Original Research Article

Impact of technological interventions on the Yield and Income of Tribal farm women's in Arunachal Pradesh under Eastern Himalayan Region

Abstract

The study was conducted to determine the extent of Impact, adoption of improved technologies, economics and yield gap analysis in the empowerment of tribal farm women's cluster having 50 nos. of respondents selected among a pool of 105 farm families in the Chug village of West Kameng District Arunachal Pradesh. Various technological interventions were made by the K.V.K for the tribal farm women's empowerment. In this reference the present study was undertaken to have an understanding of the nature and extent of the empowerment of rural women's through involvement in income generational activities under the aegis of Doubling Farmers Income Programme started by Govt. of India. The study revealed that the highest income generating activity was paddy cum Fish farming and nursery raising of temperate fruit crops with >100% increase while the lowest income generating activity was SRI of local rice with 25% increase only. The extension gap recorded was highest 2000Kg/ha in the introduction of HYV of ginger and lowest 30 eggs/year in the introduction of improved poultry breed having same trend in (TG) technology gap *i.e.* 12000kg and 60 egg/year respectively. The technology index TI was highest 60 in ginger production and 16.66 in SRI of local paddy.

Key words: Empowerment, nursery raising, SRI (System of Rice Intensification), HYV(High yielding varieties), TG (Technology Gap) etc.

1. Introduction

Doubling farmers Income progarmme was launched by the Government in the year 2016-17 with aiming to boost the Indian agriculture, with a goal to double the farmers' income level by the year 2022. It is possible by formulating suitable action plan for development of location specific technologies, and timely transfer of such technologies to the farmers' fields. To fulfill the aim, a range of approaches and strategies need to be adopted starting from transformation of production-driven as well as market-driven factors and providing an enabling environment, which support farmers in all their endeavours [1]**.** The objective of the any DFI activity cannot be fulfilled without the participation of women's especially in North Eastern Region of India. In NE states the participation of women's in agriculture is likely more about 70% in comparison to other Indian states *i.e.* on an average 57.8% of total agricultural workers and in Arunachal

Pradesh women's play a major role in agriculture, including looking after livestock and collecting fuel wood and vegetables. They work as cultivators, entrepreneurs, and laborers in a variety of activities, from planting and harvesting to post-harvest operations. Women are also involved in allied fields such as livestock production, horticulture, fishing, and agro/social forestry. Without the participation of women in the development process, society as a whole cannot be said to develop sufficiently [2]. Rural women are still stands near negligence and have little opportunity to make decision, to engage in IGAs, to participate in social and political activities. But national development is not possible without integrating them into the mainstream of the development process. Empowerment is a continuous process of realizing the goals of equality, human liberation and freedom [3]. Women empowerment in India is dependent on different variables that include geographical location i.e. urban and rural, educational status, social status *i.e.* caste and class and age. Thus, women empowerment implies equality of opportunity and equality between the genders, ethnic groups, social classes and age groups, collective participation in different spheres of life. An important sphere in life of rural women all over the world revolves round agriculture [4]. In view of the above facts the present study was undertaken to have an understanding of the nature and extent of the empowerment of rural women through involvement in income generating activities under the aegis of Doubling Farmers Income Programme and subsequently with the expectation of helping the researchers, extension personnel, policy makers and women to establish empowerment of rural women exposure throughout the country.

2. Material and Methods

The study was taken up in a cluster of 50 farm women from Chug villages in Dirang circle of West Kameng district Arunachal Pradesh during 2017- 2022. Out of 105 farm women's, who were listed with the help of Gaon Buras of concerned village, 50 had been selected randomly to test their knowledge level and extent of adoption of improved practices using a well-structured schedule. Assessment of demographic profile, primary data collection on farm women's contribution in to the family income, scope of doubling family income and analysis of cropping pattern and other allied activities were carried out. Micro level studies were also conducted for identification of gaps and prioritization of needs, and developing an action plan. Need-based modules to double the income of farm families were implemented and supported through training, demonstrations, capacity building programmes, critical inputs and advisory services.

Modules were allotted as per the resource availability and interests among the respondents. Concurrent monitoring and impact assessment for all the technological interventions were done by following suitable methods and techniques. All the technological interventions were taken as per the packages of practices for different activities adopted by them. Subject wise need-based awareness programs/on field method demonstration for the farmers were organized by the scientists of KVK as part of technological interventions with improved packages of practices. The earlier practice applied by them was considered as a control which was maintained by the traditional cultivation practices. The KVK provided critical inputs such as quality seeds, fertilizers, IPM, implements, bio-fertilizers fingerlings and chicks to the farm women with technical support. The necessary steps for the selection of the site, the layout of demonstrations etc. were followed properly. The KVK scientists visited the demonstration fields and farmer's field (control) regularly for close supervision and data collection during the entire experimentation.

2.1 Impact analysis of different IGAs:

The analysis of impact on the respondents with respect to different income generational activities IGAs. was done properly from the collected data by the respective KVK scientists after pooling and careful assessment.

2.2 Yield Gap analysis:

The estimation of the technology gap, extension gap and technology index was done properly for yield gap analysis by using the Following formula [5, 6]

Percent (%) Yield increase over farmers practice = Demonstration plot yield – Farmers' plot yield

Technology Gap = Potential Yield – Demonstration yield

Extension gap = Demonstration plot yield - Farmer's plot yield

$$\text{Technology index (\%)} = \frac{\text{Potential yield} - \text{demonstration yield}}{\text{Potential yield}} \times 100$$

2.3 Economic analysis:

The average cost of cultivation included the cost of inputs like seeds, fertilizers, pesticides purchased by the farmers in the control plot/supplied by the Krishi Vigyan Kendra as well as hired labour (if any), sowing charges of bullocks/tractor, and postharvest operation charges. The gross net returns were worked out accordingly by taking the cost of cultivation and the price of various yield obtained from different farming segment. Similarly, the Benefit-Cost-Ratio (BCR)

was worked out as a ratio of net-returns corresponding costs of cultivation as followed by Vedna (2007) [7].

2.4 Knowledge level and extent of adoption about of improved technologies:

The random survey was conducted by the related subject scientist of KVK to test their level of knowledge and the extent of adoption of improved technologies for various IGAs by using a well-structured schedule. The respondents knowledge level and extent of adoption for different activities related to income generation were calculated on the basis of their responses with reference to related subject scientist question about the subject as per schedule.

3. Results and Discussions:

3.1 Impact of different Income Generational Activities (IGAs) on Yield and respondents income:

During the study, it was observed that the demonstrations of improved technologies in the respondents field impacted significantly in form of increased productivity and economy both over existing farming practices. The increase in productivity and respondents' income is depicted below in the Table 1.

Table 1: Impact of Interventions on yield and respondents income

Activities under taken on crop/enterprise	Average yield & yearly income (Rs.) In village		(%) Increase in income by IGAs	B:C Ratio	
	Before intervention	After intervention		FP	Demo
(INM)Integrated Nutrient Management in Rajmash	600 kg / Rs30,000/-	800kg/Rs. 40,000	33%	1.36	1.60
Use of HYV & scientific cultivation and management practices in Ginger *(Zingiber officinalis)*	6000 kg/ 2,40,000/-	8000kg/4,00,000/-	66%	1.32	1.65
Introduction of HYV rice CAU R-1 & Ranjeet along with scientific management practices	2000 kg/ha (Local paddy) Rs. 40,000 (Sale @ Rs. 20/kg)	3000 kg/ha Rs. 54,000(Sale @ Rs. 18/kg)	35%	1.0	1..3
SRI Techniques on HYV rice and on local varieties too	2000 kg/ ha (Local paddy) Rs. 40,000 (Sale @ Rs. 20/kg)	1)3500 kg/ ha (HYV) Rs.63 000 (Sale @ Rs. 18/kg)	57%	2.1	2.4
		2).2500 kg/ha (Local variety) Rs. 50000 (Sale @ Rs. 20/kg)	25%	1.8	2.2
Introduction of HYV Maize with existing practices	2100 kg/ha Rs.31500(Sale @ Rs. 15/kg	3500 kg/ha Rs.52500(Sale @ Rs. 15/kg)	66%	1.2	1.6
Introduction of HYV Maize	2100 kg/ha	4000 kg/ha	90 %	1.4	1.8

along with scientific management practices	Rs.31500(Sale @ Rs. 15/kg)	Rs.60,000(Sale @ Rs. 15/kg)			
Introduction of improved Breed of poultry	60 eggs + 1.5kg/birds (600 birds)	90 eggs + 2.0kg/birds (850 birds)	33%	1.08	1.6
Fish cum Poultry farming	Rs. 3,60,000 (1200kg fish)	Rs. 6,90,000 from fish sale (2300kg fish+ egg+ Poultry meat)	91%	2.14 in Fish culture only	2.85 in IFS
Fish cum Duck farming	Rs. 3,60,000 (1200kg fish)	6,60,000 from fish sale (2200 kg fish+ egg+ Duck meat)	83%	2.14 in Fish culture only	3.10 IFS
Introduction of Low cost Vermi-composting	New intervention	300 kg/ tank Rs.6000 (Sale @ Rs. 20/kg) 10% partial labour cost goes during preparation of Vermi –compost	90%	3.4:1	
Low-cost oyster mushroom cultivation	New intervention	Rs.15000/unit (sale 75kg @ Rs.200/kg (20% partial labour and input-cost goes during Cultivation	80%	2.8:1	
Paddy cum Fish farming	2000kg paddy Rs. 40,000 (Sale @ Rs. 20/kg)	2500 kg paddy+ 500-600kg fish Rs. 50,000 (Sale @ Rs. 20/kg) from paddy and 250 kg fish Rs 75000(Sale @ Rs. 300/kg) Total 1,25,000	>100 %	1.62 in Paddy farming only	2.35 in paddy cum fish farming
Grafted Nursery raising of temperate fruit crops	Rs7000/bed (In 10x10 mtr bed) (Without graft)	Rs 20,000/ unit (In 10x10 mtr bed) grafted planting material	>100 %	4.5:1	
Introduction of short duration vegetable farming activities for income generation	New intervention (Before that land was unutilized now after solar fencing farm women from cluster are getting benefit)	Rs. 3500-5000/ farmer / unit (20% partial labour and plowing cost goes during Cultivation)	80%	1.9:1	

Note: (Values are mean average of 5 years) FP= farmers practice Demo= Demonstration

Data presented in above table reveals that knowledge and transfer of improved farm technology among the respondents resulted in an increase in yield from various farming components and income of farm women's. The increase in yield is directly proportional to increase in income of respondents. Results indicated that there was 200 kg/ha increase in Rajmah production through application of INM technology with increment in income about 33%, 2000

kg/ha increase in ginger yield with 66% increment in income by using the HYV & scientific cultivation and management practices, 1000 kg increase in rice production due to introduction of HYV of rice CAU R-1 & Ranjeet along with scientific management practices with increase of income with 35%, by application of SRI technique there was 1500 and 500 kg increase in local paddy and HYV production respectively with increase in income of 57% through HYV and 25% by increase of local paddy yield, there was very good increment in fish production having 1100kg/ha with additional production of egg and poultry meat having 91% income increase through introduction of IFS Fish-Poultry farming (the results are in accordance with Misra *et.al* 2019) [8] while with application of IFS Fish-Duck farming there was an increase of 1000 kg in fish production with additional production of egg and duck meat having 83% increase in income. Introduction of Low cost Vermi-composting technology have given the production of 300 kg/ tank with a minimum expenditure of 10% which given the 90% increment in the income of respondents while introduction low-cost oyster mushroom cultivation technology has given the result in form of 75kg mushroom production/ unit with a selling price @ Rs.200/kg result in the increase in income with 80% as about 20% cost goes towards cultivation expense. There was 20% (500kg) increase in paddy production with additional production of 250 kg fish results the >100% increase in income of respondents, whereas the introduction of grafted nursery raising technology of temperate fruit crops given also a very good result in form of Rs13000/bed increase in value (1x10 meter bed) having>100 % increase of respondents income followed by 80% income increase with Introduction of short duration vegetable farming with the participation of Rs3500-5000/participants. The almost similar findings have also been reported by Dar *et.al.*, 2023 [9].

Training programmes for the respondents to improve the farming Skill

Green vegetable production by the respondents during Covid-19

Ginger production

Production of Kiwi planting material

Kiwi planting material Ready to sale

Mushroom Production by the respondents


Mix cultivation of Lahipatta and Dhaniyapatta


Seed Input distribution to the respondents in Covid "19" Low cost vermi-compost production

Some glimpses of IGAs done by the respondents in study area

3.2 Yield Gap Analysis:

There were a found a wide gap in Technology, Extension and Technology Index among different IGAs adopted by the respondents. The detail about recorded gaps are narrated in the table given below (No.2).

Table 2: Detail about recorded gap in different IGAs

Name of IGAs	Potential yield	Check yield	Demo yield	EG	TG	TI %
(INM)I in Rajmash	1500Kg/ha	600Kg/ha	800Kg/ha	200Kg/ha	700Kg/ha	46.66
Use of HYV & scientific cultivation in Ginger *(Zingiber officinali)*	20000Kg/ha	6000Kg/ha	8000Kg/ha	2000Kg/ha	12000Kg/ha	60.00
Introduction of HYV rice CAU R-1 & Ranjeet	5000Kg/ha	2000 Kg/ha	3000 Kg/ha	1000Kg/ha	2000Kg/ha	40.00
SRI Techniques on HYV	6000Kg/ha	2500 Kg/ha	3500 Kg/ha	1000Kg/ha	2500Kg/ha	41.66

rice and on local varieties too	3000Kg/ha	2000 Kg/ha	2500 Kg/ha	500 Kg/ha	500 Kg/ha	16.66
Introduction of HYV Maize with existing practices	8000Kg/ha	2100 Kg/ha	3500 Kg/ha	1400Kg/ha	4500 Kg/ha	56.25
Introduction of HYV Maize with scientific practices	8000Kg/ha	2100 Kg/ha	4000 Kg/ha	1900Kg/ha	4000 Kg/ha	50.00
Introduction of improved Breed of poultry	3.5 kg	1.5kg/bird	2Kg/bird	0.5kg/bird	1.5kg/bird	42.85
	150 egg/year	60 egg/year	90 egg/year	30 egg/year	60 egg/year	40.00
Fish cum Poultry farming	4000kg/ha	1200 kg/ha	2300 kg/ha	1100 kg/ha	1700 kg/ha	42.50
Fish cum Duck farming	3500Kg/ha	1200 kg/ha	2200 kg/ha	1000 kg/ha	1300 kg/ha	37.14
Introduction of Low cost Vermi-composting	2000Kg/unit/year (10x3x1ft) tank	1500Kg/unit/year (10x3x1ft) tank	1800Kg/unit/year (10x3x1ft) tank	300Kg/unit	200Kg/unit	10.00
Low-cost oyster mushroom cultivation	950gm/bag in 4 flushes	450gm/bag in 4 flushes	700gm/bag in 4 flushes	250gm/bag	250gm/bag	38.46
Paddy cum Fish farming	5000Kg/ha	2000Kg/ha	2500Kg/ha	500Kg/ha	2500Kg/ha	50.00
Grafted Nursery raising of temperate fruit crops	1500 sapling/bed (1x10mtr)	1000 sapling/bed (1x10mtr)	1100 sapling/bed (1x10mtr)	100 sapling/bed	400 sapling/bed	26.66
Introduction of short duration vegetable farming activities for income generation	50t/ha	20t/ha	30t/ha	10t/ha	20t/ha	40.0
Cabbage						
Cauliflower	140q/ha	60q/ha	90q/ha	30 q/ha	50q/ha	35.71
Leafy vegetable (Dhaniyapatta and Lahipatta)	5t/ha	2.5t/ha	4.0 t/ha	1.5t/ha	1t/ha	20.00

Note: Potential yield values are given in Arunachal context.
Abbreviation: EG= Extension gap, TG= Technology gap & TI= Technology Index

*3.2.1 **Extension gap-***

The extension gap (EG) means the differences between demonstration plot yield and farmers' practice yield. An extension gap of 200 kg/ha in Rajmah, 2000 kg/ha in ginger, 1000kg/ha in paddy due to lacuna of HYV while it was 1500 for paddy HYV and 500 kg/ha in case of local paddy with an intervention of SRI, while it was 1100kg/ha in fishery in case of IFS on Fish-Poultry farming whereas it was 1000kg/ha in fishery, having IFS on Fish-Duck farming, 300 kg/ tank in vermi-compost technology and the gap was recorded 75kg in case of mushroom

/ unit whereas it was found 500kg/ha in paddy with introduction of IFS on Paddy cum Fish Culture and recorded gap was found 1000 nos. average sapling/bed having bed size 1x10 meter. The recorded value of extension gap EG were 10t/ha for cabbage, 30t/ha for cauliflower and 1.5t/ha for leafy vegetable respectively.

3.2.2 Technology gap -

The technology gap (TG) means the differences between potential yield and demonstration plot yield. The highest technology gap was found 12000 kg/ha in the intervention on Use of HYV & scientific cultivation in Ginger *(Zingiber officinalis)* followed by 4500 Kg/ha in the Introduction of HYV on Maize with existing practices, followed by 4000 kg/ha in case of Introduction of HYV Maize with scientific practices followed by SRI Techniques on HYV of rice and on local varieties having TG value 2500 kg/ha while it was same in Paddy cum Fish farming also. The 2000 kg/ha TG value was recorded in case of Introduction of HYV of rice *i.e.* CAU R-1 & Ranjeet followed by 1700 kg/ha in Fish cum Poultry farming while the value of TG was 1300 kg/ha in Fish cum Duck farming. The recorded value of Technology Gap (TG) was 700 Kg/ha in the intervention made on (INM) in Rajmash followed by 400 sapling/bed in the intervention of Grafted Nursery raising of temperate fruit crops followed by 250gm/bag in the intervention of Low-cost oyster mushroom cultivation, while the value of TG was 200 Kg/unit in case of Introduction of Low cost Vermi-composting technology. While the value of TG was found 60 egg/bird/year and 1.5.kg meat/bird/year in the intervention on Introduction of improved poultry Breed. In case of seasonal vegetable production, the highest value of TG was 20t/ha in cabbage followed by 1t/ha in the production of leaf of lahipatta and dhaniyapatta leaf while it was lowest in cauliflower *i.e.* 50q/ha.

3.2.3 Technology index –

It has been found that the recorded value of The technology index varied for all the income generational activities (IGAs) adopted by the respondents. It was highest 60% for use of HYV & scientific cultivation in Ginger followed by 56.25% in case of Introduction of HYV of Maize with existing practices followed by 50% for Introduction of HYV of Maize with scientific practices and same value for in case of Paddy cum Fish farming also. The recorded technology index (TI) value was 46.66%, 42.85, 42.50 and 41.66 percent in introduction of INM in Rajmash, Introduction of improved Breed of poultry in case of meat production, Fish cum Poultry farming and for SRI Techniques on HYV of rice respectively. The same value of recorded technology index (TI) was 40% The 40% same TI value were recorded for two interventions *i.e* for

introduction of HYV of rice CAU R-1 & Ranjeet and Introduction of improved Breed of poultry in case of egg production respectively whereas it was 38.46% for low cost oyster mushroom cultivation followed by 37.14% for Fish cum Duck farming followed by 26.66% in grafted nursery raising of temperate fruit crops, 16.66% in the intervention of SRI techniques on local varieties, while the recorded TI 10% that was lowest for introduction of Introduction of low cost Vermi-composting technology. The recorded TI value in case of seasonal vegetable production was highest 40% for cabbage production followed by 35.71% in production of

cauliflower while it was recorded 20% only in of lahipatta and dhaniyapatta production, the results are in corroboration with the findings of Dhaka *et. al*., 2015 [10].

the highest value was 40% in cabbage followed by 35.71% in cauliflower while it was recorded 20% only in of lahipatta and dhaniyapatta production, the results are in corroboration with the findings of Dhaka *et. al*., 2015 [8].

3.3 Economic analysis-

The input cost involved in the adoption of improved technology for different IGAs varied and obtained economic return was profitable. The input and output prices of commodities that prevailed during the demonstrations were taken for calculating gross return, cost of cultivation, net return, and benefit cost ratio. Use of pricey seeds for crop sowing, seed treatment, recommended dose of chemical fertilizers, proper pest management etc. all of these are the main reasons for the high cost of cultivation in demonstration fields than local check. The benefit-cost ratio under technology of INM in rajmah was 1.60 as compared to 1.36 under farmers' practices while it was 1.65 under Use of HYV & scientific cultivation in Ginger *(Zingiber officinalis)* in compare to 1.32 in farmer practice and the B:C ratio under introduction of HYV rice CAU R-1 & Ranjeet was 1.3 in compare to 1.0 in farmer practice. The recorded B:C ratio under SRI technology for HYV was 2.4 and 2.1 for farmer practice respectively while it was 2.2 for SRI in local rice and 1.8 for farmer practice. The benefit-cost ratio under technology of introduction of HYV of Maize with existing practices was 1.6 in compare to 1.2 for use of local variety of maize while it was 1.8 and 1.4 for scientific cultivation of HYV of maize and local maize respectively. The value of B:C ratio was 1.6 on introduction of improved Breed of poultry in comparison to 1.08 on use of indigenous poultry breed where as it was 2.85 under Fish cum Poultry farming in comparison of 2.14 in Fish culture only. The IFS technology on Fish -Cum-Duck Farming showed the B:C ratio of 3.10 in compare to 2.14 in Fish culture only while it was found 3.4:1 on Introduction of Low cost Vermi-composting technology whereas the recorded B:C ratio was

2.8:1 for low-cost oyster mushroom cultivation technology. The IFS on paddy cum fish culture showed the B:C ratio of 2.35 in compare to 1.62 in paddy cultivation only while it was found 4.5:1 for grafted nursery raising of temperate fruit crops and 1.9:1 on introduction of short duration vegetable farming activities for income generation.

3.4 Knowledge, age and education level of farmers-

The respondents knowledge level, % share for that particular variable, age and education standards of respondents are depicted below in the given table. below (no 3).

Table 3: Respondent's Knowledge, age and education standard

Level of knowledge	No. and % share of respondents	Age (years)	Education standard
High	13 (26%)	25-30	Class 12 to Graduate
Medium	29 (58%)	30-45	Class 6-10
Low	8 (16%)	45-50	Class 3 to 5

Note: The data are recorded during survey before intervention.

Results showed that, the majority of farm women's *i.e.* 29 respondents nos. (58%) had a medium level of knowledge having education level Class 6-10 between age group of 30-45 year, while 13 respondents nos. (26%) had a high level of knowledge with education level Class 12 to Graduate & age between 25-30 years whereas 8 respondents (8 nos.) (16%) had a low level of knowledge with Class 3 to 5 standard of education and having age group between 45-50 years. The findings are in association with the results of Thakur and Simran 2024 in the study of tribal women empowerment in Madhya Pradesh through creation of resources.[11]

3.4.1 *Respondent's knowledge about improved farming practices-*

The knowledge about various farming activities earlier practiced by the respondents before intervention has been depicted is given in the table below. (No.4)

Table 4: Applied IGAs, their recommended practices and Existing farming practices

Technology applied with details	Existing Farm Practice	Recommended Practice
Introduction of HYV rice CAU R-1 & Ranjeet along with scientific management practices	Local paddy cultivation with traditional system	Application of Scientific package of practice for paddy cultivation
Introduction of SRI in paddy	Local paddy cultivation with traditional system	SRI Techniques on HYV of rice and on local varieties too
Introduction of HYV Maize varieties	Use of Local varieties without proper scientific practice	Introduction of HYV Maize varieties
Introduction of HYV Maize with existing practices	Use of Local varieties	Introduction of HYV Maize with proper scientific package of practices
(INM) Integrated Nutrient Management in Rajmash	Use of Local varieties without any nutrient management technology	Scientific Integrated nutrient management technology

Introduction of Vermi-composting	New intervention there was no vermin-compost practice earlier	Introduction of low cost Vermi-composting
Low-cost Oyster mushroom cultivation	New intervention there was no any mushroom cultivation practice earlier	Low-cost oyster mushroom cultivation
Income generation activities through seasonal vegetable farming	Earlier they were growing only lahi patta with traditional system in their kitchen garden only	Introduction of short duration (leafy, cabbage and cauliflower) vegetable farming for income generation
Use of HYV & scientific cultivation and management practices in Ginger *(Zingiber officinali)*	farming at very small scale without scientific package of practice with unknown varieties	Use of HYV & scientific package of practice
Backyard Poultry farming	Use less productive local Breed	Introduction of improved Breed
IFS (Paddy + Fish)	Only local paddy cultivation in low land areas occasionally	Paddy cum Fish farming
Fish cum Duck farming	Only carp farming without any integration and scientific practice	Integration with ducklings applying scientific culture practice
Nursery raising of temperate fruit crops	New intervention Earlier they were not known about this practice	Nursery raising of grafted walnut, kiwi, persimon, peach and apple etc for income generation

There were observed a wide difference in application of respondents practices between recommended scientific farming and existing farming during the study period.

There were a wide difference had been observed with reference to application of recommended farming practice in comparison to existing farming practices by the respondents.

3.4.2 *Extent of adoption by the respondents for improved farming practices-*

The extent of adoption for the different improved farming technologies by the respondents through application in their farming patch are described in Fig.1

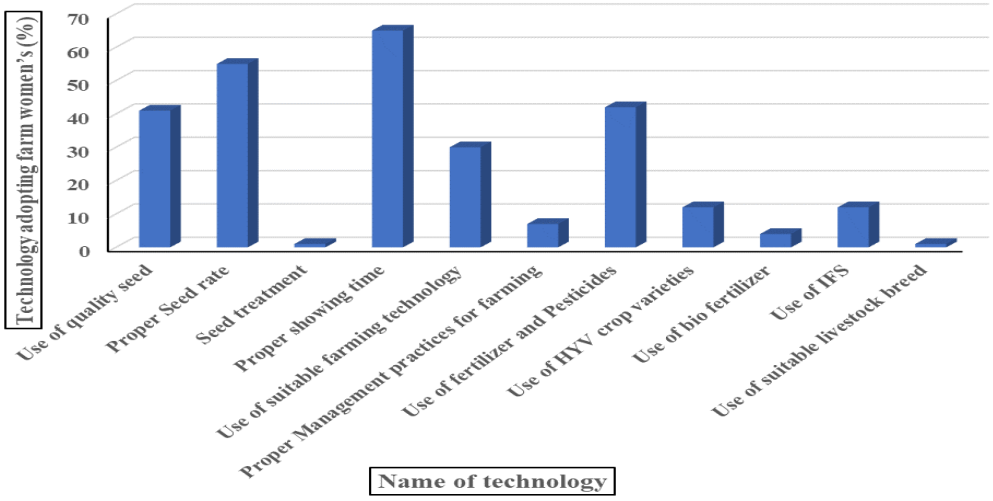

Fig.1 Extent of adoption and adopting farm women %

Note: The findings given in the table were recorded on the basis of personal interview from the respondents.

It has been recorded that the adoption of Proper showing time is highest 65%, followed by 55% for Proper seed rate, 42% in case of Use of fertilizer and pesticides and 41% for Use of quality seed material followed by 30% in case of Use of suitable farming technology. The recorded percentage was 12% for Use of IFS and Use of HYV crop varieties respectively followed by 7% in the adoption of Proper farming management practices. While the extent of adaptation was recorded 4% for Use of bio fertilizer and 1% for both *i.e.* seed treatment as well as for Use of suitable livestock breed.

4. Conclusion:

The results from this study clearly showed that the integration of improved technologies technology along with the active participation of by the tribal farm women's was found had a highly significant positive effect on increasing the yield, economic return, knowledge, and adoption of improved farming practices. It can is also be concluded from the present study that there were exists a wide gap between the potential and demonstration yield in different income generational activities mainly due to technology and extension gaps and also due to the lack of awareness about newer technology. Technological and extension gaps existed can be bridged by popularizing a suitable package of practices for different activities along with application of scientific and managerial practices.

5. Recommendation :

Technological and extension gaps existed can be bridged by popularizing the suitable package of practices for different activities along with application of scientific and managerial practices.

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Disclaimer (Artificial intelligence)

Option 1:

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

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