible for establishing Dairy Information Services Kiosks (DISK)?	41.66	0.90
71.	Name the services provided by Dairy Information Services Kiosks (DISK).	22.91	0.88
72.	What is Jan Mitra project?	21.66	0.55
73.	Who initiated E–Chopal?	80.0	0.55
74.	What designated name is for operator of common service center at village level?	33.33	0.91
75.	How many villages are covered by one CSC?	30.0	0.90

coefficient (rtt) calculated was 0.83 which was significant at 1 per cent level of significance indicating that the scale is reliable.

Validity of the test: The validity of the test depends upon the fidelity with which it measures what it is expected to measure. To find out the validity of the test content and construct validity of the test was examined. Questions were properly selected to cover the whole universe of the content of the knowledge. The selected questions were presented to a panel of subject matter specialists of information & communication technologies to find out the jury validity. All the experts rated the test as highly valid for measuring the knowledge of respondents about information & communication technologies. Only those questions which secured 80-85 per cent occurrence of expert's opinion were included in the final knowledge test.

Administration & scoring of knowledge test items: The selected items on the basis of indices were incorporated in the final format of the interview schedule for administration to the sample respondent. The obtained score of these respondents will reflect the knowledge level of the sample.

CONCLUSION

The scientific proccedure was used to develop a test to measure the knowledge of Extension professonals about information and communication technology. The relaibility and validity of this test was measured and finally 75 questions were finalized for inclusion of knowledge test.

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Sindhudurg district were selected on the basis of maximum area under mango cultivation. For selection of villages, five villages having maximum area under mango cultivation were selected from each identified tehsils. Thus, in all twenty villages were selected. To select the respondents, a category-wise comprehensive list of small and big orchardists of respective villages were prepared with the help of revenue officials and officials of State Agriculture Department. From the list so prepared, five small and five big orchardists were selected randomly from each identified village. Thus, in all 200 farmers (100 small and 100 big orchardists) were included in the sample study.

RESULTS AND DISCUSSION

1. Socio-economic constraints in adoption of eco-friendly management practices of mango

The socio-economic constraints experienced by the mango orchardists in adopting the eco-friendly management practices of mango are given below:

1.1 Social constraints: The social constraints experienced by the mango orchardists in adopting the eco-friendly management practices are given in table 1.

It can be observed from the data accorded in table 1 that 'lack of skilled labour' in the study area was serious constraint of mango orchardists. Nearly ninety per cent of the respondents have experienced skilled labour problems and accorded 1st in the rank order. Similarly, 'unavailability of labour in peak period' as constraints was faced by fair majority (86.67 %) of the orchardists which accorded 2nd ranked by the respondents.

The orchardists are suffering due to 'lack of co-operation among the mango growers'(85.00 %) with 3rd rank accorded to this constraint. The other constraints 'lack of co-operation between mango growers and extension agencies' (78 %), 'cultivable land is turning to non-agricultural land' (76.47 %) were experienced by the mango orchardists. 'Lack of effective leadership in the village' (64.83 %) and 'lethargic nature of farmer' (64.33 %) were not in

Table 1 : Social constraints perceived by the mango orchardists

S. No.	Social constraints	Small orchardists		Big orchardists		Total (n = 200)	
		MPS	Rank	MPS	Rank	MPS	Rank
1.	Lack of co-operation among the mango growers.	83.00	3	87.00	2	85.00	3
2.	Lack of co-operation between mango growers and extension agencies.	80.00	4	76.00	4	78.00	4
3.	Lack of skilled labour.	89.33	2	90.33	1	89.83	1
4.	Unavailability of labour in peak period.	92.00	1	81.33	3	86.67	2
5	Cultivable land is turning to non-agriculture land.	78.61	5	74.33	5	76.50	5
6	Lack of effective leadership in the village.	68.33	6	61.33	6	64.83	6
7	Lethargy nature of farmer.	68.33	7	60.33	7	64.33	7

MPS = Mean Per cent Score $\lfloor r_s = 0.8928^{**} \rfloor$

** = Significant at 1 per cent level of significance

agreement with significant number of mango orchardists and as such was accorded 6th and 7th rank in order by the respondents.

The rank order correlation co-efficient was calculated between the ranks accorded by the small and big mango orchardists about social constraints in adopting the eco-friendly management practices of mango. The calculated value of rank order correlation co-efficient (rs) was found to be 0.89 which is statistically significant at 1 per cent level of significance. While comparing the data individually for small and big orchardists, it was observed that both the categories have experienced the constraints with the similar magnitude resulting into significant rank order correlation between the ranks accorded by them.

These findings are similar with findings of Anony (2011b), Anony (2013) and Anony (2014b).

1.2 Economic constraints: The economic constraints experienced by the mango orchardists in adopting the eco-friendly management practices of mango are given in table 2.

The data accorded in table 2 clearly visualized that 'high labour charges' was perceived to be a severe constraint by maximum number of orchardists

Table 2 : Economic constraints perceived by the mango orchardists

S. No.	Economic constraints	Small orchardists		Big orchardists		Total (n = 200)	
		MPS	Rank	MPS	Rank	MPS	Rank
1.	High cost of organic fertilizer.	90.00	2	91.00	2	90.50	2
2.	High cost of organic insecticides and bio-pesticides.	89.00	3	86.33	3	87.67	3
3.	High labour charges.	91.33	1	92.67	1	92.00	1
4.	Lack of credit institution at village level.	69.33	9	75.00	9	72.17	9
5.	Lack of sufficient credit in peak period.	74.00	8	75.67	8	74.84	8
6.	Difficult and lengthy procedure for getting loan.	76.00	7	76.00	7	76.00	7
7.	Fencing cost is high.	84.00	5	85.33	4	84.67	5
8.	Cost of cold storage is high.	67.33	11	63.67	10	65.59	10
9.	High transport cost.	68.67	10	47.67	11	58.17	11
10.	Lack of capital.	80.67	6	82.67	6	81.67	6
11.	High electric charges.	49.00	12	38.00	12	43.50	12
12.	High cost of packaging material	86.67	4	85.33	5	86.00	4
13.	Cost of kerosene is high	49.00	13	38.00	13	41.50	13

MPS = Mean Per cent Score

$\lfloor r_s = 0.9890^{**} \rfloor$

** = Significant at 1 per cent level of significance

with (92 %) with 1st rank. 'High cost of organic fertilizers' (90.20 %) and 'high cost of organic insecticides and bio-pesticides' (87.67 %) were perceived to be severe constraints to mango orchardists and ranked 2nd and 3rd by the respondents, respectively.

The severe constraints experienced by the respondents were 'high cost of packaging material' (86 %), 'cost of fencing is high' (84.67 %), 'lack of capital' (81.67 %), 'difficult and lengthy procedure for getting loan' (76 %) with 4th, 5th, 6th and 7th rank in the rank order, respectively. The comparatively less severe constraints like 'lack of sufficient credit in peak period' (74.84 %), 'lack of credit institution at village level' (72.17 %), 'cost of cold storage is high' (65.59 %), 'high transport cost' (58.17 %) were experienced by the mango orchardists and ranked 8th to 11th, respectively. 'High electric charges' (43.50 %) and 'cost of kerosene is high' (41.50 %) were not issue to bothering much to the orchardists and as such were accorded lower rank (12th and 13th) to these.

The rank order correlation co-efficient was calculated between the ranks accorded by the small and big orchardists about economic constraints in adopting the eco-friendly management practices of mango. The calculated value of rank order correlation co-efficient (rs) was found to be 0.98 which is statistically significant at 1 per cent level of significance. Thus, it was inferred that there was significant correlation between small and big orchardists with regard to assigned ranks about economic constraints in adopting the eco-friendly management practices of mango.A comparative view of data regarding big and small orchardists clearly indicates that there exists no much difference in their perception on economic constraints, resulting into highly significant rank order correlation between two categories of orchardists.

These findings are similar with findings of Anonymous (2011b).

2. Suggestions offered by mango growers to overcome the socio-economic constraints in adoption of eco-friendly management practices of mango

The various suggestions given by the respondents to overcome the socio-economic constraints and for improving the existing level of knowledge and adoption of eco-friendly management practices of mango in the study area. The suggestion wise distribution of mango growers for improving the existing level of knowledge and adoption of eco-friendly management practices of mango is presented in Table 3.

To know the suggestions received from orchardists, a comprehensive list of 14 suggestions was prepared and the suggestions separately for big and small orchardists were recorded accordingly. A close observation of the data indicate that 'bio fertilizers should be made available at low cost' (98.17%) was suggested by nearly all the orchardists in the study area and accorded rank 1st in rand order. The constraint 'supportive role of the govt. in marketing, subsidy and loan for eco-friendly mango' (87.67%) ranked second.

A fair majority of the orchardists suggested that 'transport should be done on co-operative basis' (80.50%) and special encouragement for eco-friendly mango products by way of adequate premium price incentives (80.50%) which ranks 3rd and 4th. Similarly quite a significant number of respondents had suggested 'Low cost boxes which are also suitable for transport should be developed (80.00%) with 5th rank.

It is interesting to note that 'assuring availability of quality organic manure with reasonable prices at village level' (77.67 %) and 'SAUs should find out low cost technology for PHT' (77.67 %) were ranked 6th and 7th in the rank order.

Mango orchardists of the study area are quite concern with the 'initial incentives are necessary for converting conventional orchard to eco-friendly' (75%) and 'financial support through credit facilities at village level' (75%) were ranks 8th and 9th in rank order.

The other important suggestions from orchardists were 'make availability of Kerosene on subsidized

Table 3: Suggestions offered by mango growers to overcome the socio-economic constraints

S. No.	Suggestions	Small orchardists		Big orchardists		Total	
		MPS	Rank	MPS	Rank	MPS	Rank
1.	Supportive role of the govt. in marketing, subsidy and loan for eco-friendly mango.	87.67	7	87.67	7	87.67	2
2.	Assuring availability of quality organic manure with reasonable prices at village level.	78.67	13	76.67	18	77.67	6
3.	Initial incentives are necessary for converting conventional orchard to eco-friendly.	74.33	21	75.67	20	75.00	8
4.	Bio-fertilizer should be made available at low cost.	99.33	1	96.67	3	98.17	1
5.	Financial support through credit facilities at village level.	74.67	20	75.33	21	75.00	9
6.	Special encouragement for eco-friendly mango products by way of adequate premium price incentives.	83.00	10	77.00	17	80.00	4
7.	Credit awareness among mango growers about special benefits of eco-friendly mango should be made.	48.00	34	52.00	32	50.00	13
8.	SAUs should find out low cost technology for PHT	74.67	19	80.67	14	77.67	7
9.	Cold storage facilities should be established in the pockets on co-operative basis.	53.00	32	52.00	33	52.50	12
10.	Transport should be done on co-operative basis.	67.67	24	93.33	5	80.50	3
11.	Low cost boxes which are also suitable for transport should be developed.	79.00	12	81.00	13	80.00	5
12.	Scheme should be launched for eco-friendly mango production.	62.00	31	63.33	30	62.67	11
13.	Policy for developing processing units in the area should be made.	49.67	33	49.67	34	49.67	14
14.	Make availability of Kerosene on subsidized rate to mango growers in peak period only.	75.33	18	72.67	22	74.00	10

MPS = Mean Per cent Score $\llcorner r_s = 0.81^{**} \lrcorner$

** = Significant at 1 per cent level of significance

rate to mango growers in peak period only' (74%), 'scheme should be launched for eco-friendly mango production'(62.67%), 'cold storage facilities should be established in the pockets on co-operative basis' (52.50%), 'credit awareness among mango growers about special benefits of eco-friendly mango should be made' (50.00%) and 'policy for developing processing units in the area should be made' (49.67%) and accorded 10^{th} to 14^{th} rank, respectively in the rank order.

The rank order correlation co-efficient was calculated between the ranks accorded by small and big orchardists to the suggestions offered by two category of respondents. The calculated value of rank order correlation co-efficient (rs) was found to be 0.81 which is statistically significant at 1 per cent level of significance. Thus, it was inferred that there was significant correlation between small and big orchardists with regard to assigned ranks.

This findings are in line with findings of Singh (2010), Anony (2011a) and Anonymous (2011a).

CONCLUSION

1. The number of socio economic constraints are quite high, it is therefore suggested that the priority of constraints based on severity may be taken up in phased manner and followed.
2. Major Suggestions for improving the existing level of knowledge and adoption of eco-friendly management practices of mango offered by respondents were 'bio fertilizers should be made available at low cost' (98.17 %), "supportive role of the govt. in marketing, subsidy and loan for eco-friendly mango' (87.67 %), 'transport should be done on co-operative basis' (80.50 %) and 'special encouragement for eco-friendly mango products by way of adequate premium price incentives' (80.50%).
3. It is indicated that there is no significant difference in suggestions given by small and big orchardists for improving the existing level of knowledge and adoption of eco-friendly management practices of mango.

It is therefore recommended that the concern agencies should consider them according to severity. Since mango commodity is foreign exchange earner, the government should release separate funds to overcome the problems contorting to orchardists in a potential area. The numbers of constraints are quite high, it is therefore suggested that the priority of constraints based on severity may be taken up in phased manner and followed.

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IMPACT OF NAIP IN TERMS OF SEED REPLACEMENT AND ADOPTION OF NEW VARIETIES OF VEGETABLES AND FRUIT PLANTS IN SOUTHERN RAJASTHAN

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ABSTRACT

The present study was conducted in tribal dominated district of southern rajasthan. Total 28 villages were selected from 10 clustors of Udaipur, Dungarpur, Banswara and sirohi districts of the state. For the selection of respondents total 288 beneficiary farmers were selected randomly. The results of the study revealed that seed replacement intervention could exert desirable influence on the beneficiaries of tribal area farmers of horticulture based IFS. Further, it was not noted that local varieties of fruits and vegetables were replaced from improved as well as hybrid varieties in the study area.

INTRODUCTION

The Indian council of Agricultural Research launched a new initiative named as "National Agricultural Innovation Project (NAIP)" with financial assistance from the World Bank. The overall objective of NAIP is to facilitate an accelerated and sustainable transformation of Indian agriculture, so that it can support poverty alleviation and income generation through collaboration, development and application of agricultural innovations by the public organizations, in partnership with the farmers, the private sectors and other stakeholders.

Attaining livelihood and nutritional security, improved quality of life and sustainability of agriculture is an important goal for the governments. The productivity and profitability of the tribal regions in the country has not improved. It was worth mentioning that four districts of Rajasthan viz. Udaipur, Banswara, Dungarpur and Sirohi figure prominently as the disadvantaged districts identified by the planning commission based on income, tribal population, their resources and state of agriculture, etc. Food self sufficiency still eludes the major segment of the population in this region. This has led to growing disparity in the standard of living and social inequity. The agriculture in this region is the main stay of the people, yet it is at a subsistence level because of low productivity and income.

In the consortia project of NAIP under MPUAT, Udaipur, has implemented two models. (i) Horticulture based IFS and (ii) livestock based IFS model with judicious mix of proven need assessed technologies, appropriate for small and marginal farmers encompassing end to end approach were planned for development of appropriate replicable models. The public private partnership in a consortia mode was expected to accelerate the pace of sustainable development and increasing productivity. Cluster approach in a specific sites differing in natural resource base in four identified district was chosen. Appropriate, sound and effective baskets of technologies aimed at propelling agricultural transformation leading to increase in farm employment, increased productivity and profitability. Better management of natural resources, processing and value addition and federating farmers for marketing of their produce were the another strategies for research. The strategies developed drawn heavily on the past proven technologies, testing them in integrated and holistic manner and having multiple technology options for increased income leading to better quality of life to families in the clusters identified for creating sustainability fund through farmers' contribution, which will take care

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of post project sustainability.

Looking to the importance of models implemented under NAIP, the present study was undertaken to find out the impact of technologies adopted by the farmers in the study area.

RESEARCH METHODOLOGY

The present study was undertaken the NAIP project implemented by MPUAT, in Udaipur, Durgapur, Banswara and Sirohi districts of Rajasthan. District and clusters were selected purposely due to working area in the state. From the selected clusters, 10 clusters, where NAIP was implemented. For the selection of villages, there were 78 villages, in which the NAIP was executed, out of these, 28 were the sampled villages for conducting the Mid-term evaluation. Therefore, purposively, these 28 villages were considered for the present study. A total 130200 Beneficiaries were covered under NAIP in 78 villages of 10 clusters. But sampled respondents for mid-term evolution of consortia NAIP were as many as 66 each from 10 clusters (total 660). Out of these 660 total sampled respondents of consortia project, 288 beneficiaries were selected for the present investigation. Thereafter, collected data were analyzed, tabulated and interpreted in the light of above objective. The SPSS 13.0 version software was used for statistical analysis of data.

RESULTS AND DISCUSSION

Seed replacement of vegetable crops during execution of NAIP

One of the components of NAIP intervention was the replacement of local seeds of vegetables with hybrid seeds. The results are presented in Table 1. It is obvious from the table that on the whole, the seeds of brinjal, okra, chilly, bottle gourd, cauliflower, cabbage and tomato were completely replaced with hybrid varieties as expressed by 176 (61.11 per cent), 174 (60.42 per cent), 173(60.07 per cent), 173(60.07 per cent), 173(60.07 per cent), 170(59.03 per cent), and 169(58.68 per cent) respondents, respectively.

The seeds of onion were also replaced substantially, the table further depicts that the seeds of eight defined vegetables were substantially

Table 1. Seed Replacement of Vegetable crops during the execution of NAIP

Vegetables	Udaipur		Sirohi		Dungarpur		Banswara		Total	
	C f	P f	C F	P f	C f	P f	C f	P f	C F	P F
Okra	68(59.15) 15.55*	47 (40.87) 13.74*	37(67.27) 14.34*	18(32.73) 14.17*	38(55.88) 14.29*	30(44.12) 14.29*	31(62.00) 14.03*	19(38.00) 14.73*	174(60.42) 13.95*	114(39.58) 14.11*
Chilly	66(57.39) 13.15*	49 (42.61) 14.33*	37(67.27) 14.34*	18(32.73) 14.17*	38(55.88) 14.29*	30(44.12) 14.29*	32(64.00) 14.48*	18(36.00) 13.95*	173(60.07) 13.87*	115(39.93) 14.23*
Brinijal	68 (59.13) 13.55*	47 (40.87) 13.74*	37(67.27) 14.34*	18(32.73) 14.17*	38(55.88) 14.29*	30(44.12) 14.29*	33(66.00) 14.93*	17(34.00) 13.18*	176(61.11) 14.11*	112(38.89) 13.86*
Tomato	63 (54.78) 12.55*	52 (45.22) 15.20*	36(65.45) 13.95*	19 (34.55) 14.96	38(55.88) 14.29*	30(44.12) 14.29*	32(64.00) 14.48*	18(36.00) 13.95*	169(58.68) 13.55*	119(41.32) 14.73*
Bottle guard	67 (58.26) 13.35*	48(41.74) 14.04*	37(67.27) 14.34*	18(32.73) 14.17*	38(55.88) 14.29*	30(44.12) 14.29*	31(62.00) 14.03*	19(38.00) 14.73*	173(60.07) 13.87*	115(39.93) 14.23*
Cabbage	63 (54.78) 12.55*	52 (45.22) 15.20*	37(67.27) 14.34*	18(32.73) 14.17*	38(55.88) 14.29*	30(44.12) 14.29*	32(64.00) 14.48*	18(36.00) 13.95*	170(59.03) 13.63*	118(40.97) 14.60*
Cauliflower	68(59.13) 13.55*	47 (40.87) 13.74*	37(67.27) 14.34*	18(32.73) 14.17*	38(55.88) 14.29*	30(44.12) 14.29*	30(60.00) 13.57	20(40.00) 15.50*	173(60.07) 13.87*	115(39.93) 14.23*
Onion	39(66.10) 7.77*	20(33.90) 5.85*	25(40.32) 9.69*	37(59.68) 29.13*	24(53.33) 9.02*	21(46.67) 10.00*	32(64.00) 14.48*	12(27.27) 9.30*	120(57.14) 9.62*	90(42.86) 11.14*
Total	502(59.48) 100.00*	342(40.52) 100.00*	258(61.01) 100.00*	127(32.99) 100.00*	266(55.88) 100.00*	210(44.12) 100.00*	221(63.14) 100.00*	129(36.86) 100.00*	1247(60.68) 100.00*	808(39.32) 100.00*

f= frequency, %= Percentage, n= Total number of respondents, *= Percentage to columns, Figures in the parentheses show percentage of rows

replaced by the beneficiaries of Udaipur district followed by Sirohi and Dungarpur with little bit lesser extent of replacement by the beneficiaries of Banswara. The findings are contradictory with the findings of Intodia (2002), but are in support of Khuswha (1991).

On the basis of results, it is concluded that the seed replacement intervention had successfully been implemented in Udaipur, Sirohi and Dungarpur districts of NAIP project along with discouraging impact of seed replacement in Banswara district. Therefore, it is summarized that on the whole, the seed replacement intervention could exert desirable influence on the beneficiaries of tribal area farmers of the Horticulture based IFS.

It is recommended that such innovative

Table 2. New Varieties introduced under NAIP in identified districts

District	Fruits		Vegetables	
	Local	Varieties	Local	Varieties
Udaipur	Mango(Mangifera indica)	Amrpali, Mallika, Dashari	okra (Abelmoschus esculentus)	Parbhani kranti, pusa a-4
	Pomegranate (Punica granatum)	Ganesh, Mrudulla	Chilly (Capsicum annuum)	Pusa jowala, pusa sdabhar, pant mirch-1
	Citrus	Kagji, lakhnowi seedless	Brinjal (Solanum melongena)	Pusa kranti, pusa ankur
	Papaya(Carica papaya)	Kurg honey dew, p. Nanha, Pusa Dwarf, Pusa delisous	Onion (Allium cepa)	Pusa red, Pusa white round, Pusa madhavi
	Custard apple(Annona reticulate)	Laal sarifa, arka sahan	B.G(Lagenaria siceraria)	Pusa summer prolific long, pusa naveen, pusa hybrid-3
	Guava (Psidium guajava)	Allahabad safed, Sardar	Pumpkin(Cucurbita moschata)	California wonder, yellow wonder, arka basant, arka gorav.
			Pea (Pisum sativum)	Arkel , pusa prgati,
			Tomato (Lycopersicon esculentum)	Pusa ruby, pusa hybrid-1, pusa uphar, pusa hybrid-4
Sirohi	Mango(Mangifera indica)	Dashari, Mallika	Okra (Abelmoschus esculentus)	parbhani kranti
	Pomegranate (Punica granatum)	Dholka, Ganesh	Tomato (Lycopersicon esculentum)	Dev
	Citrus	Malta, kinnwo, kagji lime	Chilli (Capsicum annuum)	Pusa jwala, jwahar
	Papaya (Carica papaya)	Honey dew,	Brinjal (Solanum melongena)	Pusa kranti, pusa hybrid
	Guava (Psidium guajava)	Sardaar	B.G (Lagenaria siceraria)	Pusa summar prolific long, pusa hybrid-3
Dungarpur	Mango (Mangifera indica)	Mallika, sindhu	Okra (Abelmoschus esculentus)	Parbani kranti, pusa A-4
	Pomegranate (Punica granatum)	Mrdula	B.G (Lagenaria siceraria)	P.S.P.long, P.S.P. round, varad
	Citrus	Kinnwo	Chilli (Capsicum annuum)	Pusa jwala, pusha sadabhar, pant mirch-1
	Papaya (Carica papaya)	Pusa nanha, tiwan	Tomato (Lycopersicon esculentum)	Dev, pusa hybrid-1,2,4
			Brinjal (Solanum melongena)	Pusa kranti
			Onion (Allium cepa)	Pusa red, pusa white round
			Turmeric (Curcuma longa)	Sugandam, swanaa, suguna
Banswara	Mango (Mangifera indica)	Amrpali, mallika, kesure	Okra (Abelmoschus esculentus)	Parbhani kranti
	Pomegranate (Mangifera indica)	Ganesh	Onion (Allium cepa)	Pusa red
	Citrus	Malta,	Chilli (Capsicum annuum)	Pusa jwala, ujala
	Papaya (Carica papaya)	Pusa nanha	Tomato (Lycopersicon esculentum)	Dev

interventions for improvement of vegetable production, which may lead to nutritional security of beneficiaries, could be undertaken with required modifications and alterations. It is also recommended that the beneficiaries of Banswara are required to be trained and educated for replacement of local seeds of vegetables with hybrids.

New Varieties introduced under NAIP during

One of the parameters in order to evaluate the NAIP was to see that what type of new varieties have been introduced of vegetables and fruit crops which were incorporated in beneficiaries' life.

The qualitative data of table explained that the local varieties of mango, pomegranate, citrus, custard apple and guava were replaced by new varieties of mango (Mangifera indica)- amrpali, mallika, dashari, pomograneate (punica granatum)- ganesh, mradula, Papaya (Carica papaya) - kurg honey dew, pusa nanha, pusa dwarf, pusa delicious, Custard apple(Annona reticulata) - Laal sarifa, arka sahan, guava (psidum guajava)- Allahabad safed, sardar. In Sirohi district, the mango had been replaced by dashari, mallika, pomegranate (punica granatum) dholka, ganesh, citrus - malta, kinnwo, kagji lime, papaya(Carica papaya)- honey dew, similarly guava (psidum guajava)- sardaar in case of Dungarpur mango, pomegranate, citrus, papaya had been replaced by mallika, sindhu, mradula, kinnwo, pusa nanha, tiwan respectively.

In Banswara district, above given four fruits were replaced by amrpali, mallika, kesar, ganesh, malta, pusa nanha. On the other side, the new varieties of vegetables viz, okra, chilli, brinjal, onion, bottle gourd, pumpkin, pea and tomato had been replaced by parbhani, kranti A-4, pusa jwala, pusa sdabhar, pant mirch-1, pusa kranti, pusa ankur, pusa red, pusa white round, pusa madhavi, pusa summer prolific long, pusa naveen, pusa hybrid-3, California wonder, yallow wonder, arka gorav, arkel, pusa prgati, pusa ruby, pusa hybrid-1, pusa uphar and pusa hybrid-4 in Udaipur district. In case of Banswara district, the local varieties were replaced by parbhani kranti, pusa red, pusa jwala, ujala and dev respectively.

CONCLUSION

It is concluded that local varieties of fruits and vegetables in the investigation setting have been satisfactorily substituted by the hybrid varieties. Therefore, recommended that the newly introduced varieties must be continued and utilized elsewhere, because the NAIP project could emphasize the introduction of these new varieties of fruits and vegetables. The researcher found definite positive impact of NAIP on project's beneficiaries.

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DISPOSAL BEHAVIOUR, CONSUMPTION PATTERN AND EXPENDITURES ON DIFFERENT HEADS OF BACKYARD POULTRY REARING RURAL WOMEN OF BUNDELKHAND REGION OF UTTAR PRADESH

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ABSTRACT

The study was conducted in Bundelkhand region of Uttar Pradesh on selected 80 backyard poultry rearing rural women. Data reveal that overall average eggs and meat consumption per household were 67.87 eggs and 9.38kg respectively. Average eggs and meat consumption per household of Hamirpur and Banda districts were 69.75, 9.75kg and 66, 9.00kg respectively. Majority of respondents (75% & 88.75%) sold eggs and birds, respectively to others and only (25% & 11.25%) kept for self consumption. Overwhelming majority of respondents (93.75%) sold product direct to consumer while 6.25 percent in local market. It might be due to fact that rural people (consumer) were getting the quality and fresh eggs or meat without travelling to nearby local market. Average annual expenditure on food, cloth, health, education and household material were 13900, 2651.25, 2603, 1132.5 and 1745, respectively. Backyard poultry rearing rural women were found to spend more on food and minimum on education as compared to other expenditure heads. It indicates that rural women gave emphasis on food as it is a basic requirement and education is secondary for them.

INTRODUCTION

Backyard poultry has immense potential to create employment and provide nutritional security to rural. It serves as a small scale business for generating income controlled by women. The enterprise provides regular income using little inputs and the production can be solely managed by women in the household. Poultry population of India is 851.8 million in which backyard poultry 317.07 million. Total poultry has growth rate 16.81% but alone backyard poultry registered 45.79% growth rate than previous Census. Total eggs production is 103.32 billion in which backyard poultry is 18.41 billion contributing 17.8% of total egg production. Per capita availability of egg is 79eggs/year/person. Total meat production is 8.11 million tonnes in which poultry alone contributing slightly more than fifty percent (BAHFS-2019). Backyard poultry farming generates petty cash for house hold requirement in addition to provide balanced food with minimum inputs available in the rural areas. Feeding of the backyard poultry is made easily by using household wastes, farm products and green vegetation. The backyard farming contributes by improving the economic status of majority of rural families amongs lower socio-economic groups in the rural areas. A present study was undertaken to disposal behaviour, consumption pattern and expenditures on different heads of backyard poultry rearing rural women of Bundelkhand region of Uttar Pradesh

RESEARCH METHODOLOGY

This study was conducted in the purposively selected Banda and Hamirpur districts of Budelkhand region of Uttar Pradesh. From these districts two blocks from each were selected. Further two villages were selected from each block, as more number of backyard poultry rearing women was in these villages. Consolidated sampling list for each selected block was prepared. From the each

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four sampling list 20 backyard poultry rearing women were selected as respondents rearing five to ten backyard poultry since last two years or more. Thus total 80 rural women were selected for this study. The semi-structured interview schedule was used in this study to sought consumption of household, disposal behaviour and expenditure of backyard poultry farming reared by rural women. Frequency, percentage, range, mean and standard deviation were the statistical tools that used for analysing the data in this study.

RESULTS AND DISCUSSION

Household consumption of eggs and meat

Table 1 and 2 reveals that overall average eggs and meat consumption per household were 67.87 eggs and 9.38kg respectively. Average eggs and meat consumption per household of Hamirpur and Banda districts were 69.75, 9.75 kg and 66, 9.00 kg respectively.

Meat consumption per household

Table 1 reveals that majority (70.00%) of rural women had medium level of meat consumption per household (5-10kg) followed by low (16.25%, 0-5 kg) and high (13.75%, 10-15 kg). Overall average meat consumptions was 9.38 kg per year. Chaturvedani et al. (2014) found that majority respondent had low level of meat consumption.

Table 1. Distribution of rural women according to average meat consumptions per household

Meat consum-ption level (kg)	Hamirpur (n=40)	Banda (n=40)	Total (n=80)
Low (0-5)	7 (17.50)	6 (15.00)	13 (16.25)
Medium (5-10)	27 (67.50)	29 (72.50)	56 (70.00)
High (10-15)	06 (15.00)	05 (12.50)	11 (13.75)
Mean±Sd	9.75±1.82	9.00±1.65	9.38±1.81

(Figures in parentheses indicate percentage)

Egg consumption per household

Table 2 reveals that higher percentage (56.25%) of rural women were belonged to medium level consumption of eggs (60 to 120 eggs) per household followed by low (40%, 0 to 60 eggs) and high (3.75%, 120-180 eggs) per household. Overall average eggs consumptions was 78.86 per year. Farooq et al. (2004) found that per capita eggs consumption was 56.34.

Table 2. Distribution of rural women according to average eggs consumptions per family

Egg consum-ption level (kg)	Hamirpur (n=40)	Banda (n=40)	Total (n=80)
Low (0-60)	15 (37.50)	17 (42.50)	32 (40.00)
Medium (60-120)	23 (67.50)	22 (72.50)	45 (56.25)
High (120-180)	02 (05.00)	01 (02.50)	03 (03.75)
Mean±Sd	79.75±.49	77.98±.73	78.86±.37

(Figures in parentheses indicate percentage)

Disposal behaviour

Table 3 reveals that majority of respondents (75% & 88.75%) sold eggs and birds, respectively to others and only (25% & 11.25%) kept for self consumption. Overwhelming majority of respondents (93.75%) sold product direct to consumer while 6.25 percent in local market. It might be due to fact that when the rural people (consumer) needed, they were able to get the quality and fresh eggs or meat without travelling to nearby local market or weekly market.. Kumaresan et al. (2008) Rawat *et al*. (2015) also reported similar findings which revealed that majority respondents sold birds direct to consumers.

Expenditure on family requirement

Table 4 reveals that highest percentage (46.25%) of poultry rearing rural women were belonged to medium level expenditure (Rs. 16866-27933), followed by low (37.50%, Rs. 5800-16866) and high (16.25%, Rs. 27933-39000) level. Overall average family expenditure was Rs. 22032.5 per annum. Average expenditure of poultry rearing rural women of Hamirpur and Banda districts were Rs.

22667 and Rs. 21700 respectively. Further table 4 reveals that rural women spend money maximum on food (Rs. 13900) and minimum on education (Rs. 1132.5).

Table 3. Disposal behaviour of rural women

Ways (n=40) %	Hamirpur (n=40) %	Banda (n=80) %	Total of disposal
For eggs Self consumption	09 (22.50)	11 (27.50)	20 (25.00)
Selling to others	31 (77.50)	29 (72.50)	60 (75.00)
For birds Self consumption	03 (7.50)	06 (15.00)	09 (11.25)
Selling to others	37 (92.50)	34 (85.00)	71 (88.75)
Channels of Sold direct to consumers	38 (95.00)	37 (92.50)	75 (93.75)
Marketing Sold to local market	02 (05.00)	03 (07.50)	05 (06.25)

(Figures in parentheses indicate percentage)

Table 4. Distribution of rural women according to expenditure on family requirement

Expenditure (Rs.)	Hamirpur (n=40)	Banda (n=40)	Total (n=80)
Low (5800-16866)	15 (37.50)	15 (37.50)	30 (37.50)
Medium (16866-27933)	20 (50.00)	17 (42.50)	37 (46.25)
High (27933-39000)	05 (12.50)	08 (20.00)	13 (16.25)
Mean±Sd	22667±1.23	21700±1.01	22032.5±1.11

(Figures in parentheses indicate percentage)

Average annual expenditure on different heads

Table 5 reveals that average annual expenditure on food, cloth, health, education and household material were Rs. 13900, 2651.25, 2603, 1132.5 and 1745, respectively. Backyard poultry rearing rural women were found to spend more on food and minimum on education as compared to other expenditure heads. It indicates that rural women give emphasis on food as it is a basic requirement and education is secondary for them.

Table 5. Average expenditure on different heads (Rs.)

Heads	Hamirpur (n=40)	Banda (n=40)	Total (n=80)
Education	1042.50±1.20	1222.50±1.36	1132.5±1.78
Cloths	2750.00±1.22	2552.5±1.43	2651.25±1.32
Food	14350±1.99	13450±1.42	13900±1.64
Health	2575±1.22	2632.50±1.68	2603.75±1.44
Household material	1950±1.12	1540±1.137	1745±1.24

(Figures in parentheses indicate percentage)

CONCLUSION

Meat and eggs of backyard poultry are inexpensive and good source of protein for rural families. Their is need to aware rural women about importance of egg & meat for fulfill the nutrition requirement of child, young, adult, old and for women also. Government should provide vocational training to rural women about scientific poultry farming, support to initiate more poultry farming and should provide market facility also.

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ASSOCIATION BETWEEN PERSONAL VARIABLES AND UTILIZATION PATTERN OF E-RESOURCES AMONG THE POSTGRADUATE SCHOLARS

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ABSTRACT

The present study was conducted in state of Rajasthan by selecting three agriculture universities i.e. MPUAT (Udaipur), SKNAU (Jobner) and SKRAU (Bikaner) purposively. Among these three universities 180 respondents were selected randomly. The basic information regarding the personal profile characteristics were collected from the postgraduate scholars. To determine the association of each independent variable with the dependent variable i.e., utilization pattern of e-resources the chi-square test (χ^2) was used. The χ^2 clearly showed that age, training, internet use and ICT skills had significant association with the utilization pattern of e-resources at 1 percent level of significance. The other variables like academic performance and computer exposure was associated at 5 per cent level of significance. Remaining independent variables like gender and annual income did not have any association with the dependent variable.

INTRODUCTION

With the emergence of educational technology, goals, objectives and processes of teaching and learning have been continuously changing. It seems that education is affected by technology, specifically ICT, which has undoubtedly affected teaching and learning processes. Many educational systems use ICT believing its use brings many benefits to students and empower teachers and learners in terms of enhancing their learning and acquiring 21st century skills. It is generally believed that ICT presents students with a new teaching and learning environment that is more collaborative and engaging. However, despite this rapid growth in use of ICT and technology, the use of digital technologies for learning has created challenges for schools and policy makers to incorporate new skills that become necessary in today's knowledge society. However, the literature reveals that there is a dearth of studies on use of e-resources and internet in context of academics, researchers and students not only in India but also across the globe. This makes internet use a necessary condition for effective utilization of library resources. However, the use of electronic resources does not take the place of printed resources but facilitates it through access to large stock of Library materials (Okazie, 2016). The personal variables also played significant role in utilization of e-resources. Therefore, the present study was conducted with aim to find out the association between personal variables and utilization pattern of e-resources among the post graduate scholars.

RESEARCH METHODOLOGY

Rajasthan state comprises of five Agricultural Universities, out of which three Agriculture Universities were selected on the basis of post graduate programmes (M.Sc. and Ph.D. in Agriculture) are running for more than 20 years in various disciplines. 60 postgraduate scholars were selected from each identified college with the help of a random selection technique. Thus, a total of 180 postgraduate students were included in the sample of study. To determine the association of each independent variable with the dependent variable i.e., utilization pattern of e-resources the chi-square test (χ^2) was used. It gives an overall idea about the influence of different personal variables with the extent of utilization of e-resources for the academic and research work.

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Chi-square Test

In order to judge the significance of association between two attributes, we make use of Chi-square test by finding the value of Chi-square (χ^2) and using Chi-square distribution the value of can be work out as under:

$$\chi^2 = \sum \frac{(Oij - Eij)^2}{Eij}$$

Where,

Oij= Observed frequencies

Eij= Expected frequencies

i& j= 1 to n

RESULTS AND DISCUSSION

To determine the association of each independent variable with the dependent variable i.e., utilization pattern of e-resources the chi-square test (χ^2) was used. It gives an overall idea about the influence of different personal variables with the extent of utilization of e-resources for the academic and research work. The results of each variable have been presented in subsequent tables.

1. **Association between the age and utilization of e-resources:** It was obvious from the Table 1 that out of 24 respondents of less than 23 years age group, 12 (50.00 %) had medium utilization category, while 7 (29.16 %) and 5 (20.83%) respondents had high and low category of utilization pattern of e-resources, respectively. In the age of 23-27 years group, out of 127 respondents, 74.02 per cent of postgraduate scholars were under medium category of utilization pattern of e-resources, followed by high (14.96%) and low level (11.02%) of utilization pattern of e-resources. In the age group of above 27 years, majority of the postgraduate students (37.94%) had medium level, followed by 43.48 per cent and 27.58 per cent belongs to high and low level of utilization pattern of e-resources, respectively.

Data presented in Table 1 further reveal that calculated chi-square value (17.45) was found to be greater than its tabulated value at 1 per cent level of significance. Therefore, null hypothesis "there is

Table 1:Association between the age and utilization pattern of e-resources among the postgraduate scholars

N=180

S.No	Age Category	Utilization Pattern			Total	χ^2 value
		Low	Medium	High		
1.	Less than 23 years	7(29.16)[1] (24.14)[2]	12(50.00)[1] (10.26)[2]	5(20.83)[1] (14.70)[2]	24(100)[1] (13.33)[2]	17.45**
2.	23 to 27 years	14(11.02)[1] (48.28)[2]	94(74.02)[1] (80.34)[2]	19(14.96)[1] (55.89)[2]	127(100)[1] (70.56)[2]	
3.	Above 27 years	8(27.58)[1] (27.58)[2]	11(37.94)[1] (9.40)[2]	10(43.48)[1] (29.41)[2]	29(100)[1] (16.11)[2]	
	Total	29(16.11)[1] (100)[2]	117(65.00)[1] (100)[2]	34(18.89)[1] (100)[2]	180 (100)	

**Significant at 1 percent level of significance, 1=Percentage of row, 2= Percentage of column

no association between age of respondents with utilization pattern of e-resources" was rejected and alternate hypothesis was accepted. It means that age and utilization pattern are associated with each other & significant relationship is present between them.

The present findings are similar to the Yadav (2018) found that positive and significant relationship between age and awareness of e-resources.

2. **Association between gender and utilization pattern of e-resources among the postgraduate scholars:** Data presented in Table 2 indicate that out of 103 male, majority of the postgraduate scholars (65.05 %) fell under medium level of utilization pattern of e-resources, followed by 19.42 percent and 15.53 percent belongs to high and low level of utilization pattern of e-resources, respectively. Out of 77 females, 69.94, 18.18 and 16.88 per cent were found under medium, high and low level of utilization pattern of e-resources, respectively.

Further analysis of Table 2 reveals that calculated chi-square value (0.08) was less than its tabulated value at 2 degree of freedom. Therefore,null hypothesis "there is no association between gender of postgraduate scholars and utilization pattern of e-resources was accepted and alternate hypothesis was rejected. It means that both gender and utilization pattern of e-resources are independent and no association between them. Hence, there is no significant role played by gender of students in the utilization of e-resources.

These findings are in accordance with findings reported by Mwantimwa and Elia (2017) examined that on sex chi-square test confirmed that an insignificant difference was found between male and female respondents.

3. **Association between training and utilization pattern of e-resources among the postgraduate scholars:** Table 3 shows that out of 115 respondents of non-training received, 56.52 per cent of the postgraduate scholars had medium level of utilization pattern, followed by 25.22 per cent of postgraduate scholars belongs to high and 18.26 per cent of the respondents fall under low category of utilization pattern of e-resources. Out of 65 respondents of training received, majority of the postgraduate scholars (80.00 %) were found under medium category of utilization pattern of e-resources, followed by 12.31 and 7.69 per cent were belongs to low

Table 2: Association between gender and utilization pattern of e-resourcesamong the postgraduate scholars

N=180

S.No.	Gender category	Utilization Pattern			Total	χ^2 value
		Low	Medium	High		
1.	Male	16(15.53)[1] (55.17)[2]	67(65.05)[1] (57.26)[2]	20(19.42)[1] (61.76)[2]	103(100)[1] (57.22)[2]	0.08[NS]
2.	Female	13(16.88)[1] (44.83)[2]	50(64.94)[1] (42.74)[2]	14(18.18)[1] (38.24)[2]	77(100)[1] (42.78)[2]	
	Total	29(16.11)[1] (100)[2]	117(65.00)[1] (100)[2]	34(18.89)[1] (100)[2]	180 (100)	

NS=Non significant, 1= Percentage of row, 2= Percentage of column

Table 3: Association between training and utilization pattern of e-resources among the postgraduate scholars

N=180

S.No.	Training category	Utilization Pattern			Total	χ^2 value
		Low	Medium	High		
1.	No	21 (18.26)[1] (72.41)[2]	65(56.52)[1] (55.56)[2]	29(25.22)[1] (85.29)[2]	115(100)[1] (63.89)[2]	11.18**
2.	Yes	8(12.31)[1] (27.59)[2]	52(80.00)[1] (44.44)[2]	5(7.69)[1] (14.71)[2]	65(100)[1] (36.11)[2]	
	Total	29(16.11)[1] (100)[2]	117(65.00)[1] (100)[2]	34(18.89)[1] (100)[2]	180 (100)	

**Significant at 1 percent level of significance, 1=Percentage of row, 2= Percentage of column

and high category of utilization pattern of e-resources, respectively.

Analysis of data presented in Table 3 further indicate that the calculated chi-square value found to be (11.18) greater than its tabulated value at 1 per cent level of significance at 2 degree of freedom. Therefore, null hypothesis "there is no association between training with utilization pattern of e-resources among the postgraduate scholars" was rejected and alternate hypothesis was accepted. Hence, there is significant role played by the training of respondents and utilization pattern of e-resources among the scholars. It is concluded that there was association between training and utilization pattern of e-resources.

Similar findings are also reported by Chien (2012).

4. **Association between academic performance and utilization pattern of e-resources among the postgraduate scholars:** Data presented in the Table 4 show that out of 39 respondents of academic performance less than 7.00 OGPA, 30.76, 17.94 and 5.13 per cent of the post-graduate scholars were placed under high, low and medium level of utilization pattern of e-resources, respectively. Among the respondents who had 7.00 to 8.00 OGPA, majority of the postgraduate scholars (69.14 %) were belongs to medium, followed by 20.98 and 9.88 per cent were of high and low level of utilization of e-resources, respectively. Out of 60 respondents who had above 8.00 OGPA, 68.34 per cent had medium level of utilization pattern of e-resources, while 23.33 per cent of respondents found to have low level of utilization pattern of e-resources and rest of them 8.33 per cent belonged to high level of utilization pattern of e-resources.

The calculated chi-square value 12.06 is more than its tabulated value at 4 degree of freedom at 5 percent level of significance. Therefore, null hypothesis "there is no association between academic performance of respondents with utilization pattern" is rejected and alternate hypothesis is accepted. Hence, there is significant relationship between academic performance and utilization pattern of e-resources.

The results are similar with the results of Sivathaasan and Velnampy (2013) who observed that correlation value of 0.623 which is significant at 1 per cent of level of significance. It means that there is a positive relationship between utilization pattern of e-resources and academic performance.

Table 4: Association between academic performance and utilization pattern of e-resources among the postgraduate scholars

N=180

S.No.	Academic performance	Utilization Pattern			Total	χ^2 value
		Low	Medium	High		
1.	Less than 7.00	7(17.94)[1] (24.14)[2]	20(5.13)[1] (17.09)[2]	12(30.76)[1] (35.29)[2]	39(100)[1] (21.67)[2]	12.06*
2.	7.00 to 8.00	8(9.88)[1] (27.59)[2]	56(69.14)[1] (47.87)[2]	17(20.98)[1] (50.00)[2]	81(100)[1] (45.00)[2]	
3.	Above 8.00	14(23.33)[1] (48.28)[2]	41(68.34)[1] (35.04)[2]	5(8.33)[1] (14.71)[2]	60(100)[1] (33.33)[2]	
	Total	29(16.11)[1] (100)[2]	117(65.00)[1] (100)[2]	34(18.89)[1] (100)[2]	180 (100)	

*Significant at 5 percent level of significance, 1=Percentage of row, 2= Percentage of column

5. Association between annual family income and utilization pattern of e-resources among the postgraduate: Table 5 indicates that out of 53 postgraduate scholars of low income group, 60.38 per cent were of medium level of utilization pattern of e-resources. Whereas, 24.53 and 15.09 per cent respondents were observed in high and low level of utilization of e-resources group, respectively. In the group of medium annual income, 73.49, 14.46 and 12.05 percent had medium, high and low category of utilization pattern of e-resources, respectively. In high income group, majority of the post graduate scholars had medium category, followed by 25.00 and 20.45 per cent were belongs to high and low level of utilization pattern of e-resources, respectively.

Further, it was understood that calculated chi-square value (6.68) was less than tabulated value at 4 degree of freedom. Therefore, null hypothesis "there is no association between annual income and utilization pattern of e-resources" was accepted and alternate hypothesis was rejected. Thus, it is concluded that there is no any significant relation between them.

The results of the present study are in line with the findings of Shankaraiah and Swamy (2012) who found that annual income was non-significantly correlated with the attitude of farmers towards ICT.

6. Association between computer exposure and utilization pattern of e-resources among the postgraduate scholars: Table 6 indicates that in category of 1hour per day computer exposure, majority of the postgraduate scholars (62.69 %) had medium level of utilization pattern of e-resources, followed by high (22.39%) and low (14.92%) level of utilization pattern of e-resources. Out of 62 respondents with 1 to 2 hours of computer exposure, 79.03 per cent were of medium level of utilization pattern. While, 11.29 and 9.68 per cent were had low and high level of utilization pattern of e-resources, respectively. In the group of above 2 hours of computer exposure, 50.99, 25.49 and 23.52 were belonged to medium, high and low level of utilization pattern of e-resources, respectively.

Data presented in the Table 6 further indicate that the calculated chi-square value 10.56 was found to be more than tabulated value at 5 percent level of significance. Therefore, null hypothesis "there is no association between computer exposure and utilization pattern of e-resources" was rejected and alternate hypothesis was accepted. Thus, it is concluded that significant relation is present between computer exposure and utilization pattern of e-resources among the respondents.

The present results are similar with the findings of Bringula *et al*. (2017) who reported that

Table 5: Association between annual income and utilization pattern of e-resources among the postgraduate scholars

N=180

S.No	Annual income category	Utilization Pattern			Total	χ^2 value
		Low	Medium	High		
1.	Less than Rs. 1,00,000	8(15.09)[1] (27.59)[2]	32(60.38)[1] (27.35)[2]	13(24.53)[1] (38.24)[2]	53(100)[1] (29.44)[2]	6.68[NS]
2.	Rs. 1,00,000-2,00,000)	10(12.05)[1] (34.48)[2]	61(73.49)[1] (52.14)[2]	12(14.46)[1] (35.29)[2]	83(100)[1] (46.11)[2]	
3.	Above Rs. 2,00,000	11(25.00)[1] (37.93)[2]	24(54.55)[1] (20.51)[2]	9(20.45)[1] (26.47)[2]	44(100)[1] (24.45)[2]	
	Total	29(16.11)[1] (100)[2]	117(65.00)[1] (100)[2]	34(18.89)[1] (100)[2]	180 (100)	

NS=Non significant, 1= Percentage of row, 2= Percentage of column

computer exposure of the students had significant relationship with the utilization pattern of e-resources.

7. Association between internet exposure and utilization pattern of e-resources among the postgraduate scholars: Data reported in the Table 7show that majority of respondents (49.15%) in < 1 hour per day internet exposure had medium level of utilization pattern of respondents. Among the postgraduate scholars who had 1 to 2 hours/day internet exposure, 73.07 per cent of them had medium category of utilization pattern of e-resources, followed by 15.38 per cent of the respondents had low level of utilization pattern and 11.54 per cent of the postgraduates were having high level of utilization pattern of e-resources. Out of 69 respondents who belongs to above 2 hours/day internet exposure, 72.46 per cent of them were of medium group whereas, 20.29 and 7.25 per cent were fall under low and high group of utilization pattern of e-resources, respectively.

The analysis of data presented in Table 7 further indicate that the calculated chi-square value 23.86 was found to be more than its tabulated value at 4 degree of freedom at 1 per cent level of significance. Therefore, null hypothesis "there is no association between internet exposure of postgraduate scholars and utilization pattern of e-resources" was rejected and alternate hypothesis was accepted. Hence, it is

Table 6: Association between computer exposure and utilization pattern of e-resources among the postgraduate scholars

N=180

S.No.	Computer Exposure	Utilization Pattern			Total	χ^2 value
		Low	Medium	High		
1.	< 1 hour/day	10(14.92)[1] (34.48)[2]	42(62.69)[1] (35.89)[2]	15(22.39)[1] (44.12)[2]	67(100)[1] (37.23)[2]	10.56*
2.	1 to 2 hours/day	7(11.29)[1] (24.14)[2]	49(79.03)[1] (41.89)[2]	6(9.68)[1] (17.64)[2]	62(100)[1] (34.44)[2]	
3.	Above 2 hours/day	12(23.52)[1] (41.38)[2]	26(50.99)[1] (22.22)[2]	13(25.49)[1] (38.24)[2]	51(100)[1] (28.33)[2]	
	Total	29(16.11)[1] (100)[2]	117(65.00)[1] (100)[2]	34(18.89)[1] (100)[2]	180 (100)	

*Significant at 5 percent level of significance, 1=Percentage of row, 2= Percentage of column

Table 7: Association between internet exposure and utilization pattern of e-resources among the postgraduate scholars

N=180

S.No.	Internet Exposure	Utilization Pattern			Total	χ^2 value
		Low	Medium	High		
1.	< 1 hour/day	7(11.86)[1] (24.14)[2]	29(49.15)[1] (24.78)[2]	23(38.98)[1] (67.65)[2]	59(100)[1] (32.78)[2]	23.86**
2.	1 to 2 hours/day	8(15.38)[1] (27.59)[2]	38(73.07)[1] (32.48)[2]	6(11.54)[1] (17.65)[2]	52(100)[1] (28.89)[2]	
3.	Above 2 hours/day	14(20.29)[1] (48.28)[2]	50(72.46)[1] (42.74)[2]	5(7.25)[1] (14.70)[2]	69(100)[1] (38.33)[2]	
	Total	29(16.11)[1] (100)[2]	117(65.00)[1] (100)[2]	34(18.89)[1] (100)[2]	180 (100)	

**Significant at 1 percent level of significance, 1=Percentage of row, 2= Percentage of column

concluded that there is a significant association between internet exposure and utilization pattern of e-resources by the respondents.

The present results are in line with previous studies of Bringulaet al. (2017) who found that internet exposure of the students had significant relationship with the utilization pattern of e-resources.

8. Association between ICT skills and utilization pattern of e-resources among the postgraduate scholars: Table 8 shows that out of 49 respondents who were fall in low group of ICT skills, 44.89 per cent had medium level of utilization pattern of e-resources, followed by 40.82 per cent were placed in high level group and 14.29 per cent were under low level of utilization group. In the medium group of ICT skills, 72.58 per cent of postgraduate scholars had medium level, followed by 14.52 and 12.90 per cent of respondents were fall under high and low category of utilization pattern of e-resources, respectively. Out of 69 respondents in the group of high category of ICT skills, majority of the postgraduate scholars (72.46%) belongs to medium, followed by low (20.29%) and high (7.25%) level of utilization pattern of e-resources, respectively.

Table 8: Association between ICT skills and utilization pattern of e-resources among the postgraduate scholars

N=180

S.No	ICT skills	Utilization Pattern			Total	χ^2 value
		Low	Medium	High		
1.	Low	7(14.29)[1] (24.14)[2]	22(44.89)[1] (18.80)[2]	20(40.82)[1] (58.83)[2]	49(100)[1] (27.23)[2]	23.48**
2.	Medium	8(12.90)[1] (27.59)[2]	45(72.58)[1] (38.46)[2]	9(14.52)[1] (26.47)[2]	62(100)[1] (34.44)[2]	
3.	High	14(20.29)[1] (48.28)[2]	50(72.46)[1] (42.74)[2]	5(7.25)[1] (14.70)[2]	69(100)[1] (38.33)[2]	
	Total	29(16.11)[1] (100)[2]	117(65.00)[1] (100)[2]	34(18.89)[1] (100)[2]	180 (100)	

**Significant at 1 percent level of significance, 1=Percentage of row, 2= Percentage of column

Further observation of Table 8 show that calculated chi-square value 23.48 was more than its tabulated value at 4 degree freedom at 1 per cent level of significance. Therefore, null hypothesis "there is no significant association between ICT skills of postgraduate scholars and utilization pattern of e-resources" was rejected and alternate hypothesis was accepted. Thus, it is concluded that there is significant association between them i.e. ICT skills improves the knowledge of the respondents towards the utilization pattern of e-resources

The present findings support the view expressed by Rodolfo et al. (2016) who revealed that ICT skills and utilization pattern of e-resources had positive relation with each other.

CONCLUSION

The aim of the present study was examining the association between personal variables and utilization pattern of e-resources among the postgraduate scholars it was observed that age, training, internet exposure and ICT skills had significant association with the utilization pattern of e-resources at 1 per cent level of significance. Academic performance, computer exposure was associated at 5 per cent level of significance. Remaining independent variables like gender and annual income does not had any association with utilization pattern of e-resources.

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ASSESSMENT OF KNOWLEDGE LEVEL OF THE BENEFICIARIES ABOUT PRADHAN MANTRI JAN DHAN YOJANA

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ABSTRACT

The study entitled 'Knowledge and Constraints of Beneficiaries about Pradhan Mantri Jan Dhan Yojana (PMJDY) in Udaipur District of Rajasthan' was conducted in the purposely selected Udaaipur district of Rajasthan. Two Tehsil, Girwa and Vallabhanagar were purposely selected on the basis of maximum numbers of respondents. Keeping in view the nature of study, only beneficiaries respondent who were ensured under the PMJDY were selected. Ten beneficiaries from each village were selected randomly. Thus, total 100 respondents were selected for present investigation. Data were collected through pre structured interview schedule. The study indicated that majority of respondents fell in medium level of knowledge towards Pradhan Mantri Jan Dhan Yojana. Beneficiary respondents of Girwa and Vallabhanagar tehsils possessed the maximum knowledge about the aspects like 'Business correspondent provided the knowledge about PMJDY' and 'PMJDY started in 2014'. These aspects were ranked first and second by beneficiary respondents.

INTRODUCTION

Pradhan Mantri Jan-Dhan Yojana is well know financial inclusion service started by Hon'ble Prime Minister Shri Narendra Modi on 28th August 2014 (announced on 15th August, 2014). PMJDY is National Mission for Financial Inclusion to ensure access to financial services, namely, Banking Savings & Deposit Accounts, Remittance, Credit, Insurance, Pension in an affordable manner. Account can be opened in any bank branch or Business Correspondent (Bank-Mitra) outlet. Accounts opened under PMJDY are being opened with Zero balance. However, if the account-holder wishes to get cheque book, he/she will have to fulfill minimum balance criteria. Special benefits under PMJDY scheme are like interest on deposit, accidental insurance cover of Rs. 1 lakh, no minimum balance required in account, life insurance cover of Rs. 30,000/-, easy transfer of money across India, beneficiaries of Government Schemes will get Direct Benefit Transfer in these accounts, after satisfactory operation of the account for 6 months an overdraft facility will be permitted, access to Pension, access to insurance products, accidental insurance cover with condition of RuPay Debit Card must be used at least once in 45 days and overdraft facility up to Rs. 5000/- is available in only one account per household, preferably lady of the household.

RESEARCH METHODOLOGY

The present study was conducted in Udaipur district of Rajasthan. The Udaipur district has been selected purposively on the basis of maximum number of respondents who were ensured under PMJDY. The Udaipur district comes under the administrative area of Maharana Pratap University of Agriculture and Technology Udaipur where the study was conducted. Udaipur district consists eleven tehsils, out of which Girwa and Vallabhanagar tehsils were purposely selected on the basis of maximum numbers of respondents. Five villages from each selected tehsil were identified randomly. Keeping in view the nature of study, only beneficiary respondents who were ensured under the PMJDY were selected. Ten beneficiaries from each village were selected randomly.

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RESULTS AND DISCUSSION

Knowledge level of respondents about Pradhan Mantri Jan Dhan Yojana (PMJDY)

To get an overview of the knowledge level of respondents about Pradhan Mantri Jan Dhan Yojana (PMJDY), the respondents were categorized in to low, medium and high level knowledge group on the basis of calculated mean score and standard deviation.

Table 1 reveals that out of total 100 respondents, majority of respondents (76.00%) were in medium level knowledge group, whereas, 13.00 per cent insured respondents were observed in the high level knowledge group and remaining 11.00 per cent respondents possessed low level of knowledge about PMJDY.

Analysis of Table 1 further reveals that 10 (20.00%) and 1 (2.00%) respondents were observed in low level knowledge group in Girwa and Vallabhanagar tehsil, respectively. While, 32 (64.00%) and 44 (88.00%) respondents were observed in medium level of knowledge group in Girwa and Vallabhanagar tehsil, respectively. About 8 (16.00%) and 5 (10.00%) respondents were observed in high level of knowledge group from Girwa and Vallabhanagar tehsil, respectively.

Aspect wise extent of knowledge of insured respondents: Individual aspect wise knowledge of insured respondents was also worked out for drawing a picture about the areas where insured respondents had good knowledge and where they are lacking, so that areas where respondents had low knowledge can be given more importance in future.

For working out the knowledge of respondents (both Girwa and Vallabhanagar tehsil) toward different aspects of PMJDY scheme, in all 30 statements were considered. The mean per cent score (MPS) was calculated for each statement and rank was assigned accordingly. The results have been presented in Table 2.

It is evident from the data incorporated in Table 2 that 'Business correspondent provided the knowledge about PMJDY' was the most favoured knowledge statement expressed by majority of the insured respondents with MPS 93 and was ranked first and 'PMJDY was started in 2014' was second important knowledge area perceived by the insured respondents with MPS 92 and was ranked second.

Table 2 further shows that insured respondents considered 'Type of account is saving' with 91.00 MPS and ranked third. Likewise, 'Maximum amount of Rs 10,000 can be withdrawan at a time with the help of ATM' was ranked fourth (82.00 MPS) by the insured respondents followed by 'Mera Khata Bhagya Vidhata is the slogan of PMJDY' with 68.00 MPS and ranked fifth by the insured respondents.

The table 2 further shows that 'PMJDY change the communication related to financial matters' with 62.00 MPS was ranked sixth by insured respondents, whereas, the knowledge area like 'This scheme was inaugurated by PM Shree Narendra Modi' and 'Accidental insurance cover for the new RuPay Card in PMJDY accounts opened after August 28, 2018 is 2.0 lakh' were ranked seventh by insured respondents each with MPS of 61.00. Another knowledge aspects which were important for insured respondents included 'We can also get

Table 1. Distribution of respondents according to their knowledge about PMJDY

(n=100)

S. No.	Category	Girwa		Valabhanagar		Total	
		F	%	F	%	F	%
1.	Low (<15.48)	10	20.00	1	2.00	11	11.00
2.	Medium (15.48 - 20.63)	32	64.00	44	88.00	76	76.00
3.	High (>20.63)	8	16.00	5	10.00	13	13.00
	Total	50	100	50	100	100	100

F = frequency, % = per cent

Table 2. Aspect wise knowledge of respondents regarding Pradhan Mantri Jan Dhan Yojana

n=100

S. No.	Aspects	Girwa MPS	Vallabha-nagar MPS	Total MPS	Overall Rank
1.	Business correspondent provided the knowledge about PMJDY	92.00	94.00	93.00	I
2.	PMJDY was started in 2014	88.00	96.00	92.00	II
3.	Account is saving	90.00	92.00	91.00	III
4.	Maximum amount of Rs 10,000 can be withdrawn at a time with the help of ATM	74.00	90.00	82.00	IV
5.	"Mera Khata Bhagya Vidhata" is the slogan of PMJDY	62.00	74.00	68.00	V
6.	PMJDY change the communication related to financial matters	58.00	66.00	62.00	VI
7.	This scheme was inaugurated by PM Shree Narendra Modi	56.00	66.00	61.00	VII
8.	Accidental insurance cover for the new RuPay Card in PMJDY accounts opened after August 28, 2018 is 2.0 lakh	62.00	60.00	61.00	VII
9.	We can also get our pension in PMJDY account	60.00	60.00	60.00	IX
10.	PMJDY is helpful in reducing the spread of poverty in the country	56.00	64.00	60.00	IX
11.	PMJDY reduce the dependency on local money landers	54.00	64.00	59.00	XI
12.	PMJDY reduce inequality in distribution of family monthly income	54.00	64.00	59.00	XI
13.	It is necessary to open new bank account in PMJDY	50.00	66.00	58.00	XIII
14.	NGO provided knowledge about PMJDY	58.00	56.00	57.00	XIV
15.	Mobile banking and net banking facilities are available in this account	60.00	52.00	56.00	XV
16.	PMJDY increase the reliability of the people in bank	58.00	54.00	56.00	XV
17.	The over draft facility of rupees10,000 is available after completion of six months of satisfactory conduct of the account	54.00	56.00	55.00	XVII
18.	PMJDY is the mission to open bank account for every Indian citizen	58.00	52.00	55.00	XVII
19.	No minimum balance required in PMJDY bank account	56.00	54.00	55.00	XVII
20.	PMJDY cover life insurance of Rs. 30,000	50.00	58.00	54.00	XX
21.	Illiterate person can open an account in PMJDY	54.00	54.00	54.00	XX
22.	PMJDY card also use for online purchasing	54.00	54.00	54.00	XX
23.	PMJDY account can be used for general transaction purpose	56.00	50.00	53.00	XXIII
24.	The age limit for the availing overdraft facility has been revised from 18-60 years to 18-65 years	60.00	44.00	52.00	XXIV
25.	We can open an account of PMJDY in post office	48.00	56.00	52.00	XXIV
26.	Only RuPay card is provided in PMJDY	46.00	58.00	52.00	XXIV
27.	SHG provided the knowledge about PMJDY	54.00	48.00	51.00	XXVII
28.	Account can be open in any bank including public sector bank, private sector bank and RRBs under PMJDY	52.00	46.00	49.00	XXVIII
29.	PMJDY can used as a platform for Direct Benefits Transfer (DBT) for subsidies provided by Government under other schemes	50.00	44.00	47.00	XXIX
30.	PMJDY facilitated insurance service to the account holders	46.00	46.00	46.00	XXX

MPS= Mean per cent score

our pension in PMJDY account' and 'PMJDY is helpful in reducing the spread of poverty in the country' which got 60.00 MPS and both were ranked ninth by insured respondents.

Table 2 further indicates that 'PMJDY reduce the dependency on local money lenders' and 'PMJDY reduce inequality in distribution of family monthly income' got 59.00 MPS and were ranked eleventh, while aspect like 'It is necessary to open new bank account in PMJDY' with 58.00 MPS was ranked thirteenth. Statement 'NGO provided knowledge about PMJDY with 57.00 MPS was ranked fourteenth. Statements 'Mobile banking and net banking facilities are available in this account' and 'PMJDY increase the reliability of the people in bank' with 56.00 MPS were ranked fifteenth by the insured respondents, while 'The overdraft facility of rupees10,000 is available after completion of six months of satisfactory conduct of the account', 'PMJDY is the mission to open bank account for every Indian citizen' and 'No minimum balance required in PMJDY bank account' were favoured statements with 55.00 MPS and each was ranked seventeenth by the insured respondents.

Table 2 further indicates that 'PMJDY cover life insurance of Rs 30,000', Illiterate person can open an account in PMJDY' and 'PMJDY card also use for online purchasing' got 54.00 MPS and were ranked twentieth by the insured respondents, while 'PMJDY account can be used for general transaction purpose' got 53.00 MPS and was ranked twenty-third by the insured respondents.

Table 2 further shows that insured respondents considered 'The age limit for availing overdraft facility has been revised from 18-60 years to 18-65 years', 'We can open an account of PMJDY in post office' and 'Only RuPay card is provided in PMJDY' got 52.00 MPS and ranked twenty-fourth, while 'SHG provided the knowledge about PMJDY' with 51.00 MPS ranked twenty-seventh by the insured respondents. 'Account can be open in any bank including public sector bank got 49.00 MPS and was ranked twenty-eighth. 'PMJDY to be used as a platform for Direct Benefits Transfer (DBT) for subsidies provided by Government under other schemes' was ranked twenty-ninth with 47.00 MPS. 'PMJDY facilitated insurance service to the account holders' was ranked thirtieth with 46.00 MPS.

The results shows that 'Business correspondent provided the knowledge about PMJDY' was the most favoured knowledge statement expressed by majority of the insured respondents with MPS 93 and was ranked first and 'PMJDY was started in 2014' was second important knowledge area perceived by the insured respondents with MPS 92 and was ranked second.

The aspect 'Business correspondent provided the knowledge about PMJDY' was the most favoured knowledge statement expressed by majority of the insured respondents because business correspondents were localized and they provide most of the information of benefits of scheme to local people. Business correspondents were personally recognized by the local people.

The statement 'PMJDY was started in 2014' was also one of the most favoured statement from knowledge point of view which indicates that majority of respondents were having knowledge about start year of the programme. The possible reason for high knowledge on this aspect might be that 2014 was an election year and government schemes were given high publicity during the election campaign.

CONCLUSION

Majority of the respondents (76.00 %) fell in medium level knowledge group whereas, 13.00 percent respondents possessed high level of knowledge and remaining 11.00 percent respondents possessed low level of knowledge. it may be concluded that majority of respondents possess medium level of knowledge about PMJDY because scheme was not much popular in study area. People were not well aware because of lack of proper advertisement of benefits of scheme and lack of interest in mass media. Beneficiary respondents of Girwa and Vallabhanagar tehsils possessed the maximum knowledge about the aspect like 'Business correspondent provided the

knowledge about PMJDY' and 'PMJDY started in 2014'. These aspects were ranked first and second by beneficiary respondents.

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STUDY OF KNOWLEDGE, ADOPTION AND CONSTRAINTS FACED BY FARMERS ABOUT SOIL HEALTH CARD BASED FERTILIZER APPLICATION IN RATLAM DISTRICT, M.P.

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ABSTRACT

Indian government launched soil health card programme in the year 2015-2016 in order to increase agricultural production and sustain soil health. Since inception of soil health card programme, a huge number of soil health cards have been given to the farmers. In order to know the knowledge, adoption and constraints of soil health card, the present study was carried out. The farmers who were issued soil health card were comparatively more aware about various soil health card aspects like major nutrients (N, P & K), soil pH and Soil EC and micronutrients as compared to farmers without soil health card. Data shows that maximum no. of respondents had medium knowledge score that is 56.95 % followed by respondents with low knowledge score (23.61%) and only 19.44 percent respondents had high knowledge score about soil health card. Major constraints faced by the farmers in adoption according to soil health card were difficulty in having knowledge about the importance of micronutrients, the prices of fertilizers being too high and non-availability of organic manure.

INTRODUCTION

Soil Health Card is a Government of India's scheme promoted by the Ministry of Agriculture and Farmers' Welfare. It is being implemented through the Department of Agriculture of all the State and Union Territory Governments. A Soil Health Card is used to assess the current status of soil health and, when used over time, to determine changes in soil health that are affected by land management. A Soil Health Card displays soil health indicators and associated descriptive terms. The indicators are typically based on farmers' practical experience and knowledge of local natural resources. The card lists soil health indicators that can be assessed without the aid of technical or laboratory equipment.

SHC is a printed report that a farmer will be handed over for each of his holdings. It will contain the status of his soil with respect to 12 parameters, namely N,P,K (Macro-nutrients); S (Secondary-nutrient); Zn, Fe, Cu, Mn, Bo (Micro - nutrients); and pH, EC, OC (Physical parameters). Based on this, the SHC will also indicate fertilizer recommendations and soil amendment required for the farm. The card will contain an advisory based on the soil nutrient status of a farmer's holding. It will show recommendations on dosage of different nutrients needed. Further, it will advise the farmer on the fertilizers and their quantities he should apply, and also the soil amendments that he should undertake, so as to realize optimal yields.

RESEARCH METHODOLOGY

The study was conducted in Ratlam district of M.P. The Soil Health Card prepare in all block of Ratlam district, out of which two Block were taken for

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study. For selection of villages lists of villages were prepared from the selected Block for the study purpose. There were 6 villages in the selected block where soil health card activities have been in operations in the last year 2017-18. Out of the list three villages were selected randomly for the study purpose from each selected block. This way a total of 6 villages were selected from this identified block. From the lists so prepared, 12 soil health card holders were selected randomly from each identified village. Thus, a total of 72 respondents were selected on the basis of random sampling method from the identified villages.

An interview schedule was prepared consisting of tools to measure the dependent and independent variables. The reliability and validity of the schedule were measured in order to record the authentic information from the respondents. Responses of the respondents were recorded by personal interview method by the investigator himself. The responses were then converted in to scores and transferred in master table. Data were analyzed by applying appropriate statistical tests.

RESULTS AND DISCUSSION

The findings suggested from Table-1 that maximum number of respondents had medium knowledge score that is 56.95 % followed by respondents with low knowledge score (23.61%) and only 19.44 per cent respondents had high knowledge score about soil health card. The findings are supported by Bhatt *et al.,* 2010.

Table 1. Knowledge among farmers about Soil Health Card

(n=72)

S.No	Item	Frequency	Percentage
1	Low Knowledge Level (Score up to 12.55)	17	23.61
2	Medium Knowledge Level (Score From 12.56 to 17.53)	41	56.95
3	High Knowledge Level (Score above 17.53)	14	19.44

Mean 15.04, S. D. 2.49

The data reported in Table 2 show that maximum no. of respondents had high adoption per cent related to nutrient deficiency which found in major nutrients. Adoption 97.56 per cent was found in application of Nitrogen, whereas lowest adoption percentage i.e 35.29 and 39.58 per cent was found in application of copper and boron.

The data reported in Table 3 reveal that majority of farmers (72.22 per cent) expressed difficulty in having the prices of fertilizers are too high. 69.44 percent of them expressed lack of knowledge about

Table 2 Extent of adoption of soil health card based nutrient management practices by the soil health card beneficiary farmer's.

(n=72)

S.No.	Nutrient	No. of Farmers finding soil nutrient deficient in SHC	No. of Farmers adopted according to SHC	
			Frequency	Percentage
1. Major	i. Nitrogen	41	40	97.56
	ii. Phosphorus	55	49	89.09
	iii. Potash	21	13	61.90
	iv. Sulphur	18	15	83.33
2. Micro	i. Zinc	39	29	74.36
	ii. Iron	35	21	60.00
	iii. Manganese	59	24	40.67
	iv. Boron	48	19	39.58
	v. Copper	51	18	35.29

Table 3: Constraints among farmers about soil health card

(n=72)

S.No	item	Percent	RANK
1	Difficult to understand the information on SHC without the assistance of agricultural/extension officer	56.94	V
2.	Difficulty in calculating fertilizer dose on the basis of nutrient status of soil	45.83	VII
3.	Unavailability of micronutrient fertiliser in market	58.33	IV
4.	Sometimes adequate quantity of fertilisers not available	47.22	VI
5.	Prices of fertilisers are high	72.22	I
6.	Lack of knowledge about the importance of micronutrients	69.44	II
7.	Collection of soil sample was not done as per scientific equipment & technique	31.94	IX
8.	Non-availability of NPK combination fertiliser	36.11	VIII
9.	Non –availability of Organic Manure	65.27	III

the importance of micronutrients. While, 65.27 per cent farmers expressed their view on non-availability of organic manure. Similar trend have been reported by Patel & Chauhan ,2012.

CONCLUSION

It can be concluded from this study that majority of the farmers had medium knowledge level towards soil health card. Major constraints faced by the farmers in adoption of soil health card were difficulty in having Prices of fertilisers are high, lack of knowledge about the importance of micronutrients and non-availability of organic manure. Therefore, it is suggested that the policy makers should make suitable programmes and train the farmers to use the soil health card to a maximum level.

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ADOPTION BEHAVIOUR OF HOMESTEAD VEGETABLE GROWERS ABOUT AMARANTHUS CULTIVATION

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ABSTRACT

Amaranthus is an important leafy vegetable grown in Kerala. Even though Kerala Agricultural University recommended many high yielding varieties and scientific cultivation practices for increasing the production and income of homestead growers, the expected result could not be achieved yet. Keeping this in mind, adoption behaviour of vegetable growers about amaranthus cultivation have been studied in the homesteads of Kollam district. From the study we can conclude that majority of the farmers belongs to medium level of adoption category. Further observed that among the recommended practices widely adopted practices were KAU varieties and least by adoption of plant protection measures and fertilization application.

INTRODUCTION

Among the vegetables grown in homesteads, amaranthus is an important one,which belongs to the family amarantheceae. It has an impressive nutrient profile and been associated with a number of health benefits. By considering the demand, Kerala Agricultural University released many high yielding varieties and recommended many scientific cultivation practices in order to increase the production and income of the vegetable growers. But, the expected result could not be achieved yet. Still exist some gap regarding the adoption of various cultivation practices especially in homesteads. The present investigation was therefore carried out with an objective, to identify the adoption behaviour of vegetable growers about amaranthus cultivationin the homesteads of Kollam district. The findings will give an idea about the current status of their adoption level and based on that the Scientists of KAU, officials of State Department of Agriculture, Extension scientists of KVKs, Development Organisations and other change agencies can formulate and implement plans, policies and programs for the benefit of homestead growers.

RESEARCH METHODOLOGY

The present study was conducted in AEU 12 and AEU 9 of Kollam district. Three panchayaths were selected from each zone on the basis of maximum area under selected crop. Further, twenty homesteads were selected from each panchayat. Thus, a total sample size of 120 homesteads. The data were collected with the help of pretested structured interview schedule. Then data were analyzed, tabulated and the results were interpreted in the light of objective of the study.

In this study adoption level refers to the level of adoption of recommended amaranthus cultivation practices of by the homestead growers. The homestead vegetable growers were categorized in to three group based on their obtained adoption index score. The adoption index of each respondent was calculated by using the following formula:

$$\text{Adoption Index} = \frac{\text{Total adoption score obtained by an individual}}{\text{Maximum obtainable score}} \times 100$$

Ten recommended practices included in the package of practices in vegetable cultivation were used for measuring the rate of adoption. Against each of the practice, the scoring was on a three-point continuum ranging from 'adopt', 'partially adopt' and 'not adopt' with weightage of 3, 2, and 1 respectively.

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RESULTS AND DISCUSSION

Extension services in India today have a large number of professional extension workers at national, state, district, block and village level. Several programmes are in operation throughout the country for helping the farmers to adopt the new technologies. Still there exist a wide gap between the technology available at the research end and its adoption at farm level. Keeping this in mind, an attempt has been made to know the adoption behaviour of vegetable growers about amaranthus cultivation in the homesteads. The results are discussed below:

1.1 Distribution of respondents based on their rate of adoption of KAU practices

To get an overall view of adoption level, the vegetable growers were grouped into three strata, low adoption group, medium and high adoption group based on the adoption index.

Table 1: Distribution of respondents according to their rate of adoption about KAU practices in selected vegetables

Sl. No	Category	Frequency	Percentage
1	Low (34-55)	10	8
2	Medium (56-77)	86	72
3	High (78-100)	24	20
Total		120	100

Table 1 makes it clear that of the total, 72 percentage of respondents were observed in the category of medium level of adoption. Twenty per cent of respondents were found having high level of adoption. The table also depicts that 8 percentage of the respondents were categorised in low level of adoption. It was due the fact that different extension programmes conducted by KVK, FSRS, KrishiBhavans, VFPCK, helped in rapid transfer to technology and at the same time in acceptable manner to the respondents which might have resulted in increasing the adoption level of the KAU cultivation practices. The higher knowledge possessed by the respondents, higher literacy rate and increased participation in social activities and training programmes etc had a significant role in this result. The findings are on par with the results of Natarajan (2004) who reported that majority (36.66%) of farmers were grouped into medium adoption category accompanied by high (35.56%) and low (27.78%).

From the findings it was clear that the majority of the farmers (92%) had medium to high rate of adoption about recommended technology of KAU practices, because most of the farmers were literate due to which they may read literature regarding recommended technology of vegetables. Also, they participated more in social organizations due to which they might gain more knowledge by discussing to the farmer's group leaders about recommended KAU production practices. The few number of marginal farmers having low rate of adoption (8 per cent) might be attributed due to the fear among the marginal farmers about innovation. The results of the study are fitting to the findings of Patel *et al*. (1994).

1.2. The extent of adoption of KAU practices by the respondents

In order to understand the extent of adoption of various KAU cultivation practices about amaranthus by the respondents, the recommended practices were ranked separately. The adoption scores were calculated for each practice based on the respondent's rate of adoption for amaranthus and then the results are presented below:

A close look at the table 2 reveals that majority of the respondents ranked KAU varieties as the major practice they adopted followed by transplanting. Avoid use of insecticide or fungicide maximum possible was the next practice which was adopted by most farmers. They were interested in organic farming. It might be presumably due to the awareness of respondents regarding the side effects of using pesticides. The next mostly adopted practices were use of 50 t/ha FYM as basal dose before planting, seed rate, avoid sowing of red leaved varieties during period of heavy rain to prevent leaf spot diseases in that order.

The least adopted practices were spraying of 0.1% of Malathion or Malathion 10% DP during severe cases of leaf Webber incidence, spraying 1% urea immediately after each harvest for

Table 2: Adoption scores of respondents recommended practices in amaranthus cultivation

n=120

S. No.	Vegetable practices – Amaranthus	Adoption score	Rank
1	Avoid sowing of red leaved varieties during period of heavy rain to prevent leaf spot diseases	230	6
2	Varieties : Red – Kannara local, Arun, Krishnasree Green – Co1, Co2, Co3, Mohini and Renusree	348	1
3	Seed rate is 1.5 – 2.0 Kg/ ha	255	5
4	Transplant in the late afternoon or on a cloudy day to minimize transplanting shock	340	2
5	50 t/ha of FYM as basal dose before planting	310	4
6	NPK: 50:50:50 Kg/ ha after preparing trenches	220	7
7	Top dressing of 50 Kg of N fertilizer at regular interval	180	8
8	Spraying of 0.1% of Malathion or malathion 10% DP during severe cases of leaf webber incidence	148	9
9	Spraying 1% urea immediately after each harvest for increasing yield	130	10
10	Avoid use of insecticide or fungicide if maximum possible	330	3

increasing yield, application of NPK fertilizers and top dressing of 50 Kg of N fertilizer at regular interval. The result revealed that they were using organic manures more than that of chemical fertilizers. Similar result was reported by Anju (2016). Also, the subsidy on fertilizers will increase its adoption rate. The low adoption of 'plant protection measures' which might be due to the reason that most of the growers were not using insecticides and fungicides. It might also be due to the need of special equipments for spray or their hazardous effect on human beings and non-availability of suitable insecticides and fungicides. This result also suggests that special attention of the extension personnel is needed to educate the homestead vegetable growers about the importance of adoption of recommended doses of fertilizer application and to popularize the use of organic plant protection measures by conducting demonstrations and trainings. These findings are in conformity with the earlier work of Choudhary and Bangarva (2013).

CONCLUSION

It was found that majority (72%) of the respondents were observed in the category of medium level of adoption followed by twenty percentage in high level. Majority of the respondents ranked KAU varieties as the major practice they adopted followed by transplanting and majority of the them adopted plant protection measures,weedicides chemicals, application of correct dose of fertilizer are in low level.

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AN ANALYSIS OF SOIL AND WATER RESOURCES MANAGEMENT AND IRRIGATION SYSTEMS

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ABSTRACT

Agriculture, including livestock, fishery and forestry, is the most important sector of the national economy. Agriculture and rural poverty are closely linked. Development of the agriculture sector is the key to poverty reduction and water is the most fundamental requirement for the agricultural development. Estimates by the food and Agriculture organisation of the United Nations, indicated that the world's population may reach over 9 billion by year 2050, based on the current rate of population growth. Increasing limitations in freshwater resources have increased the competition for water between various sectors and will likely continue to increase the pressure on all disciplines to use water resources more efficiently.

However, this pressure will most likely be imposed on agriculture sector more than other sectors because over 70 per cent of the total fresh water resources withdrawn worldwide are for agriculture sector. Therefore, effective and carefully designed agricultural water management programs, need to be implemented in production fields. This will enhance crop water productivity to deal with these important issues and be able to keep pace with increasing food demand.

INTRODUCTION

Soil is the thin skin covering of the land and clean water is becoming more valuable every day. To conserve these two essential resources, we have to study the interactions between soil, plants and water, which influences the way these resources are used in planning irrigation systems, tillage and cultivation practices, conservation buffers and animal production facilities. The development of the agriculture sector is placed on top priority by the government of India. This sector is perceived as the basis for food security, increased employment and export promotion. The primary means of improving food crop production will be effected by extending and upgrading irrigation systems. Overcoming constraints such as deficient flood control structures, inadequate drainage and soil erosion are also vital.

We have to apply engineering and design skills to improve water quality and minimize pollution and also learn how to use biological systems as cleaning systems, namely bio-filters and construction of wetlands for the purification of air and water. We have to review all the relevant aspects of activities related to use of water for agriculture, including water capture, storage and utilization as well as soil conservation and management practices.

Soil Erosion and Land Degradation

A priority environmental concern is land degradation including soil erosion and decline of soil fertility. The main causes of land degradation include water erosion, wind erosion, deforestation, poor agricultural practices, overgrazing and shifting cultivation. To sustain agriculture productivity, targets should have been set for the reclamation of sloping agricultural land. This included tackling soil and water conservation on hillsides and cultivated lands. Villagers often recognise that wind and water erosion are occurring on their land but they do not know about various soil conservation and land rehabilitation programmes which have being initiated through the government departments and NGO's. Soil conservation measures such as construction of spillways, bench terraces, soil sedimentation bunds and check dams to protect village range land and farmland should be carried out by taking a watershed or catchment area approach.

Due to inadequate budgets and staff, soil

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conservation activities on agricultural land are mainly limited to small demonstration plots. The emphasis is still on physical, rather than vegetative, techniques for control of runoff and erosion. Techniques such as terracing often do little to increase production and have a high labour requirement. In drier areas however, where it is more difficult to implement vegetative methods, physical methods may be needed to help plants to become established and cover the ground quickly. Many farmers are already familiar with physical techniques that have relatively low labour requirements such as contour ploughing, contour earth or stone bunds and these methods are commonly used.

Water Resources

There is considerable potential for further development of water resources and related infrastructure, but a planning and institutional framework for overall water resource management, taking full account of long term river flow data and aquifer recharge rates is vital for ensuring the sustainability of water resources. Groundwater is being widely promoted as a solution for water resources issues, particularly in the Dry Zone. However, comprehensive data on the locations, depths, extent and quality of suitable aquifers have not been adequately compiled and there is an urgent need to provide detailed hydro geological maps using remote sensing and GIS. In order to ensure the recharge of groundwater aquifers, surface water has to be managed along with groundwater in an integrated way.

There is always a danger of increasing competition between users i.e. industry hydropower plants, urban water supply schemes and farmers, overexploitation in the dry season and pollution from mining and industry. Also, inappropriate agricultural practices and the loss of forest cover are leading to siltation of reservoirs and riverbeds and to more and faster runoff causing greater variations in river flows.

For conservation measures to succeed they must be seen by farmers as a means of attaining increased production and not just as a means of controlling erosion. Low cost soil and water conservation practices in rain fed uplands can improve crop yields and reduce production risks and droughts. The emphasis should be on working across catchments to slow the movement of water through the landscape, to enhance infiltration and availability of water, and reduce erosion. Biological conservation and moisture retention techniques, which make the best use of water where it falls, increase vegetative cover and generally improve soil structure and water-holding capacity. These may include: i Contour planting, strip cropping, ii. Putting degraded sloping crop land under permanent cover of fodder grasses and legumes, iii. Minimum mechanical soil disturbance, iv. Maintaining a permanent soil cover, v. Diversified crop rotations and associations.

Irrigation

Irrigation is an age old art that has been influencing the well being of civilizations for thousands of years. Probably of greater importance historically then irrigation has been the provision of water control infrastructure to prevent flooding and to improve drainage. Irrigated agriculture has been a vital part of human civilization and has been significantly contributing to food security and aiding in reducing poverty since its beginning. Government gradually begin to replace the earth diversion weirs of the traditional systems with more stable masonry of concrete structures, replace simple canal off takes with gate structures and lining of some canals. Today, irrigation continues to play a crucial role in meeting the food demands of a rapidly growing modern civilization. With the increasing concern for food security government initiated a number of ambitious expansion and land reclamation programmes.

All new projects relying on dam construction are now multipurpose projects. Besides stoning water for irrigation, they assist in flood control, provide domestic water for urban areas or provide hydroelectricity. The priority for multipurpose projects with hydropower is an indicator of the expanding demand for energy. In some cases, an irrigation scheme is of secondary importance and only been partially developed. Considerable efforts

had been made by the government to increase water utilization in agriculture. A number of tanks, dams and weirs had been constructed, river pumping stations had been built and tube wells had been installed. Irrigated land is served by gravity systems from dams, tanks and river diversions.

The main irrigation infrastructure, including dams, weirs, rivers, groundwater pumps and the water distribution system to farm level, is constructed operated and maintained by the irrigation Department. Beneficiary farmers are expected to construct and maintain tertiary-level canals and filed ditches. Many irrigation schemes function below their potential due to inappropriate operation of reservoirs, poorly developed systems and inadequate management, operation and maintenance. Farmers frequently fail to construct and maintain the field level channels.

Improvements to irrigation structures, drainage, land levelling, and operation and maintenance, combined with a change in cropping patterns would enable cropped areas to be extended and cropping intensities to be increased in existing schemes. Small scale schemes have sometimes been developed as a component of broadly based livelihood programmes. Many individual farmers own or rent low lift diesel pumps to irrigate from rivers, groundwater and the canals within large irrigation schemes because their land is out of command. Due to the technical complexity and the high investment required, farmers are still reluctant to try sprinkler systems and drip irrigation technologies.

RESEARCH METHODOLOGY

A number of meetings and discussions with government officers, Engineers, Researchers, NGO's and farmers were carried out and visits were made to irrigation schemes of various types, water control and storage structures including floods control embankments and soil conservation activates in various regions of India. The findings of these interactions together with a detailed literature review on agriculture and natural resources, policies, strategies, programmes and projects related to agricultural water and soil management in India have been used in the preparation of this research paper.

Table 1. Respondents Profile

S. No.	Respondents	No. of Respondents	Percentage Share
1.	Farmers	10	25
2.	Engineers	12	30
3.	Govt. Officers	8	20
4.	Researchers	6	15
5.	NGO's	4	10

RESULTS AND DISCUSSION

Soil degradation has become a serious problem in both rainfed and irrigated areas of India. Widespread land degradation caused by inappropriate agricultural practices has a direct and adverse impact on the environment, food and livelihood security of farmers, inappropriate agricultural practices include excessive tillage and use of heavy machinery, excessive and imbalanced use of inorganic fertilizers, poor irrigation and water management techniques, over use of pesticides, inadequate crop residue, organic carbon inputs and poor crop planning. Agricultural activities and practices and cause land degradation in a number of ways depending on land use, crops grown and management practise adopted. Some f the common causes of land degradation by agriculture include cultivation in fragile deserts and marginal sloping land without any conservation measures, land clearing and deforestation depletion of soil nutrients due to poor farming practices, overgrazing, evasive irrigation, commercial development and land pollution through industrial waste disposal.

Development and management of watershed resources to achieve optimum production without causing deterioration to the resources is the focus of integrated watershed management. The objectives are to increase percolation of water, decrease run off and improve water availability. Saline soils are a problem on sections of a number of large government irrigation schemes. On the large gravity schemes they result from poor drainage. In

groundwater systems they come from the use of poor quality ground water sometimes combined with saline soils. Once land has become saline, reclamation is difficult, expensive and can take several years, requiring provision of good drainage and regular application of lime or gypsum. If the problem resulted from use of poor quality groundwater, farmers have to revert to rained cropping and rely on rainfall to leach the soils.

Agro forestry has significant role in reversing trend of land degradation and improve livelihood, ecosystems services in terms of soil water conservation. Thus, for ensuring food and nutritional security in one hand and conserving natural resources and ensuring environmental security in other hand, there is urgent need to employ and adopt conservation effective best practices in various aspects of agriculture and allied sectors.

CONCLUSION

- A primary means of improving food crop production will be through extending and upgrading irrigation systems and, in particular improving the availability of irrigation for crops in the dry season.
- Rehabilitation and upgrading of flood control structures and drainage works are important to protect the area form floods and to manage water resources.
- Soil erosion and land degradation in hilly and mountainous areas need to be tackled to improve land productively, to protect valuable resources such as reservoirs and lakes and reduce the silt land in rivers.
- Farmers are more likely to respond to incentives and technical assistance. These should only be used for works benefiting the community as whole such as the planting of trees, provision of materials and tools, funding of transport or equipment hire, and payment for a portion of the labour involved.
- A comprehensive analysis of the water sector, both surface and groundwater and coherent development strategy are urgently required to avoid piece meal development and to establish an effective nationwide water related data management system.

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INTERNET USAGE AMONG THE RURAL YOUTH OF UDAIPUR DISTRICT OF RAJASTHAN

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ABSTRACT

The present study is focused on the usage of internet for different purposes among the youth of Udaipur district of Rajasthan. The study was undertaken in the Badgaon Panchayat samiti of Udaipur district. For the study a sample of 140 rural youth including 70 males and 70 females were selected randomly. Questionnaire was used for collecting the related data which comprised of a three point continuum scale. For analysing the extent of usage for different purposes frequency, percentage, and mean per cent score were used. The study revealed that internet was always used by 28.57 - 43.57 per cent respondents for educational purposes such as searching for academic information, online result, admission for higher studies, for project work, searching for scholarship and online examination.

INTRODUCTION

Education is considered as the basic right of a human being, which is considered most important for the human development and for the sustainable development of the country.Education enables an individual to gain knowledge about the world, make their lives prosperous and successful and also enables them to contribute for the development of the society. To make education available to everyone as a basic right, internet has been playing an integral role in education. Internet has opened doorways for the abundance of knowledge, learning and educational resources. It has also contributed in increasing opportunities for learning in and beyond the classroom learning.

In the rural areas where it was very difficult to make available all the resources to the students and the teachers, internet has been proved to a blessing that enables teachers to use online materials to prepare lessons, and students to extend their range of learning. Internet supports interactive teaching methods,this enables the teachers to pay attention to the individual needs of the students and ensures better understanding between the teacher an learner.Internet has immense potential to address the problems of inequalities in education faced by the female learners and learners from poor socio-economic background. Accessing education through internet also reduces the cost and in turn improves the quality of learning and hence help the students to be able to compete at the global level.

Flexibility in accessing information and educational resources is the main attribute of learning via internet that makes it most effective and accepted worldwide. That means we can access information and resources anywhere, anytime and or learnat our own pace. Another attribute is access of multimedia based resources; that means different type of media like text, audio, video, animation, graphics, pictures will be supported by the network and communication technology, which provide effortless accessing of information by not only text or pictures but also with enriched animations, videos, presentations, audio etc. which makes learning experience more interesting and effective. Use of internet has made lives very easy and simple. Almost every activity is now influenced by internet. Also educational activities like project work, assignments and information related to higher studies, scholarships, competitive examinations, online results and learning concepts through simple videos can be done easily through internet. So, here, an attempt has been made to analyse the extent to

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which rural youth are indulge in internet use for educational and other purposes.

RESEARCH METHODOLOGY

The study was conducted in the rural areas of Udaipur district of Rajasthan. A sample of 140 rural youth (70 male and 70 female) from Badgaon panchayat samiti was included in the study. Data collection was done using a questionnaire and percentage and mean per cent scores were employed to critically analyse the data.

RESULTS AND DISCUSSION

a) General information of the respondents regarding internet use

Now a day most of the educational content is very easily available on internet Table 1 clearly reveals that most of the respondents (93.57 %) were using internet. Further it can be seen that majority of the respondents (87.85%) used internet on their smart phones which makes e-learning more portable and easy to use.

It is evident from Table 1 that almost all the respondents (100%) knew about internet as a source of e-learning and most of them (99.28 %) have accessed it. Regarding source of motivation to use internet for learning, it can be seen from the table that around half of the respondents (50.71%) were motivated by their friends, whereas rest of them were motivated by teacher (32.14%) and family member (20.71 %). In this regard Madhumita (2016) revealed that majority of the respondents (75%) got encouragement from their teachers for e-learning, while 25 percent of them did not get any encouragement.

b) Use of internet for educational purposes

Perusal of Table 2 shows that respondents had always used internet for educational purposes such as searching for academic information (43.75 %), access to social networking sites(42.14%),online result (37.85), admission for higher studies (36.42%), for project work (31.42), searching for scholarship (29.57%) and online examination (28.57). Overall MPS for the educational purposes ranged between 30- 70, which reflects that rural youth utilised internet for learning to an average to higher extent.It was further observed that about 54.28 per cent youth never used internet for distant learning. Similar findings were reported by Grover *et al*. (2012) that the most common purpose of internet for two third of the respondents was educational.It can be seen from the table that respondents used internet for searching academic information and for online results to greater extent with MPS ranging between 61.42 and 69.28.

Table 1: General information of the respondents regarding internet use

n=140

S No.	Items	Total	
		f	%
a)	Use of internet	131	93.57
b)	Internet access by smart phone	123	87.85
c)	Know about learning via internet	140	100.0
d)	Access to learning through internet	139	99.28
e)	Attended training regarding computer or internet use	58	41.42
f)	Source of motivation for learning through internet		
i.	Friends	71	50.71
ii.	family members	29	20.71
iii.	Teachers	45	32.14

Table 2: Use of internet for educational purposes by the respondents

n=140

S No.	Purpose	Extent of use (%)			MPS
		Always	Sometimes	Never	
a)	Searching for academic information	43.57	51.42	5.00	69.28
b)	Searching for project work	31.42	50.00	18.57	56.42
c)	Searching for scholarship	29.28	48.57	22.14	53.57
d)	Online examination	28.57	44.28	27.14	50.71
e)	Online results	37.85	47.14	15.00	61.42
f)	Admission for higher studies	36.42	52.85	10.71	62.85
g)	Distance learning	15.71	30.00	54.28	30.71
h)	Access to social networking sites	42.14	41.42	16.42	62.85
	Pooled MPS				**53.57**

Table 3: Use of internet for different other purposes by the respondents

n=140

S No.	Purpose	Extent of use (%)			MPS
		Always	Sometimes	Never	
a)	Download music	64.28	32.85	2.85	80.71
b)	Chatting	57.85	35.00	7.14	75.35
c)	Games	52.14	38.57	9.28	71.42
d)	Sharing of views	39.28	50.71	10	64.57
e)	E-ticketing	20.71	43.57	35.71	42.50
f)	Searching online employment	19.28	5.000	30.71	44.28
g)	Banking transaction	17.85	45.71	36.42	40.71
h)	Medical/health tips	48.57	25.00	52.85	51.42
i)	Shopping	19.27	48.57	32.14	43.57
j)	Cooking tips	17.14	45.71	37.14	40.00
k)	Beauty tips	16.4	37.85	45.71	35.42
l)	**Pooled MPS**				**55.71**

c) Use of internet for other purposes

Internet has not only contributed in the educational benefits but it has made a positive impact in student's daily life too. There were several other purposes for which internet was being utilised. Table 3 clearly reflects that the respondents always used internet for various entertainment purposes such as sharing of views (39.28%), chatting (57.85%) and for downloading music (64.28%). It is here to note that respondents used internet for downloading music and chatting to higher extent with MPS lying between 71.42 and 80.71.

It was further reported that respondents never used internet for medical/ health tips (52.85%), beauty tips (45.71%), and cooking tips (37.14%).

Similar studies were reported by Kumar *et al*. (2010) in a study on "Internet usage among undergraduate dental students in India"which revealed that only 5.7 per cent and 4.1 per cent of the students used the internet daily for general and dental purposes, respectively. More than half of the respondent (55.5%) never used the internet for academic purposes and only 9.3 per cent used it for general use. Nearly half of the respondents accessed the internet at home and at school (7.9%).

CONCLUSION

The Internet is not a panacea for development of educational facilities in rural areas, but it does bring new information resources and can open up new communication channels for rural communities and other related organisation. It offers new means for bridging the gaps between the learners and the teachers across globe. Most importantly, it can support mechanisms that promote and ensure the bottom-up approach in education and sharing of information according to the personal needs of the students. The Internet brings with it the option of spreading education in a widespread way without the constraints of distance and time. In rural areas where schools are distant away and many girls and boys drop out from school because of the reason, thus, the Internet can help increase literacy rate of rural areas.

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KNOWLEDGE OF RURAL CREDIT AMONG RURAL WOMEN OF UDAIPUR DISTRICT

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ABSTRACT

The present study was undertaken to find out the knowledge of rural women of Udaipur district about rural credit. The study was conducted in four villages of randomly selected Mavli panchayat samiti of Udaipur district of Rajasthan. A sample of 100 rural women was selected randomly for the present study. Personal interview method was used for data collection. Frequency, percentage, means and per cent score were used for analysis of the data. Majority of the respondents had average knowledge regarding rural credit, while nearly one fourth of the total respondents had good knowledge about rural credit with overall MPS 67.95.

INTRODUCTION

The role of women is fundamental for the development of all societies. Indian women are vital and productive agent but they are unskilled, restricting them to low-paid occupations and lag behind the men in terms of access to education, health care and jobs. They suffer in all the spheres of social and economic life. Women's role in overall context of human resources development requires to get their rightful role in society. Rural credit, as a financial strategy has acquired great dimension and recognition for meeting the credit need of poor for starting up their income generating activities, or for meeting their consumption needs. Credit is part of system of financial intermediation, which allocates resources over time and transfer resources from one individual household or firm to another. Women engaged in subsistence activities can use credit to make home production more efficient and commercialize household tasks. Credit for off farm production can provide households with more flexibility in coping with landlessness and the instability in agricultural income. For effective utilization of Rural Credit, women must be aware of available credit facility. The present paper attempts to study knowledge of rural women about rural credit.

RESEARCH METHODOLOGY

The study was conducted in four villages *viz.* Gadoli, Bhopatkhedi, Martadi and Fatehpura of randomly selected Mavli Panchayat Samiti of Udaipur district (Rajasthan). From each village, 25 rural women were selected randomly, thereby making a total sample of 100 respondents. Data were collected with the help of personal interview schedule. Frequency, percentage and mean percent score were calculated for analyzing the data statistically.

RESULTS AND DISCUSSION

Rural credit means an effort of government and bank to help rural people by providing them with easy credit at low interest rates with less paper work. Data in Table 1 clearly show that most of the respondents (94%) were aware of meaning of rural credit.

Regarding the sources of institutional credit, majority of the respondents (95%) reported banks followed by Large and Multi-Purpose Credit Society (LAMPS) (50%) and SHGs(40%).Primary Agricultural credit society was mentioned by 40 per cent while one fourth of the respondents (25%) knew Gramin Sahkari Samiti as institutional source of credit. Majority of respondents knew that credit can be taken for consumption (80%) and production

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(75%) purposes.

Data in Table 1 regarding perceived advantage of rural credit depicts that majority of the respondents (65%) knew that rural credit is provided at low interest rates and there is no chance of fraud in getting the loan from bank (50%). More than one third of respondents reported that there is convenience in repayment of bank loan (40%). Further, 54 per cent of the respondents expressed that it also avoided the cheating by money lenders.

The findings of the study get decisive support from the study conducted by Parveen (2008) who

Table 1: Knowledge of the respondents regarding rural credit (n=100)

S.No	Item	f/%
1	**Meaning of rural credit**	94
2	**Sources of institutional credit**	
i.	Banks	95
ii.	Self Help Groups	40
iii.	Primary Agriculture Credit Society	40
iv.	Gramin Sahakari Samiti	25
v.	Large &Multi-Purpose Society	50
3	**Purpose of getting credit**	
i.	Production purpose	75
ii.	Consumption purpose	90
4	**Advantage of rural credit**	
i.	Low interest rate	65
ii.	No chance of fraud	50
iii.	Convenience in repayment	40
iv.	Avoid cheating by money lenders	54

Table: 2 Knowledge of the respondents regarding bank loan and procedure (n=100)

S.No.	Item	f/%
1	**Application form**	60
2	**Steps of receiving credit**	
i.	Filling application form	90
ii.	Submission of application form with documents	90
iii.	Verification of application form and documents	90
iv.	Sanctioning of credit	90
3	**Documents required for loan**	
i.	Voter identification	80
ii.	Adhaar card	80
iii.	Domicile certificate	80
iv.	Ration card	75
4	**Need of collateral security for taking loan form banks**	80
i.	Equitable mortgage of residential property	72
ii.	Equitable mortgage of land	66
iii.	Third party guarantee	75
5	**Duration of bank loan**	
i.	Short term loan	60
ii.	Medium term loan	40
iii.	Long term loan	30
6	**Bank interest rate**	49

revealed that all the office bearers (100%) and majority of the SHGs members (95.71%) were aware of meaning of rural credit. The respondents also knew the advantages of rural credit i.e. credit at low interest rate (61%), no chance of fraud (58%) and convenience in repayments (39%).

Data in the Table 2 reveal that majority of the respondents (60%) were aware of application form provided by bank. Step by step procedure has to be followed for receiving credit form banks i.e. first filling application form, submission of application form with documents ,verification of application form and documents and sanctioning of credit .All these steps of receiving credit form bank were known to most of respondents (90%). For taking loan from formal institutions, voter identification card/ domicile certificate/aadhar and ration card required. Majority of the respondents (75-80%) knew about various documents required for getting loan. The findings of the study are similar to Rathore (2006) who revealed that majority of the respondents (87.77-100%) knew about the requirement of ration card, voter identification, and domicile during loan transition from bank and for verification of details of individual taking loans.

Perusal of data in table highlight that majority of respondents (80%) were aware of requirements of collateral security. Regarding type of collateral security, majority of respondents reported about third party guarantee (75%) followed by equitable mortgage of residential property (72%) and equitable mortgage of land (66%) . The respondents were well aware of the loan procedure as majority of them have availed loan from bank. Data in Table 2 denote that majority of the respondents (60%) knew about short term loan (1 to 2 years), whereas more than one third of the respondents (40%) mentioned about medium term loan (2 to 5 years) while 30 per cent knew about long term loan(more than 5 years). Further bank interest rates on different schemes were known to 49 per cent of the respondents.

CONCLUSION

It can be inferred that the rural women of the study area were well aware about the concept of rural credit,its sources, purposes, advantages and bank loan procedure. They should be helped to utilize to this knowledge and improve the quality of life.

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A STUDY ON GROWTH AND PERFORMANCE OF KISAN CREDIT CARDS SCHEME IN CHITTORGARH DISTRICT OF RAJASTHAN

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ABSTRACT

In India, the Kisan Credit Card Scheme was initiated in 1998-99 providing entrance to short term credit in the agricultural sector. The paper vitally examines the growth in Kisan Credit Cards issued, amount sanctioned of credit and constraints faced by the farmers holding Kisan Credit Card (KCC) across Chittorgarh district in Rajasthan State, India. The study used secondary data from the year 2008-09 to 2014-15. The year wise secondary data was obtained from Lead Bank of the Chittogarh district. The results revealed that the number of Kisan Credit Cards (KCC) issued from past years was continuously positive and increased. Overall CGR of number of KCC issued in Chittorgarh district and Rajasthan were 22.68 per cent and 1.56 per cent per annum, respectively during the study period. It was also observed that the compound annual growth rate in credit amount sanctioned was 1.46 per cent and 17.26 per cent per annum in Chittorgarh district and Rajasthan as a whole, respectively. There was consistent growth in amount sanctioned through Kisan Credit Card (KCC) in Chittorgarh district and sizable increase in Rajasthan. Thus, banks had shown keen interest in the credit disbursement to farmers in Chittorgarh.

INTRODUCTION

Agriculture is the backbone of Indian economy, with nearly 58 per cent of the population of the country continuing to depend on it either directly or indirectly for their livelihood. Considering the dominant role of agriculture sector and the importance of credit as an input, a multi-agency approach has been adopted by the Reserve Bank of India (RBI) for ensuring credit flow to the sector. In spite of several improvements in the credit delivery the institutional credit available to a large number of farmers, particularly small and marginal farmers, continues to be a challenge to the banking industry. Provision of timely and adequate agricultural credit and its disbursement to the farmers has been one of the major challenges for banks in India. Continuous innovations are required in order to achieve the aim. Kisan Credit Card in this direction is not a new concept in the field of agricultural banking in India.

The Kisan Credit Card (KCC) scheme is a landmark in the history of rural credit in India. The mechanism of credit cards has been one of the key products developed to expand the outreach of banks and simplify the credit delivery system. The announcement relating to the introduction of Kisan Credit Card scheme was made by the Union Finance Minister during the budget speech for the year 1998-99. National Bank for Agriculture and Rural Development (NABARD) formulated a Kisan Credit Card scheme for uniform adoption by the banks so that the farmers may use the card to readily purchase agricultural inputs such as seeds, fertilizers, pesticides etc. and draw cash for their production needs. The model scheme was circulated to Commercial Banks, Co-operative Banks and Regional Rural Banks in August 1998.

Kisan Credit Card (KCC) Scheme aims at providing adequate and timely support from the banking system to the farmers for their short term credit needs for cultivation of crops. This mainly helps them to purchase of inputs during the cropping season. Credit card scheme proposed to introduce

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flexibility to the system and improve cost efficiency.

In the state of Rajasthan during 2013, total numbers of Kisan Credit Cards issued were 749000, while sanctioned amount was 115 billion rupees. Out of which maximum number of KCC were issued by Commercial Banks (50%) followed by Co-operative Banks (37.19%) and RRBs (12.81%). The amount sanctioned by Commercial Banks was 75.6 billion rupees followed by Co-operative Banks (22.8 billion rupees) and Regional Rural Banks (16.7 billion rupees). Looking to the importance of KCC scheme, the present study was undertaken to study growth and performance of KCC in Chittorgarh district of Rajasthan.

RESEARCH METHODOLOGY

Chittorgarh district was purposively selected for the study because which it made highest progress in implementing Kisan Credit Card scheme in the state of Rajasthan.. The present study is based on secondary data. The year wise secondary data on number of KCC issued, the amount dispersed and amount repaid through KCC in Chittorgarh district of Rajasthan were obtained from Lead Bank of the district and used to analyze the growth in the number of KCC in the study area. The information on procedure followed for issue and renewal of KCC and other crop loan was also collected.

Statistical Techniques for Analysis of Data

The percentage change and compound growth rate of number of KCC issued and amount sanctioned through KCC scheme has been calculated as follows..

Percentage change =

$$\frac{\text{Current year value} - \text{Base year value}}{\text{Base year value}}$$

Compound Growth rate

Compound growth rates (C.G.R.) of number of KCC issued, amount sanctioned and amount disbursed have been worked out by fitting exponential function. Using the least square method, the following form of exponential function was used to calculate compound growth rates.

$$y_t = ab^t$$

where, b = 1 + r

y_t = number of KCC/ Loan sanctioned in 'tth' year

a = intercept or constant

r = compound growth rate

t = Time variables

RESULTS AND DISCUSSION

In order to study the growth and status of KCC issued in Chiittorgarh district and Rajasthan, the secondary data has been collected, analyzed and presented in Table 1. Regarding growth in the issue of KCC in the study area, the secondary data were collected from the respective district lead bank (Bank of Baroda) for Chiittorgarh district. The year wise data on number of KCC issued and amount sanctioned was available with the District Lead Bank. The analysis of growth rate and per cent change in Kisan Credit Cards issued showed that, the number of Kisan Credit Card issued from April, 2009 to March, 2015 was continuously increasing with decreasing percentage change over the years in the Chittorgarh district as well as in Rajasthan except during the year 2011-12, there was a great decline in the number of KCC issued i.e. -132.08 per cent in Chittorgarh district and by -59.06 per cent in Rajasthan during the year 2014-15. Overall CGR of number of KCC issued in Chittorgarh district and Rajasthan were 22.68 per cent and 1.56 per cent per annum, respectively during the study period. Thus, highly significant increase was observed in number of KCC issued in Chittorgarh district as compare to Rajasthan state during the period from 2008-09 to 2014-2015. This may be due to the fact that number of branches of all banks increased in Chittorgarh district after 2012-13 and awareness of farmers about KCC was also increased.

Progress of credit amount sanctioned through Kisan Credit Cards to the in Chittorgarh district as well as in Rajasthan state is depicted in the Table 2.

Table 1: Growth and Status of KCC issued in Chittorgarh district and Rajasthan

(Number)

S. No.	Year	No. of KCC in Chittorgarh	% Change over previous year	No. of KCC in Rajasthan	% Change over previous year
1	2009-10	11228	0	4692341	0
2	2010-11	33332	66.31	5472897	14.26
3	2011-12	14362	-132.08	6183110	11.49
4	2012-13	23440	38.73	6469352	4.42
5	2013-14	37880	38.12	7068731	8.48
6	2014-15	39441	3.96	4444001	-59.06
	CGR	**22.68**		**1.56**	

It was observed that during the year 2009-10 to 2014-15, the amount sanctioned through Kisan Credit Card (KCC) in the Chittorgarh district was Rs. 94120.36 lakh in the year 2009-10 that was declined by -665.18 per cent in the next year i.e. 2010-11. From the year 2011-12, the amount sanction through KCC scheme was increased over the years. The maximum increase in the amount sanctioned was 59.16 per cent in the year 2012-13 and minimum in the year 2013-14 i.e. 2.71 per cent. In case of Rajasthan, the amount sanctioned in the year 2009-10 was Rs. 2752519.00 lakh which was increased in the year 2010-11 by 49.71 per cent i.e. Rs. 5472897.00 lakh but in the next year, the amount sanction was declined by -26.25 per cent. In the year 2012-13, 2013-14 and 2014-15, the amount sanctioned through KCC scheme was increased with increasing rate i.e. 7.67 per cent, 13.35 per cent and 34.79 per cent, respectively in Rajasthan. Thus, it can be concluded that most of the farmers have taken the credit from the banks were the major source of credit acquisition in the study area.The compound annual growth rate was 1.46 per cent and 17.26 per cent per annum in Chittorgarh district and Rajasthan as a whole, respectively. There was consistent growth in amount sanctioned through Kisan Credit Card (KCC) in Chittorgarh district and sizable increase in Rajasthan. Thus, banks had shown keen interest in the credit disbursement to farmers in Chittorgarh District and Rajasthan state.

Opinion survey of KCC holders and non-KCC holders was carried to find out timeliness, security, adequacy, interest and other issues of KCC and the results are summarized in Table 3. More than 75 per cent of farmers borrowed credit to meet the expenditure incurred in agriculture under the KCC category while about 63.21 per cent of the

Table 2: Growth and Status of Amount Sanctioned in Chittorgarh district and Rajasthan

(Rs. in Lakh)

S. No.	Year	Amount Sanctioned in Chittorgarh	% Change over previous year	Amount Sanctioned in Rajasthan	% Change over previous year
1	2009-10	94120.36	0	2752519	0
2	2010-11	12300.36	-665.18	5472897	49.71
3	2011-12	15659.34	21.45	4334875	-26.25
4	2012-13	38340.44	59.16	4694830	7.67
5	2013-14	39407	2.71	5418189	13.35
6	2014-15	43295.02	8.98	8309000	34.79
	CGR	**1.46**		**17.26**	

Table 3: Opinion of borrowers towards the terms and conditions of credit

S. No.	Particular		KCC holders	Non-KCC holders
1.	Purpose of loan	Agriculture Non – agriculture	50 (76.63) 10 (23.37)	40 (63.31) 20 (36.69)
2.	Adequacy	Adequate Inadequate	37 (59.32) 24 (40.68)	25 (43.34) 35 (56.66)
3.	Timeliness	Timely Untimely	52 (83.33) 08 (26.67)	12 (26.04) 48 (73.96)
4.	Rate of interest	High Low	46 (71.30) 14 (28.70)	52 (79.29) 08 (20.17)
5.	Repayment term	Easy Difficult	58 (87.28) 02 (12.72)	55 (83.28) 05(16.72)
6.	Procedure of advances	Simple Cumbersome	57 (85.95) 03 (14.05)	04 (15.39) 56 (84.61)
7.	Accessibility	Easy Difficult	56 (84.61) 04 (15.39)	53(80.62) 07 (19.38)
8.	Security	Flexible Rigid	50 (76.63) 10 (23.37)	26 (44.67) 34 (55.33)
9.	Loan supervision	Frequently Rarely	23 (40.68) 37 (59.32)	19 (35.36) 41 (64.64)
10.	Did borrowing helped	Yes No	57 (85.95) 03 (14.05)	54 (81.95) 06 (18.05)

borrowers were reported to borrow for agriculture purpose in non KCC category. With regard to adequacy of credit majority of farmers under KCC opined that the credit was adequate (59.32 %) but under non KCC the borrowers opined that it was inadequate (56.66 %). About the timeliness, 83.33 per cent farmers under KCC holders felt that the credit was timely, while majority of the farmers under non KCC holders felt that it was untimely (73.96 %). The large number of farmers in both the categories opined that the rate of interest was high (71.30 % in KCC holders and 79.29 % in non KCC holders). As regard to repayment terms, majority of the farmers in both the categories felt that it was easy to repay i.e. 87.28 % in KCC holders and 83.28 % in non KCC holders. Majority of the farmers expressed easy accessibility of the bank and it was within their reach. In respect of security for advance, 76.63 per cent of the respondents under KCC holders felt that it was flexible and on the other hand 55.33 per cent respondents under non KCC holders felt that bank insisted for guarantors and other collateral securities for release of loan. With regards to the loan supervision by the staff of the bank, 59.32 per cent under KCC holders and 64.64 per cent under non KCC holders respondents opined that loan supervision was rare. The large number of the farmers in both the categories opined that borrowed funds helped (85.95 % in KCC holders and 81.95 % in non KCC holders) in cultivating the farms.

CONCLUSION

The growth of Kisan Credit Card (KCC) and amount disbursed in the study area was positive and the credit acquisition pattern, in case of Chittorgarh district of Rajasthan. Commercial Banks were the major source for farmersfor the credit which sanctioned Rs.88017.18 lakh (44.77%) of the total credit given by the banks to thefarmers. Thus, Commercial Banks had shown highest credit disbursement in Chittorgarh District.Overall compouned growth rate was 25.59 for KCC issued and 33.46 per cent for amount sanctioned during

the study period. Thus a significant increase was observed in KCC in all banks during 2013-2014 because number of branches of all these banks increased in Chittorgarh district after 2012-13. Awareness of farmers about KCC was also increased. Opinions of Chittorgarh farmers for Kisan Credit Card Scheme was positive in towards meeting the credit requirement, adequacy, timeliness, rate of interest repayment, accessibility, security, loan supervision etc. Thus, Kisan Credit Card Scheme is easy and beneficial scheme to providing credit for all farmers.

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(Review paper)

DOMESTIC VIOLENCE: THE DISCOURAGING TRUTH OF SOCIETY

Aabha Gupta* and Anuprita Purohit**

ABSTRACT

Violence against women is a global phenomenon and involves a spectrum of physical, sexual, and psychological act of control, threat, aggression, abuse, and assault. Violence against women takes many forms, such as female infanticide, (girl) child abuse, incest, rape, sexual harassment, intimate partner violence, and abuse and neglect of older women. Violence against women and girls is widespread. Woman enduring emotional and psychological trauma through harassment, terror and threats, intimidation, humiliation, degradation, exploitation and physical etc. lead towards chronic health consequences even death too. This extreme expression of male control and power over woman often begins at infancy and may accompany a woman throughout her life till old age, through various relationships. Physical and mental and emotional health impairment is common problems result of the various types of violence.

INTRODUCTION

In our society, violence is bursting. It is present almost everywhere and nowhere is this eruption more intense than right behind the doors of our homes. Behind closed doors of homes all across our country, women are being tortured, beaten and killed. It is happening in rural areas, towns, cities and in metropolitans as well. It is crossing all social classes, genders, racial lines and age groups. It is turning in to a inheritance being passed on from one generation to another.

Though women today have proved themselves in almost every field of life affirming that they are no less than men. Domestic violence among women is most common in Indian society. Since times immemorial, domestic violence has been an intrinsic part of the society we are residing in. The contributing factors could be the desire to gain control over another family member, the desire to exploit someone for personal benefits, Social taboos and so forth. On various occasions, psychological problems and social influence also add to the intensity. Orthodox and idiotic mindset of the society that women are physically and emotionally weaker than the males is one of the reasons for the prevalence of domestic violence in Indian society. These reasons lead or pressurize women to take action of suicide to remove tensions and all.

The most common causes for women stalking and battering include dissatisfaction with the dowry and exploiting women for more of it, arguing with the partner, refusing to have sex with him, neglecting children, going out of home without telling the partner, not cooking properly or on time, indulging in extra marital affairs, not looking after in-laws etc. In some cases infertility in females also leads to their assault by the family members. In addition to these desire for a male child and alcoholism of the spouse are major factors of domestic violence against women in rural areas. There have been gruesome reports of young bride being burnt alive or subjected to continuous harassment for not bringing home the amount of demanded dowry.

Mishra (2006) in his study concluded that Poverty, alcoholism, unemployment, frustration and poor role modelling also contribute to violent behaviour. The major factor behind the violent behaviour is the patriarchal attitude of Indian society which perceive woman as a object rather than a 'subject' and give her low status in the society.

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Physical abuse against women include slapping, punching, grabbing, burdening them with drudgery, public humiliation and the neglect of their health problems. Some of the other forms of psychological torment against them could be curtailment of their rights to self-expression and curbing the freedom to associate with the natal family and friends.

Domestic violence also called intimate partner violence occurs between in an intimate relationship. Domestic violence is any behaviour the purpose of which is to exert power and control over a spouse, partner or intimate family member. Abuse is a learned behaviour; it is not caused by anger, mental problems, drugs or alcohol, or other common excuses.

Types of Domestic Violence:

Domestic violence is not physical violence alone. There are various category of violent behaviour, each of which has its own devastating consequences and results. Domestic violence can be done in many forms, including emotional, sexual and physical, financial abuse and intimidation.

Lethality involved with physical abuse may place the victim at higher risk, but the long term demolition of personhood that go along with the other forms of abuse is significant and cannot be minimized. There are several ways to torture and let down behaviour persist in society as dominance, humiliation, isolation, rejection, threats, intimidation, denial, blame etc. which leads soulless life for a woman where she cannot do nothing even for the herself. It also shatter self concept, mental health and emotional health of the women.

Physical abuse:

Physical abuse is any physically aggressive behaviour, withholding of physical needs, indirect physically harmful behaviour, or threat of physical abuse. This may include pushing, pulling, punching, slapping, kicking, hitting, biting shaking pinching, pulling hairs, hitting and threatening with different objects etc. Abuser can also hold back of physical needs including interruption of sleep or meals, denying money, food, transportation or any other help, locking victim into or out of the house, disallowing to give or rationing necessities.

Sexual Abuse:

Sexual abuse refers to any action that pressures or persuades someone to do something sexually they don't wish for to do. It can also refer to manners that impacts a person's ability to control their sexual activity or the circumstances in which sexual activity occurs, including oral sex, rape or restricting access to birth control and condoms. Unwanted kissing or touching, unwanted rough or violent sexual activity, Rape or attempted rape, Refusing to use condoms or restricting someone's access to birth control, Keeping someone from protecting themselves from sexually transmitted infections (STIs), Sexual contact with someone who is very drunk, drugged, unconscious or otherwise unable to give a clear and informed decision about involvement in sexual activity, Threatening or pressuring someone into unwanted sexual activity, forcing sex.

Emotional Abuse & Intimidation:

Emotional abuse is any activity that exploits another's vulnerability, insecurity, or character. Such behaviours include continuous degradation, intimidation, manipulation, brainwashing, or control of another to the detriment of the individual mental health. It also disregarding, ignoring, or neglecting the victim's requests and needs and using actions, statements or gestures that attack the victim's self-esteem and self-worth with the intention to humiliate.

Verbal Abuse:

Verbal abuse refers to abusive language used to denigrate, embarrass or threaten the victim. Verbal abuse is related to the use of words to control, threat and hurt someone. Some kinds of verbal abuse are more obvious like using swear words or yelling. Verbal offender can cause a lot of damage with underhanded comments or even with silent treatments.

Economic Abuse:

Economic abuse as actions that is coercive, deceptive or unreasonably controls another without

their consent and in way that denies them economic or financial autonomy. It also include situations where one person withholds or threatens to withhold financial support necessary to meet reasonable living expenses.

Effects of Domestic Violence:

Violence against women has serious consequences on women's mental and physical health, including their reproductive and sexual health. These include injuries, gynaecological problems, temporary or permanent disabilities, depression and suicide, amongst others. Physical abuse may impact on physical, psychological and social damage, which leads a woman to having a low self-image. Emotional abuse makes a woman feel unimportant, useless and destroys her self confidence. The effects of psychological abuse are that a woman ends up confused because she often does not really know what brings on the violence.

Abusive relation makes the woman to travel a downhill emotional ride, which leads to the eradication of self-concepts such as self-esteem, self worth, self identity, self confidence and self assurance. Many abusive women become depressed when they perceive that their situation is hopeless and unbearable. This feeling of inadequacy may temper with one's self concept as well.

Outcomes of domestic violence are equally harmful for women and their children. It has been noted that women who face domestic violence are at greater risk for mental health disorders. Children are at an increased risk for emotional behavioural problems regardless if they were directly abused or not. The effects include anxiety, depression, academic problems, fearful etc. These children more likely to attempt suicide, use drugs, commit crime especially sexual assault, use violence as a power weapon at school and community.

Physical effects:

Bruises, broken bones, head injuries, lacerations, sprained and broken wrists, chronic fatigue, shortness of breath, Muscle tension, Involuntary shaking, changes in eating and sleeping patterns, sexual disinfection, Menstrual cycle and fertility issue in women, internal bleeding etc are some of the acute effects of a domestic violence incident that require medical attention and hospitalization. Some chronic health conditions that have been linked to victims of domestic violence are arthritis, irritable bowel syndrome, chronic pain, pelvic pain, ulcers, and migraines. Victims who are pregnant during a domestic violence relationship experience greater risk of miscarriage, pre-term labor, and injury to or death of the fetus.

Mental effects:

Victim women feel depression including prolonged sadness, anxiety, alcohol and drug abuse, low self-esteem and questioning sense of self, post-traumatic stress disorder (PTSD) including flashbacks, psycho somatic disorders, identity crisis, nightmares, severe anxiety and uncontrollable thoughts, suicidal thoughts or attempts.

Paul E. Mullen et al. (2012) find out the impact of physical and sexual abuse on women's mental health. 20% of women who had been exposed to sexual abuse as a child were identified as having psychiatric disorders, predominantly depressive in type, compared with 6·3% of the non-abused population. Similar increases in psychopathology were found in women who had been physically or sexually assaulted in adult life. These findings indicate that the deleterious effects of abuse can continue to contribute to psychiatric morbidity for many years.

Emotional effects:

Woman faced emotional abuse are reluctant to do any work, less enthusiasm, feel unworthy, hopeless, dissatisfied, less motivated, insecure, anxious and discouraged about the future, Inability to trust, questioning and unbelieving, unwillingness for life, suicidal thoughts for many years are some of the common emotional behaviour pattern in sufferer woman.

Cause of violence:

There are many different theories as to the causes of domestic violence. These include psychological theories that consider personality traits and mental

characteristics of the perpetrator, as well as social theories which consider external factors in the perpetrator's environment, such as family structure, stress, social learning. As with many phenomena regarding human experience, no single approach appears to cover all cases. Need for power and control, low self esteem, personality traits, gender role stereotypes, patriarchal beliefs, gap in spousal education and employment, marital maladjustment, alcohol consumption by husband, unemployment, attitudes towards women are some of the socio psychological factors leading to domestic violence.

Education level:

Intimate partner violence has strong relation with educational level of both the partners. People with less education are more likely to commit violence against women as they think that it is normal and very common phenomena.

Social Mindset:

Some people with very traditional beliefs and orthodox mindset assume they have the right to control their partner, and that women aren't equal to men. Woman is an instrument to show power and to male supremacy. Several time social stress and norms also contributes for the violent behaviour.

Financial Problem:

Social stresses, due to inadequate finances or other such problems in a family may further increase tensions. Violence is not always caused by stress, but may be one way that some people respond to stress. Families and couples in poverty may be more likely to experience domestic violence, due to increased stress and conflicts about finances and other aspects.

Psychological Problems & Poor Mental Health:

Personality traits and mental characteristics of the offender cause violence against women. Personality traits like sudden bursts of anger, poor impulse control, poor self-esteem and mental health, unrecognized behaviour disorder, psychological disorders leads discrimination, inequalities and misdeed against woman.

Family Background:

The perpetrator learned this behaviour from growing up in a household where domestic violence was accepted as a normal part of being raised in their family. They assumes that women are puppets and congenital servant of men to complete the all physical, mental, emotional and societal needs of the men in male dominated society. She is born to serve her full life by playing different sacrificing role like daughter, sister, wife and mother for man. There is no matter of self image, identity and concept.

Prevention of Domestic Violence:

At the society level gender sensitivity will be helpful to remove discrimination, inequalities, injustice from the destiny of woman. There is a strong need to build awareness for the gender equalities to give equal rights to every woman in terms of education, employment, social, economic and political leaderships.

Parents and teachers are also needed to develop the sensitivities and boundaries of man-woman relationships right from the childhood and during school age. Parents and teachers should strive to infuse good moral and religious values in children and serve as role models. There should be equal opportunities for both man and woman during upbringing of children which can directly affects the status of violence against woman.

Society should provide similar respect, honour and treatment with the women survivors of domestic abuse. There is necessity to maintain dignity and privacy of victim women rather than making the issue of gossiping, derision and sympathy. Keeping in this view, an Open mind set and nurturing environment is very much required for victim woman which is favourable for the growth, new start for the shameless, fearless and guiltless life.

Government should implement proper law and order and legal aspects to prevail over such societal issues. Strong implementation of legal proceedings can promote gender equality and prevent exploitation by switching state of mind of community

that give men power over women. Government should introduce financial, emotional self help guidelines and legal help for women. Guidance and counselling centre must set up to overcome from the problem of domestic abuse for victim women by the government.

CONCLUSION

Thus, it can be inferred that domestic violence affects the women negatively. There are several affects on the physical, mental and emotional health which have detrimental effect on the personality's aspects of the women like trauma, less decision making power, erosion of self respect, lack of confidence etc. There is very much requirement to change the mindset and remove social discrimination from the society for the welfare of women and humanity.

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(Review paper)

COMMUNICATION THROUGH DIGITAL MEDIA FOR EMPOWERING FARMERS COMMUNITY IN AGRICULTURE

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ABSTRACT

Indian agricultural system is the largest national agricultural system in the world The ICAR is the apex body for coordinating, guiding and managing research and education in agriculture sciences in India. Various digital media including social media, web-based services, mobile based services such as Facebook, WhatsApp and YouTube are now being used to share diversefarming based information across different parts of India. Varied forms of information across different agricultural subsectors (crops, dairy, goat and poultry) and on different aspects of production, preventive management and marketing is being shared. In recent years (2014 onward), YouTube has become a good source of animal husbandry based information, as evident from number of videos uploaded in different Indian languages. The potential of Social Media channels like Facebook, WhatsApp and YouTube among others are not yet fully exploited by agricultural extension and development departments to reach out to farmers in India. However, there appears to be bright prospects of social media use in agricultural extension and advisory services given the recent initiatives taken by the Indian government to enhance social media use.

INTRODUCTION

Global agriculture has witnessed a paradigm shift in the past few decades and extension mechanism need to stay ahead and equip the farmers by developing their management and decision making skills; help rural people develop leadership and organizational skills; participate in cooperative credit societies and other support organizations. But the ground reality is hard-hitting with only one extension worker available for every 2879 farmers in India (Mukherjee and Maity, 2015). A recent survey reported that only 41 per cent of the farm households received any assistance from either government or private extension services, and the government extension machinery covering only 11 per cent of the households who received extension assistance (Bera, 2014). As an aftereffect of globalization, agriculture needed to change rapidly to keep pace with the global economy but infrastructural issues, low productivity, poor extension coverage, and low quality manpower became major challenges which still persist. In a world where information drives the change, extension needs to be adept with latest digital media to influence and facilitate farmers.

Television and radio have been used for disseminating agricultural information for a long time (Purushothaman *et al*. 2003), the recent developments in the mobile, computing and networking technologies provide new ways of technology transfer.

Increase in mobile subscriptions in the last decade have also increased the use of web based services and applications like web portals and mobile apps. Social media penetration is 14 per cent while growth of social media users in 2016-2017 have been 40

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per cent (55 million), which is second highest in the world (We are social, 2017). Social media platforms like Facebook, YouTube, Twitter and Google+ have higher levels of use among Indians compared to US, UK and European countries. These developments have opened up new avenues for improving reach of extension services for the needy farmers and other stakeholders.

Popular social media tools :

Facebook : Facebook is the most used social media platform in the world with more than 1.87 billion monthly active users on the site (we are social, 2017). And this means an immense potential for extension professionals.

Twitter : Twitter is quick and easy, allowing users to share 140 character messages. These messages are called "Tweets," that are available to anyone who is interested in reading them.

YouTube : YouTube is a video-sharing website where users can upload and view videos.

WhatsApp : WhatsApp messenger is a proprietary, crossplatform instant messaging application for smartphones. In addition to text messaging, users can send each other images, video, and audio media messages.

Linkedin : Linkedin is geared toward the professional community. It allows you to network with work colleagues and is a powerful for brands and job seekers. You can post your resume, connect with other professionals, and keep up to date with industry news. You can follow groups focused on topics relevant to your industry.

Agropedia : Agropedia is an open-ended knowledge sharing platform. It is an online agricultural knowledge repository that makes agriculture information available to scientists, researchers, extension personnel and the agricultural community and allows them to search and make contributions to the vast knowledge base. It is a collaborative project of seven consortium partners *viz*., ICRISAT Hyderabad, NAARM- Hyderabad, IIT Kanpur, IIT Bombay, GBPUAT- Pantnagar, UAS- Raichur and\ IIITM-Kerala. Project is backed by Government of India and sponsored by the World Bank through the National Agricultural Innovation Project of the Indian Council of Agricultural Research (ICAR). The project was launched on 12 January 2009.

Mobile Platform

Mobile platform is a software tool that integrates resources, and provides services and content to support interactions and transactions among multiple sets of actors (Kankanhalli *et al*., 2018). Mobile platform is based on smartphones or other portable devices and has the advantages of mobilization, connection, and interaction. It can deliver information accurately and promptly, facilitate interactions among multifactors (Kallinikos *et al*., 2014) and promote community building (Culnan *et al*., 2010). There are different types of mobile platforms, for example, transactional platforms serve as intermediaries between buyers and sellers (Brynjolfsson *et al*., 2000), such as the mobile payment platform, including Apple Pay and Kakaopay (Lin *et al*., 2019). Communication platforms support participants group communication, sharing and opinion expressions, such as social media, including Facebook and We Chat (Singaraju *et al*., 2016). Participative platforms attract customers to participate actively in product improvement and to configure new service or business decision with the company together, for example, a company motivate and invite customers to participate in new product R&D (Xie *et al*., 2016). In rural areas, mobile platforms play an important role mainly as the transactional and communication platforms. Although the majority of urban citizens can be connected to the Internet by mobile phones, most rural citizens in developing countries can hardly access to information services. Mobile platforms provide potential features or functionalities to overcome the barriers of distance through mobile connectivity (Park, 2017), increasing farmers' access to public and private information, as well as linking buyers and sellers, facilitating agricultural data collection and improving access to financial services (Aker *et al*., 2016). However, the mobile platform enabled ICT innovation in rural areas is relatively

new and yet has not been studied much in the academic field. With government and other organization realize the value of the mobile platform and promote its application in rural areas, it is necessary to research how this latest ICT application driven by organizations empowers villagers, especially in structural and psychological aspects, and what effects it brings about.

Many social enterprises are currently addressing the agriculture space, attempting to bring new technologies to rural areas to improve the efficiency and profitability of farmers. Agropedia works as a one-stop hub for information on the agriculture ecosystem. The Wiki-style platform provides, among other things, a space for stakeholder interaction, best practice sharing, news updates, and an online library certified by the Indian Council of Agricultural Research (ICAR). Agropedia has also collaborated with Krishi Vigyan Kendra, a training and education center for farmer and rural entrepreneurs, to develop "Voice Krishi Vigyan Kendra" (vKVK), a mobile based advisory system that sends SMS and voice-based messages to field officers and farmers around the country. It is a human psychology that, each of us have our own circle of influence. We need to convey the message of agriculture within our circles, so our stories can be influential.

Networking (Farmer -Farmer) :

The formation of social media was initially created to create networking opportunities between people, which allowed for communication over larger distances, and in much quicker time frames. Therefore, it is understandable that one of the first facets of social media investigated was its networking abilities for the rural industry. It is commonly noted by farmers around the world that farming can be a relatively lonely occupation, which may have you only communicating with your dogs, cows and occasionally your partner on the ordinary day. People find relationships a good source of satisfaction and are one of the reasons social networks have value in farming because it can reduce social isolation. Networking has widely been recognised as an important part of business and innovation. Holmlund and Fulton (1999) described networks as "associations of individuals or communicate with each other for mutual benefit". The presence for the access and creation of new knowledge. The potential for increased future value of social media as a networking tool is only as powerful as the users that are engaged in the technology.

Rural and Urban Agriculture in India

India is the seventh largest country in the world and ranks second in population. It has 28 states and 8 union territories. It covers an area of 3287263 sq. km. There are 22 official languages in India (India, Ministry of Information and Broadcasting, 2018). As per the 2011 Census, 68.8 per cent of country's population and 72.4 percent of workforce resided in rural areas. The rural area population is directly or indirectly dependent on agriculture.

The Government of India with private sector is planning to harness the big data in agriculture sector through big data analytics, artificial intelligence and internet of things for precision agriculture. Under the pilot project, crop yield prediction model will be developed using artificial intelligence in selected 10 districts so that real time advisories can be provided to the farmers. Government has been working on smart agriculture system like poly-house monitoring system that can create automatic SMS alerts for any change in temperature, humidity and soil moisture. (Haq, 2018).

Agriculture extension work in India

There are 721 KVKs, i.e. Farm Science Centers for agricultural extension work i.e. transfer of agricultural research and technology to the farmers in INARES. The 44 Agricultural Technology Information Centres (ATIC) established under ICAR institutes and SAU in various states of India employ thousands of Agricultural Extension Workers/Officers (AEW). Agricultural Extension Subject experts (AES) have been working in KVKs for providing agriculture extension and training to the farmers and AEW. There are more than 250

Agricultural Technology Management Agency (ATMA) at district level which are set up by Central Government to operate the extension reforms with active participation of farmers, NGOs, KVKs and other Stakeholder operating at district level and below. In each state, a State Agricultural Management and Extension Training Institutes (SAMETI) have been established. The SAMETI provides training and undertakes human resource development on the concepts and processes of ATMA to the extension functionaries. SAU plays major role in Indian agriculture extension system through Directorate of Extension, AES, KVK, SAMETI, ATMA, etc.

In the context of ICT, information has become vital source for world economy, science, technology, education, research and development, etc. In India, most of the villages are connected through telephone/mobile phone and millions of villagers are connected through Internet. Community Radio has also been started in agricultural extension by the SAUs for Indian farmers. In India, various initiatives have been taken in the area of ICT applications in agriculture extension by the Government. A comprehensive study conducted by Indian Council of Agricultural Research (2014) on development and analysis of ICT initiatives in agriculture to meet the information need of the Indian farmers covered 26 ICT initiatives in agriculture. The study found wide information gaps between agricultural research and farmers in India. The study also found that Mobile is the most popular ICT gadget followed by TV and Radio. Further, the study suggested a need to provide farmer queries in multimedia mode i.e. audio mode (in local language) along with digital mode i.e. text, image and video.

CONCLUSION

The popular social media tools i.e. Facebook, WhatsApp and YouTube are being used for information delivery and sharing across different agriculture subsectors (crops, horticulture, dairy, goat farming) in India. Most of them are through individual efforts. There is definite lack of organized efforts to use social media from public extension system in India. Appreciably, in recent times, the Government of India including Indian Ministry of Agriculture has given importance to Social Media. The Minister of Agriculture in India not only maintains a Facebook account but also recently he answered the queries of the public online using Facebook (The Statesman, 2016)which is a significant move forward to enhance use of social media. Using social media tool for agricultural extension activities can be regarded as 21st century skill (Neill *et al*., 2011).

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