J. Cotton Res. Dev. **35**(1), 131-139 (January, 2021) **ISSN No. 0972-8619**

Gender friendliness of transfer of technology programs in cotton

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ABSTRACT: In India, various Transfer of Technology (TOT) programs on cotton have been implemented underlining the importance of problem solving, creating effective linkage among stakeholders and transferring the latest cotton production technologies. Front Line Demonstrations, Institute Village Linkage Program, Farmers Field Schools and Contract Farming Approach are some of the TOT programs which created remarkable impact on cotton production. Analysis on the laurels and let downs of those initiatives revealed that they have high farmers' acceptability due to focus on problem solving and the practical application of knowledge. But the acceptability of these TOT programs by the women farmers was remained as a less attempted researchable problem. A study was conducted to analyze the gender friendliness of popular cotton extension programs viz., Front Line Demonstration and e-*Kapas* network among 120 regular women e-*Kapas* beneficiaries and 50 FLD women beneficiaries in South India. The data collected through personal interview using a semi structured interview schedule with an exclusive scale to analyze the women friendliness of cotton TOT programs found that the cotton extension programs both FLD and e-*Kapas* network were having medium level of women friendliness.

Key words: Cotton extension, e-*Kapas*, farm women, FLD, gender friendliness, TOT

Indian cotton reached the highest place at world level both in acreage and production due to various technological advancements and development initiatives of public and private research organizations. Cotton Extension Scheme, Grow More Cotton, Package program or Intensive Cotton Cultivation Scheme (ICCS), Intensive Cotton Development Program (ICDP), Technology Mission on Cotton (TMC) and National Food Security Mission (NFSM) – Commercial crops (CC) are the popular cotton technology transfer interventions attempted by the Government of India. The well defined extension approaches used in these interventions are both conventional and contemporary which include field demonstrations like Front Line Demonstration (FLD) and Farmers Field Schools (FFS); the print media, radio talks, television, Decision Support System (DSS), interactive videos / voice modules, web and mobile based cotton advisory services including the well-known "e-*Kapas*" advisory service and mobile apps. The private sectors make use of contract farming approach and Corporate Social Responsibility (CSR) for extending cotton technologies to farmers. Commodity Interest Group (CIG), Farmers Interest Group (FIG), Farmers Association, Farmers Producers Organization (FPO) and Self Help Group (SHG) are the popular collective organizational structures used as means by the public and private cotton extension functionaries to reach cotton growers for technology transfer. Among these, the recent ones *viz.*, Front Line Demonstrations, Farmers Field Schools, Contract Farming Approach are some of the TOT programs which created remarkable impact on cotton production (Rani, 2019). Analysis on the laurels and let downs of those initiatives revealed that they have high farmers' acceptability due to its focus on problem solving and the practical application of knowledge. But the acceptability of these TOT programs by the women farmers was remained as a less attempted researchable problem. The acceptability of any TOT program by the farmwomen generally depends upon the gender friendliness of the programs.

Around 80 per cent of farm work is undertaken by women in India. However, they own only 13 per cent of the land. Recent statistics

released by the University of Maryland and National Council of Applied Economics Research (NCAER, 2018) stated that women constitute over 42 per cent of the agricultural labour force in India but own less than two percent of farmland. The women in agriculture in India are affected by issues of recognition and in the absence of land rights, female agricultural labourers, farm widow and tenant farmers are left bereft of recognition as farmers, and the consequent entitlements. The root of the problem begins at the official lack of recognition of the female agricultural worker, and the resultant exclusion from rights and entitlements, such as institutional credit, pension, irrigation sources, etc., (Pachauri, 2019). NCEAR 2018, reported that according to the India Human Development Survey (IHDS, 2018), 83 per cent of agricultural land in the country is inherited by male members of the family and less than two per cent by their female counterparts. Women farmers in cotton farms are no exception.

Women are the major source of knowledge for cotton farming and they have accumulated a variety of indigenous technical knowledge. Women perform many tasks in cotton farming. They constitute almost half of the work force engaged in cotton farms. They participate in a broad range of activities in cotton farms such as production, processing, preservation and marketing. ITC (2011), in its technical paper on women in cotton studied the role of women along the cotton value chain in cotton producing countries outlines women's role in various cotton different regions of the world, with special focus on production activities in Africa, Asia and Latin America. Overall, preliminary results showed that women working in cotton in these three regions (Africa, Asia, and Latin) of the world are mostly involved in picking (over 60% of participation), catering (around 60%), planting (around 50% on average), and field management (around 40% on average) activities. Besides these top four activities, women also play a substantial role in banking (around 40%), light work at gin (30% of participation), administrative work in trading or ginning activities (both around 25%), and use of fertilizers or pesticides (around 20%). It was stated by Rani, (2013) that women play key roles in the cotton based cropping system, starting from the selection of seeds through sowing, manuring, weeding, harvesting, cleaning, drying, stacking and storing to marketing. They play a major role in the decision making process at the farm household level regarding the choice of varieties/hybrids as well as the performing the crop protection measures. Considering their importance in Indian cotton farming, an extension research study was attempted to analyze the inclusiveness and gender friendliness of the two top most successful cotton TOT programs viz, Front Line Demonstrations and e-*Kapas* mobile phone based cotton advisory service with the objectives of developing a scale to find out the gender friendliness of cotton extension programs, finding out the profile characteristics of women beneficiaries of cotton TOT programs and documenting the constraints faced by the women beneficiaries and their suggestions to improve the women friendliness of cotton TOT programs.

MATERIALS AND METHODS

The study was undertaken in major cotton growing districts of Tamil Nadu, South zone *viz.*, Perambalur, Salem, Virudhunagar, Dharmapuri, Madurai and Coimbatore. Using *ex post- facto* research design and purposive sampling method, a total of 170 farm women were selected as respondents. The sample consists of 120 regular women e-Kapas beneficiaries twenty in each district and 50 FLD women beneficiaries from Salem and Virudhunagar districts where cotton FLDs were conducted. The respondents were from the households that have been growing cotton for the past three years and were owners / wives of the

cotton farm owners/laborers. Selected respondents were interviewed personally using semi structured pre-tested interview schedules. Data thus collected were analyzed using appropriate statistical tools to infer results. A separate scale to analyze the women friendliness of cotton extension programs was developed exclusively for this study. To develop the scale, initially, the parameters to measure the women friendliness were listed out and their relevancy were tested with 30 Scientists using questionnaires and the parameters which were suggested as relevant by the scientists were finally included in the scale.

RESULTS AND DISCUSSION

Profile characteristics of the women involved in cotton farming : The data on profile characteristics *viz.*, age, educational status, occupational status, farm size, area under cotton cultivation, of women beneficiaries of cotton TOT programs FLD and e-*Kapas* were collected and presented in the following table.

From the above Table it is revealed that majority of the women respondents in both FLD (50%) and e-*Kapas* (66.67%) cotton TOT programs were middle aged people. As regards, educational status, majority of the respondents fell between the categories of illiterate to middle school level education in both FLD (74.00%) and e-*Kapas* (60%). Majority of the FLD women beneficiaries (40%) had farming as their sole occupation. Under e-*Kapas,* majority of the respondents (40.83%) had farming + MGNREGA as their occupation. Majority of the women respondents in both categories were marginal and small farmers. Majority of the respondents had less than two hectares under cotton cultivation in both the categories. The women respondents from FLD program (40%) and e-*Kapas* program (68.34%) had medium level of farming experience. As regards experience in cotton cultivation, the women respondents from FLD program (40%) and e-*Kapas* program (81.66%) had medium level of experience. The extension agency contact of women beneficiaries in both the programs was very poor. Majority of them (>70%) reported that they never met extension agencies for crop oriented information and the agencies also never approached them for extension activities. In both programs, almost half of the women beneficiaries were never exposed to the agricultural related mass media channels. However, nearly half of the women were exposed to radio, television, mobile phones, newspapers and Tamil agricultural Journal like 'Valarum Velanmai'. This finding is in accordance with the findings of Swathilakshmi (2015) on Mass Media utilization behavior of farm women.

Gender friendliness of cotton TOT programs: The women friendliness of the cotton TOT programs – FLD and e-*Kapas* was assessed with the selected women beneficiaries using a scale having 20 statements and the results are detailed in Table 2. All the respondents felt that FLD - cotton extension program was available to women farmers since it has reservation for women farmers. Cent per cent of them also felt that it is a feasible extension program for the women to participate since they could afford to spare the portion of land either owned or had share by them for demonstration purpose. Building up rapport with other line departments, feeling conceited, technical empowerment, understanding the technology, support by the implementing agency, visibility of the results, feeling accountable, empowered and inclusive were the parameters expressed by more than 90 per cent of the respondents which favored the women friendliness of the FLD program. Based on the score value, the TOT program FLD was found to have medium level of women friendliness.

Similarly, majority of the respondents (92.5%) felt that e-*Kapas*, cotton extension program was available to women farmers.

Table 1. Distribution of respondents according to their profile characteristics

n=170

S. N	Profile characters	FLD women beneficiaries(n=50)	e-*Kapas* women beneficiaries(n=120)
1	**Age**		
	Younger	17 (34.00)	33 (27.50)
	Middle	25 (50.00)	80 (66.67)
	Old	8 (16.00)	7 (5.83)
2	**Educational status**		
	Illiterate	15 (30.00)	27 (22.50)
	Primary	8 (16.00)	17 (14.17)
	Middle	14 (28.00)	28 (23.33)
	Secondary	5 (10.00)	23 (19.17)
	H. Secondary	8 (16.00)	16 (13.33)
	College	-	9 (7.50)
3	**Occupational status**		
	Farming	20 (40.00)	26 (21.67)
	Farming+ Farm Labour	11 (22.00)	8 (6.67)
	Farming + MGNREGA	9 (18.00)	49 (40.83)
	Farming+ Farm Labour+ MGNREGA	4 (8.00)	32 (26.67)
	Farming +Others	5 (10.00)	5 (4.17)
	Farming+ Farm labour + Others	1 (2.00)	-
4	**Farm size**		
	Marginal	21(42.00)	46 (38.33)
	Small	26 (52.00)	59 (49.17)
	Medium	2 (4.00)	12 (10.00)
	Large	1 (2.00)	3 (2.50)
5	**Area under cotton cultivation**		
	Marginal	1 (2.00)	52 (43.33)
	Small	45 (90.00)	63(52.50)
	Medium	3 (6.00)	4 (3.33)
	Large	1(2.00)	1(0.83)
6	**Farming experience**		
	Low	18 (36.00)	22 (18.33)
	Medium	20 (40.00)	82 (68.34)
	High	12 (24.00)	16 (13.33)
7	**Experience in cotton cultivation**		
	Low	18 (36.00)	-
	Medium	20 (40.00)	98 (81.66)
	High	12 (24.00)	22 (18.34)
8	**Extension agency contact**		
	Regularly	1 (2.00)	10 (8.33)
	Sometime	7 (14.00)	12 (10.00)
	Rarely	7 (14.00)	11(9.17)
	Never	35 (70.00)	87 (72.50)
9	**Mass media exposure**		
	Regularly	13 (26.00)	47 (39.17)
	Sometime	9 (18.00)	4 (3.33)
	Rarely	3 (6.00)	11(9.17)
	Never	25 (50.00)	58 (48.33)

(Data in parenthesis are in percentage)

Table 2. Distribution of respondents according to their answers to the statements in the scale on gender friendliness of cotton extension programs

n=170

S.N	Statements deciding the gender friendliness of cotton extension programs FLD and e-*Kapas* network	FLD women beneficiaries (n=50)		e-*Kapas* women beneficiaries(n=120)	
		Response as "Yes" (Frequency)	Response as "Yes" (Per cent)	Response as "Yes" (Frequency)	Response as "Yes" (Per cent)
1.	As a woman, FLD / e-*Kapas*- cotton extension program was available to me	50	100	111	92.50
2.	I could participate in the FLD / e-*Kapas*, since it is a feasible extension program for the women to participate	50	100	104	86.67
3.	I could afford to spare the portion of land for demonstration purpose since I own / having share in the land / spare time for hearing the e-*Kapas* voice SMS alerts	50	100	42	35.00
4.	I could build up rapport with the line departments through the conduct of FLD in my field / e-*Kapas* network with CICR	50	100	34	28.33
5.	I feel conceited that I could have linkage with the Scientists through FLD / e-*Kapas* programs	46	92	56	46.67
6.	I feel technically empowered by these programs since technology is demonstrated / taught by the Scientist in e-*Kapas*	47	94	67	55.83
7.	I could understand the technology advised by the Scientist under FLD / e-*Kapas* programs	50	100	93	77.50
8.	I was supported by the implementing agency by getting critical inputs needed for the demonstration / by getting the timely voice SMS alerts about cotton production technologies in e-*Kapas*	46	92	85	70.83
9.	I could spend for buying other inputs needed for the demonstration/recommended in the e-*Kapas* voice SMS alerts	47	94	65	54.17
10.	I could accompany the scientists during their visits to the fields and make note of their observations	39	78	51	42.50
11.	I could visibly see the results of the technology demonstrated/ disseminated through the e-*Kapas* network and believe it	50	100	69	57.50
12.	I could completely learn the technology I did in the demonstration field / I hear through the e*Kapas* voice SMS alerts	49	98	84	70.00
13.	I could understand the differences between the technology demonstrated in the demonstration and my own practice/technology learnt through the*Kapas* voice alerts and my own practice	50	100	75	62.50
14.	I could disseminate the technology demonstrated in my field to my fellow women farmers in the village during the field day /e*Kapas* voice alerts to my fellow women farmers during various occasions	14	28	56	46.67
15.	I felt accountable when I documented the details of yield, cost of cultivation and profit of the demonstration plot/ learnt through the e*Kapas* and my own practice	40	80	33	27.50
16.	Due to FLD / e-*Kapas*, I was exposed to other cotton related information through print and mass media	21	42	32	26.67
17.	Due to FLD / e-*Kapas*, I got contact with other extension officials	43	86	19	15.83
18.	Since I participated in FLD/e-*Kapas* program, I can also participate in the other extension programs for cotton viz., Farmers Field School etc.,	36	72	26	21.67
19.	Due to participation in FLD/e-*Kapas* I was empowered to testify the pros and cons of the technologies to other stakeholders	25	50	34	28.33
20.	I felt inclusive when my feedback was considered by the Scientists for further research through FLD /e-*Kapas* programs	40	80	58	48.33

Majority of them (86.66%) also felt that it is a feasible extension program for the women to participate. Majority of the respondents (65.00%) stated that they could not afford to spare time for hearing the voice SMS alerts, could not build up rapport and linkage (71.12%) with research institute through e-*Kapas* network. More than fifty percent of them felt that they could completely learn the technology that they hear through the e*Kapas* voice SMS alerts could understand the differences between the technology learnt through the e*Kapas* voice alerts and their own practices. Less than fifty percent of them felt that they could disseminate the technology learnt through the e*Kapas* voice alerts to my fellow women farmers in the village during the field day. Less accountability, exposure, extension agency contact, less participation in other related extension program, less empowerment and less inclusiveness were the major factors expressed by majority of the respondents.

The statements in the gender friendliness assessment scale were assigned with scores and the average score obtained by the FLD women beneficiaries was 36.86 (STV 1.57) and e-*Kapas* beneficiaries was 29.65 (STV 3.65). Based on the score values the women friendliness of each program was grouped into low, medium and high levels (Fig. 1). Majority of the respondents (32 (64%) from FLD beneficiaries felt that the TOT program FLD had medium level of gender friendliness. Similarly the majority of the respondents (96 (80%)) from e-*Kapas* network beneficiaries considered that the program e-*Kapas* network had medium level of gender friendliness. Hence, from the results it was found that both the cotton extension programs FLD as well as e-*Kapas* network were having medium level of gender friendliness. It is conceived from the results that the future cotton TOT programs must be developed with more women friendliness and aspects.

Constraints faced by the women beneficiaries in cotton TOT programs : Constraints faced by the women beneficiaries in cotton TOT programs were enquired from the selected respondents. Majority of them (81.50 %)

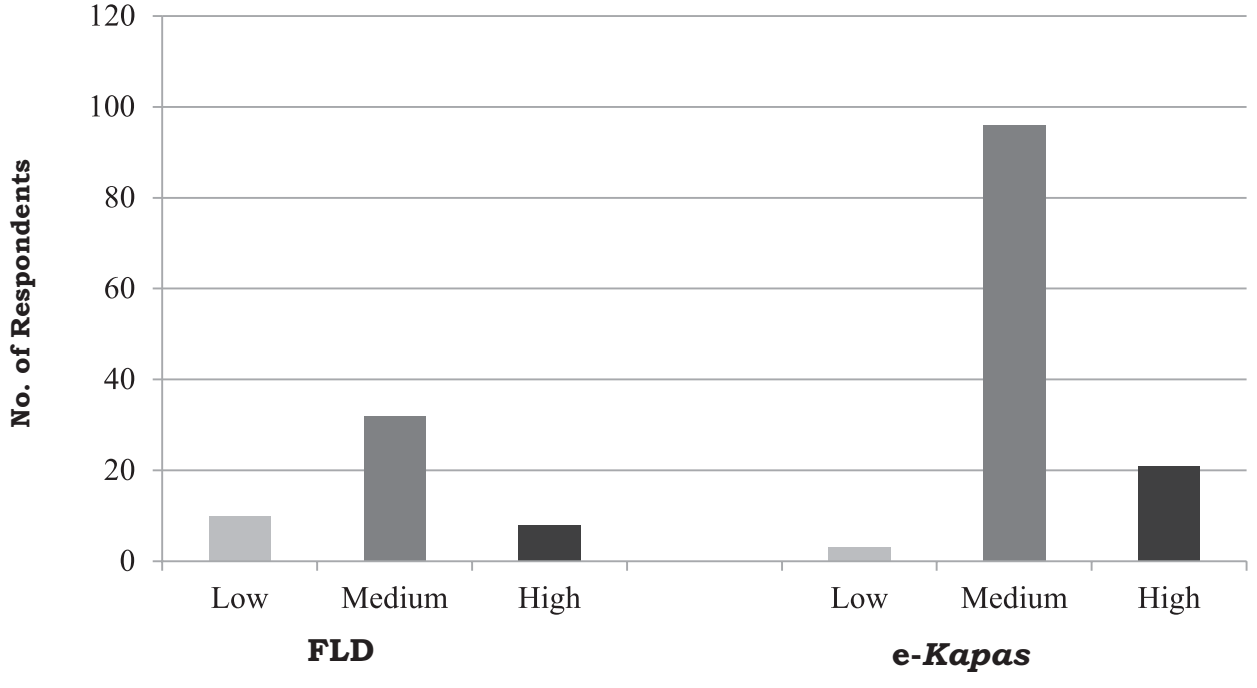

Fig. 1. Distribution of respondents according to their gender friendliness levels pertaining to the cotton extension programs FLD and e-Kapas network

expressed that lack of awareness about cotton extension programs was the major constraint. This result is on par with the results published by Paula (2019) about the constraints faced by African women in agriculture while mentioning about their access to agricultural information service. Lack of inclusiveness in extension programs (81.50%) *i.e.*, not included in the programs unless separate requirement (quota) and less chances to participate in the training programs especially on campus training programs (73%) are other major constraints faced by women farmers. It is supported by the report of Bani (2018) wherein it is mentioned that the 2011 census report recognized a large number of women as "cultivators" but not "farmers", which does not guarantee them the rights which being recognized as farmers would, such as loans for cultivation, loan waivers, crop insurance, subsidies – or even compensation to their families in cases where they commit suicide.

As regards FLD program, not owning land (89%) was the top most concern expressed by the women beneficiaries. The same was reported by the development economist Bina Agarwal, in her book 1995, "A field of one's own" as landlessness is the most significant factor upholding female subjugation in India. She discussed the importance of land ownership – a woman's bargaining and decision-making power in the household increases when she owns land. According to Food and Agricultural Organization (FAO, 2011), empowering women through land and ownership rights has the potential of raising total agricultural output in developing countries by 2.5 to 4.0 per cent and can reduce hunger across the world by 12-17 per cent.

Not owning the mobile phones (65%) and lack of time to participate in TOT activities due to severe labor scarcity (68.5%) at farm level were the other constraints expressed by the respondents (Table 3).

Suggestions expressed by the women beneficiaries to improve the gender

Table 3. Constraints faced by the women beneficiaries in Cotton TOT programs

S.N	Constraints faced	FLD Beneficiaries (n=50)	e-*Kapas* Beneficiaries (n=120)
1	Lack of awareness about cotton extension programs	78.00 (III)	85.00 (I)
2	Lack of inclusiveness in extension programs Not included in the programs unless separate requirement (quota)	87.00 (II)	76.00 (III)
3	Not owning the mobile phones / lands	89.00 (I)	65.00 (IV)
4	Less chances to participate in the training programs especially on campus training programs	67.00 (V)	79.00 (II)
5	Lack of time to participate in TOT activities due to severe labour scarcity at farm level	72.00 (IV)	65.00 (IV)

Table 4. Suggestions expressed by the women beneficiaries to improve the Gender Friendliness of Future Cotton Extension Programs

S.No	Suggestions offered	FLD Beneficiaries (n=50)	e-*Kapas* Beneficiaries (n=120)
1	Creating awareness about cotton extension programs among women	81.00	88.00
2	Reservation for women in cotton extension programs including training in future	84.00	89.00
3	Solutions for labour scarcity – farm women to participate in the TOT programs	87.00	79.00
4	Hands on training to handle the gadgets for understanding the new ICT based TOT	78.00	86.00
5	Participatory TOT development - Considering the opinions of women farmers while formulating the TOT programs	72.00	74.00

friendliness of future cotton extension programs : Creating awareness about cotton extension programs among women, fixing reservation for women in cotton extension programs including training programs, finding solutions for labor scarcity, hands on training to handle the gadgets for understanding the new ICT based TOT and considering the opinions of women farmers while formulating the TOT programs were the suggestions expressed by the women beneficiaries to improve the women friendliness of future cotton extension programs.

CONCLUSION

Women perform many tasks in cotton farming. They constitute almost half of the work force engaged in cotton farms. They play key roles in the entire cropping system, starting from the selection of seeds through sowing, manuring, weeding, harvesting, cleaning, drying, stacking and storing to marketing. They play a major role in the decision making process at the farm household level regarding the choice of varieties/hybrids as well as the performing the crop protection measures. But study on their inclusiveness in cotton development programs was remained as a less attempted researchable problem. The current study attempted to find out the gender friendliness of popular cotton extension programs like FLD and e-*Kapas* network and found that the programs had medium level of gender friendliness. The study further revealed that lack of ownership of land is the top most concern addressed by majority of the women farmers. Offering reservation for women farmers in the cotton development programs was the suggestion given by majority of the farmers. The results demand that the future cotton TOT programs must be developed with more women friendly technologies and features.

ACKNOWLEDGEMENT

The authors acknowledge the support given by the Director, ICAR-CICR, Nagpur and the Project Coordinator and Head, ICAR-CICR, Regional Station, Coimbatore to collect and analyze the data under ICAR flagship project "Gender Knowledge System in Agriculture".

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Received for publication : October 15, 2020
Accepted for publication : November 16, 2020