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EDITORIAL

Dear Readers

Ensuring a thriving agricultural economy is critical for reducing poverty, enabling food security and managing natural resource in a sustainable fashion. Many observers are concern that public extension system is not doing enough, not doing it well and not always relevant. In developing counties bureaucratic inefficiency and poor programme design and implementation have led to poor performance and incoherent links with client farmers and research sector. As they sick solutions, policy makers must confront clashing views of what extension should do, and chose among a number of extension priorities, products, mandates and models. Given fiscal restraint, there is extreme pressure to demonstrate the payoff to investment in extension and explore alternatives to public financing by involving the private sector, local authorities and producer groups. The generic problems of agricultural extension are bound to its diverse functions, as well as the bureaucratic, political and social operating environments within which extension systems operate. We believe that focusing on these generic problems- regardless of the management system or approach to extension- highlights the areas that should form the agenda for future direction in extension.

With all my best wishes…

Dr. R. K. Raj

Chief Editor

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Kisan Mobile Advisory Service- An Effective ICT Tool For Technology Dissemination

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ABSTRACT

It was observed that our population is growing; per capita availability of arable land and irrigation water is shrinking. Agriculture is not food producing machine, but is the backbone of the livelihood security system for over 60 percent population. The shifting emphasis of Indian agriculture towards diversification, commercialization, sustainability and efficacy has made it necessary for the state extension organizations to critically examine their extension approaches in relation to livelihood of rural masses. Actually extension official are grappling with the question of how best to harness information and communication technology to improve rural livelihood with sustainability. Sustainability emerges out of shared human resources objectives, knowledge, decision, technology and organization. Development in science and technology in general as well as information and communication technology in particular endorses with ways of facilitating a wide range of communication, information and advisory services in process of technology transformation. Kisan mobile advisory services (KMAS), which is a part of the ICT tools is employed by the most of the Krishi Vigyan Kendras in Orissa. Likewise KMAS was launched during May, 2010 by the KVK, Mayurbhanj. In the programme the mobile numbers of progressive farmers, Krushak Sathis (Farmers' friend), extension officials, and input dealers were registered and grouping is done as per the enterprise/activity basis for facility of filtering purpose. The usual messages are being serving twice a week and timely information/advices are communicating as per the need of the situation. From the list of progressive farmers, seventy five farmers were selected for the study with the objective to know their preferences and utility in their field situation. Majority of the farmers opined that time specific advisories are most important followed by weather forecasting and marketing information. The messages on agronomic practices are most suitable followed by management of disease & pests are found to be most suited as per the result. They suggested to serve the message on local language.

Key Words : *ICT, KMAS, Technology Dissemination*

Introduction

Farmers are more desirous and become anxious to get quick, exact and authentic information in the changing scenario of agriculture at global level. Dissemination of the required and recent agricultural information to the farmers in scattered villages at the variegated geographical situation in India is very difficult task. Transfer of technology to farmers is not a onetime exercise because new farm technology is being constantly evolved (Mehta, 2003). A continuous flow of technologies in an appropriate manner is vital to provide quick benefit of this development to the farmers. There has been a technological explosion in the field of agriculture. This demands that the farmer has to know all aspects of technology prior to its adoption.

Scientists observed our population is growing; per capita availability of arable land and irrigation water is shrinking. The frequent suggestion for food import ignores the fact that agriculture is not food producing machine, but is the backbone of the livelihood security system for over 60 percent population. The shifting emphasis of Indian agriculture towards diversification, commercialization, sustainability and efficacy has made it necessary for the state extension organizations to critically examine their extension approaches in relation to livelihood of rural masses. Development in science and technology in general as well as information and communication technology in particular endorses with ways of facilitating a wide range of communication, information and advisory services in process of technology transformation. Actually extension official are grappling with the question of how best to harness information and communication technology to improve rural livelihood with sustainability. Sustainability emerges out of shared human resources objectives, knowledge, decision, technology and organization. The extensive use of ICT needs to be promoted for communication between researchers, extension workers and farmers to transfer technologies and information in a cost effective manner. ICT has many potential applications

in agricultural extension (*Zijp, 1994*). It can bring new information services to rural areas where farmers, as users, will have much greater control than before over current information channels.

The 'Task Force on India as Knowledge Superpower' (*GOI, 2001*) emphasized the necessity of developing the capacity to generate, absorb, disseminate and protect knowledge and exploit it as a powerful tool to derive societal transformation. Information and Communication Technology (ICT) can play a significant role in achieving such a transformation as it consists of three main technologies. They are: Computer Technology, Communication Technology and Information Management Technology. These technologies are applied for processing, exchanging and managing data, information and knowledge. Recent developments in information and communications technology (ICT) offer a great opportunity to facilitate the flow of information and technology services delivery especially to the farmers (*Maningas, 2006*). It is comprehensible that on the one hand agriculture is becoming highly science driven and knowledge intensive, but on the other hand the existing public extension system, has become less effective, more time consuming and costly and fails to meet the expectations of those involved in agricultural production (*Mruthunjaya and Adhiguru, 2005*). The use of ICT is an important pillar of agriculture extension and in the current scenario of a rapidly changing world, has been recognised as an essential mechanism for delivering knowledge (information) and advice as an input for modern farming (*Jones, 1997*). *There is an increasing realization about the potentialities of Information and Communication Technology (lCT) in dissemination of agricultural technologies among the farmers. The use of ICT is an important pillar of agriculture extension. Here, attempt has been made to analyze the reaction of the farmers towards ICT as a source of reliable and timely information about best production practices, processing, marketing, input and output prices, financial and risk covering institutions etc.*

Amongst the various means of information communication, satellite based internet communication through mobiles are very efficient, accurate, quick and cheaper in the field of disseminating the information from research system to farmers, as now a-days mobile sets have widely reached at most bottom of the society. It has touched almost all the districts in our country and is mainly down up to the village levels. From educated youth to even little educated people are now equipped and familiar with this gadget. Due to its easiness in operating technique a lay man can also handle the mobile and receives the messages. It offers a means for bridging the gap between developmental professional, rural people and agricultural producers through the initiation of interaction and dialogue.

Kisan mobile advisory services (KMAS), which is a part of the ICT tools is employed by the most of the Krishi Vigyan Kendras in Odisha. Likewise KMAS was launched during May, 2010 by the KVK, Mayurbhanj. In the programme the mobile numbers of progressive farmers, Krushak Sathis (Farmers' friend), extension officials, and input dealers were registered and grouping was done as per the enterprise/activity basis for facility of filtering purpose. Till April, 2014 about 1500 numbers were registered. The usual messages are being serving twice a week and timely information/advices are communicating as per the need of the situation.

Here, an attempt has been made to analyze the reaction of the farmers towards Kisan Mobile advisory service as a source of reliable and timely information about best production practices, processing, marketing, input and output prices, financial and risk-covering institutions etc. The favourable attitude of farmers towards ICT as an effective and efficient information support tool would lead to stronger conviction and efficient extension programme planning in changing agri-rural environment. The study mainly focused with the following objectives

1. To study the socio-economic profile of the respondents
2. To analyse the preferences of the respondents on the content of the messages and their utilities in their fields
3. To find out the suggestion for better service

Materials & Methods

From the list of progressive farmers, seventy five farmers were selected *as the sample for the study. Stratified random sampling technique was used in the selection from different categories like farmers, krushak sathis, input dealers and extension personnel. A pre-tested structured interview schedule was used to elicit information from the respondents. The data were analyzed using appropriate statistics tool.*

Results & Discussion

Socio-economic Profile of Respondents: Socio-economic characteristics of respondent farmers utilizing KAMS services were analysed and presented in Table 1

TABLE.1. Distribution of respondents based on their socio economic characteristics

TABLE.1.a. Distribution of the respondents according to their Age

n=75

Sl. No.	Category	Number	Percentage
1	Young (18 - 35 years)	33	44.00
2	Middle (36 - 50 years)	27	36.00
3	Old (more than 50 years)	15	20.00

From the Table.1.a, it was indicated that most of the respondents (44 percent) were belong to young age group (between 18- 35 years) followed by medium age group (36 percent) whereas only 20 percent represents to old age group (above 50 years). So, it is clear from the table that the respondents those were more accessed to mobile services belonged to young and medium age group (80 percent).

TABLE.1.b. Distribution of the respondents according to their Gender

n=75

Sl. No.	Category	Number	Percentage
1	Male	67	89.33
2	Female	08	10.66

Gender is a major factor for determining the mobility. From the above table it was found that male respondents were more (about 89.33 percent) than the female respondents (10.66 percent) which imply the dominance of the male persons over the female person in the farming operation.

TABLE.1.c. Distribution of the respondents according to their Educational Status

n=75

Sl. No.	Category	Number	Percentage
1	Illiterate	0	0
2	Primary Level	7	09.33
3	Middle school Level	15	20.00
4	Matriculation	15	20.00
5	Higher secondary	8	10.66
6	Graduation	23	30.66
7	Post-Graduation and above	07	09.33

Education is the way of life for socio-economic development. The table implied that majority of the respondents were graduates (30.66 percent) followed by matriculation and middle level (15 percent each). Only few were post graduate level (9.33 percent) and no one was illiterate. From the observation it is evident that most of the respondents were literate and well versed with mobile sets.

TABLE.1.d. Distribution of the respondents according to their Land holding

n=75

Sl. No.	Category	Number	Percentage
1	Large	15	20.00
2	Small	38	50.66
3	Marginal	22	29.33

From the table mentioned above it was found that the majority of the respondents had small land holding (50.66 percent) and also 20 percent belonged to large farmer category. It implies that the mobile service was availed by most of the small and large farmers.

TABLE.1.e. Distribution of the respondents according to their mass media exposure

n=75

SN	Mass Media	Very often	Often	Occasionally	Never	Mean	Rank
1	Radio	23 (30.66)	23 (30.66)	29 (38.66)	0	1.92	IV
2	Television	44 (58.66)	16 (21.33)	15 (20.00)	0	2.38	II
3	Internet	07 (09.33)	08 (10.66)	15 (20.00)	45 (60.00)	0.69	V
4	News paper	29 (38.66)	15 (20.00)	31 (41.33)	0	1.97	III
5	Mobile	52 (69.33)	23 (30.66)	0	0	2.69	I

*The figures shown in the parentheses are percentages

From the table it was clearly stated that most of the respondents had mass exposure by using mobile sets than any other mass media gadgets.

TABLE.1.f. Distribution of the respondents according to their Social Participation

n=75

Sl. No.	Organization	Extent of Participation							
		Very often		Often		Occasionally		Never	
		N	%	N	%	N	%	N	%
1	Village level society	67	89.33	08	10.66	0	0	0	0
2	Block level society	22	29.33	23	30.66	30	40.00	0	0
3	District level society	07	09.33	15	20.00	15	20.00	38	50.66
4	State level society	0	0	07	09.33	15	20.00	60	80.00
5	National level society	0	0	0	0	08	10.66	60	80.00

The table reflected that all the respondents had participation in village level society out of which 89.332 percent and 10.66 percent had very often and often participation. Among them only 20 percent and 10.66 percent had participation occasionally in state level and national level society respectively. They had fairly involvement in the block level societies.

TABLE.1.g. Distribution of the respondents according to their Extension Contact

n=75

Sl. No.	Personnel	Extent of Contact							
		Very frequently		Frequently		Sometimes		Never	
		f	%	f	%	f	%	f	%
1	Field level official/worker	52	69.33	15	20.00	08	10.66	0	0
2	Block level officials	22	29.33	30	40.00	23	30.66	0	0
3	Sub division level officials	15	20.00	07	09.33	22	29.33	31	41.33
4	District level officials	07	09.33	08	10.66	22	29.33	38	50.66
5	State level officials	0	0	07	09.33	15	20.00	53	70.66

For development in the field of agriculture and allied sector, extension contact is very important in which the individual come across with different official at different level and gets consultancy. The table displayed the extent of extension contact of the respondents under study in which it was found that very few were in contact with state, district, sub division and block level, However they had quite fair contact at the field level and block level officials.

Section-II- Analysis of the preferences of the respondents on the content of the messages and their utilities in their fields

TABLE.2.a Distribution of the respondents according to Importance of the information as perceived by the respondents

n=75

S. N.	Type of information	Most Appropriate		Appropriate		Least Appropriate		Mean	Rank
		N	%	N	%	N	%		
1	Weather information	49	65.33	23	30.66	03	04.00	1.61	II
2	Production practices	44	58.66	23	30.66	08	10.66	1.48	IV
3	Time Specific advisory	51	68.00	22	29.33	02	02.66	1.68	I
4	Market information	52	69.33	15	20.00	08	10.66	1.58	III
5	Value addition	08	10.66	22	29.33	45	60.00	0.51	VIII
6	Live stock management	33	44.00	22	29.33	30	40.00	0.90	VII
7	Awareness message	29	38.66	30	40.00	16	21.33	1.17	V
8	Event information	31	41.33	14	18.66	30	40.00	1.01	VI

From the analysis of the above table, it was inferred that time specific advisory services had more importance for Kisan mobile service followed by weather forecasting and market information.

TABLE.2.b Distribution of the respondents according to usefulness of the information received through KAMS as perceived by the farmers

n=75

S.N.	Area	Very much useful	Useful	Partially useful	Not at all useful	Mean
1	Land preparation	22 (29.33)	30 (40.00)	23(30.66)	0	1.98 (VIII)
2	Selection of crop and variety	36(48.00)	23(30.66)	16(21.33)	0	2.26 (VI)
3	Agronomical practices	52(69.33)	23(30.66)	0	0	2.69 (I)
4	Nutrient management	36(48.00)	31(41.33)	08(10.66)	0	2.37 (IV)
5	Plant protection techniques	45(60.00)	30(40.00)	0	0	2.60 (II)
6	Post harvest management	22(29.33)	22(29.33)	23(30.66)	08(10.66)	1.77 (X)
7	Animal husbandry	31(41.33)	21(28.00)	15(20.00)	08(10.66)	2.00 (VII)
8	Fishery	23(30.66)	29(38.66)	15(20.00)	08(10.66)	1.89 (IX)
9	Input support	45(60.00)	14(18.66)	16(21.33)	0	2.38 (III)
10	Marketing support	37(49.33)	22(29.33)	16(21.33)	0	2.28 (V)

*The figures shown in the parentheses are percentages

From the above table, it implied that the farmers were utilising the mobile services mostly in the field of agronomic practices followed by plant protection measures and input support.

Section-III- Suggestions for better service

TABLE.3. Prioritization of Suggestions as perceived by the respondents

n=75

S. N.	Suggestions	Mean	Rank
1	The message should be served in local language	1.61	I
2	The message should be simple and understandable	1.45	III
3	The message have practical applicability	0.68	V
4	Voice message facility should be provided	1.48	II
5	Apart from technology information on inputs and marketing should be provided	0.91	IV

Conclusion

From the list of progressive farmers, seventy five farmers were selected for the study with the objective to know their preferences and utility in their field situation. Majority of the farmers opined that time specific advisories are most important followed by weather forecasting and marketing information. The messages on agronomic practices are most suitable followed by management of disease & pests are found to be most suited as per the result. They preferred to serve the message on local language.

References

Adhiguru, P.; Mruthunjaya and Birthal, P. S. (2003). Project on 'Innovative Institutions for Agricultural Technology Dissemination: Role of Information and Communication Technology,' *National Center for Agricultural Economics and Policy Research*, New Delhi.

Chauhan, Nikulsinh M. (2010). Expectations of the Farmers from ICT in Agriculture. *Indian Res. J. Ext. Edu*. 10 (1), January, 2010

Dhaka, B.L. and Chayal, K. (2010). Farmers' Experience with ICTs on Transfer of Technology in Changing Agri-rural Environment. *Indian Res. J. Ext. Edu*. 10 (3), September, 2010:114

GOI (2001). '*Report of Prime Minister's Task Force on India as Knowledge Superpower*'. Planning Commission, Government of India, New Delhi.

Jones, G.E. (1997). The history, development and the future of agricultural extension. In: B. E. Swanson, R .P. Bentz, and A.J. Sofranko (Eds), *Improving agricultural extension – a reference manual*. Rome: FAO.

Maningas, R. V. (2006). Mainstreaming Farmers and Intermediaries Into Information and Communications Technology (ICT): A Strategy Towards Adopting ICT for Rural Development and Agricultural Extension. *Computers in Agriculture and Natural Resources, 4th World Congress Conference*, Proceedings of the 24-26 July 2006 (Orlando, Florida USA) Publication.

Mehta, P. (2003). *Information Technology in Agriculture: Reaching the unreached*. Theme paper presented by at national workshop on ICT for Agriculture and Rural Development organized by Indian Association for Information Technology in Agriculture and Dhirubhai Ambani institute for information and communication technology.

Mruthunjaya and Adhiguru, A. (2005). ICT for livelihood security: a reality check. *Mainstreaming ICTs,* II (2):14-18.

Zijp, W. (1994). *Improving the transfer and use of agricultural information – a guide to Information Technology*. Washington DC: World Bank.

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Analytical study on Distribution of Female headed households in different districts of Odisha

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ABSTRACT

The present investigation was carried out on Analytical study on Distribution of Female headed households in different districts of Odisha. The study was undertaken by taking census data of female headed households of Odisha and India. A questionnaire was set off to identify the problems of female headed households with respect to male headed household. The variables are based on agriculture related problems. The distribution of female headed households in India and Odisha was plotted in graph and it is found that the female headed households are comparatively low in number than male headed households. They have lack in banking facilities. Most of the female headed households are living in rural areas than urban according to census data 2011.To identify their problems two districts Bolangir and Bargarh are selected according to productivity difference in rabi paddy. Bargarh has high and Bolangir has lowest productivity. The survey data was analyzed in chi-square to know the significant difference among the male and female headed households. It is found that there is significant difference among the variables which are taken to identify the problems. There is also significant difference in use of farm tools, resources and opportunity to upscale business, decision on sell of crops and lands, use of fertilizer and pesticides, identifications of pests and diseases. The correlation is identified between productivity and different variables in both male and female headed households. There is significant relationship between productivity with education, land owned, access to resources and decision making.

Key Words : *Female headed household, Access to resources*

Introduction

A household is the basic residential unit where economic production, consumption, inheritance, child rearing, and shelter are organized and carried by the person who has greater authority in the household and who takes decision by his own. The households are mostly headed by male members but in some cases females also get opportunity to take decision of their households. Those households, where females are the main contributor of their family in sustaining their households are called female headed households. They took responsibility over their households by executing different roles in managing their livelihood activities such as doing all the farm activities, taking part in different social meetings, income earning, and takes decision of their child education. The reasons for taking female as an organizer in households when her husband is unable to take decision in the household works or she is a widow or her husband has migrated to other city to get work or if she is a divorced women.

In these modern worlds the women are furnishing their own path on taking themselves in divergent roads by shifting from joint to singly households. They are maintaining their own dignity and performing multiple tasks in different organizations. As a part of change in life style different from the traditional role, women are now assuming the role of the prime careers, educators, and even household income earners.

1.1 Female headed household in India

The Constitution of India has granted men and women equal rights but some customs and rituals demoralized the strength of female headed households. A female is still viewed as a liability and she is congealing to deem herself as inferior and subordinate to men. In patriarchal societies all over the world and in India, an elderly male member of the family is considered the household head. Now a day's women are taking headship status in the household. According to 2011 census among the total households 11 percent are female headed. In India a number of factors

contribute to increasing incidence of female headship which is addiction of men to evil practices, migration of men and death of her spouse causes female headed households in India.

The poverty is leading problems in female headed households in India. The female headed are in more catastrophic condition because they face problems in managing their all activities simultaneously.

1.2 Female headed household in Odisha

The economy of Odisha is mostly dependent on agriculture and the performance in this sector is crucial for development of the state. The main reason for female headed households is the people of Odisha are migrating to big cities for employment lead their soul mate to face many problems in survival. These wives or soul mate faced economical problems; problems related to agriculture production, social problems and problems in maintain their children's. In Odisha the widow female headed is higher than the left behind women due to migration. It is estimated that in Odisha has 9.15% of the total number of house hold which are headed by female. There are 9.91% for STs and 9.70% for SCs which are headed by females. The widow woman faces problems mostly because of their cultural traditions and indiscrimination towards their wages in agriculture production.

1.3 Female headed households towards agriculture

Female headed household have always played the key role of conserving the basic life support system such as land, water, flora and fauna. They are lagging behind in technological innovations and working with indigenous technology for maintaining their livelihood. Therefore, without intellectual and physical participation of female headed, it is not be possible to step up towards development in agriculture economy. Thus, it is important for us to study the problems of female headed household in agricultural sector.

Female headed households play a significant and crucial role in agricultural development and allied fields including the main crop production, livestock production, horticulture, post harvest operations, agro/social forestry, fisheries, etc. There is hardly any activity in agricultural production, in which women are not actively involved except ploughing.

Materials & Methods

2.1 Types of Data

Both the primary and secondary data are collected for conducting this study. The secondary data is taken from Census of India. The secondary data were taken to know the distribution of female headed households in India as well as in Odisha. To study the problem of female headed households related to agriculture, primary data were collected for the study. The primary data is based on questionnaire schedule developed to know strength and constraints of female headed households in agriculture production.

2.2 Area of the Study

To know the influence of female headed household and their problem in agriculture of two districts Bolangir and Kalahandiwere identified having the highest and lowest productivity of *rabi* paddy respectively.

2.3 Data Collection

Primary data for this study were collected from the selected households using a schedule questionnaire. The information was taken from the female headed households and male headed households on different issues and problems related to the agriculture production. The questionnaire had both qualitative and quantitative questions.

2.4 Chi-Square Test

The chi-square test is used to determine whether there is significant difference between the expected frequencies and the observed frequency. The value of $\chi 2$ is based on the difference between observed values and expected values and is calculated

$$x^2 = \sum \frac{(f_0 - f_e)^2}{f_e}$$

Where f_o denotes the observed frequency and f_e the expected frequency. The degrees of freedom are calculated as df = (r-1) (c-1) where there are r rows and c columns.

First null and alternate hypothesis was made.

H_o = There is no significant difference between male and female headed households with use of farm tools, resources and opportunity and some other variables.

H_1 = There is significant difference between male and female headed households with use of farm tools, resources and opportunity and some other variables.

The numbers of male and female headed household were calculated for each variables falling under different categories: high, medium and low. Their expected values were computed in excel. Using Chi-square option in MS

Excel the p values were calculated for each variable. If the p-value is less than 5% level of significance (0.05) then the variable is said to be significant. Then, the null hypothesis was rejected and interpretation was made on the alternate hypothesis.

2.5 Correlation

Correlation refers to how close two variables are to having a linear relationship with each other.Correlations are useful because they can indicate a predictive relationship that can be exploited in practice. Pearson's and Spearmen's rank correlation were used to analyze the data in the study. The quantitative values were measured by Pearson's correlation and Spearman's correlation was used for

$$r_{xy} = \frac{n\left(\sum xy\right) - \left(\sum x\right)\left(\sum y\right)}{\sqrt{n\left(\sum x^2\right) - \left(\sum x\right)^2}\sqrt{n\left(\sum y^2\right) - \left(\sum y\right)^2}}$$

Where r = Coefficient of correlation

n = sample size

x and y are variables

The correlations of numerical values were calculated in excel using the data analysis tool pack and the dummy variables were calculated in SAS software for getting probability value. The P values which were less than (0.05) were considered as significant.

Results & Discussion

3.1 Female Headed Households Population

Odisha has total 96,05,629 numbers of households. Out of these 85,86,662 are male headed and 10,19,213 number are female headed households (Census 2011). Odisha has total 10.61 percent of female headed households having distributed in different districts of Odisha.

Figure 1 reveals the percentage data of male headed and female headed households. The data describes about how much female headed households are present as compared to male headed households in each district. The given data shows that Gajapati has highest female headed households of 15.24 percent followed Rayagada, Ganjam and Mayurbhanj where as Sonepur has lowest percent of female headed household of 8.24 percent.

3.2 Female Headed Households in Urban and Rural

The female headed households are distributes all around the districts in Odisha. According of their last place of residence they are categorized into urban and rural. In Odisha there are 17 percent of female headed which are in urban area and 83 percent in rural areas.

Figure 2 shows the distribution of female headed households according to the residence in urban and rural, where it is seen that Khordha has highest percentage of female headed households in urban and Kendrapada has highest percentage of female headed households in rural areas. Khordha has 49 percent of female headed households in urban areas and Kendrapada has 95 percent of female headed households in rural areas.

3.3 Banking Facility in Female Headed Households

Banking facility is important factor for agricultural production. In Odisha 36 percent of female headed are avail to banking facility.

Fig 3 reveals the banking facility of number of female headed in total female of different district of Odisha. It shows that Kendrapada has highest banking facility of 51 percent followed by Jagatsingpur and the lowest is Nabarangpur with 17.21 percent. In most of the district's the female headed households does not have proper access to banking facility indicating there is huge gap between total female headed households and number of female headed accessing banking facility in Odisha.

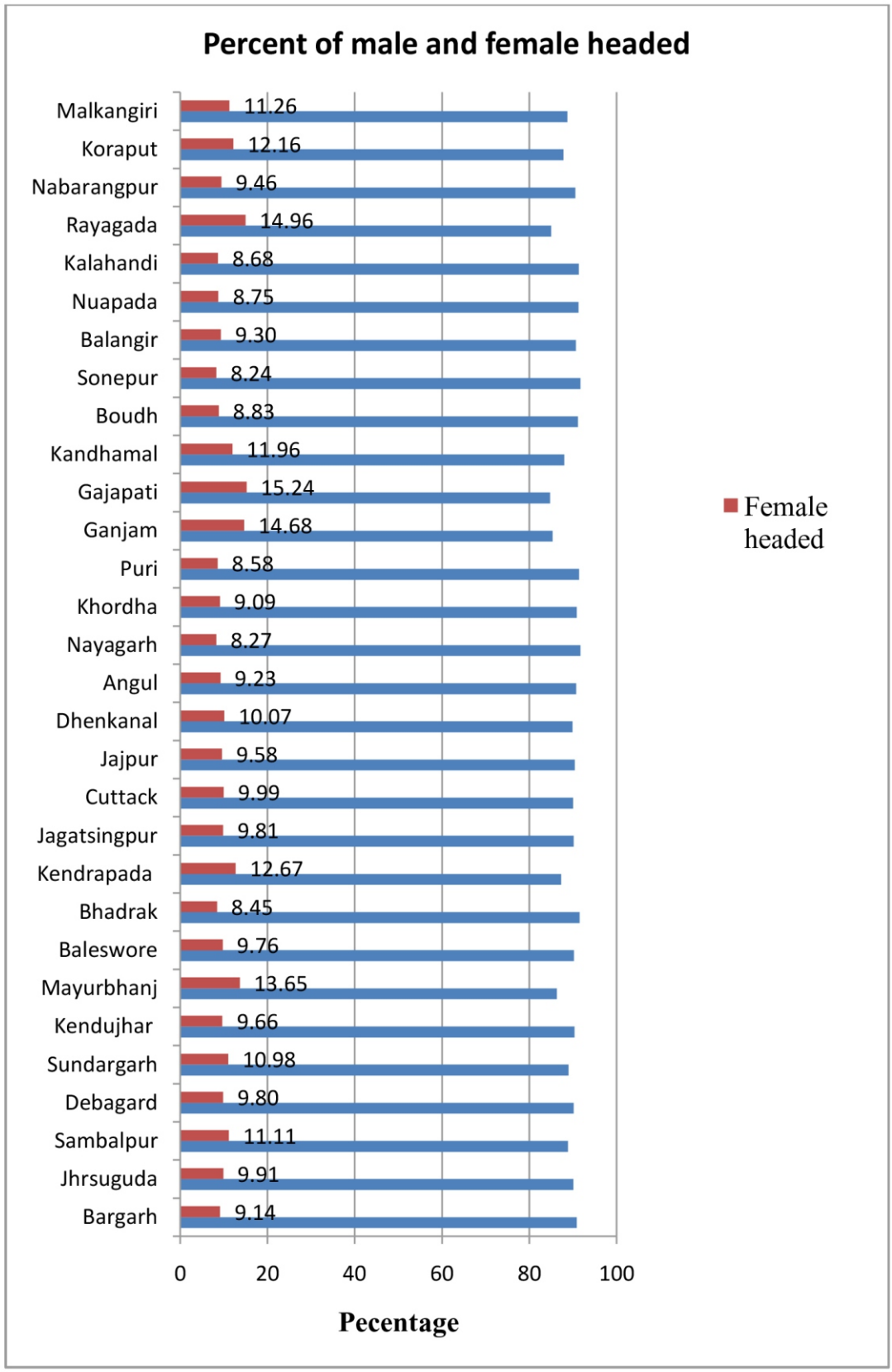

Figure 1 Percentage of male and female headed in Odisha (2011)

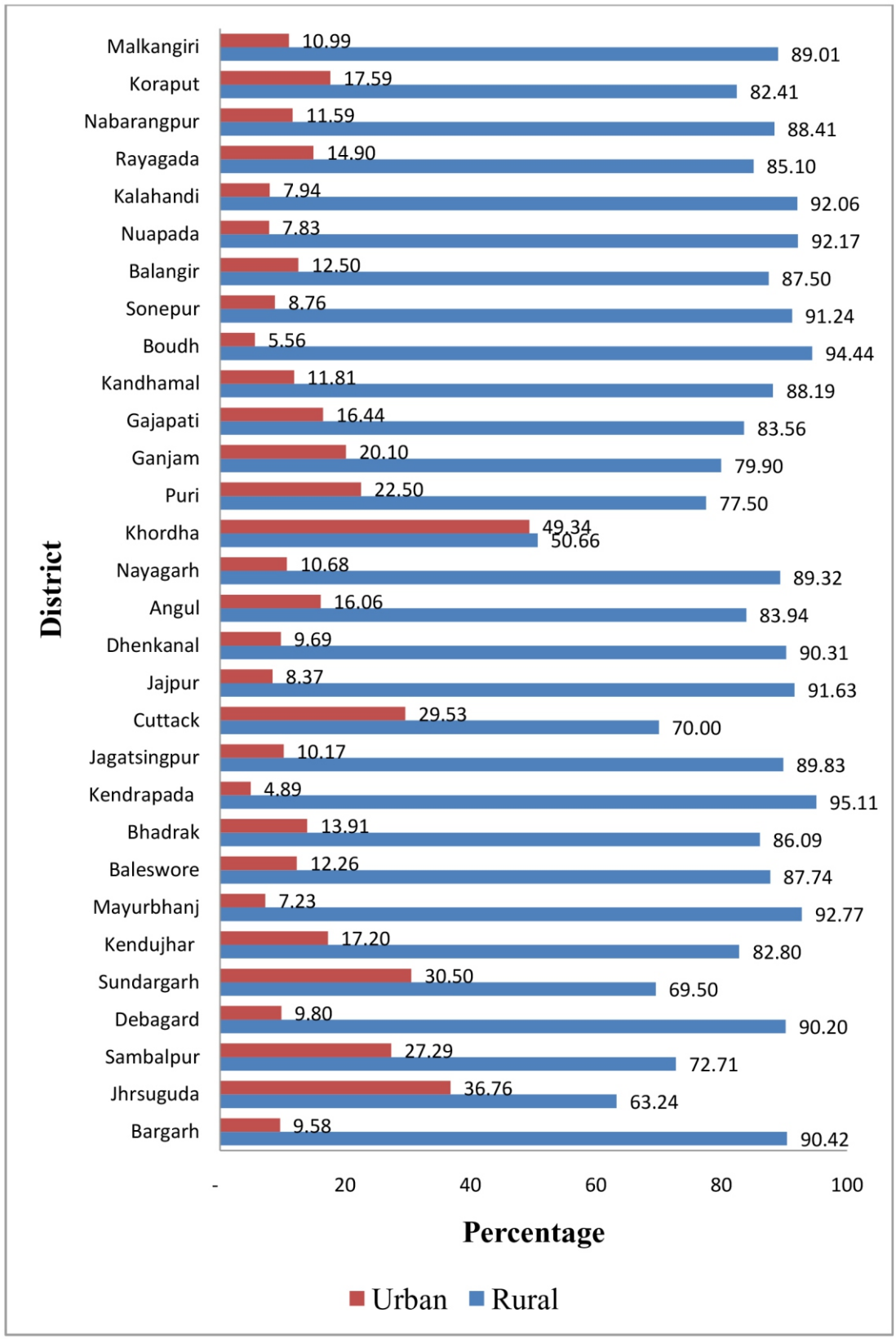

Figure 2: Percentage of female headed households living in urban and rural areas of Odisha (2011)

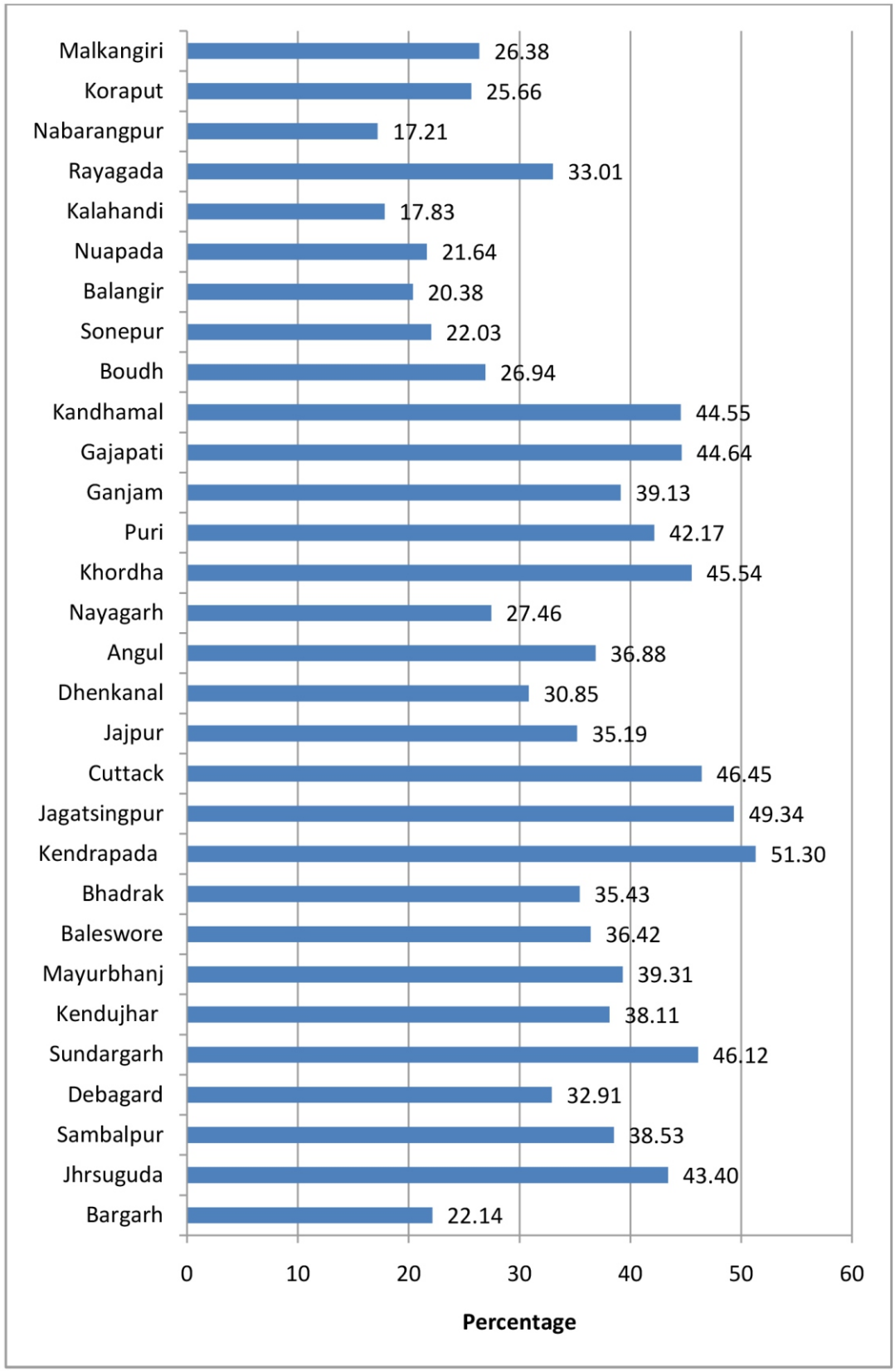

Figure 3: Number of female headed households having banking facility (2011)

Conclusion

The secondary data of female headed in India and Odisha are taken from the census of India (2011). The graphs are designed to know their distribution in India and Odisha. It is concluded that the female headed have less no of household percentage. They are dominated mostly in rural areas. They are getting less banking facilities. On going through the reviews and literature it is concluded that the female headed households suffers from many problems in agriculture. To understand their problems in agriculture a questionnaire having different variables was made to recognize the problems of female headed differ from male headed.

On analyzing the variable in chi-square tests it is found that the female headed have significant difference from male headed households in different variables, like use of farm tools, getting agricultural information, getting resources and opportunity, use of farm inputs, use of new farm techniques, diagnose disease and pests. It is concluded that female headed are also taking interest in farm activity and they can handle the agriculture production. They are good in decision making and in management of both households and farm activities. They are lagging in such types of manual and cultural activities.

References

Agrawal, B. 2012. Food security, Productivity and Gender Inequality. Institute of economic growth, 320: 9-12

Chant, S. 2008. How female headed households became the poorest of the poor: causes, consequences and cautions. *Journal of Gender and development,* 24:70-89.

Cheryl, A. and Janice, H. 1980. Managerial Behavior and Stress in Families Headed by Divorced Women" Journal of Family Relations, 29: 525-532.

Chowdhry, S. 2004. Invisible Activities of Rural Women. Kurukshetra, 52(**9**).

Doss, C. 2011. The Role of Women in Agriculture, Agricultural Development Economic Division, The food and agricultural division of the United Nations.

Gangopadhyay, S. and Wadhaw, W. 2003. Are Indian Female-Headed Households More vulnerable To Poverty .*India Development Foundation*.

Githinji, M. 2011. small and productive : Female headed households and the inverse relationship between land size and output in kenya. *journal of economics*, 31:1-6.

Mazumdar et.al, 2009. Nature and Extent of Rural Women's Participation in Agricultural and Non-Agricultural Activities, *Agriculture Science Digest*, 29 (**4**): 254-259.

Meenakshi, and Ray 2002. Impact of household size and family composition on poverty in rural India. *Journal of Policy Modeling* ,22:450

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Composite Carp Culture in Odisha- A study on fish farmers' adoption behaviour

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ABSTRACT

Aquaculture is the world's fastest growing food producing sector and rapidly growing sector in India with an annual growth rate of over 7%.The sector has a huge potential in terms of providing employment opportunities and livelihood security.The present study was undertaken in Jagatsinghpur district of Odisha with an aim to measure the levelof adoption of composite carp culture technology in the district and to establish a relation between the socio-economic variables and the level of adoption. The district, village and respondents were chosen through random sampling, whereas blocks were selected through purposive sampling procedure. Primary data were collected from 57 fish farmers practicing composite carp culture using structured interview schedule. The average pond area was found to be 1.92 acreand a mean fish yield of 2.57 t/ha/year.The study indicates that 72, 21 and 7 percent of the respondents were in the category of medium, low and high level of adoption respectively. The study observed a positive and significant correlation of exposure to mass media, knowledge level, extension contact and fish farming experience with level of adoption of composite carp culture technology.

Keywords: *Adoption, Composite Carp Culture, Fish farmers, correlation*

Introduction

Fisheries is a sunrise sector with varied resources and potential, engaging over 14.50 million people at the primary level and many more along the value chain. Transformation of the fisheries sector from traditional to commercial scale has led to an increase in fish production from 0.75 MT in 1950-51 to 13.75 MT during 2018-19 (GOI, 2020). Inland fisheries presently have a share of 71% in total fish production of the country. Freshwater aquaculture with a share of 34 percent in inland fisheries in mid-1980 has increased to about 80 percent in recent years. (DADF, 2019). Freshwater aquaculture is accounted for 63.8% of global total aquaculture production of 47, 102, 391 t (FAO, 2016). India is bestowed with 3.15 million ha of reservoirs, 2.42 million ha of ponds and tanks as well as 0.19 million ha of rivers and canals. This indicates the huge potential for the development in aquaculture in India. However, only around 50% of ponds and tanks are being used currently for aquaculture (Jayasankar and Das, 2015).Foreseeing high potential, the Hon'ble Prime Minister has called for "Blue Revolution" in the fisheries sector. It focuses mainly on increasing fisheries production and productivity from aquaculture and fisheries resources, both inland and marine with the objectives of ensuring food and nutritional security, to generate employment and export Earnings, to ensure inclusive development and empower fishers and aquaculture farmers (DADF, 2019).The Union Government has also recently launched Pradhan Mantri Matsya Sampada Yojana with an investment of Rs 20050 Cr to turn India in to a hot spot for fisheries and aquaculture product through appropriate policy, marketing and infrastructure support. Through implementation of this scheme the fish production is targeted at 22 MMT by 2024-25, while the current (2018-19) production is 13.75 MMT. To achieve this target freshwater aquaculture sector has to play a vital role through an additional fish production of 50 lakh tons. The national average productivity is also set at 5 t/ ha. from the current productivity of 3 t/ha.

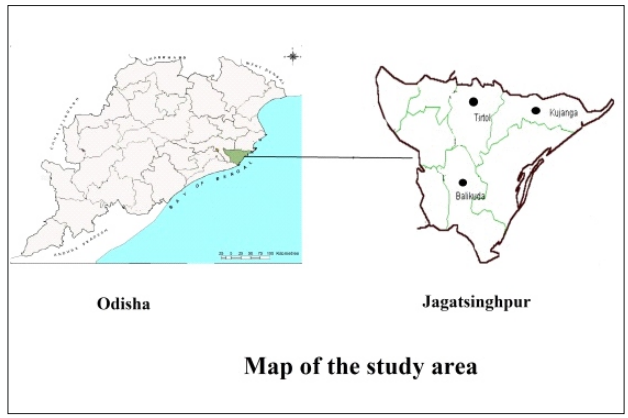
Odisha isa coastal state with a coastline of 480 kms, is situated in eastern India, between West Bengal in the north and Andhra Pradesh in the south. The state has 6.83 lakh ha of freshwater resources. The state occupies fifth position in inland fish production among various states of India. Inland fish production of Odisha has almost doubled *i.e.* from 2.68 lakh tonnes in 2011-12 to 5.34 lakh tonnes in 2017-18 (GOI, 2019).**However,there is a gap between the total production potentiality and present productivity level. In case of culture fisheries the present productivity stands at 3.31 lakh MT against the total production**

potentiality of 3.9 lakh MT indicating a gap of 60,000 MT (GoO, 2018). Despite the efforts made by the central and state departments to transfer carp technology, it is observed that farmers are operating mostly in subsistence level. This indicates why there is a gap between the potential yield and the actual yield farmers are getting.Adoption of scientific fish farming practices by the farmers is of paramount importance for bridging this gap. Adoption of modern technologies is one of the most promising strategies to increase farm incomes (Varshney *et al*., 2020).Composite carp culture is the stocking of different carp species viz., catla, rohu and mrigal (Indian major carps) together with three other exotic carps viz., silver carp, grass carp and common carphaving different feeding habits. The three Indian major carps viz. catla, rohu and mrigal contribute the major chunk of the freshwater aquaculture production followed by the exotic carps silver carp, grass carp and common carp forming the second important group (Rutaisire *et. al*, 2017). This is one of the most widely adopted technologies in fish farming. Hence, this study was undertaken in Jagatsinghpur district of Odishawith the objectives i) to study the extent of adoption of composite carp culture technology in the districtand ii) **to establish a relation between the socio-economic variables and the level of adoption**.

Material & Methods

Study Area

For the present study, Jagatsinghpur district was selected randomly. Jagatsinghpur district is one of the coastal districts in Odisha. It is bounded by the Kendrapara district in north, Puri district in south, Bay of Bengal in the east and Cuttack district in the west. Total geographical area of the district is 1759.00 Sq Km. The total population of the district is 11.37 lakhs as per 2011 census.Jagatsinghpur occupies a pivotal position in the agrarian and industrial economy, sea trade and fishing commerce. Around seventy percent of its population depends upon agriculture and agro–based occupations.The state has a production potentiality of 3.9 lakh MT in culture fisheries (GoO, 2017-18). Freshwater fish production in Jagatsinghpur district was 12672.45 MT in 2017-18, contributing 2.8% towards total freshwater fish production of Odisha (GoO, 2019). After discussion with the Head, Krishi Vigyan Kendra and fishery officials from the district three blocks namely Tirtol, Kujanga and Balikuda block were selected purposively because of the presence of more fish farmers. Selection of village and respondents was done through multistage random sampling. From each block 19 respondents were selected to get a representative sample. Hence a total of 57respondentswere interviewed.



Map of the study area

Collection of Data

Both primary and secondary data were collected for the study. For the collection of primary data, a structured interview schedule was prepared. Before administering the schedule to the respondents, it was pre-tested with 20 fish farmers of the district. Primary data was collected from 57 fish farmers through personal interview using the pre tested interview schedule. The data was collected during Jan-Feb, 2020. Secondary data was collected through reviewing various literatures, from Directorate of fishery, Odisha and District Fishery Office, Jagatsinghpur.The inferences were drawn using suitable statistical methods viz., frequency, percentage, mean, standard deviation, correlation coefficient.

Measurement and Scoring pattern of variables

Independent Variable : The schedule contained information on the socioeconomic factors, which were likely to influence the adoption of recommended technology of composite carp culture. Variables included were age, education level, pond area, extension contact, exposure to mass media, knowledge on recommended technology and fish farming experience.

*Dependent Variable:*For measuring the adoption level, a total number of 13 practices that constitute composite carp culture technology were selected. The farmers were asked to respond whether they adoptor do not adopt the practices.Score of 1 and 0 were assigned to adoption and non-adoption of the technology respectively. Therefore, maximum possible score was 13 for each respondent. The adoption quotient for each of the respondent was calculated by using the formula given by Pareek and Chattopadhyay (1966):

Adoption quotient = No. of practices adopted/ No. of practices advocated x 100.

After working out the adoption quotient, the respondents were categorized into 3 categories by computing the meanand standard deviation for the adoption quotient. The three categories are- low (<Mean- SD), medium (Between

Mean ± SD) and high (>Mean + SD).Descriptive statistics of variables and correlation analysis were also carried out to draw further inferences.

Results & Discussion

Socio-economic profile of the fish farmers

Socio-economic characteristics of the respondents are presented in Table 1. It is evident that majority of the respondents (54.39%) were from the age group of 35-50 years while 36.84 percent of them were falling in the category of >50 years and only 8.77 percent of them were in 20-35 years age group. With regard to education level majority (28.07%) of the respondents had matriculation level of education followed by graduation level (24.56%). Interestingly no one of them was illiterate. Majority (73.68%) of them had a pond area of 1-2 ac. whereas, 19.20 percent of the respondents had a pond area of more than 2 ac and only 7.02 percent of the respondents had less than 2 ac of pond. Majority (42.11%) of the respondents were having medium level of extension contact followed by low level (31.58%) and high level (26.31%). Most (59.65%) of the respondents have medium level of exposure to mass media followed by low level (28.07 %) and high level (12.28%) of exposure to mass media. More than 2/3rd of the respondents (71.93%) possessed a medium level of knowledge while 17.54 per cent of them were having a low knowledge level and only 10.53 percent of them possessed a low knowledge level. Roy and Bhagat (2012) also reported that majority of the respondents belonged to medium knowledge level in adoption of technology.

Table 1: Distribution of respondents based on their Socio-economic characteristics (Independent variable) (n=57)

Independent Variables	Category	Frequency	Percent
Age	Young (20-35 years)	5	8.77
	Middle (35-50 years)	31	54.39
	Old (>50 years)	21	36.84
Education level	Illiterate	0	0.00
	No formal schooling	6	10.53
	Primary	3	5.26
	Middle	6	10.53
	Matriculation	16	28.07
	Higher secondary	9	15.79
	Graduation	14	24.56
	Post-graduation	3	5.26
Pond area	<1 ac	4	7.02
	1-2 ac	42	73.68
	>2 ac	11	19.30
Extension contact	Low	18	31.58
	Medium	24	42.11
	High	15	26.31
Exposure to mass media	Low (<43.50)	16	28.07
	Medium (43.50-75.16)	34	59.65
	High (>75.16)	7	12.28
Knowledge level	Low (<44.76)	10	17.54
	Medium (44.76-80.38)	41	71.93
	High (>80.38)	6	10.53
Yield (tonnes/ha./yr)	Range	0.77-6.2	
	Mean	2.57	

Table2: Frequency distribution of the respondents on the basis of adoption of the recommended practices of composite carp culture technology (n=57)

Sl. No	Practices	Frequency	Percentage (%)
1	Predatory and weed fishes removed	45	78.95
2	Pond preparation done for every crop cycle	43	75.43
3	Water pH was adjusted through lime or alum	46	80.70
4	Water inlet and outlet were provided with filters	31	54.38
5	Seeds were stocked after proper acclimatization	39	68.42
6	Seeds were disinfected before stocking	39	68.42
7	Fertilization and manuring done as per recommendation	38	66.67
8	Plankton crash was observed during crop cycle	34	59.65
9	Supplementary feeding is given based on biomass calculation	38	66.67
10	Water exchange and aeration adopted for maintaining water quality	32	56.14
11	Fortnightly sampling to check the health status of the fish	32	56.14
12	Careful disposal of dead animals	41	71.92
13	Supplementary feeding with pellet feed	33	57.89

From table 2 it is evident that'Water pH was adjusted through lime or alum' was the highest adopted practice among all other recommended practices i.e by around 81 per cent of the respondents. The second and third most frequently adopted practices were 'Predatory and weed fishes removed' (79%) and Pond preparation done for every crop cycle' (75%) respectively. 'Careful disposal of dead animals' was practiced by 72 per cent of the respondents. As most of the farmers buy seed from other districts of Odisha or from vendors, acclimatization becomes necessary hence, before stocking the seeds they are acclimatized properly and also disinfected (68%).'Fertilization and manuring done as per recommendation' and 'Supplementary feeding with pellet feed' were practiced by 67 per cent of the fish farmers. Other recommended practices in decreasing order of adoption are 'Plankton crash was observed during crop cycle' (59.65%),Around 58 percent respondents are adopting the practice of 'Supplementary feeding with pellet feed'.A mixture of groundnut oil cake, rice bran,jaggery andyeast powder in 10:7:7:1 ratio as supplementary feeding is practiced by most of the farmers. The mixture is used after soaking them for 1 day(24 hours). It is applied in 15 days interval. This enhances water productivity and reduces the cost of supplementary feeding. 'Water exchange and aeration adopted for maintaining water quality' and 'Fortnightly sampling to check the health status of the fish' each by 56 per cent of the respondents. The least adopted practice by the respondents was 'Water inlet and outlet were provided with filters' (54%). This may be due to lack of knowledge and awareness about composite carp culture technology.Among the constraints in technology adoption, the most prominent ones are the lack of information and credit (Varshney *et al*., 2019).

Adoption level of the fish farmers

It is clearly depicted from Fig.2 that 71.93 percent respondents were found in the category of medium adoption whereas, 21.05 per cent of them had a low level of adoption. Only 7 per cent of the respondents were in the high adoption level category. Socio-economic status, entrepreneurial interest, organized market are among the factors that determine growth and development of any

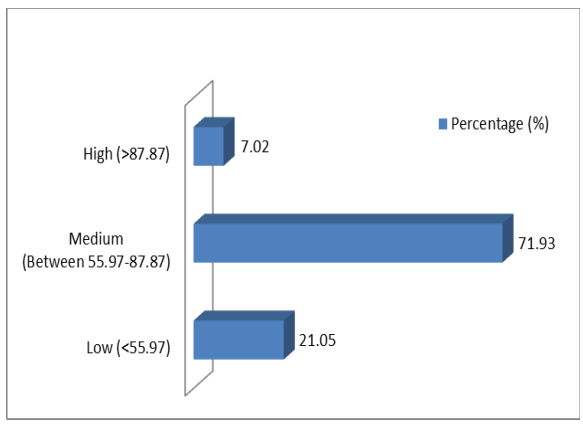


Fig.2. Distribution of respondents based on level of adoption (n=57)

sector. Aquaculture sector is not an exception.Farmers of Jagatsinghpur district reported to have obtained yield from fish pond that ranges from0.77 to 6.2 t/ha/yr.Mean yield is worked out to be 2.57 t/ha/yr. Poor adoption of scientific practices, use of low level of external inputs coupled with other socio-economic factors may explain the low yield.

Relationship between socio-economic variables of respondents with their level of adoption of composite carp culture technology

For this study, six independent variables *viz.*, age (X_1), education level (X_2), Pond Area (X_3), exposure to mass media (X_4), extension contact (X_5), knowledge level (X_6) and fish farming experience (X_7) were taken.**The relationship between selected socio-economic characteristics of fish farmers and their level of adoption was found by correlation coefficient and the computed 'r' values are presented in table 4.**

Table 3: Correlation coefficient of selected socio economic variables with adoption(n= 57)

Sl. No	Variables	r	sig
1	Age (X_1)	-0.598	.000**
2	Education level(X_2)	0.164	$.112^{NS}$
3	Pond area(X_3)	0.138	$.152^{NS}$
4	Exposure to mass media(X_4)	0.566	.000**
5	Extension contact(X_5)	0.593	.000**
6	Knowledge level(X_6)	0.600	.000**
7	Experience (X_7)	0.498	.000**

** Significant at 1% level of significance NS - Non Significant

Table 3 indicates that the variables *viz.*,exposure to mass media (X_4), extension contact (X_5) and knowledge (X_6) and fish farming experience (X_7) have a positive and significant association with the level of adoption of the technology at 0.01 level of probability**.**Whereas, age (X_1) was negatively correlated with the level of adoption of composite carp culture technology.It is probably due to the fact that older people are reluctant to adopt the recommended practices. **Roy and Bhagat (2012) observed that extension agency contact and mass media exposure had positive and significant correlations with the extent of adoption. Whereas, age of the respondents was negatively correlated with the extent of adoption.** Prasad and Choudhary (2010) in their study also observed a negative association of age of farmers with the extent of adoption.Education level (X_2) and pond area (X_3) were also found to have a positive association with the extent of adoption but non-significant. Though these to variables contribute positively towards the extent of adoption but their association is not to a significant level. Ndah *et al.,* (2011) studied that that inputs provided by public or non-governmental bodies, favourable environmental conditions and socio-cultural attitudes act together as driving factors towards fish farming adoption in Cameroon.

Conclusion

Adoption behaviour of fish farmers of Jagatsinghpur district of Odisha indicates that more than 2/3rd of the respondents have a medium level of adoption. Yet the average productivity is 2.57 t/ha/yr. leaving lot of scope for vertical expansion. The harvested fish are marketed in the district itself. As the district is also blessed with resource potential for freshwater fish culture, it is desirable that farmers adopt more scientific measures and practice semi-intensive culture of fish. This would help raising productivity as well as profitability. The farmers can also be benefitted through the "Matsya Pokhari Yojana",a new State Plan Scheme has been implemented during 2017-18 to create new additional water bodies of targeting for 1059 ha. with a 50% subsidy assistance & advanced fingerling production in 200.00 ha. of water area with unit cost of Rs.8.50 lakh/ha. for excavation of new tanks and with a unit

cost of Rs.2.50 lakh/ha. under fingerling production under the scheme. In addition, it would also generate opportunities for employment for rural youth. The study suggests that fisheries extension need to be strengthened and provide farmers with latest information about technologies, market, policies etc. A concerted effort by all stakeholders would help furthering the cause of aquaculture development in Jagatsinghpur.

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References

Anonymous, (2018).*Annual Activity Report* 2017-18, Fisheries and Animal Resources Development Department, Government of Odisha. pp 51.

Anonymous, (2019). District at a glance, Directorate of Economics and Statistics, Odisha. pp 37.

Anonymous, (2014). Guidelines for the Centrally Sponsored Scheme "National Mission on Agricultural Extension and Technology (NMAET)" to be implemented during the XII Plan. pp 110.

Anonymous, (2019). Hand Book on Fishery Statistics 2018. Government of India. pp 190.

Anonymous. (2020). Pradhan Mantri Matsya Sampada Yojana, Department of Fisheries, Ministry of Fisheries, Animal Husbandry and Dairying, Government of India. 26 pp.

DADF, (2019). Annual report 2018-19. Department of Animal Husbandry, Dairying and Fisheries. Ministry of Agriculture, Government of India. pp 162.

https://Jagatsinghpur.nic.in/about-district/district-at-a-glance/

Jayasankar P and Das PC, (2015). Vertical expansion strategy for increased freshwater aquaculture production. Fishing Chimes, 35, pp. 44-51.

Ndah HT, Knierim A and Ndambi OA, (2011).Fish Pond Aquaculture in Cameroon: A Field Survey of Determinants for Farmers' Adoption Behaviour. Journal of Agricultural Education and Extension, 17 (4) :309-323.

Pareek U. and Chattopadhyaya SN, (1966).Adoption Quotient: A Measure of Multipractice Adoption Behaviour. The Journal of Applied Behavioural Science, 2 (1): 95-108.

Prasad SN and Choudhary AK, (2010). Extent of Adoption and Constraints in Boro Rice Cultivation Faced by the Farmers in Darbhanga District of Bihar. Indian Journal of Extension Education, 46 (1 & 2):106-111.

Roy S and Bhagat R, (2012). Level of Knowledge and Extent of Adoption of Farmers onRecommended Tuberose Production Practices. Indian Journal of Extension Education, 48(1& 2): 78-80.

Rutaisire J, Nandi S andSundaray JK, (2017). A review of Uganda and India's freshwater aquaculture: Key practices and experience from each country. Journal of Ecology and the Natural Environment, .9 (2):15-29.

Varshney D, Joshi PK, Roy D and Kumar A, (2020). PM-KISAN and the Adoption of Modern Agricultural Technologies. Economics & Political Weekly, 55 (23): 6 June.

Varshney D, Joshi PK and Dubey SK,(20190. Direct and Spillover Effects of Agricultural Advisory Services: Evidence from Uttar Pradesh, India, 1850, IFPRI, Washington,DC.

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Elephant Foot Yam-Potential for Nutritional Security & Economic Viability of Farm Women

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ABSTRACT

Elephant foot yam is a highly potential tropical crop. The corm is rich in carbohydrates, minerals and vitamin-A&B. It is used as vegetable and useful in stomach-ache, a tonic recommended for piles. In India, as a cash crop, its area under cultivation is increasing fast. Wild plant of elephant foot yam is found throughout Odisha. The corms of wild plants are highly acrid, causing irritation in the throat and mouth due to excessive production of calcium oxalate present in the corms. Variety Gajendra released by APAU, Kerala which is acrid free and is highly accepted by the farmers. An attempt was taken for cultivation of elephant foot yam to propagate the corms at Giringaput model village of ICAR-CIWA , Bhubaneswar. Crop was planted during Kharif season. The cut corms (400-500g) were used as planting material after treated with mancozeb (0.2%) + monocrotophos (0.05 %) for 5-10 minutes, followed by drying in shade for 24 hours, as these are prone to decay after planting due to possible presence of several soil borne pathogens. The proper planting spacing at (90x90) cm with pit size of (60x60x60) cm was followed. Care was also taken to prevent water stagnation at every stage of crop growth. After six month the crop was harvested. Data was collected on yield of elephant foot yam. Total 360 kg of planting material was distributed among 60 farm families. Each was given 6 kg planting material. The yield was 48-50 kg per family. A farm woman can earn around Rs 1500/- Rs 1800/- in a season by investing Rs 200/- in a small backyard patch. After analyzing the BC Ratio, it is ascertained that the crop has a potential for propagation in rural areas of Odisha as it has nutritional, medicinal and economic viability.

Ke words: *Nutritional security, Farm women*

Introduction

In India, Amorphophallus paeoniifolius; commonly known as elephant foot yam (in Hindi Ol (ওল) & Olua in Oriya). It is grown mostly in Bihar, West Bengal, Kerala, Karnataka, Andhra Pradesh, Maharashtra and Orissa. It is a tropical tuber crop that offers excellent scope for adoption in the tropical countries as a cash crop due to its production potential and popularity as a vegetable in various delicious cuisines.

Hot (25-30°C) and humid (80-90 % RH) climate is required at initial stage of the crop growth, whereas dry climate facilitate corm bulking at later stage.

As per Indian Medicinal Plants dictionary by C.P. Khare, published by Springer, the Elephant-foot yam has several medicinal benefits and widely used in Indian medicine including Ayuverda, Siddha and Unani. The corm is prescribed in bronchitis, asthma, abdominal pain, emesis, dysentery, enlargement of spleen, piles, elephantiasis, diseases due to vitiated blood, rheumatic swellings. The corm is rich in carbohydrates, minerals and vit-A&B. It is used as vegetable and useful in stomachache, a tonic recommended for piles. The corm contains an active diastatic enzyme amylase, betulinic acid, tricontane, lupeol, stigmasterol, betasitosterol and its palmitate and glucose, galactose, rhamnose and xylose. In India, as a cash crop, its area under cultivation is increasing fast.

Yam is considered to be a healthy low-fat food and is a rich source of essential fatty acids (Omega-3 fatty acids) which are known to increase the good cholesterol levels in the blood. Eating elephant yam helps in increasing the estrogen levels in women's bodies, thus helping in maintaining the hormonal balance. It is also high in vitamin B6. Consuming vitamin B6 provides relief from pre-menstrual syndrome in women. It is a natural product that is high in fiber. So it can be used as slimming food because it lowers cholesterol levels and promotes weight loss and also has a high concentration of key minerals. It is loaded with potassium, magnesium and phosphorous, as well as with trace minerals like selenium, zinc and copper.

The nutritional values of the edible portion of the elephant yam (A. paeoniifolius) are: Energy 330 kJ/100g (approx), Water:- 72-79%, Protein:- 1.7-5.1%, Fat:- 0.2-0.4%, Carbohydrate:- 18-24%, Fibre:- 0.8%, Calcium:- 50-56 mg/100g, Iron:- 0.6-1.4mg/100g, Phosphorus:- 20-53 mg/100g, Vitamin A:- 434 IU/100g.

A study has indicated the gross cost of cultivation as Rs 1,73,105, Rs 93,450 and Rs 1,68,032 per ha and the benefit-cost ratios as 1.38, 1.38 and 1.50 for elephant foot

yam cultivation in Kerala, Andhra Pradesh and Tamil Nadu, respectively. The study has revealed excessive use of all NPK fertilizers in Kerala, indicating the need for rationalization in use of these inputs, while there is a scope for increase in the use of these inputs, except nitrogenous fertilizers, in Tamil Nadu and Andhra Pradesh. Expenditures on manures in Tamil Nadu and hired human labour in Kerala can be enhanced without any adverse effect on the productivity of the crop. The analysis has revealed the need for reorganization of farm resources so as to maximize the returns on elephant foot yam farms under different production systems in India. (Srinivas, T., Ramanathan, S., 2005)

The corm production potential of this crop is 50-80 t ha-1 and net economic return is about 2000 – 3000 US$ per ha. Plant growth and corm yield is influenced by the size of planting material (corms/cornels/corm pieces), plant spacing, nutrient management and water availability. (*V. Ravi et al.)*

Materials and Methods

Wild plant of elephant foot yam is found throughout Odisha. The corms of wild plants are highly acrid, causing irritation in the throat and mouth due to excessive production of calcium oxalate present in the corms. Variety *Gajendra* released by APAU, Kerala which is acrid free and is highly accepted by the farmers. An attempt was taken for cultivation of elephant foot yam to propagate the corms at Giringaput model village of ICAR-CIWA, Bhubaneswar. The experiment was conducted in the kitchen garden of 60 farm families in this village. Each family was given 6 kg of planting material. Especially women were sensitised and trained for cultivation of this high yielding acrid free elephant foot yam.

The planting material was collected from CTCRI Sub-centre, Bhubaneswar. The cut corms weighing about 400-500g were used as planting material. Before planting this cut croms were treated with *mancozeb* (0.2%) + *monocrotophos* (0.05 %) for 5-10 minutes, followed by drying in shade for 24 hours, as these are prone to decay after planting due to possible presence of several soil borne pathogens. Some planting materials also planted by treating the traditional method of dip in cow dung slurry form some hours and the dried in shed for 24 hrs. The proper planting spacing at (90x90) cm with pit size of (60x60x60) cm was followed. Care was also taken to prevent water stagnation at every stage of crop growth. The pits were partially filled with cow dung and ash. After planting the pits was filled with same loose soil came during digging the pit.

Result and Discussion

After six months the crop was harvested from the kitchen garden of the farm families. Data was collected on yield and adoption level of elephant foot yam. Total 360 kg of planting material was distributed among 60 farm families. The yield was 48-50 kg per family from 6 kg of planting material. A farm woman can earn around Rs 1500/- Rs 1800/- in a season by investing Rs 200/- in a small backyard patch. After analyzing the BC Ratio as in table, it is ascertained that the crop has a potential for propagation in rural areas of Odisha as it has nutritional, medicinal and economic viability.

Table : 1. Benefit Cost ration of elephant foot yam cultivation

Sl No	Particulars	Quantity /Cost
1	Planting material/ family, kg	6
2	Cost of planting material, Rs	150
3	Pit digging, Rs	120
4	Fertilizer/ chemical, Rs	-
5	Harvesting cost, Rs	- (self)
6	Total cost of cultivation, Rs	270
7	Yield per family, kg	48
8	Selling cost/kg, Rs	20
9	Total Income/Return, Rs	960
10	Benefit Cost ratio	**3.5:1**

Conclusion

This crop is highly adopted by small and marginal farm families. They kept planting material for future use. As per their opinion, it requires less maintenance & prepares varietal recipes like, foot yam chutney, varta, curry and also this crop is a substitute of potato for them. It was ascertained that women prefer to cultivate this crop in backyard. Those farm families who are not involved in cultivating this crop at first, they are now demanding to grow this crop. Farm families also are interested to share their planting materials to others. It is highly adopted by the farm women and demanded to grow sweet potato and colocasia.

References

C.P. Khare (2007) Indian Medicinal Plants: An Illustrated Dictionary. *Springer*-Verlag Heidelberg.

Extension Folder No.: 61 (2013) Improved production technology for elephant foot yam. ICAR research complex for Goa, Old goa - 403 402, goa, India

http://www.diethealthclub.com

Nedunchezhiyan, M.; Saurabh, A. & Ranasingh, N. (2006) Elephant Foot Yam : A Commercial Crop for Orissa. Orissa Review.

Srinivas, T. and Ramanathan, S. (2005) A Study on Economic Analysis of Elephant Foot Yam Production in India. Agricultural Economics Research Review.Vol. 18, pp 241-252.

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The Scenario of Women Participation in Aquaculture

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ABSTRACT

Aquaculture is an important source of food and livelihood for many people around the world. Fish provides a vital source of cash income for many fishing community families in developing countries. Aquaculture sector also plays a major role in the Indian economy, employment generation, supplementing food supply, increasing nutritional level, and earning foreign exchange through the export of fish, meat, etc. It helps in improving the socio-economic condition of fisherfolk. Mostly fisher is men involved in offshore and deep-sea fishing, on while women play an important role as entrepreneurs and by providing labor before, during, and after the catch in aquaculture. The faith that men do the actual fishing, with women more involved in post-harvest and marketing activities, remains prevalent across most cultural, social, political, and economic strata. Poor women use low technology and input systems for aquaculture activities with domestic tasks, household, and childcare chores. Women often manage their own fishing boats and may even have their fishing gear and also give out loans to husbands and other fishers. Women have performed a leading role in the rapid growth of aquaculture, with their participation along with the aquaculture value chains higher than in capture fisheries for their livelihood.

***Keywords**: Women, Aquaculture and Fisheries*

Introduction

There is an old axiom – "Give a man a fish and you feed him for a day, teach him how to fish and you feed him for a lifetime". But this axiom does not hold in the present situation. The large human population and diminish of natural aquaculture resources discouraging the fishers for aquaculture activities and knowing only how to fish is not enough for today's fisher's families. In the present dynamic economic situations, the fisher community would be better off by learning how to grow fish or trying another related trade altogether. Global fish supply is increasingly scanting and more focused on human influences. The transition to relative scarcity cannot be prevented by more intensive fishing but rather will be ameliorated by better management of fisheries resources and improved aquaculture production. Aquaculture and fisheries sector is an important source of food and livelihood for many people around the world. Fish provides a vital source of cash income for many families in developing countries. About 200 million people all over the world are dependent on fish for their incomes (Akpaniteaku *et al.,* 2005). Indian fisheries occupy the second position in global fish production with an annual growth rate of 4.7 percent recording 3.2 percent growth in the marine sector and 6.2 percent growth in the inland sector thereby contributing 1.10 percent to the total GDP and 5.3 percent to agricultural GDP of the nation. The sector engages over Rs 10,000 crores annually through export (Handbook of fisheries and aquaculture, 2011). Fisheries and aquaculture sector plays a major role in the Indian economy, employment generation, supplementing food supply, increasing nutritional level, and earning foreign exchange through export. It helps in an item of contributing to our food basket as well as improving the socio-economic condition of fisherfolk. A group of fisher communities locally known as mallah (*i.e.* Sahni, Bind, Beldar, Chai, Tiyar, Khulwat, Godhi, Banpar, Kol, etc.), are traditionally skilled with aquatic resource management. Inherently, they engaged in fish cultivation, harvesting, and processing, etc.

Role of Women

Aquaculture and fish culture have often been regarded as male responsibilities (FAO, 2010). The aquaculture sector is often considered as the male domain due to the high levels of investments and the nature of work. But this is one of the most important commodities handled by women is fish (Akpaniteaku *et al.,* 2005). Worldwide, fishery and aquaculture activities provide revenues to an estimated 155 million people, of whom an extensive proportion is female. Fishing communities migrate seasonally within and outside regions to find better catches and markets. The number of women fisher migrating in search of economic opportunities related to fishing, as well as other livelihoods, emerges to be rising in many parts of the world. Approaches to small-scale fishing encompass economic aspects of livelihood together with a focus on capabilities such as education, health, and food security that shape livelihood

options and aspirations for the future. Women practice different livelihood strategies with varying levels of capacities and assets during their life courses, resultant in different well-being outcomes (Hapke and Ayyankeril 2004). The crucial engagement of women in a natural resources-based occupation such as fisheries in the rural communities has long been accepted, with women more involved in post-harvest and marketing activities (Obetta *et al.,* 2007). Women's roles, responsibilities, and participation have often been ignored partially due to the socio-cultural taboo against them. According to Cliffe *et al.,* (2011a) women's role in fish-related activities is though supportive, imperative, and indispensable. Their role is repeatedly being ignored and relegated, consequent of primordial systems of social setting (Ibrahim *et al.,* 2011). Women play an important role as entrepreneurs and by providing labor before, during, and after the catch in both artisanal and commercial fisheries. However, there is no comprehensive picture of the role of women and exact data regarding actively participating in the fisheries sector. Women engaged in at least half of the inland fisheries as well as 60% and 80% seafood also marketed by women in Asia and West Africa (FAO 2012). Two main fish producing countries in the world are China and India where women represent 21% and 24% respectively of all fishers and fish farmers (FAO 2012). Global average statistics support this perception; mark the real importance of women at the country level. Women often own and manage fishing boats and may even have their fishing gear. Women fisher's income is vital for supporting the entire fishing industry, as they invest in canoes and other gear and give out loans to husbands and other fishers.

Aquaculture Activities

Women play a vital role in fishery-related activities around the world, especially in the coastal environment, where these activities are classified majorly in three ways; fishing, processing, and marketing (Olufayo, 2012). Women working as labor 'before fishing' includes making and mending nets, baskets and pots, and baiting hooks. Labor during fishing includes fishing from small boats and canoes in coastal or inland waters, harvesting bivalves, fish, mollusk, crab, etc., collecting weed and setting nets or traps. Labor 'after fishing' is probably the most common among women especially in fish processing and marketing either in their cottage-level industries or as wage laborers in the large-scale processing industry. Women play a critical role in the whole chain from pond construction, fingerlings sorting, pond stocking, feeding, sex identification, and fish harvest. Women are also engaged in other aquaculture activities like manuring pond, prawn seed collection, fish and shrimp farms, hatcheries and salt pans, transport and marketing cultured fish, rearing of mud crab, ornamental fish culture, aqua-feed preparation and processing, value-addition of fish and farm products, etc. Women are actively involved in all activities including pre-pond preparation, pond digging, stocking, harvesting and marketing, etc. (Kelkar, 2001) as well as unloading of fish from landing canoes, fish marketing and processing (Cochrane *et al.,* 2009); which form the link between production and consumption. In fresh and brackish water aquaculture, women are engaged in ornamental fish breeding and culture, carp breeding and nursery raising, carp polyculture, breeding of catfish and freshwater prawns in backyard hatcheries, the culture of *Spirulina* and *Azolla,* net making and mending, and feed preparation for carps and prawns. 30% of women engaged in the production and breeding of ornamental fish are women in Sri Lanka, (FAO 2012). However, this kind of formal enumeration rarely divulges the informal ways in which women are essential to pursuing livelihoods in engaged in small-scale fishing. In many parts of the world, women engage in collecting mollusks and fish using small hand nets. More commonly, women support men's fishing activities by engaging in pre- and post-harvesting tasks and managing the household. They might also support men by providing credit for boats and gear (Walker 2001). In some cases, women might even engage in activities that bring more returns than fishing, such as migrant labor, the remittances from which effectively subsidize men's fishing effort. Most frequently women's fisheries-related activities that contribute to the overall wellbeing of households bring lower returns to women compared to men (Weeratunge and Snyder 2009). Aquaculture then creates job opportunities for illiterate women to earn side income for their household.

Access to Resources

There is a lesser extent of constraints for women's participation in aquaculture in terms of access to and control over resources such as land, time, labor, credit, and equipment. Women often had not as much access to knowledge since extension officers mainly address the male head of households. According to Tamale (2004), the non-recognition of women's contribution to the production process is enhanced by an uneven allocation of resources. Consequently, lack of access and control over the production process is one of the major factors limiting women's participation in economic activities such as coastal fishery practices (Acharya, 2003). Access to and control over profit from aquaculture was often due to the contribution of women in fish farming. Women participation in the decision-making process and access to power, are fundamental for the achievement of equality, development, and peace (Jayasuriya and Jayasuriya, 1999). Decision-making patterns on the use of aquaculture produce for home consumption, share with relatives, friends and the utilization of cash from the sale were jointly taken by women and men in the household. Fishing women

are less constrained in their daily activities and have more power because of access to an independent income from selling fish (Davis and Nadel-Klein, 1988). Co-operative banks and informal credits also help in lending money to the fisherwomen. According to Joseph (1989) cooperatives provide loans to members to buy salt for fish curing and twine for net-making, access to education, health care, and family welfare services. Women and girls of these communities have the worst levels of education and health because they are often marginalized, mobile, and live in remote locations which can restrain their access to education and health facilities. However, women also come forward through reservations under the road map of Bihar government that allows women to nominate for the fishery election. In particular area committees are formed by Sahani people, known as Matshay Jeevi Committee which is also registered under the Animal & Fish Resource Department, Bihar government for better cooperation among the community to serve those who are directly and indirectly associated with aquaculture. Women fishers can learn sophisticated techniques when transmitted visually and given the opportunity and support to adopt them.

Aquaculture Issues

According to Davis and Nadel-Klein (1992) issues are focused on the land-sea division approach, production and reproduction approach and multiple roles approach. Women are assigned to the domestic, land-based, private sphere, and have roles as mothers, daughter, wife, family members, Women who work in the sea-based sphere are regarded as exceptions requiring explanation. Another study conferred about issues surrounding higher expectations of women and increasing demands on their time in modern western societies (McMahon, 1999). Women's fisherfolk problems are unemployment, drudgery, heavy investment, traditional skills, job opportunities, and migration, etc. The fish processing industry employs migrant women on a contract basis (Warrier, 2001). Some issues are closely related to multiple roles and using different tools and techniques is the scale of the fishing operation. Aquaculture technology was not women-friendly and drudgery reducing. Women issue is always known but is seen as women's own voluntary decisions to have children or not to be ambitious. They are suffering from harder staffing issues, finances, corporate issues, etc. There is a lack of support and encouragement to build their confidence and provide a forum to air issues without fear of being ridiculed or criticized. The restrictions on the transferability of fishing rights, high workload, and 'all-consuming' nature of the work were also sources of dissatisfaction. Women of more remote locations have issues related to geographical isolation and lack of access to community services. Many of them endure participation in religious events, choice of guest and entertainment at social functions, poor health, hygiene, and nutrition, lack of education, child care, transportation, water crisis, property rights issues, knowledge and awareness on various subjects, and fishery-related business, etc.

Aquaculture Technology

Aquaculture technology plays a vital role in the changing scenario of the information and technology revolution. It is necessary to develop women-friendly technology for their current interest and need which are closely related to gaining a livelihood improvement of the fishing community. They have also performed a leading role in the rapid growth of aquaculture (fish, shrimps, mussel, seaweed, crab fattening, makhana (*Euryale Ferox*), singhara (*Trapa*), etc), with their participation along with the aquaculture value chains (production, transforming, and marketing) higher than in capture fisheries. Women adopted different aquaculture technology such as edible oyster and pearl culture, mussel farming, shrimp farming, crab fattening and culture, seaweed farming, pond fish culture, raising fry and fingerlings in seasonal ponds, carp fry production, backyard hatchery management, integrated aquaculture, management of fish cages, ornamental fish breeding and culture, carp polyculture, an integrated farming system like fish cum duck, fish cum poultry, fish cum horticulture and post-harvest value addition like drying and other processing methods, etc.

Conclusion

Traditionally, women are obliged to take care of the family in terms of feeding, clothing schooling, health care, and some other domestic chores like cooking, cleaning, fetching of water, and firewood. Women are also deeply involved in artisanal fisheries activities. Aquaculture enables poor women to operate low technology and low input systems for their domestic tasks, allowing them to integrate aquaculture activities with household and childcare chores. Engagement in aquaculture appears to have fewer gender barriers, as this sector developed outside cultural traditions. The increased involvement of women towards fish farming is due to several reasons like as; they consider capture fishery a herculean task only possible to men, most of the women have been left to care for the families in the absence of husbands, small-scale fish farming requires less labor than many other livelihood activities, and can be carried out by female and need to uplift their socio-economic and generate of self-employment. Women in rural areas participate actively in the traditional fisheries for the economy. They are either fully involved or play a complementary role for men in the provision for their families. Therefore, there is a need to promote and to encourage womenfolk in this sector, to boost the supply of food fish and improve the economic welfare of their families.

References

Acharya, M. (2003). Efforts at promotion of women in Nepal, Kathmandu, Tanker Prasad Acharya Foundation.

Akpaniteaku, R. C., Weimin, M., and Xinhua, Y. (2005). Evaluation of the contribution of fisheries and aquaculture to food security in developing countries. NAGA 28 (1 & 2):28-31.

Ayyappan, S. (2011). Handbook of fisheries and aquaculture.

Cliffe, P.I., Akinrotirni, O. A., and lbcmere, I. F. (2011a). The role of fish in improving child nutrition in Nigeria. Journal of Technology and Education in Nigeria 16/7:20-30.

Cochrane, K., De Young, C., Soto, D., and Bahri, T. (2009). Climate change implications for fisheries and aquaculture: Overview of current scientific knowledge, FAO Fisheries and Aquaculture Technical Paper No. 530. Rome, FAO. 2009. 212pp.

Davis, D. L., and Nadel-Klein, J. (Ed.) (1988). To work and to weep? Women in fishing economies. Institute of Social and Economic Research, St John's, Newfoundland.

FAO (2010). The State of Fisheries and Aquaculture, Food and Agriculture Organization, Rome.

FAO (2012). The State of Fisheries and Aquaculture, Food and Agriculture Organization, Rome.

Hapke, H. M., and Ayyankeril, D. (2004). Gender, the work-life course, and livelihood strategies in a South Indian fish market. Gender, Place and Culture 11(2): 229–256.

Ibrahim, I., Kigbu, A. A., and Mohammed, R. (2011). Women experience in small scale fish processing in Lake Feferuwa fishing community, Nasarawa State. Livestock Research for Rural Development Tests: 1-8.

Jayasuriya, S., and Jayasuriya, D.C. (1999). Women and development – the road from Beijing. Har Anand, New Delhi.

Joseph, K. M. (1989). Role of women in fisheries. Social Welfare, May, 24-28.

Kelkar G. (2001). Gender Concerns in Aquaculture: Women's Roles and Capabilities. In: Gender Concerns in Aquaculture in Southeast Asia (K. Kusakabe and G. Kelkar, eds.), Asian Institute of Technology, Bangkok, pp.1-10, PMid: 11349519.

McMahon, A. (1999). Taking care of men. Cambridge University Press, Cambridge.

Obetta, N. C., Ifejiaka, P. T., and Nwabeze, G. O. (2007). Assessment of fishery content in agricultural activities of the rural women in Kukuwa LGA of Bomo State. Proceedings, FISON Annual Conference, Nov. 29, 2004, Ilorin, 148-152.

Olufayo, M. O. (2012). The gender roles of women in aquaculture and food security in Nigeria. IIFET, Tanzania Proceedings. 7pp.

Tamale, S. (2004). Gender trauma in Africa: Enhancing women's likely to resources. Journal of Africa La1\l48/1:50-61.

Walker, B. L. E. (2001). Sisterhood and seine-nets: engendering development and conservation in Ghana's marine fishery. Professional Geographer 53(2): 160–177.

Warrier, S. M.V. (2001)**.** Women at Work**.** *Economic and Political Weekly.*37.

Weeratunge, N., and Snyder, K. A. (2009). Gleaner, fisher, trader, processor: Understanding gendered employment in the fisheries and aquaculture sector. Paper presented at the FAO-IFAD-ILO Workshop on 'Gaps, trends and current research in gender dimensions of agricultural and rural employment: differentiated pathways out of poverty'. Rome: FAO.

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Animal Husbandry Practices Followed Among Tribal Goat Farmers in Kandhamal District of Odisha

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ABSTRACT

Goat farming has huge potential to emerge as a very good source of income and employment especially for the tribal farmers. In spite of having potential of good economic returns from goat, tribal farmers do not earn good income from such activities. Therefore, the present study was carried out to know the existing practices followed by the tribal goat farmers. The study was carried out in Kandhamal district of Odisha with 60 respondents. The findings of the study indicated that existing animal husbandry practices adopted by majority of tribal goat farmers in the study area includes castration (70%), grooming by hand (66.7%) and brush (5%). Feeding includes greens, broken rice as concentrate (55%), salt as feed supplements (58.3%) and stover as roughages (55%). Breeding was done naturally. Majority of goat shed were kuchcha (88.3%) with mud wall fencing (65%), mud floor (85%) and thatched roofing (88.3%).Treatment of wound were done with veterinary medicine (50%) and traditional medicine (16.7%). Marketing was done directly at home. As the study also revealed that the tribal goat farmers were very far away from the improved goat management practices, strategic training mechanism should be planned among the goat farmers to benefit them.

Key words : *Animal husbandry practices, Tribal goat farmers, Kandhamal district*

Introduction

Livestock sector in Odisha is highly livelihood intensive. The sectorcontributes 7.25 per cent of the state's net domestic product and therefore, developmentof the livestock sector is the critical pathway to rural prosperity. Goat is one among such species whichprovides supplementary incomes to the farmers in the rural areas.It has huge potential to emerge as avery good source of income and employment especially in the lessfavoured environment and also a vital source of animal protein for the family. The tribalfarmers who cannot afford to maintain a cow or a buffalo find goat as the best alternative source of supplementary income. Unlike a cow or buffalo, a fewgoatscan be maintained easily and can be easily liquidated intimes of distress. In spite of having potential of good economic returns from goat, tribal farmers do not earn good income from such activities. There arenumber of reasons that impacted for such a situation. Therefore, the present study was carried out to know the existing practices followed by the tribal goat farmers.

Materials and Methods

The study was conducted in Kandhamal district of Odishawhich is predominantly inhibited by tribal population. From this district, two blocks and from each block three villages and from each village ten beneficiaries were selected as respondents for study. Thusa total number of 60 respondents were identified for data collection. The respondents were selected on the basis of their experience in goat rearing practices (minimum of two years continuous rearing practices)andnumber of goats (at least five numbers) kept by them. Primary data were collected through interview method withthe help of structured interview schedule designed beforehand.A total of 30 statements weredeveloped with 5 statements in each 6 categories which includes care and management,feeding management, breeding management, housing, general disease management,record keeping and marketing.

Results and Discussion

1. Practices related to Care and management of goat

Table 1 reveals that, majority of respondents (70 %) did castration of goatwith the help of veterinary doctors and livestock inspectors, whereas 30 per cent ofrespondent did not do castration. Reason for castration may be due to huge demand of castratedgoat meat in market and for non-

castration to meet therequirement of uncastrated male buck for different traditional ritual practices.

Similarly, due to accessibility to veterinary hospital the deworming was taken care by

veterinary doctors (50%), whereas 16.7 per cent still were depending upon ITK's fordeworming. Use of brush for grooming purpose was not practiced, rather 66.7 per centrespondents were using hand for grooming. Trimming of hoofs of the goat was notpracticed by the tribal.

Dehorning was not practiced at all. Whereas, 50 percent of the respondents were doing deworming by using allopathic medicine, as against16.7 per cent through ITKs and 25 percent were using both ITKs as well as allopathicmedicine. It was observed that 66.7 per cent were grooming their goats by hand andonly 5 per cent were using brush for grooming. Trimming of hoof was not done at allby the tribal goat farmers.

Table 1. Practices related to Care and management of goat

Sl. No	Care and management of goat		Total No. of Respondents	%
1.	Castration	Done	42	70.00
		Not done	18	30.00
2.	Dehorning	Done	0	0.0
		Not done	60	100
3.	Deworming by	Indigenous medicine	10	16.70
		Allopathic medicine	30	50.00
		Both	15	25.00
		None	5	8.30
4.	Grooming by	Brush	3	5.00
		Hand	40	66.70
		Both	5	8.50
		Not done	12	20.00
5.	Trimming of hoof by	Done	0	0.0
		Not done	60	100

2. Practices related to Feeding management of goat

Table 2 reveals that, all the respondents were giving leaves of trees, grassand vegetable remnants as green feeds to their goats, but none of respondents wasgiving green fodder. The reason may be availability of vast jungle landin their habitation.With respect to concentrate feeding of goats, 55 per cent of therespondents were feeding broken rice only and rest of respondents were not giving anygoat feed. This may be due to easily availability of broken rice residue at their home.It was also observed that feed supplement like salt was given by 58.3 per centrespondents and no other feed supplement like molasses and mineral mixture weregiven as feed supplement. It may be due to easily availability of this feedsupplement at their door step and they have realized the importance of salt feeding togoat for the growth performance.55 per cent of respondents were giving stover as roughages.Feeding of stover as roughage may be due to theavailability of stover as a residue of sugarcane. 63.3 per cent of tribal goat farmers conserve the goat feed like broken rice and stoverby sun drying method.

Similar finding was reported by Lavania*et.al.* (2014) whichrevealed that animals were mostly grazed in mixed grazing on community land/publicrange land for about 4-8 h in a day.

Table 2. Practices related to Feeding management of goat

Sl. No	Feeding management of goat		Total No. of Respondents	%
1.	Greens given	Leaves of Trees	60	100
		Grass	60	100
		Vegetables remnants	60	100
		Green fodder	0	0.0
2.	Concentrate given	Maize	0	0.0
		Broken rice	33	55.00
		Groundnut	0	0.0
		Pulse/Jowar	0	0.0
		Do not give	27	45.00
3.	Feed supplement giv	Molasses	0	0.0
		Salt	35	58.30
		Mineral mixture	0	0.0
		Do not give	25	41.70
4.	Roughages given	Hay	0	0.0
		Husk	0	0.0
		Stover	33	55.00
		Do not give	27	45.00
5.	Conserving of feed done by	Sun drying	38	63.30
		Silage	0	0.0
		Hay	0	0.0
		Not done	22	36.70

3. Practices related to Breeding management of goat

Table 3 reveals that, almost all goat respondents did not have any fixed ratio of keeping buck and doe in a group. 81.7 per cent respondents determined the breeding age of doe from body size, followed by 18.3 per cent by body weight. It was also observed that, all the respondents followed introduction of well grown up ram or buck in the herd for getting healthy kids, no advance technique like hormone administration, synchronization method were followed. Further, it was also observed that all the respondents followed natural breeding procedure for breeding of does. Neither A.I., nor selective breeding was followed for breeding of goats, 88.3 per centre spondents determined the sign of oestrous by observing the restlessness of does, followed by 75 per cent through bleating & 25 per cent through vaginal secretion, respectively.

Similar findings were reported by Mbuku*et.al.* (2006) which describes that the pastoral communities perceive only productive and adaptive traits as important in the selection of breeding stock. Hence, it is inferred that tribal were still far away from the improved goat management practices. Hence, strategic training mechanism should be planned among the goat farmers.

Table 3. Practices related to Breeding management of goat

Sl. No	Breeding management of goat		Total No. of Respondents	%
1.	Ratio of buck and doe	1:05	0	0.0
		1:10	0	0.0
		No fixed ratio	60	100.0
2.	Determination of breeding age of doe	Dentition	0	0.0
		Horn ring	0	0.0
		Body weight	11	18.30
		Body size	49	81.70
3.	Methods adopted for optimize breeding	Hormone administration	0	0.0
		Ram or Buck introduction	60	100.0
		Synchronization	0	0.0
4.	Breeding method	Natural	60	100.0
		Artificial insemination	0	0.0
		Selective	0	0.0
5.	Identification of Sign of oestrous	Bleating	45	75.00
		Vaginal secretion	15	25.00
		Restlessness	50	83.30

4. Practices related to Shed management of goat

Table 4 reveals that, majority of respondents (88.3%) werehaving Kuchcha shed, as against only 11.7 per cent Semi-pucca shed. 65 per cent ofrespondents constructed goat shed with mud wall fencing, as against 26.7 per cent werehaving wooden fencing and 8.3 per cent did not have any fences. It is interesting to notethat, 85 per cent of respondents constructed goat shed with mud floor, as against 15 percent respondents wooden floor, none of the respondents was having cemented floorgoat shed. The data reveals that, all the respondents were giving the leaves and branchesof trees by hanging in shed wall, also placing such green leaves on ground also.Whereas, the grain such as broken rice were given in utensil or wooden manger. As perdata it was found that 88.3 per cent respondents constructed the goat shed havingthatched roof and very few such as 11.6 per cent galvanized steel sheet for constructinggoat shed.

It may be concluded that the tribal goat respondents havenot yet been able to follow the improved recommendation of goat shed construction.

Table 4. Practices related to Shed management of goat

Sl. No	Shed management of goat		Total No. of Respondents	%
1.	Goat shed	Kuchch	53	88.30
		Pucca	0	0.0
		Semi-pucca	7	11.70
2.	Side wall of shed	Wooden fencing	16	26.70
		Mud wall fencing	39	65.00
		No fence	5	8.30

3.	Sheds construction	Mud floor	51	85.00
		Cemented floor	0	0.0
		Wooden floor	9	15.00
		Litter	0	0.0
4.	Feeds given in	Wooden manger	7	11.60
		Cement manger	0	0.0
		Ground	60	100.0
		Hanging	60	100.0
5.	Roof	Asbestos	0	0.0
		Thatched	53	88.30
		Cement	0	0.0
		Galvanized steel sheet	7	11.60

5. Practices related to Disease management of goat

Table 5 reveals that, majority of tribal respondents were using cow dung(81.6%) for disinfecting the goat shed, followed by 11.7 per cent with lime water and6.7 per cent both dung and lime water respectively. It might be due to the old traditional culture of dung washing of their own residence as well as goat shed. It was also observed that 50 percent of respondents were using allopathic medicine either supplied by government or purchasing from outside for treatment of wound, followed by 16.7 per cent ITK medicine. However, 33.3 per cent were using both ITK and allopathic medicine for treatment of wounds. The result also reveals that 50 per cent respondents were treatingec to parasitic infestation by using allopathic medicine, as against 15 per cent through ITK, 35 per cent of respondents were managing to control ectoparasites manually. Moreover, 58. 3 per cent respondents were using allopathic medicine for treatment of endoparasites, followed by 25 per cent ITK, 16.7 per cent through both allopathic and ITK medicine. It was also seen that all the respondents were giving vaccines againstgoat /sheep pox, PPR, enterotoxaemia by the help of technical persons of the state veterinary service department from time to time but none of the respondents was given vaccine against tetanus and FMD.

Thus, it can be interpreted that there has been gradual change from traditional methods of disease treatment using ITK to scientific recommended protocol of using allopathic medicines for treatment of various health related ailments.

Table 5. Practices related to Disease management of goat

Sl. No	**Disease management of goat**		**Total No. of Respondents**	**%**
1.	Disinfection	Dung	49	81.60
		Lime-water	7	11.70
		Both dung & lime water	4	6.70
		Bleaching powder	0	0.00
2.	Treatment of wound	Indigenous medicine	10	16.70
		Allopathic medicine	30	50.00
		Both	20	33.30
3.	Ectoparasites	Manually	21	35.00
		Indigenous medicine	9	15.00
		Allopathic medicine	30	50.00

4.	Endoparasites	Allopathic medicine	35	58.30
		Traditional medicine	15	25.00
		Both	10	16.70
5.	Vaccination	Tetanus	0	0.00
		FMD	0	0.00
		Goat-Sheep pox	30	50.00
		PPR	30	50.00
		Enterotoxaemia	30	50.00

6. Practices related to Record keeping and marketing of goat

The data from Table 6can be concluded that majority of tribal goat respondents(81.7%) were marketing goats at the age of 12 month, followed by 11.7 per cent at the age of 6 month and 6.6 percent at the age of 18 months respectively. The reason being either they were in need of money to meet the financial challenges or by virtue of their experience they knew selling goats at this age is remunerative enough.

It was alsoob served that majority of respondents (81.7 %) marketed their goat having the body weight 10.2 kg, followed by 10 per cent of respondents marketed the goat having body weight 6-8 kg and 8.3 per cent 14-16 kg, respectively. While, analysing the data it was also observed that 80 per cent respondents did not maintain marketing record. Similarly, majority of respondents (91.7%) were selling the goats at their home site, but very less percentage (8.3%) were marketing their goats at the market place by walking on foot. Majority (81.7%) of the respondents determined the marketing age of the goat by observing body size of goat, followed by 18.3 per cent by body weight respectively.

The study shows respondents were well aware of marketable age as well as marketable body weight for marketing their goats with profit. It is inferred that there was good demand of goat meat in the area due to which respondents were selling the goats at their home state instead carrying the goats to the market place.

Table 6. Practices related to Record keeping and marketing of goat

Sl. No	Record Keeping and Marketing		Total No. of Respondents	%
1.	Goat is marketed at the age of	6 month	7	11.70
		12 month	49	81.70
		18 month	4	6.60
2.	Goat is marketed at the weight of	6-8 kg	6	10.00
		10-12 kg	49	81.70
		14-16 kg	5	8.30
3.	Record is maintained in	Copy	12	20.00
		Mobile	0	0.00
		Computer	0	0.00
		Not maintained	48	80.00
4.	Transportation to market done by	Foot	5	8.30
		Sold directly at home	55	91.70
		Bullock-cart	0	0.00
		Two-wheeler	0	0.00
5.	Marketing age is determined by	Dentition	0	0.00
		Horn	0	0.00
		Body weight	11	18.30
		Body size	49	81.70

Conclusion

Existing animal husbandry practices adopted by majority of tribal goat farmers in the study area includes castration, grooming by hand and brush. Feeding includes greens, broken rice as concentrate, salt as feed supplements and stover as roughages. Breeding was done naturally. Majority of goat shed were kuchcha with mud wall fencing, mud floor and thatched roofing. Treatment of wound were done with veterinary medicine and traditional medicine. Marketing was done directly at home.

Thus it may be concluded that some of the veterinary service are accessible to tribal farmers which they had adopted. The tribal farmers had adopted locally available feeding materials to feed their goats and traditional way of shed construction. They are gradually changing from traditional methods of disease treatment using ITK to scientific recommended protocol of using allopathic medicine. As the tribal goat farmers were very far away from the improved goat management practices, strategic training mechanism should be planned among the goat farmers to benefit them.

References

Lavania, P., Jingar, S.C., Kumar, D., Kumar, A., and Kantwa, S.C. (2014). Feeding and health care management practices adopted by tribal goat farmers in Sirohi district of southern Rajasthan, *J. Bio. Innovation,* **3(3):** 170-175.

Mbuku, S.M., Kosgey, I. S., and Kahi, A.K. (2006). Indigenous breeding practices of pastoralist goat keepers in Northern Kenya, World Congress on Genetics Applied to Livestock Production*,* (pp. 30-16)

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Extent of computer use by the extension officials in extension activities

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ABSTRACT

Computer based technologies armed with capabilities of functional interaction provide services to mass at their convenience to meet the challenges imposed on extension system. At the same time, extension officials should have capabilities of computer use. A study conducted with 40KVK Scientists and 174 extension officials revealed that the respondents had agreed for the benefit of computer use for better functioning of the extension system. They were using computer and spending substantial time in computer use every day. However, they need technical and management support, positive attitude of the superiors in computer use, training and orientation for effective implementation of computer assisted extension system.

***Key words**: Computer use, extension officials*

Introduction

Information and Communication Technologies (ICT) increases the quantity and quality of information to the extension officials as well as farming community and promotes greater predictability in the production, sale and consumption of foods. (ESCAP,2006). Developments of computer and advancements in telecommunications provide numerous opportunities to obtain a variety of information in agriculture and use it for decision making (Omedi et. al. 2009). It has opened a whole set of options for the agricultural extension scientists and extension officials to improve the speed and accuracy of the communications at relatively lower cost (Vipinkumar and Nimisha (2012). Computer based information system has changed the way, enhance ability to identify and solve problems as well as performing task that are beyond the physical ability (Sabes,2007). Moreover, Computer based technologies armed with capabilities of functional interaction could provide services to mass as well as to individuals at their convenience to meet the challenges imposed on extension system. A study was therefore conducted to analyse the extent of computer use by the extension officials in their extension activities.

Materials & Methods

The study was undertaken in the state of Odisha during 2019. The extension officialsin the department of Agriculture, Horticulture and Watershed Mission (Soil Conversaiton) as well as Scientists of KVKs, Odisha were selected purposively as the respondents of the study. A questionnaire was developed and finalised offer pre-testing. It was mailed to all the extension officials and KVK scientists working in the 30 districts of Odisha. After a lot of persuations, only 174 extension officials and 40 KVK scientists had responded and sent the filled questionnaire. The statistical tools such as mean score, gap percentage, multiple regression were used for the analysis of data.

Results & Discussion

Computer use is a strategic action in the successful deployment of new technologies and the international competitiveness of agricultural producers. It is advantageous for information collection, documentation and transfer speedily to a large number of farmers within possible shortest time. The data collected on the scale point of strongly agree, agree and disagree were analysed with score value of 3, 2 and 1 respectively. The respondents of both extension officials and KVK scientists were almost of similar opinions on various aspects about benefits of computer (Table-1) as significant gap percentages not observed although KVK scientists opined in a better manner in comparison to extension officials. The respondents had stated that computer use improve efficiency, effective in technology transfer, faster in technology dissemination, very much applicable in extension work, training through computer more effective, computer based extension become relevant and feasible as well as help farmers in taking timely and rational decisions. Hence, both KVK scientists and extension official respondents had good opinion about the benefits of computer.

Table-1 : Opinion towards benefits of computer.

Sl. No.	Benefit	Mean Score		Diff (%)	Pooled mean score (n = 214)	Rank
		KVK scientist (n = 40)	Extension functionary (n = 174)			
i.	Improve efficiency	2.75	2.63	4.36	2.65	I
ii.	Effective in technology transfer	2.70	2.64	2.22	2.65	I
iii.	Faster in technology dissemination	2.75	2.54	7.64	2.58	III
iv.	Training through computer more effective	2.63	2.43	7.60	2.46	V
v.	Computer based extension become relevant and feasible	2.58	2.41	6.59	2.44	VI
vi.	Help farmers in taking timely and rational decisions	2.53	2.31	8.70	2.35	VII
vii.	Very much applicable in extension work	2.70	2.45	9.26	2.50	IV

(Maximum obtainable score – 3)

Frequency in computer use indicate the activities undertaken by the extension officials as it is related with their activities performed. The data in Table-2 indicate thatmajority of KVK scientists (67.50%) and extension official (67.50%) respondents were using computer several times in a day. Further analysis revealed that 95.00% of KVK scientists and 70.73% of extension officials were using computers every day. It indicate the affinity of the respondents in use of computer for their job performance.

Table-2: Frequency of computer use in extension activities

Sl. No.	Frequency	KVK scientist (n = 40)		Extension functionary (n = 174)		Total (n = 214)	
		F	%	F	%	F	%
i.	Very occasional	0	0.00	7	4.02	7	3.27
ii.	Once in a month	0	0.00	0	0.00	0	0.00
iii.	Few times in a month	2	5.00	5	2.88	7	3.27
iv.	Few times in a week	0	0.00	25	14.37	25	11.68
v.	Few times in a day	11	27.50	47	27.01	58	27.10
vi.	Several times in a day	27	67.50	90	51.72	117	54.68

Use of computer has many advantages in performing various extension activities. Unless the respondents devote adequate time in computer use, computer assisted extension system will not be much effective. The study revealed that majority of KVK scientists (50.00%) had spent more than two hours followed by one to two hours (30.00%) and 30 minutes to one hour (15.00%) daily with computer for their extension activities. Similarly; 33.91% of the extension officials had spent more than two hours followed by one to two hours (27.59%) and thirty minutes to one hour (23.56%) daily. Further analysis indicate that 61.50% of the respondents were utilizing substantial time in computer use everyday.

Table-3: Extent of time spent everyday in computer use

Sl. No.	Time	KVK scientist (n = 40)		Extension functionary (n = 174)		Pooled (n = 214)	
		F	%	F	%	F	%
i.	Never	0	0.00	2	1.15	2	0.93
ii.	Very occasional	0	0.00	15	8.62	15	7.01
iii.	Less than 30 minutes	2	5.00	9	5.17	11	5.14
iv.	30 minutes to one hour	6	15.00	41	23.56	47	21.96
v.	One to two hour	12	30.00	48	27.59	60	28.04
vi.	More than two hours	20	50.00	59	33.91	79	36.92

Successful implementation of computer assisted extension system require effective extension system, organisational environment, quality information material available and cost effectiveness of the technology used in extension. The data collected in the scale point of strongly agree, agree and disagree over the farmed statements toward support required were analysed with the score value of 3, 2 and 1 respectively. As revealed from Table-4; extension scientists had given priority for the collegial support followed by positive attitude of superiors for computer use and time availability to learn computer. The extension official respondents had given priority for the technical support followed by training and orientation, management support and positive attitude of the superiors towards computer use. However, opinions of both KVK scientists and extension officials were almost similar as significant differential gap percentages not observed. The pooled mean score value revealed that the respondents were essentially need technical and management support, positive attitude of superiors, as well as training and orientation.

Table-4: Extent of support required by the respondent.

Sl. No.	Support	Mean Score		Diff (%)	Pooled mean score (n = 214)	Rank
		KVK scientist (n = 40)	Extension functionary (n = 174)			
1.	Management support	2.50	2.54	1.57	2.53	II
2.	Technical support	2.40	2.57	6.61	2.54	I
3.	Collegial support	2.58	2.42	6.20	2.45	V
4.	Training and Orientation	2.38	2.55	6.67	2.51	IV
5.	Time availability to learn computer	2.45	2.40	2.07	2.41	VII
6.	Accessibility to computer	2.48	2.43	2.02	2.44	VI
7.	Positive attitude of superiors towards computer	2.53	2.52	0.40	2.52	III

Further attempt was made for multiple regression analysis to assess the contribution of socio-economic attributes of the respondents influencing computer use. It is observed from Table-5 that computer devices and communication channels used, place of service and educational background of the respondents had exhibited significant influence in computer use. However, the best fitted regression equation could explain only 44.40% of the total variance exhibiting significant influence.

Table-5: Influence of socio-economic attributes influencing computer use

Sl. No.	Attribute	Unstandardized Coefficients		Standardized Coefficients		't' value	Probability
		Beta	Std. Error	Beta	Std. error		
X_1	Age	-2.914	1.851	-0.205	0.031	-1.575	0.117
X_2	Education	-3.484	1.982	-0.129	0.002	-1.757	0.080
X_3	Annual income	2.775	2.759	0.085	0.004	1.006	0.316
X_4	Service experience	-2.249	1.941	-0.139	0.011	-1.159	0.248
X_5	Extension activities undertaken	-0.501	0.483	-0.091	0.031	-1.038	0.301
X_6	Service place	0.082	0.047	0.216	0.006	1.729	0.085
X_7	Work on each day	-1.536	2.450	-0.042	0.035	-0.627	0.531
X_8	Computer devices used	1.355	0.339	0.300	0.006	3.993	0.000
X_9	Communication used	1.886	0.578	0.274	0.012	3.262	0.001

R^2 - 0.444 Adj R^2 – 0.410 Std. error – 15.395

Conclusion

The study revealed that both KVK scientists and extension officials had stated computer use improve efficiency, effective in technology transfer, faster in technology dissemination and very much applicable for the computer assisted extension system. Majority of the respondents were using computer and spending substantial time everyday. However, they need technical and management support, positive attitude of the superiors in computer use as well as training and orientation for better implementation of computer assisted extension system. The planners and executives of the related organizations have to extent all these supports enabling the extension officials for effective use of computer assisted extension system for the betterment of the farming community.

Reference

Chilimo, W. L. and Sanga, C.2006 Towards effective knowledge management practices for agricultural information specialists, *SCECSAL XVII*

ESCAP 2008 Information and communications technology for food security and systainable agriculture in the knowledge economy, available at *http://* www.unescap.org/idd/events/ciit-2008

Fallah, H.N.2006: An analysis of factors influenced in the use of information technology in agricultural extension, *M.Sc. Thesis (unpub),* University of Tehran, Iran

Hedjazi, V Rezaee, R and Zamani, N.2006: Factors affecting the use of ICTs by the Iranian agricultural extension specialists, *Journal of Extension System*, 22 (1) : 1-15

Maraham- Martin, J. and Schumacher, P.2007: Attitudinal and experiential predictors of technological expertise, *Computers in Human Behaviours*, 23: 2230-2239

Omidi, N.M., Hosseini,J.F.and Mirdamadi, M.2009 A case study of requirements and challenges of information and communication technology system to train private agricultural insurance brokers, *American Education Journal of Agriculture and Environmental Sci*ence, 6 (2): 152-159

Vipinkumar, V.P. and Nimisha,C.P. 2012: ICTs in information management and networking- New tools and trends, *Central Marine Fisheries Research Institute Training Module* on ICT oriented strategic extension for responsible fishery management at page1-30.

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Checklist to Assess the Women Friendliness of the Technology

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ABSTRACT

It is realized, the interest of men farmers is dwindling in farming and they are migrating to earn ample income from non-farming activities. As per NSSO survey (2010), 40% of the men farmers want to quit farming due to less profitability. The Gaon Connection Survey (2019) revealed thatabout 48% farmers don't want the next generation to take up farming.In this situation, women have to look after the household as well as farming activities. Further, the Indian women spend 354 minutes a day, compared to 36 minutes by men on household activities including cooking and child care (Budlender, 2010). Despite the actuality that women are key producers of food, they wrap well behind men in ownership of agricultural land. They also lack access to and control over productive resources like: credit, market, inputs, information, technology, etc. While many of the existing empirical studies and literature on 'women in agriculture' suggest that women do have serious constraints in access to and control over resources such as land, credit, critical farm inputs (improved crop varieties, irrigation, fertilizers, etc.) training, information, marketing services, farm related decision making and agricultural groups (Akter, et. al. (2017),Hazel and Agnes (2015), Fletschner and Kenney (2014). Alkire, et. al. (2013). Study says that, if women had provided the same access to productive resources as men, they could boost yield by 20-30%; raising the overall agricultural output in developing countries by 2.5-4%. This gain in production could lessen the number of hungry people in the world by 12-17% (FAO, 2011). Again, women's access to technology has the prospective to urge their economic improvement. However, need based technologies can be familiarized to farmwomen subsequently judging its women friendliness. Keeping this in view, a checklist was developed to assess the women friendliness of the technology.

Keywords: *technology, women friendliness, access and control, checklist, statements*

Introduction

Agriculture sector employs 80% of all economically active women in India; they comprise 33% of the agriculture labor force and 48% of the self-employed farmers. According to Economic Survey (2017-18), with growing rural to urban migration by men, there is 'feminization' of agriculture sector, with increasing number of women in multiple roles as cultivators, entrepreneurs, and labourers. About 60-80% food are by rural women. According to Dash and Sarkar (2014-15), considering both cultivators and agricultural labourers, during 2001 and 2011, 28.9 million workers were added to agriculture including 22.7 million men and 6.2 million women which means female workers constitued 21.4 percent of incremental workforce in agriculture during 2001 and 2011. Their contributions were not acknowledged and so they were left out in development programmes. This has led to decrease in agricultural productivity (Odebode, 2008). This circumstance desires gender sensitization for gender mainstreaming and equality in order to prop up women with identical access to and control of productive resources, information and technology for sustainable and profitable farming. Technology is indispensable to women's economic advancement, to swell their production, to generate new entrepreneurial ventures and access new income-generating pursuits. But, technology has been underused in unlocking women's money-making opportunities. Even though most low-income women in escalating countries are principally engaged in agriculture, an outsized literature shows that men have been the primary adopters and shapers of agricultural technologies in developing countries. As a consequence, women have less access to and control over the need based technologies and they carry on to use conventional, more labor-intensive methods, undermining their agricultural productivity.

Women friendliness of a technology: However, need based technologies can be familiarized to farm women subsequently judging its women friendliness. Hence, women friendly technologies can be identified from the pool of technologies by considering few parameters while judging. Also, a technology can be prepared women friendly by required modification in its base model making its software and hardware components very specific to her physique and location. For inspecting the women

friendliness of a technology, a checklist of a few identified parameters can be very useful. The parameters employed in the checklist can be revised by a researcher to assess women friendliness for a specific agricultural technologies.

Standardization of the Checklist:

The validity is ascertained for standardization of the checklist. The validity is measured by content validity. The content of checklist is validated through literature scan and expert's opinion who are working in the area of gender and development. The statements having at least and more than 80% expert's agreement are retained in the final checklist. As the relevancy weightage and mean relevancy scores of all the statements had discriminating values, it seemed reasonable to accept the checklist as valid measure of the desired dimension.

How to use the Checklist?

This checklist follows a gender analysis framework and is intended to be comprehensive, flexible and adaptable. The checklist consists of 14 statements/items to be used as check while assessing women friendliness of agricultural technologies. The equal weightage is assigned to each statement/item in checklist. The checklist statements may be administered to the any agricultural technology/ technology inventor on two point continuums, *viz. Yes* and *No* with the scores of 1 and 0, respectively. The overall possible maximum and minimum scores are 14 and 0, respectively. Thus, women friendliness value of each response/technology ranges from 0 to 1 i.e. when it is lowest, the score will be 0 and when it is highest, the score will be 1. The higher women friendliness value indicate greater women friendliness of technology. It is calculated by following formula;

$$\text{Women Friendliness Value} = \frac{\text{Obtained Score}}{\text{Maximum Possible Score}} = \frac{\text{Outof14}}{14}$$

Checklist for assessing women friendliness of agricultural technologies

A	**General Information**	
A01	Name of the Institution :	
A02	Name of the Respondent :	
A03	Sex of the Respondent (M/F) :	
A04	Email of the Respondent :	
A05	Mobile No. of the Respondent :	
A06	Discipline & Expertise of the Respondent:	
A07	Did you or any member of your project team attend any training (minimum 3 days duration) related to gender/ women before?	( ) Yes ( ) No
A08	Do you or any member of your team have any experience of being a part of any gender/ women based programme before?	( ) Yes ( ) No
A09	Name of the Technology you worked with:	
A10	For how many men and women your technology has been used?	( ) Men ( ) Women
A11	How do you rate your technology?	( ) Women friendly ( ) Gender neutral

Use the following checklist for assessing women friendliness of agricultural technology:

Sl. No.	Statements	Weigh-tage	Yes	No
1	Is it generated by considering the preferences of both the genders?	1/14		
2	Does it consider physical parameters of both the genders?	1/14		
3	Does it fulfil the location specific needs of both the genders?	1/14		
4	Is it compatible with the existing socio-cultural climate of the society?	1/14		
5	Is it easily accessible and affordable to both the genders?	1/14		
6	Is it simple to understand by both farm men and women?	1/14		
7	Is it easy to handle and operate by both farm men and women?	1/14		
8	Is it efficient to reduce drudgery of both farm men and women?	1/14		
9	Does it reduce workload of women?	1/14		
10	Does it boost efficiency and productivity of both the genders?	1/14		
11	Does it work with less and easily accessible inputs?	1/14		
12	Is it adoptable with the existing skill of both the genders?	1/14		
13	Is it flexible to get modified according to the needs of both gender?	1/14		
14	Is it having potential of contributing to any livelihood component of farm men and women?	1/14		

Relevance:

Introduction of technologies for development of farming community is a common agenda in almost all agricultural programmes. However, technologies are rarely considered before its use for farmwomen. So, impact of the technology is felt differently on men and women. Gender issues and concerns are neither considered in development of technology nor are farmwomen involved during its inception. Rather being gender sensitive most of the available technologies are gender neutral. Hence, care should be taken to test the women friendliness of a technology before aiming women development through its introduction. So these checklists developed will help in relooking into the details of a technology through a gender lens for determining its women friendliness. This document will be very useful for research, extension and development workers in selecting the most appropriate technology for women thereby ensuring better penetration and adoption of it to rural women. Further, the checklist has been prepared for self-sensitization on how to look at women friendliness of a technology.

References:

Akter, S., Rutsaert P.,Luis, J., Htwe, N. M., San, S. S., Raharjio, B. and Pustika, A. (2017) Women's empowerment and gender equityin agriculture: Adifferent perspective from Southeast Asia. Food Policy, 69: 270-279.

Alkire, S., Meinzen-Dick, R. S., Peterman, A., Quisumbing, A.R., Seymour, G. and Vaz, A.(2013)The women's empowerment in agriculture index. World Dev, 52: 71-91.

Budlender, Debbi (2010)What do time use studies tell us about unpaid care work? Time use studies and unpaid care work. 2010, 1.

Dash and Sarkar (2014-15) ICAR Annual Report, 2014-15, p.7.

FAO (2011)State of food and agriculture. Women and agriculture: Closing the gender gap for development. Rome: Food and Agriculture Organization of the United Nations.

Fletschner, D. and Kenney, L. (2014)Rural women's access to financial services: credit, savings, and insurance. In: Quisumbing, A.R., Meinzen-Dick, R., Raney, T.L., Croppenstedt, A., Behrban, J. A., Peterman, A. (*Eds),* Gender in Agriculture. Springer, Netherlands.

Hazel J. L. M. and Agnes R. Q. (2015)What dimensions of women's empowerment in agriculture matter for nutrition in Hgana? Food Policy, 52: 54-63.

Odebode S. O. (2008) Appropriate Technology for Cassava Processing in Nigeria: Users Point of View Journal of International Women Studies 9, No: 3 269 – 283 (U. S. A).

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Constraints faced by rural women entrepreneurs in dairy sector

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ABSTRACT

A study entitled "Constraints faced by rural women entrepreneurs in dairy sector was undertaken to analyze the problems faced by them. Women not only play an important role for agricultural development but also plays significant role in agricultural allied sectors such as dairy, fishery, poultry, mushroom production etc. In Indian condition dairy has been considered as "Rural Banking" as it is practiced by majority of the marginal, small and landless farm families for their sustenance and livelihood. Keeping this in view the study was undertaken in Khordha district of Odisha in 2019. Both purposive and random sampling techniques were followed for selection of the district, blocks, panchayats, villages and respondents. The total sample size of the study was 120. In respective of the problems and challenges that emerge in the process of entrepreneurship, women are going ahead in the business domain.

***Key words**: Rural women,dairy enterprise*

Introduction

Women entrepreneurship in economic development of any nation has been recognised for its significant contribution. The women folk can be considered as backbone of any nation . Now time has come for women empowerment. In rural Odisha, women not only play an important role for agricultural development but also plays significant role in allied agricultural sector such as dairy, fishery, poultry, mushroom production etc. In Indian condition dairy has been considered as "Rural Banking" as it is practiced mostly by majority of the marginal, small and landless farm families for their sustaenance and livelihood. The role of rural women for animal husbandry is of paramount importance. In this sector they are managers as well as decision makers. Women do more than 80% dairy operation like cleaning, feeding, milking, marketing of milk and milk products. The state and central government initiate several scheme, programmes and projects for empowerment of women through various micro enterprises including dairy. Against this background a study was undertaken to identify the constraint faced by women entrepreneur in dairy sector in Khordha district of Odisha.

Materials & Methods

A study was conducted in the Khordha district of Odisha state. Both purposive and random sampling techniques were followed for selection of blocks, panchayats, villages and respondents. The sample size was 120 women entrepreneurs of animal husbandry sector. The response was obtained from each individual respondent through a pre tested structured interview schedule on the major constraints faced by the women entrepreneurs such as family related constraints, technical constraints, marketing related constraints, financial constraints, socio-personal constraints. The response was collected accordingly in a 3 point continuum i.e Strongly Agree, Agree, Disagree with a scale value of 3,2,1 respectively.

Result & Discussion

Table-1: Constraints faced by women entrepreneurs N=120

SL.NO.	STATEMENT	FREQUENCY	PERCENTAGE	RANK
A	**Family related constraints**			
1	Lack of support from family members	90	75	I
2	Multiple role conflict	26	21.66	II
3	Strain in managing home	4	3.33	III
B	**Technical constraints**			
1	Non- availability of animal health care	9	7.5	III

2	Lack of suitable technology	18	15.0	II
3	Inadequate training skills	93	77.5	I
C	**Marketing constraints**			
1	Lack of knowledge of diversification of product	4	3.33	V
2	Lack of proper marketing facilities	58	48.33	I
3	Lack of preservation facilities	20	16.67	III
4	Low price of milk	22	18.33	II
5	Risk orientation towards processing and other value adding activities	16	13.33	IV
D	**Financial constraints**			
1	High rate of interest	18	15	IV
2	Lack of awareness of different government schemes	60	50	I
3	Difficulty in getting credit	20	16.66	III
4	Subsidies and their procedures for availing loan	22	18.33	II
E	**Socio-personal constraints**			
1	Time management	15	12.5	II

The above table revealed the five major areas of constraint, such as family related constraints, technical constraints, marketing related constraints, financial constraints, socio-personal constraints. Entrepreneurs generally face different kinds of problem and this problem assume more seriousness in case of women entrepreneur as they face gender discrimination for solving them. Among family related constraint lack of support from family members (75%), multiple roles of conflicts (21.66%), strains in managing home (3.33%) were the major constraint. In order of importance which ranked as first, second and third respectively. Under technical constraints inadequate training skills (77.5%), lack of suitable technology (15%), non-availability of animal health care facility (7.5%), were major constraint which ranked first, second, third in order of importance. Under marketing related constraint lack of proper marketing facility (48.33%), low price of milk (18.33%), lack of preservation facility (16.67%), risk orientation towards processing and other value adding activities (13.33%), lack of knowledge of diversification of product (3.33%) were the major constraint in order of importance first, second, third, fourth, fifth respectively. Under finance constraint lack of awareness of different government schemes (50%), subsidies and their procedures for availing loan (18.33%),difficulty in getting credit (16.66%) , high rate of interest (15%) perceived as major constraint in order of severity and ranked first, second, third respectively. A major problem experienced by women entrepreneur under socio-personal constraint, such as stress due to dual role (77.5%) followed by risk and uncertainties (10%) were the major problems which act as a barrier for women entrepreneur in dairy sector. The findings of Bhagyalaxmi (2002) and Usha Kiran (2012) were in the same line of the present finding of constraint faced by women entrepreneurs in dairy sectors.

Conclusion

In respective of the problems and challenges that emerge in the process of entrepreneurship, women are going ahead in the business domain. The findings of the study will be helpful to administrators, policy makers and extension functionaries of the government, to solve the problems of women empowerment in animal husbandry sector and to take remedial measures to attract more number of rural women to promote entrepreneurial activities in dairy sectors.

References

Bhagyalaxmi .C.(2002). A Critical study on micro-enterprises management among women entrepreneur of Andhra Pradesh Unpub, Phd Thesis, ANGRAU,Hyderabad

Usha Kiran V. (2012). A Study on business women in micro enterprises. International Journal of Multidisciplinary Research. Vol.2 (1),pp -66-70

Vani.CH.S (2013). Constraint in dairy micro enterprises faced by women entrepreneur of Andhra Pradesh Indian Res. J.Ext.Edu,13 (3), pp-106-108

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Profile analysis of farmers in Upper Krishna Project (UKP) command area in Karnataka – A Socio-economic perspective

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ABSTRACT

The study was carried out to analyse the WUAs in irrigated commands of Krishna river basin and study the impact of WUAs on agricultural water management in canal commands. The work was carried out by making use of both primary and secondary data. Primary data were collected from farmer respondents in different villages of canal command areas in the study area. The study made use of the descriptive statistics. The indicators such as age (years), family size (no), occupation (no), education, land holding per farmer (acres), sources of irrigation (per cent) and membership of the society (WUA) were chosen for the study and these may further help the researchers to explore different views which may cause significant impact on the livelihoods of the farmers in the regions.

Key words: *Command areas, Water Users' Associations*

Introduction

India has a geographical area of 329 m. ha (3.29 M Km^2) which is endowed with vast land and water potential that can be rated as one of the best in the world. It accounts for 16 per cent of the world population with roughly four percent of the world's water resources and 2.45 per cent of the world's land area. The distribution of water resources in the country is largely uneven over space and time. Over 80 to 90 per cent of the run-off in Indian rivers occurs in four months of the year and there are some regions experiencing abundance while others experience acute water scarcity.

The Krishna is the second largest river in the peninsular India. It rises in the Mahadev range of the Western Ghats near Mahabaleshwar at an altitude of 1,337 m above the mean sea level and flows through Maharashtra, Karnataka and Andhra Pradesh, before joining the Bay of Bengal near Vijayawada. The following are the four canals chosen for the study considering the flow of water in the state of Karnataka.

Almatti Left Bank Canal (ALBC): It starts on the foreshore of *Almatti* dam with a length of 85 km with a designed discharge of 54.95 cumecs. It covers an area of about 20,235 ha. The notified area for the canal was 21,981 ha while the potential created so far is about 23,530 ha. It covers *BasavanaBagewadi* and *Muddebihal* taluks of *Vijayapur* district.

Indi Branch Canal (IBC): It is an off at 77.5 km of NLBCnear Kembhavi of Shahpur taluk with a length of 172 km with a designed discharge of 2,650 cusecs. It covers an area of about 1,31,260 ha. The notified area for the canal was 1,03,591 ha while the potential created so far is about 1,03,293 ha. It covers Shahpur taluks (*Yadgiri* district), *Jewargi* taluk (*Kalaburgi* district), *Sindagi* and Indi taluks (*Vijayapur* district).

Narayanpur Left Bank Canal (NLBC): It is an off take from *Narayanpur* dam with a length of 78 km with a designed discharge of 10,000 cusecs. It covers an area of about 47,223 ha. The notified area for the canal was 50,133 ha while the potential created so far is about 48,000 ha. It was started in the year 1972 and completed in the year 1982. It covers *Shorapur* and *Shahpur* taluks of *Yadgiri*district.

Narayanapur Right Bank Canal (NRBC): It is an off take from right bank of *Narayanpur* dam with a length of 95 km with a designed discharge of 10,000 cusecs. It covers an area of about 84,000 ha. The notified area for the canal was 97,203 ha while the potential created so far is about 97,500 ha. It was started in the year 1972 and completed in the year 1982. It covers *Lingsugur* and *Devadurga* taluks of *Raichur* districts.

The study aims to understand the social and economic aspects of farmers in the canal command areas of Upper Krishna Project in Karnataka.

Materials & methods

Purposive sampling was employed to select the respondents. However, they were selected based on their proportional representation. Primary data was collected from the respondents living in the villages of Upper Krishna Project, Karnataka. The data on age (years), family size (no), occupation (no), education, land holding per

farmer(acres), sources of irrigation (per cent) and membership of the society (WUA)were documented for different small, medium and large farmers using the personal interview schedule.Socioeconomic characteristics of the respondents were analysed using descriptive statistics.

Results & Discussion

General characteristics of sample respondents in UKP command area

Table 1 depicts the general characteristics of sample respondents in different canal areas of Upper Krishna Project. Important characteristics like age (years), family size (no), occupation (no), education, land holding per farmer(acres), sources of irrigation (per cent) and membership of the society (WUA). These characteristics were assessed for different categories of farmers' *viz* small farmers (less than 5 acres), medium farmers (less than 10 acres) and large farmers(more than 10 acres).

General characteristics of sample respondents in ALBC command area

General characteristics of sample respondents in ALBC command area are shown in Table 1 Among the small farmers the average age was found to be 51.5 years similarly medium and large farmers were found to have 48.50 and 50.00 years, respectively. However, the average age of all the farmers in ALBC command area was 50.00 years. Further, small and large farmers were found to have a family size of about 6 people (5.2 and 5.8 members, respectively). However, medium farmers were found to have a lower family size of about 5 people (4.6 members) but the average family size in the command area was about 6 people in a family (5.2 members).

Further regarding On-farm and Off-farm occupation, large farmers were found to have about 5 people (4.79) engaged in On-farm and about one person (1.01) engaged in Off-farm occupation. Similarly, small farmers showed to have about 4 people (4.08) engaged in On-farm occupations while about one person (1.12) was engaged in Off-farm occupations. However, the case was different among medium farmers where about 4 people (3.88) were found to have engaged in On-farm occupation while less than one person (0.72) was found to have engaged in Off-farm occupations. Similarly, on an average about 4 people (3.88) were found to have engaged in On-farm occupation while about less than a person (0.62) was found to have engaged in Off-farm occupations across the all the categories of farmers.

Education attained by the farmers was classified into four categories *viz*, illiterates, primary education, secondary education and graduation. Small and large farmers were found to have higher illiterate population (40.00% each) whereas medium farmers were found to be illiterate to the tune of 24.00 per cent. Nearly 19.00 per cent of the small farmers were found to have attained the primary education while the per cent was less in case of medium (16.00%) and large farmers (10.00%). Regarding secondary education medium farmers were found to have higher percentage (44.00) followed by small farmers (31.00%) and large farmers (30.00%). Regarding graduation large farmers were found to have a higher percentage (20.00%) of people who have obtained a degree followed by medium farmers (16.00%) and small farmers (10.00%). On an average nearly 38.00 per cent of farmers were found to have secondary education while about 34.00 per cent were found to be illiterates. About 15.00 per cent of the farmers were found to have a degree and about 13.00 per cent of the farmers were found to have primary education.

The average land holding in case of small farmers was found to be 4.74 acres of which 3.12 acres was irrigated and 0.62 acres was unirrigated. Similarly, medium farmers were found to have an average holding of 8.63 acres of which 7.62 acres was irrigated and 1.01 was unirrigated. Further, in case of large farmers the land holding was 14.75 acres of which 12.14 acres was irrigated and 2.61 acres was unirrigated. However, the average land holding in the command area was about 8. 14 acres of which 7.23 acres was irrigated while about 0.091 acres was unirrigated. Further, regarding sources of irrigation, the dependency of small farmers on canal irrigation was high (78.48) followed by bore well (17.51) and tank irrigation (4.01). Similarly, medium and large farmers showed a larger dependency on canal irrigation (90.16% and 79.74 %, respectively) followed by bore well (5.77% and 11.70 %, respectively) and tank irrigation (4.07 % and 8.57 %, respectively). Similarly, the average dependency on canal irrigation was highest (84.92 %) across all categories of farmers followed by bore well (8.44 %) and tank (6.64 %) irrigation.

General characteristics of sample respondents in IBC command area

General characteristics of sample respondents in IBC command area are shown in Table 2. Among the small farmers the average age was found to be 47.45 years whereas medium and large farmers were found to have higher ages of 52.10 and 50.24 years, respectively. However, the average age of all the farmers in IBC command area was 49.46 years. Further, medium and large farmers were found to have a higher family size of about 6 people (5.3 and 6.2 members, respectively) whereas small farmers were found to have a lower family size of about 3 people (3.4 members) but the average family size in the command area remained as 4 people in a family (4.4 members).

Further regarding On-farm and Off-farm occupation, large farmers were found to have about 5 people (4.90) engaged in On-farm and about one person (1.30) engaged in Off-farm occupation. Similarly, medium farmers showed to have about 4 people (4.1) engaged in On-farm occupations while about one person (1.20) was engaged in Off-farm occupations. However, the case was different among small farmers where about 3 people (2.70) were found to have engaged in On-farm occupation while less than one person (0.70) was found to have engaged in Off-farm occupations. Similarly, on an average about 4 people (3.78) were found to have engaged in On-farm occupation while about less than a person (0.67) was found to have engaged in Off-farm occupations across the all the categories of farmers.

Further, small and large farmers were found to have higher illiterate population of 43.75 per cent and 37.50 per cent, respectively whereas medium farmers were found to be illiterate to the tune of 23.09 per cent. Nearly 18.75 per cent of small farmers were found to have obtained primary education while it was less in case of medium (15.38%) and large (12.50%) farmers. Regarding secondary education medium farmers were found to have higher percentage (46.15%) followed by small farmers (31.25%) and large farmers (25.00%) Regarding graduation large farmers were found to have a higher percentage (25%) of people who have obtained a degree followed by medium farmers (15.38%) and small farmers (6.25%). On an average nearly 32.00 per cent of the farmers were found to be illiterate while about 28.00 per cent of the farmers have found to have primary education. Similarly, about 22.00 per cent farmers were found to have attained graduation while the least 18.00 per cent of the farmers received their secondary education.

The average land holding in case of small farmers was found to be 4.72 acres of which 3.89 acres was irrigated and 0.83 acres was unirrigated. Similarly, medium farmers were found to have an average holding of 7.03 acres of which 5.93 acres was irrigated and 1.10 was unirrigated. Further, in case of large farmers the land holding was 15.57 acres of which 13.51 acres was irrigated and 2.06 acres was unirrigated. However, the average land holding in the command area was about 8.62 acres of which 7.19 acres was irrigated while about. 1.43 acres was unirrigated. Further, regarding sources of irrigation, the dependency of small farmers on canal irrigation was high (80.00) followed by bore well (10.51) and tank irrigation (9.49). Similarly, medium and large farmers showed a larger dependency on canal irrigation (84.65 and 84.60 %, respectively) followed by bore well (10.467% and 11.55 %, respectively) and tank irrigation (4.89 % and 3.85 %, respectively). Similarly, the average dependency on canal irrigation was highest (81.35%) across all categories of farmers followed by bore well (11.72%) and tank (6.93 %) irrigation.

General characteristics of sample respondents in NLBC command area.

General characteristics of sample respondents in NLBC command area are shown in table 3 Among small farmers the average age was found to be 44.80 years similarly medium and large farmers were found to have 42.30 and 50.60 years, respectively. However, the average age of all the farmers in NLBC command area was 45.16 years.Further, small and large farmers were found to have a family size of about 6 people (5.2 and 5.8 members, respectively). However, medium farmers were found to have a lower family size of about 5 people (4.7 members) but the average family size in the command area was about 6 people in a family (5.12 members).

Further regarding On-farm and Off-farm occupation, large farmers were found to have about 5 people (4.79) engaged in On-farm and about one person (1.10) engaged in Off-farm occupation. Similarly, small farmers showed to have about 4 people (4.10) engaged in On-farm occupations while about one person (1.10) was engaged in Off-farm occupations. However, the case was different among medium farmers where about 4 people (4.20) were found to have engaged in On-farm occupation while less than one person (0.50) was found to have engaged in Off-farm occupations. Similarly, on an average about 4 people (4.20) were found to have engaged in On-farm occupation while about less than a person (0.92) was found to have engaged in Off-farm occupations across the all the categories of farmers.

Further, small and medium farmers were found to have high illiterate population of 53.33 per cent and 50.00 per cent, respectively whereas large farmers were found to be illiterate to the tune of 28.57 per cent. Nearly 42.86 per cent of large farmers were found to have obtained primary education while it was less in case of medium (26.92%) and small (26.67%) farmers. Regarding secondary education small farmers were found to have higher percentage (20.00%) followed by medium farmers (15.38%) and large farmers (14.29%) Regarding graduation large farmers were found to have a higher percentage (14.29%) of people who have obtained a degree followed by medium farmers (7.69%) and small farmers were found to have no persons (0.00%) who have attained graduation.

On an average nearly 40.00 per cent of the farmers were found to be illiterate while about 26.00 per cent of the farmers have found to have primary education. Similarly, about 22.00 per cent farmers were found to have received their secondary education while the least 16.00 per cent of the farmers had attained graduation.

The average land holding in case of small farmers was found to be 4.79 acres of which 4.16 acres was irrigated and 0.63 acres was unirrigated. Similarly, medium farmers were found to have an average holding of 9.23 acres of which 8.12 acres was irrigated and 1.11 was unirrigated. Further, in case of large farmers the land holding was 16.71 acres of which 14.68 acres was irrigated and 2.03 acres was unirrigated. However, the average land holding in the command area was about 10.30 acres of which 8.58 acres was irrigated while about. 1.72 acres was unirrigated. Further, regarding sources of irrigation, the dependency of small farmers on canal irrigation was high (84.38) followed by bore well (10.34) and tank irrigation (5.29). Similarly, medium and large farmers showed a larger dependency on canal irrigation (79.06 and 77.86 %, respectively) followed by bore well (12.56% and 13.08 %, respectively) and tank irrigation (8.37 % and 9.06 %, respectively). Similarly, the average dependency on canal irrigation was highest (77.80%) across all categories of farmers followed by bore well (11.32%) and tank (10.88 %) irrigation.

General characteristics of sample respondents in NRBC command area.

General characteristics of sample respondents in NRBC command area are shown in table 4 Among the small farmers the average age was found to be 48.50 years similarly medium and large farmers were found to have 54.50 and 51.50 years, respectively. However, the average age of all the farmers in NRBC command area was 51.12 years. Small and medium farmers were found to have the family size of about 5 people (4.40 and 4.90) while the large farmers had about 6 people (5.30) in the family. However, the average family size in the command area was about 5 people (4.93).

Further regarding On-farm and Off-farm occupation, large farmers were found to have about 5 people (4.60) engaged in On-farm and about less than one person (0.70) engaged in Off-farm occupation. Similarly, small farmers showed to have about 4 people (4.01) engaged in On-farm occupations while about less than one person (0.39) was engaged in Off-farm occupations. Further, in case of medium farmer about 4 people (4.10) were found to have engaged in On-farm occupation while less than one person (0.80) was found to have engaged in Off-farm occupations. Similarly, on an average about 4 people (3.97) were found to have engaged in On-farm occupation while about less than a person (0.95) was found to have engaged in Off-farm occupations across the all the categories of farmers.

Additionally, small and medium farmers were found to have high illiterate population of 62.50 per cent and 57.69 per cent, respectively whereas large farmers were found to be illiterate to the tune of 50.00 per cent. Nearly 25.00 per cent of small and large farmers were found to have obtained primary education while it was less in case of medium farmers (23.08). Regarding secondary education medium nearly 12.50 per cent of small and large farmers were found to have obtained secondary education while it was less in case of medium farmers (11.54).Regarding graduation large farmers were found to have a higher percentage (12.50%) of people who have obtained a degree followed by medium farmers (7.69%) and small farmers were found to have no persons (0.00%) who have attained graduation.On an average nearly 56.75 per cent of the farmers were found to be illiterate while about 24.35 per cent of the farmers have found to have primary education. Similarly, about 11.00 per cent farmers were found to have received their secondary education while the least 7.90 per cent of the farmers found to have attained graduation

The average land holding in case of small farmers was found to be 4.83 acres of which 3.96 acres was irrigated and 0.87 acres was unirrigated. Similarly, medium farmers were found to have an average holding of 9.43 acres of which 8.24 acres was irrigated and 1.19 was unirrigated. Further, in case of large farmers the land holding was 15.74 acres of which 14.52 acres was irrigated and 1.22 acres was unirrigated. However, the average land holding in the command area was about 10.66 acres of which 8.18 acres was irrigated while about. 2.48 acres was unirrigated. Further, regarding sources of irrigation, the dependency of small farmers on canal irrigation was high (71.21) followed by bore well (18.43) and tank irrigation (10.35). Similarly, medium and large farmers showed a larger dependency on canal irrigation (75.00 and 82.51 %, respectively) followed by bore well (13.23 % and 10.40 %, respectively) and tank irrigation (11.77 % and 7.09 %, respectively). Similarly, the average dependency on canal irrigation was highest (79.42 %) across all categories of farmers followed by bore well (10.99 %) and tank (9.59 %) irrigation.

The study area comprised mainly of four canals (ALBC, IBC, NLBC and NRBC) which come under the jurisdiction of five districts *viz. Bagalakot, Kalaburgi,Raichur, Vijayapur* and *Yadagiri.* Among these districts, *Kalaburgi,Raichur* and *Yadagiri* belonged to Hyderabad-Karnataka region which has been granted a special provision of 371 J under Indian constitution for the purpose of development in the region. The lower attainment in education may be attributed to the development disparity in the state while the remaining two districts are also a part of North-Karnataka region which is relatively less as compared to their southern counterparts.

The occupation pattern in the study area is largely agrarian where almost every respondent has dependency

on farm while the least dependency was found off-farm in all villages selected across different canal command areas. The possible reason for this might be the lack of other employment opportunities in the region forcing the population to be more dependent on farming. Irrigation benefits realized might be another reason for their interest towards farming. Similarly, agro-climatic conditions in the region are congenial for taking up cultivation of commercial crops like sugarcane, cotton and paddy which may be attributed to the larger dependency on farm in the study area. The findings obtained are in line with those obtained by Hugar (1997) in Tunga Bhadra Command area, Sultanapur (2016) in canal command areasof Tunga Bhadra and Upper Krishna Project and Vijayalaxmi (2015) in Karnataka community-based tank management project in Vijayapura district.

Conclusion

It may be inferred from the study that the population of illiterates was more skewed at NLBC and NRBC command areas while ALBC and IBC command areas had relatively lower population of illiterates. Agriculture was found to be the main occupation across all the canal command areas with canal being the most important source of irrigation. The average land holding was higher in NLBC and NRBC as compared to ALBC and IBC. These indicators further help the researchers to explore different views which may cause significant impact on the livelihoods of the farmers in the regions.

References

Government of India. 2002. National Water Policy. Ministry of Water Resources, New Delhi.

Government of Karnataka. 2002. State Water Policy, Ministry of Water Resources, Bangalore.

Hugar LB. 1997. Performance of Canal Irrigations System in Tungabhadra Project- An Economic Analysis, Ph.D. Thesis, University Of Agricultural Sciences, Dharwad.

Sultanapur.V, 2016, "An economic evaluation of water productivities in upper Krishna project (UKP) and Tungabhadra project (TBP) command areas in Karnataka". *M. Sc. (Agri.) Thesis*, Univ. Agril. Sci., Raichur

Vijayalaxmi. 2015. "Socio-economic evaluation of impact of Karnataka community-based tank management project in Vijayapura district". M. Sc. (Agri.) Thesis, Univ. Agril. Sci., Dharwad.

Table 1 General characteristics of the sample respondents in canal command areas of Upper Krishna Project (n=200)

Sl. No	Characteristics	ALBC				IBC				NLBC				NRBC			
		SF n=16	MF n=26	LF n=8	Avg. n=50	SF n=16	MF n=26	LF n=8	Avg. n=50	SF n=16	MF n=26	LF n=8	Avg. n=50	SF n=16	MF n=26	LF n=8	Avg. n=50
1	**Age (Years)**	51.50	48.50	50.00	**50**	47.45	52.10	50.24	**49.46**	44.80	42.30	50.60	**45.16**	48.50	54.50	51.50	**51.12**
2	**Family Size (No.)**	5.2	4.6	5.8	**5.2**	3.4	5.3	6.2	**4.4**	5.20	4.70	5.80	**5.12**	4.40	4.90	5.30	**4.93**
3	**Occupation (No.)**																
	On Farm	4.08	3.88	4.79	**3.88**	2.7	4.1	4.9	**3.78**	4.1	4.2	4.7	**4.2**	4.01	4.10	4.60	**3.97**
	Off Farm	1.12	0.72	1.01	**0.62**	0.7	1.2	1.3	**0.67**	1.1	0.5	1.1	**0.92**	0.39	0.80	0.70	**0.95**
4	**Education (%)**																
	Illiterate	40.00	24.00	40.00	**34.00**	43.75	23.09	37.50	**32.00**	53.33	50.00	28.57	**40.00**	62.50	57.69	50.00	**56.75**
	Primary	19.00	16.00	10.00	**13.00**	18.75	15.38	12.50	**28.00**	26.67	26.92	42.86	**26.00**	25.00	23.08	25.00	**24.35**
	Secondary	31.00	44.00	30.00	**38.00**	31.25	46.15	25.00	**18.00**	20.00	15.38	14.29	**18.00**	12.50	11.54	12.50	**11.00**
	Degree	10.00	16.00	20.00	**15.00**	6.25	15.38	25.00	**22.00**	0.00	7.69	14.29	**16.00**	0.00	7.69	12.50	**7.90**
5	**Land holding per farmer (Acres)**																
	Total	4.74	8.63	14.75	**8.14**	4.72	7.03	15.57	**8.62**	4.79	9.23	16.71	**10.3**	4.83	9.43	15.74	**10.66**
	Irrigated	3.12	7.62	12.14	**7.23**	3.89	5.93	13.51	**7.19**	4.16	8.12	14.68	**8.58**	3.96	8.24	14.52	**8.18**
	Unirrigated	0.62	1.01	2.61	**0.91**	0.83	1.1	2.06	**1.43**	0.63	1.11	2.03	**1.72**	0.87	1.19	1.22	**2.48**
6	**Source of irrigation (%)**																
	Canal	78.48	90.16	79.74	**84.92**	80.00	84.65	84.60	**81.35**	84.38	79.06	77.86	**77.80**	71.21	75.00	82.51	**79.42**
	Bore well	17.51	5.77	11.70	**8.44**	10.51	10.46	11.55	**11.72**	10.34	12.56	13.08	**11.32**	18.43	13.23	10.40	**10.99**
	Tank	4.01	4.07	8.57	**6.64**	9.49	4.89	3.85	**6.93**	5.29	8.37	9.06	**10.88**	10.35	11.77	7.09	**9.59**
7	**Society (No.)**																
	Members	8	13	4	**25**	8	13	4	**25**	8	13	4	**25**	8	13	4	**25**
	Non-members	8	13	4	**25**	8	13	4	**25**	8	13	4	**25**	8	13	4	**25**

SF- Small Farmers, MF- Medium Farmers, LF- Large Farmers and Avg. - Average

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Effect of a Novel Extension Approach for Attracting Rural Youths in Agriculture

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ABSTRACT

Various extension methods are taken up by social scientists around the globe for technology dissemination. In the changing scenario, when farmers' needs are changed, lowering of self esteem is perceived as one of the major setback for reducing attraction towards farming by the next generation. Along with price, prestige is playing a major role in commercial farming. Krishi Vigyan Kendra, Deogarh, Odisha has developed a strategy and implemented it during 2018-19 and 2019-20 to increase the social status of progressive farmers by increasing their human values. It was observed from the study that young farmers feel their social status increased after branding by KVK which had a better impact on their society as well. These farmers acted as a bridge for technology transfer in their locality. Increasing of self-esteem was perceived as the greatest effect of branding by the farmers. The studied farmers were of the opinion that even after recognized by government, they had the least opportunity to easy available of government schemes.

***Key Words**: Brand, perception, prestige, socio-economic*

Introduction

Farm sector though contributes 16% of national GDP is the backbone of livelihood of 60% of Indian population. With the coming up liberalization economy and encouraging growth of non-farm sectors, e.g., service, industry and manufacturing, the attraction towards farming started gradually decreasing. Large scale professional migration from farming sector to non-farm sector was observed everywhere around the nation. Farming lost its attraction among the rural community because of unstable market, aberrant climatic condition and increasing cost of manual labour (Nath and Hossain, 2011). Besides, the human value of the farmer is at the lowest point in the society which distract the rural youths from farming. Most of the small and marginal farmers of the nation (86%) are struggling with a profession having lower and unstable income, highest insecurity and with least prestige from the society. Maslow (1954) in his hierarchy of need structure stated that self esteem is the higher grade need of a human being in the society. However, less number of studies have yet been taken up to find out such farmers' attributes on farm outcomes and its effect on society (O'Boyle, 2010). It was felt that the extension approach should be reoriented to find out the ways to tackle the poor prestige associated with farming.

Krishi Vigyan Kendra is a district level organisation working in all the rural districts of India in the field of extension research by transferring the tested technologies for holistic development of the farm families. Without any sanctioned post of grass root level extension worker at village level and with limited number of scientific posts, KVK has been given the mandate to disseminate the frontier technologies in agriculture and allied sectors to provide farmer a better return. Doubling of farmers' income is perceived as an incentive to check professional migration from the farm sector. But no specific action has ever been taken exclusively to recognize the human values of the farmers by increasing their social prestige. Keeping the things in view, KVK Deogarh, Odisha adopted a novel practice from 2018-19 to enhance the social prestige of farmers who will be the flag bearers for the fellow farming community in transfer of technologies in their respective areas. This study finds out the effect of the novel extension approach in establishing and recognizing human values of the farmers which will b beneficial for the farming community.

Materials & Methods

This novel approach was undertaken during the year 2018-19 and 2019-20 in the purposively selected agriculture predominated, industry less Deogarh district of Odisha. About 83% of total farm families (55,000) of the district are small and

marginal farmers. Besides the traditional agriculture, horticulture, animal husbandry and pisciculture, minor forest produces collection is their major means of livelihood support. The district is surrounded by neighboring district with mining and industrial sectors. Still the young farmers are switching over to non farm sector as well as migrating to other states in occupation mobility. From about 55000 farm families, more than seven thousand young rural youths have gone outside in search of employment in non-farm sector, as reported by district labor office, Degarh. In this context KVK, Deogarh took steps during the investigating period towards branding the farmers which will encourage the youths towards farming as well as increase their net income. Fourteen farmers belonging to different categories were selected purposively during the study period and felicitated by KVK in different occasions. They were designated with some brands as per their domain of specialisation. Information was collected from those branded farmers in a semi-structured interview schedule. Their socio-economic status was studied. Perception of the farmers on the effect of branding was quantified in a 3 point continuum to come to a conclusion.

Results & Discussion

KVK, Deogarh identified the sampled farmers, recognized their potentials and designated as ambassadors of those specific practices. The brand names were selected according to their traditional profession or the activity which the farmer was practising well. These farmers were performing excellently in their sphere and earning more than the others using the latest available modern technologies. However, still they were treated as a poor farmer having low social prestige.

Table 1: Branding of farmers in relation to their specific area of excellence

Sl. No.	Name of the farmer	Excelling area	Brand giving
1	Debendra Dhal	Pond based IFS	Farmer professor
2	Kishori Pradhan	Pisciculture	Blue farmer of the district
3	Ganduru Minz	Kharif Tomato	Plant doctor
4	Pravash Mishra	Poly house	Hi-tech farmer of the district
5	Randip Pradhan	Banana cultivation	Young farmer of the district
6	Arun Kumar Naik	Farm machineries	Farm Engineer
7	Amit Biswal	Seed production	Agripreneur of the district
8	Gosain Minz	Improved goat farming	Farmer Innovator
9	Pradip Lakra	Kharif Tomato	Farm Captain
10	Reena Dwibedi	Organic Farming	Smart lady farmer
11	Geetanjali Behera	Organising lady farmers	Smart home maker
12	Prasanna Pradhan	Sweet orange cultivation	KVK Bandhu
13	Sukumari Sahoo	Mushroom cultivation	Mushroom lady of the district
14	Chandan Kumar Sahoo	Composting, dairy	e-farmer of the district

The above fourteen farmers were the known faces in their locality for the above mentioned area. Farmer professor designation was given to the farmer with a well maintained pond based IFS. His knowledge in farming as a whole was recognized in his locality. Kisori Pradhan, a farmer of Reamal block found an expert in freshwater prawn culture as well as composite pisciculture. His excellency in aquaculture, i.e. the blue revolution was the factor for which he was designated as blue farmer of the district. Likewise, Ganduru Minz was designated as plant doctor seeing his knowledge in pest and disease management. Mrs Sukumari Sahoo was the farmwoman producing highest quantity of mushroom in the district. She was also catering mushroom to the district headquarter market throughout the year. She was the only lady in the district, producing mushroom around the year. She was designated as mushroom lady of the district. Prasanna Pradhan, a young sweet orange grower was taking all the latest technologies from KVK and disseminate it in their locality, hence designated as KVK Bandhu. Mrs Gitanjali Behera, a house wife made her village the *swatchha grama* of the district uniting all the women. All other farmers mentioned in the table 1 were given the brands in similar way.

The socio-economic status of the identified farmers were studied and presented in tabular form below.

Table 2 : Socio-economic profile of the identified farmers

Sl. No.	Name of the farmer	Age	Education	Caste	Land Holding (acre)	Members of organisation	Annual Income (Rs in lakh)
1	Debendra Dhal	42	B.A.	Gen	4.5 acre	ATMA	2. 20
2	Kishori Pradhan	39	C.T.	Gen	7.0 acre	-	3.00
3	Ganduru Minz	38	Ninth	ST	3.5 acre	-	2.50
4	Pravash Mishra	52	L.L.B	Gen	4 acres	Lawyer	2.30
5	Randip Pradhan	34	MBA	Gen	5.0 acre	-	4.50
6	Arun Kumar Naik	46	Matric	Gen	20 acre	-	7.50
7	Amit Biswal	41	MBA	Gen	10 acre	-	4.00
8	Gosain Minz	35	Matric	ST	5 acre	-	3.25
9	Pradip Lakra	27	C.T.	ST	2.5 acre	-	2.00
10	Reena Dwibedi	34	I A	Gen	5.0 acre	OLM	2.80
11	Geetanjali Behera	35	I A	Gen	1.5 acre	ICDS	1.50
12	Prasanna Pradhan	42	B A	Gen	5.0 acre	Watershed mission	3.50
13	Sukumari Sahoo	38	8^{th}	Gen	1.5 acre	Ward member	1.20
14	Chandan Kumar Sahoo	36	B A	Gen	7.0 acre	-	3.20

From the above table, it is observed that all these farmers were within age range of 25-45 years. It shows they were young to lead the society. Leaving two, the rest were matriculates; some were also having professional higher degrees. Many of them were already found associated with some organizations. Annual income of these farmers was

better according to their resources. The difference in income was related to their diversity in farming.

Major part of Deogarh district is under CDR agriculture production system, therefore the adoption rate of modern technology is very poor. However some of the branded farmers were already recognized by the society for their innovativeness. During the survey, it was found that the income and uniqueness in farming had given them a special position among their farming community.

Table 3: Branding and recognizing farmers

Sl. No.	Name of the farmer	Felicitated by	Newspaper publication (No.)	TV telecast (No.)	Farm Journal (No.)	Spl Govt. recognition
1	Debendra Dhal	Chairman, ZP	2	1	1	Govt trainer
2	Kishori Pradhan	DFO	-	-	-	Fish trainer
3	Ganduru Minz	State A& FW minister, QRT - ICAR	1	1	1	Udyan sathi
4	Pravash Mishra	CDAO	1	-	-	-
5	Randip Pradhan	State A& FW minister	2	1	1	-
6	Arun Kumar Naik	KVK	-	-	-	First SPRT
7	Amit Biswal	KVK	-	-	-	Seed producer
8	Gosain Minz	Dist Administration	1	1	-	-
9	Pradip Lakra	State A& FW minister	4	3	-	-
10	Reena Dwibedi	Dist Administration	-	-	-	OLM Coordinator
11	Geetanjali Behera	Chairman, ZP	3	1	1	Swatchha gram
12	Prasanna Pradhan	OUAT	2	1	1	Watershed assistant
13	Sukumari Sahoo	KVK	2	2	1	Trainer
14	Chandan Kr Sahoo	KVK	-	-	-	-

Table 3 revealed the information how a progressive farmer became a brand ambassador of the society after recognised by the persons of higher ranks or institutions. It was observed that publication of their names in the print media and electronics media made them a special person in their locality which encouraged them to adopt new technologies and become resource person in their profession.

A study on perception of the branded farmers on effect of farming was done in a three point scale where 0, 1, 2 scores were allotted to disagree, partially agree and totally agreed respectively. The mean score of each parameter was calculated and mentioned as below.

Table 4: Study on perception of the farmers on effect of branding

S.N.	Name of the farmer	Brand	On self				On co- farmers				On the Society			
			Social recognization	Cosmopoliteness	Govt. scheme availability	Self esteem	Resource person on techs.	Information get scheme	Input availability	Contact person	Encouragement to the people	Increase in area	Adoption of tech.	Increase in income
1	Debendra Dhal	Farmer professor	2.0	1.0	1.0	2.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0	1.0
2	Kishori Pradhan	Blue farmer of the district	1.0	1.0	2.0	1.0	1.0	0.0	2.0	0.0	1.0	1.0	2.0	1.0
3	Ganduru Minz	Plant doctor	2.0	2.0	1.0	1.0	2.0	2.0	2.0	1.0	2.0	2.0	2.0	2.0
4	Pravash Mishra	Hi-tech farmer of the district	2.0	2.0	2.0	2.0	0.0	0.0	1.0	0.0	1.0	1.0	1.0	1.0
5	Randip Pradhan	Young farmer of the district	1.0	1.0	1.0	2.0	1.0	1.0	1.0	1.0	2.0	2.0	1.0	2.0
6	Arun Kumar Naik	Farm Engineer	2.0	1.0	1.0	2.0	2.0	1.0	1.0	1.0	1.0	2.0	1.0	2.0
7	Amit Biswal	Agripreneur of the district	2.0	1.0	1.0	2.0	1.0	0.0	1.0	0.0	1.0	2.0	1.0	1.0
8	Gosain Minz	Farmer Innovator	1.0	1.0	0.0	2.0	2.0	0.0	2.0	1.0	1.0	1.0	1.0	2.0
9	Pradip Lakra	Farm Captain	2.0	1.0	0.0	2.0	2.0	1.0	1.0	1.0	2.0	2.0	2.0	2.0
10	Reena Dwibedi	Smart lady farmer	2.0	2.0	1.0	2.0	2.0	2.0	1.0	2.0	2.0	2.0	1.0	1.0
11	Geetanjali Behera	Smart home maker	2.0	1.0	0.0	2.0	0.0	1.0	0.0	1.0	2.0	1.0	1.0	1.0
12	Prasanna Pradhan	KVK Bandhu	1.0	1.0	0.0	1.0	2.0	1.0	1.0	2.0	1.0	2.0	2.0	2.0
13	Sukumari Sahoo	Mushroom lady of the district	1.0	1.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
14	Chandan Kumar Sahoo	e-farmer of the district	1.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	1.0
Total score			22.0	16.0	13.0	24.0	20.0	13.0	18.0	14.0	20.0	22.0	20.0	21.0
Mean score			**1.57**	**1.14**	**0.93**	**1.71**	**1.43**	**0.93**	**1.29**	**1.00**	**1.43**	**1.57**	**1.43**	**1.50**

From the above table it can be concluded that farmers perceived increasing of self esteem was the greatest effect after branding which scored the highest. During the survey, it was also found that their profession was recognized by the co-farmers and also it encouraged other farmers to follow them. Seeing the performance and social recognition, the attitude of fellow farmers were changed which ultimately affected the technology adoption and farm performance creating a positive psychology in their minds. It supports the study of Froh (2004) which indicated positive psychology plays a major role in adoption of innovations. Makinen (2013) from his study also revealed that attitudes of farmers were associated with 25% of the variation in farm performance. Most of the studied farmers were of the view that this branding helped them a little to avail government schemes or providing schematic benefits to their co-farmers. They were treated more as a resource person by their co-farmers for the new technologies. Nath and Nayak (2008) in their study found that 92% of farm families receive knowledge on farming from their co-

farmers only. Farmer to farmer extension is proved as the most effective technology transfer than the others (Franzel et al., 2019). However the effect of branding on the society was satisfactory with an average score of more than 1.43. It helped in horizontal and vertical spread of the technology as well as increasing in income from farming in the locality as a whole. It corroborates the findings of Boyle et al. (2010).

Conclusion

Branding farmers linking to their profession is nothing but recognizing their profession for their noble work. Felicitating farmers before their society boosts their morality and encourages their work aptitude. KVK, Deogarh has taken the innovative step of encouraging farmers by branding them who are the carriers of latest agriculture information. It is expected that other agencies working for the benefit of society will adopt such novel extension approach to attract and retain rural youths in farming profession.

References

Franzel S., Kiptot E., Degrande A. (2019). Farmer-To-Farmer Extension: A Low-Cost Approach for Promoting Climate-Smart Agriculture. In: Rosenstock T., Nowak A., Girvetz E. (eds) The Climate-Smart Agriculture Papers. Springer, Cham. https://doi.org/10.1007/978-3-319-92798-5_24

Froh, Jeffrey J. (2004). The History of Positive Psychology: truth be told. NYS Psychologist. 16 (3): 18–20.

Makinen, H., (2013). Farmers' managerial thinking and management process effectiveness as factors of financial success on Finnish dairy farms. Agricultural and Food Science, 22(May), 452–465

Maslow, A. H. (1954). Motivation and personality Harper and Brothers Publication

Nath, S. K. and Hossain, M. M. (2011). Constraints analysis in betelvine cultivation. Asian Journal of Extension Education. 29. 67-71

Nath, S. K. and Nayak, U. S. (2008). Training need of farm women in rice cultivation of Balasore district Journal of Extension education 13(1&2): 1-5

O'Boyle, E.H. (2010). The relation between emotional intelligence and job performance: A meta-analysis. Journal of Organizational Behavior, 30

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A study on constraints perceived by the farmers in adoption of Green gram production technology in Mayurbhanj district of Odisha

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ABSTRACT

The present study was carried out in Shamakhunta block which was operational area of Pulse Seed Hub programme of Krishi Vigyan Kendra, Mayurbhanj-I during summer 2019-20. Three villages naming Kundalbani, Kisandahi and Salbani from the block were selected on the basis of maximum area under pulses. The results shows that major constraints expressed by green gram growers under knowledge and information constraints is lack of information on scientific green gram production technology where as in socio economic constraints low profit and technological constraints lack of market facility ranked among major constraints.

Keywords: *Constraints, Mean percent score and Adoption.*

Introduction

Pulses are an important commodity group of crops that provide high quality protein complementing cereal proteins. Although, being the largest pulse crop cultivating country in the World, pulses share to total food grain is production is only 6-7% in the country. In India, pulses can be produced with a minimum use of resources and hence, it becomes less costly even than animal protein. In comparison to other vegetables, pulses are rich in protein which are less expensive and can be cultivated as an inter-crop and also as mixed crop.

The potential of pulses to help address future global food security, nutrition and environmental sustainability needs has been acknowledged through the UN declaration of the 2016 International Year of Pulses. Pulses are a Smart Food as these are critical for food basket (dal-roti, dal-chawal), important source of plant protein and help address obesity, diabetes etc. In addition pulses are highly water efficient, can grow in drought prone areas and help improve soil fertility by fixing soil nitrogen.

Green gram (*Vignaradiata* (L.)Wilczek) belonging to subgenus ceratoropis is an important short duration pulse crop that is under cultivation since prehistoric time in India. It is cultivated in three different seasons in India, viz., kharif, rabi and summer. It is grown under rain fed condition during kharif and on residual moisture during rabi in eastern and southern part of the country.

India is the largest producer of Green gram and account 54 per cent of the world production and covers 65 per cent of the world acreage. In India, Green gram is cultivated on an area of 23.47 million ha with production of 18.45 million tons and productivity 699 kg/ha. It is grown as sole relay crop in rice fallows during rabi season in Andhra Pradesh, Tamilnadu, Karnataka and Odisha and sole catch crop during spring/summer season in Uttar Pradesh, Bihar, West Bengal, Jharkhand, Punjab, Haryana and Rajasthan (Jat *et al* 2006).

Pulses are grown in all the thirty districts of Odisha. At present, pulses are grown in 20.8 lakh ha area with production of 10.6 lakh tonnes and productivity of 508 kg/ha. The contribution of greengram to the total pulse area is 42%, blackgram 27%, horsegram 11% and arhar 6.7%. The share of greengram, blackgram, horsegram and arhar towards total production is 39.0, 24.5, 8.5 and 11.7 %, respectively. The Mayurbhanj district is situated in the Northern part of Odisha and located at a latitude of 21^0 16' N to 22^0 34' North and longitude of 80^0 40' E to 87^0 to 11' East. The average altitude of the district is 592 m, the highest being Meghasani peak (1165 m) and lowest is Kalama (20 m) from the MSL. In Mayurbhanj district paddy is the major cultivated crop, followed by pulses and oil seeds. While there has been decrease in the coverage of Kharif paddy in high lands, the area under pulses, oil seeds and other cereals has been showing an increasing trend due to diversifications of cropping pattern in such land as

important dry land farming strategy against the erratic rainfall. The green gram is the major pulse grown in all the26 blocks of the district Mayurbhanj only in rabi season under residual moisture condition after harvest of Kharif paddy. It is primarily grown under rain fed condition and in a low fertility neglected soil under marginal and sub marginal conditions without any inputs. Residual soil moisture is fully utilized by the farmers in the fields for cultivation of pulse crops. Several high yielding varieties like Pusa Baishakhi, K-851 and PDM 54 (Moti), IPM 02-14 are available with the farmers but a wide gap is conspicuous in the actual potentiality of the variety (Chandra, 2010), the reasons for which need to be ascertained. Constraints are the circumstances or causes, which prohibit farmer to adopt improved farm technology. It was ascertained by asking open-end questions to the respondent farmers regarding the different factors, which were responsible for non-adoptions of, recommended cultivation practices. The present study was aimed to find out the various constraints in Green gram cultivation as perceived by farmers.

Materials & Methods

The study was carried out in Shamakhunta block which was operational area of Pulse Seed Hub programme of Krishi Vigyan Kendra, Mayurbhanj-I during summer 2019-20. Three villages naming Kundalbani, Kisandahi and Salbani from the block were selected on the basis of maximum area under pulses. A sample of 20 pulse growers was identified from each village by applying random sampling technique. Thus, the total sample selected was 60 farmers. Data were collected through a semi-structured interview schedule by employing personal interview technique. Thereafter data were tabulated, analyzed and interpreted in the light of objectives of the study. Individual aspect-wise constraints of pulse growers were worked out. These were categorized into four categories namely knowledge and information constraints, socioeconomic constraints and technological constraints. The intensity of constraints was measured on a three point continuum scale. Weight of 3 2 and 1 were given for most important, important and least important constraint, respectively. Total score obtained by each respondent as well as for each statement was calculated. Finally mean percent score was calculated by the following formula. Mean percent score (MPS) = Total score obtained/Maximum obtainable score × 100.

Result & Discussion

Knowledge and information constraints:

It is evident from table 1 three constraints recorded were lack of information on scientific green gram production technology, lack of knowledge about Rhizobium inoculation, lack of knowledge about new variety of green gram under knowledge and information. Lack of technical knows how about the scientific green gram production technology has been ranked first among this group by the farmers (MPS=92.23). A key to the diffusion of a new technology is providing information about its existence and properties. The lack of technical knowledge as a constraint has given a scope to train farmers about the new package of practices for better results. More over the second constraint and third constraints are lack of knowledge about value addition in green gram (MPS=89.45) followed by lack of knowledge about Rhizobium inoculation (MPS=83.89).

Table: - 1 Knowledge and information constraints faced by farmers (N=60)

Sl.no.	Constraints	Frequency			MPS	Rank
		Very serious(3)	Serious(2)	Not so serious(1)		
1	Lack of information on scientific green gram production technology	51	4	5	92.23	I
2	Lack of knowledge about value addition in green gram	47	7	6	89.45	II
3	Lack of knowledge about rhizobium inoculation	41	9	10	83.89	III

Socio economic constraints:

Table 2 reveals that four constraints were perceived by the farmers as related to their socioeconomic conditions. Low profit obtained from pulse crops, high cost of labour were the two major constraints in this category. These were ranked I & II with an overall MPS of 92.22 and 90.00 respectively. The other constraints in this category were labour scarcity (MPS=83.33) high cost of inputs (MPS=73.89).

Sl.no.	Constraints	Frequency			MPS	Rank
		Very serious(3)	Serious(2)	Not so serious(1)		
1	High cost of inputs	31	11	18	73.89	IV
2	High cost of labour	47	8	5	90.00	II
3	Labour scarcity	40	10	10	83.33	III
4	Low profit	50	6	4	92.22	I

Technological constraints:

Table 3 reveals technological constraints were perceived by the farmers related to Pulse production. Lack of market facility and untimely rainfall were the two major constraints ranking I and II of MPS 94.44 and 92.22 respectively. The other constraints in this category were harvesting and disposal trouble (MPS=90.56) lack of timely technical advised (MPS=82.22) ranking III and IV.

Table: - 2 technological constraints faced by farmers (N=60)

Sl.no.	Constraints	Frequency			MPS	Rank
		Very serious(3)	Serious(2)	Not so serious(1)		
1	Harvesting and disposal trouble	45	13	2	90.56	III
2	Untimely rainfall	48	10	2	92.22	II
3	Lack of timely technical advised	38	12	10	82.22	IV
4	Lack of market facility	51	8	1	94.44	I

Conclusion

It can be concluded that major constraints expressed by green gram growers under knowledge and information constraints is lack of information on scientific green gram production technology where as in socio economic constraints low profit and technological constraints lack of market facility ranked among major constraints. The constraints expressed for non adoption of recommended package of practices should be taken care by the researchers, state agricultural departments personal, extension agencies and commercial firms to orient their infrastructure for higher adoption of recommended technology by green gram growers for maximum production. Proper guidance and awareness for the farmers should be created through practical skill oriented training, field visits, field demonstrations and through various extension literatures (printed as well as video). The maximum participation of farmers in technology generation process as well as in the production enhancements strategies are required to face any risk of technological failures.

References

Ali, Masood and Gupta, Sanjeev (2012). Carrying capacity of Indian Agriculture: Pulses crops", Current Science, 102(6): PP 874-881.

Agriculture statistics at a glance, 2011. (http://agricoop.nic.in/agristatistics.htm)

Bhabhor G. K., Patel U. M. and Patel S. K. (2017) Gujarat Journal of Extension Education, 28(2), 318-320.

Chand, R., Kumar, P., and Kumar,S., (2012). "Total Factor Productivity and returns to Public Investment on Agricultural Research in India", Agricultural Economic Research Review, 25(5):181-194.

Chandra, Ganesh. (2010). Evaluation of Frontline Demonstration of Greengram (Vigna radiata L.) in Sundarbans, West Bengal. Journal of Indian Society of Coastal Agricultural Research 28(1): 12-15.

Jat M L, Raj K G, Erenstein O and Ortiz R (2006) Diversifying the intensive cereal cropping systems of the Indo-Ganges through horticulture. Chronica Horticulturae 46: 16-20.

Yadav, S. S. Kumar, J and Ram, H. 2002. Sustainable pulse production problems and Prospects. Intensive agriculture, 40: 10-12.

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Occupational Health Hazards faced by farm women in Fish processing activities in Coastal, Odisha

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ABSTRACT

The entire fish processing sector is highly dependent on women as women comprise more than 90% of the work force in shrimp peeling and 70% in the processing of other fish products. Odisha is a state situated in the eastern part having 480 km of seacoast with seven coastal districts. Traditional fishing and fish processing are very significant activity in coastal Odisha and its related with the culture, employment generation. At traditional level fisher women take up both wet and dry fish vending. The health hazards experienced by women during sorting, cleaning, drying and marketing of fish processing were also explored. In sorting activity pain in shoulders, hands, palm and feet was reported by 57% and headache by 30% of the respondents. In cleaning and dressing injury in feet was reported by 23% and pain in shoulder by 73%. While in drying and marketing of fish, 27% of the respondents reported itching and burning in hands. There is a need to make them aware and bring in technological intervention by promoting mechanization of various activities involved especially those predominantly performed by women. The educational programs to increase the awareness of women farmers on usage of simple fish processing tools & technologies would also help the women farmers.

Introduction

The fisheries sector in India plays a vital role in Indian economy. Post harvest activities in fisheries are dominated by women, evidenced by their roles of cleaning, trading, processing and fish farming. Post harvest fisheries have been the traditional occupation of fisher women in India for many centuries. The sector contributes to income generation directly or indirectly. In the fisheries sector, women play an active role with extensive involvement especially in the post harvest operation, where they constitute almost half of the work force. The entire processing sector is highly dependent on women as women comprise more than 90% of the work force in shrimp peeling and 70% in the processing of other fish products processing and fresh fish marketing at a small scale. Fish processing includes all activities from fish harvest to till it reaches the consumer. All through these activities, women are exposed to risks, low temperatures, poor ergonomic practices and work place disorganization.

Fisheries seem to be a female domain, the entire processing sector is highly dependent on women as women comprise more than 90% of the work force in shrimp peeling and 70% in the processing of other fish products.Odisha is the state with maximum level of indebtedness compared to other coastal states of the country. Odisha is a state situated in the eastern part having 480 km of seacoast. There are seven coastal districts. The total numbers of landing centers are 73 of which 20 are in Ganjam district. Traditional fishing and fish processing are very significant activity in coastal Odisha and its related with the culture, employment generation. At traditional level fisher women take up both wet and dry fish vending.

Rationale

A large number of women are engaged both in the organized and unorganized processing sector. This area receives importance due to the recent trends in economic activities and employment. Fish processing, mostly done by female workers. They are generally socio economically poor, illiterate, lack of awareness and knowledge about occupational health hazards and hygiene.

There is a genuine lack of systematic study of occupational health and safety among fish processing workers of India.

It calls for systematic investigation to analyze the hazards and identify the specific preventive measures that can mitigate hazards, and to make the work environment safer and healthier.

Objective

Keeping this in view, the study was conducted in coastal region of Odisha to know the health hazards faced by women who are involved in fish farming so that the measures can be taken.

Materials & Methods

Research Design: The project will be Experimental or Action Research

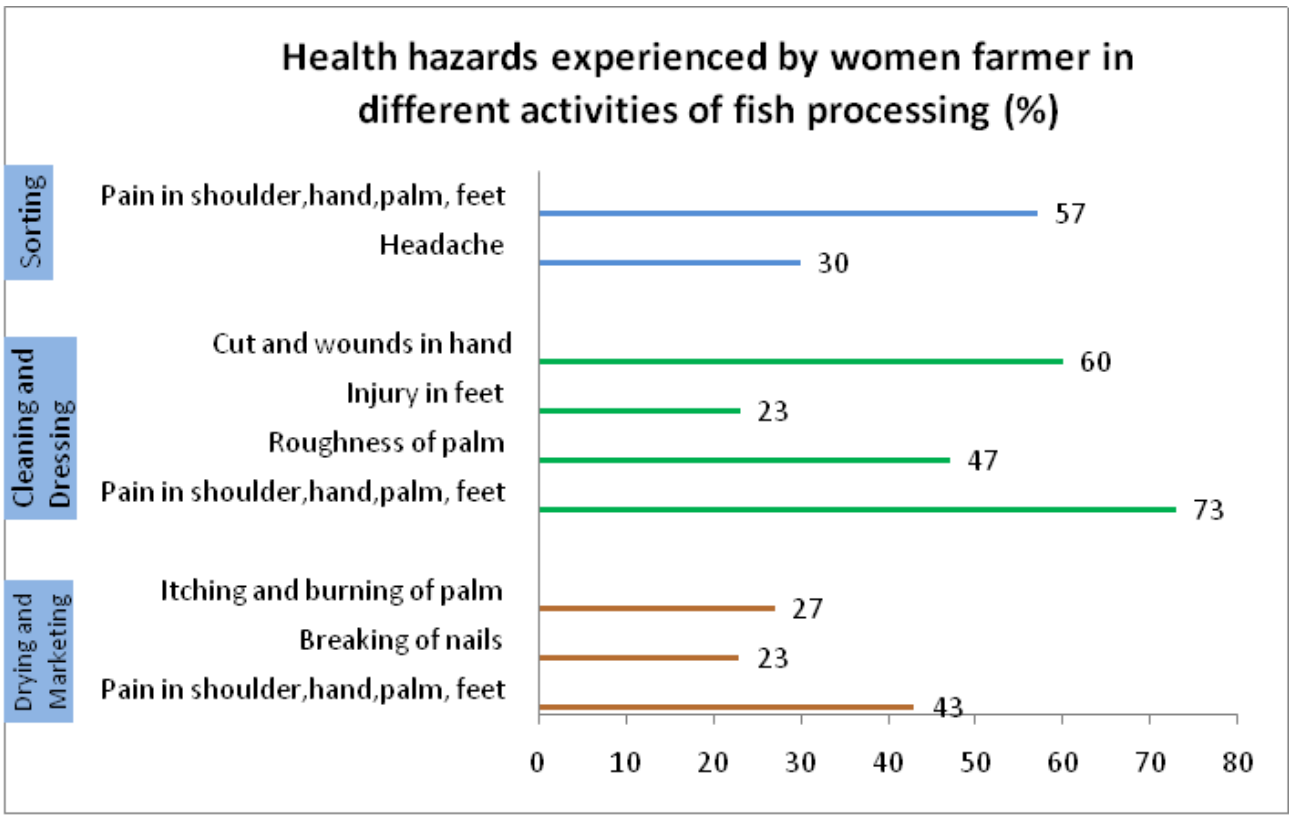
- Selection of three districts (Puri, Ganjam and Balasore) in coastal Odisha. Selection of subjects (120), 40 from each village (Balidiha, Rangeigunda, Sadar) from three respective districts.

Field Study:

- Study Population: Women involved in fish processing.

- Study duration: April 2017 to March 2019 The study was conducted covering six districts of the state namely Khurda, Nayagarh, Kendrapara, Puri, Sambalpur and Jagatsinghpur with total sample size of 250. The sample size is given below.

Fig.1. Health hazards experienced by women farmer in different activities of fish processing (%)



Results and Discussion

The women farmers selected for the study belonged to fishery community. They were all married and were below the age range of 25-45 years. It was elicited that sorting, cleaning, drying and marketing of fish were dominated activities in fish processing. Fish processing is very tedious and requires constant bending. Most of the activities carried out in squatting position.

The health hazards experienced by women during sorting, cleaning, drying and marketing of fish processing were also explored. In sorting activity pain in shoulders, hands, palm and feet was reported by 57% and headache by 30% of the respondents. In cleaning and dressing injury in feet was reported by 23% and pain in shoulder by 73%. While in drying and marketing of fish, 27% of the respondents reported itching and burning in hands. Thus, feedback from women clearly depicted that fish processing involves many health hazards.

Conclusion

Current farming practices used by women farmers have considerable degree of ergonomic and health impact on the body of the worker. Fish processing is very arduous and drudgery prone as various activities involved are still performed in age old methods, resulting in various occupational health hazards. The Occupational hazards, safety concerns and risks to health in the fish processing activities are based on the types of operation, scale of production. Fish processing workers are susceptible to many physical hazards in the course of their work as noise, injuries, sting from fish spines, cuts, sprain and snake bites. Also, hazard is a biological, chemical or physical agent with the potential to cause an adverse health effect. There is a need to make them aware and bring in technological intervention by promoting mechanization of various activities involved especially those predominantly performed by women. The educational programs to increase the awareness of women farmers on usage of simple fish processing tools & technologies would also help the women farmers.