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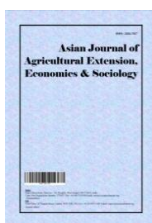
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Networking of the Farm Women by the Farm Science Centre of North Bengal

Ganesh Das^{1*} and Sarthak Chowdhury¹

¹*Department of Agricultural Extension, Palli Siksha Bhavana, Visva-Bharati, Sriniketan, Birbhum, Pin Code 731236, India.*

Authors' contributions

This work was carried out in collaboration between both authors. Author GD designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors GD and SC managed the analyses of the study. Author SC managed the literature searches. Both authors read and approved the final manuscript.

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ABSTRACT

Agricultural extension organizations of developing nations confronted numerous limitations in their activities of information age and use. Farm Science Center or Krishi Vigyan Kendra (KVK) assumes a significant job in giving information to the farmers and farm women in India. Rural women structure a huge portion of the agricultural workforce. They likewise need proper and usable information that would assist them with their cultivating exercises. Farm women will, in general, get recycled information from their spouses and companions if they are not the leader of their family. They are less intrigued to go to training activities because of family obligations or versatility imperatives. Thought of the above circumstance, an investigation (by gathering information) was directed on "Networking of the Farm women by the Farm Science Centre of North Bengal". The investigation was directed from March 2018 to April 2019 in North Bengal. The information was gathered from the optional sources. It was found from the examination that participation of farm women in extension activities was nearly higher than in training activities. Farm Science centre dispersed agricultural information through the arrangement of various grass root level extension organisation, for example, Farmers Clubs and Self Help Groups.

**Corresponding author: E-mail: ganesh.ext@gmail.com;*

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1. INTRODUCTION

India is an agrarian culture and fundamentally relies upon farming yields. It is subsequently fundamental that the innovation push should lay more noteworthy accentuation on the exchange of logical and mechanical data from the exploration foundations to the farmer's field. Rural extension organisation of developing nations confronted numerous requirements in their exercises for information generation and use. A large portion of the issues was because of the poor financial states of the farmers and feeble infrastructural and institutional advancement of the territory where they have been working [1]. Farm Science Center or Krishi Vigyan Kendra (KVK) assumes a significant job in giving data to the farmers and farm women in India. With the intercession by KVK, a larger part of the farmers has altered their agricultural patterns which were identified with the development of crops and changes in cropping pattern, seed planting procedure, utilization of composts and pesticides, changes in farm machinery utilized and in water use design [2]. In India, presently direct use of computerised information system to the farmers isn't achievable in the current conditions. The Farm Science Center or Krishi Vigyan Kendra is significant accomplices in the development and advancement of Agricultural Extension under the ICAR system. Today, the Indian Agricultural System under the ICAR is one of the biggest in the world containing research foundations, project directorates, plans, programs and so on.

Rolling [3] defined that "agricultural information systems produced, changed, moved, united, got, and bolstered back in such a way, that these procedures work synergistically to support information use systems". Women form a huge portion of the agrarian workforce. Thusly, they merit expanded consideration of rural extension administration in each developing country. There is a requirement for an action-oriented plan to arrive at the majority of women in agribusiness who will fill the bread crates of the third world and add to their fares [4]. Anonymous [5] and Raney, [6] revealed that women are liable for 50 per cent of food production in the developing country. There is an absence of worry about the numerous jobs of farm women while researching distinguishing the need issues and developing an

extension system that is fitting to the farm family's lifecycle stages. Little endeavours have been made to address and diminish the overwhelming weight of work that female farmers face. Frequently its saw that significant accentuation in agriculture is given to men's exercises while the job of women in the cultivating framework has been overlooked. Married women specifically are by-passed in the exchange of improved agricultural technologies expecting that they will get the information through their spouses [7]. Women in the farm division face numerous financial, instructive and legitimate obstructions in understanding their maximum capacity. They likewise need fitting and usable information that would assist them with their cultivating exercises. They need information on a wide scope of subjects, including agrarian generation, handling, promoting, exchange laws and common asset base. They likewise need to trade indigenous information, and they expect access to ICTs to get information both productive and financially savvy [8]. Social standards, which confine both women collaborations with men outside the family unit, just as time and versatility imperatives, may restrain roads for female farmers to get to public extension and formal agricultural information service [9].

Women's network will in general contrast from men's and research recommends that women may depend all the more intensely on them for getting to agrarian information, especially from other women [10]. Generally, women have less access to information about innovation by the ethic of their sub-par instructive status and relative seclusion from open life. In this way, there is constantly dithering to turn out and associate with the outside world. Now and again, even the recommendations of educated country women are overlooked or are not paid attention to because men think of it as dishonourable to acknowledge the choice of women. This is because customarily men have been significant legislators of society. Numerous arrangements and choices disregard women and undermine their capacities and jobs. Information and preparing in cultivating strategies and procedures are basic for both women and men, yet women farmers will, in general, have less access to this information, and especially information sensitive to their needs. Women farmers will, in general, get recycled information from spouses and

companions on the off chance that they are not the leader of their family unit. Moreover, they may not go to training programme because of family obligations or versatility limitations, and they will most likely be unable to communicate viably with male extension specialists because of social standards [11]. Based on the above references a study was led on the networking of the farm women by the Farm Science Center of North Bengal.

2. METHODOLOGY

The study was led in North Bengal, Northern portion of West Bengal. North Bengal has included eight districts of West Bengal. The descriptive research design was used in this investigation. The examination was led from March 2018 to April 2019 with information gathered from secondary sources. The secondary sources of information were various reports of KVK, statistics report and yearly report of Directorate of Extension Education, Uttar Banga Krishi Viswavidyalaya, Journal, and Book. The information were gathered from KVK, State department of Agriculture, NGO, Agriculture University and distinctive distributed and unpublished work. Descriptive statistics like frequency, percentage and ranking were used for the examination.

Transfer of innovation assumes a significant job in the development of the rural area. The wide system of Krishi Vigyan Kendras (KVKs) in the nation assumes a significant job in moving up to date technologies identifying with farming and associated division. There were seven KVKs spread over every one of the district of the North Bengal except Alipurduar and Darjeeling, out of which five KVKs in five district are under the direct managerial control of Uttar Banga Krishi Viswavidyalaya and the rest two KVKs i.e KVK Ramshai and CISH-KVK, Malda is under the regulatory control of West Bengal University of Animal Husbandry and Fishery Science and CISH-Malda.

In Malda area, there are two KVKs since the District is demographically bigger. The area Alipurduar has no KVK built up yet because of the arrangement of the isolated regions from Jalpaiguri District (25th June 2014). Another District i.e Kalimpong was shaped during fourteenth February 2017 after detachment from the Darjeeling area. Being another District, Kalimpong KVK works both the activities of the regions Darjeeling and Kalimpong.

2.1 A Short Description of Various KVKs in North Bengal is Given Underneath

Krishi Vigyan Kendra, Cooch Behar: Cooch Behar KVK was set up during 2004 under the regulatory control of Uttar Banga Krishi Viswavidyalaya. This KVK is arranged on the primary grounds of Uttar Banga Krishi Viswavidyalaya. KVK Cooch Behar particularly centres around seed production, formation and movement of farmers' club and Capacity improvement among the farmers, farm women and rural youth. Farm women of this District were very much associated with KVK. Farm women were empowered through different training activities such as beekeeping, Azolla cultivation, mushroom production, value addition, nutritional garden, SHGs strengthen, development of women food security group, women farmers club, training on handicraft making and its marketing, drudgery reduction and farm mechanization.

Krishi Vigyan Kendra, Jalpaiguri: The Krishi Vigyan Kendra, Jalpaiguri is situated in Ramshai, Maynaguri Block of Jalpaiguri district. This Krishi Vigyan Kendra initially was begun in the year 1983 under a Non-Government Organization named as Ramkrishna Seva Kendra. In any case, because of some unavoidable results, this KVK remained non-practical from 1992 to 2000. Even though the KVK, after getting the endorsement from Indian Council of Agricultural research is operational under the West Bengal University of Animal and Fishery Sciences since 2001. The KVK prepared the farm women particularly on animal husbandry, poultry and fish farming.

Krishi Vigyan Kendra, Kalimpong (Darjeeling): Krishi Vigyan Kendra, Kalimpong (Darjeeling) is situated in Kalimpong city, Kalimpong. This Krishi Vigyan Kendra began its activity from 1993 under Bidhan Chandra Krishi Viswavidyalaya. After the foundation of Uttar Banga Krishi Viswavidyalaya, this KVK was moved under the influence of UBKV (2001). The KVK focuses on value addition and food processing for income generation among the farm women. Utilization of modern ICT innovation was seen among the scientific and specialized staff of this KVK. This KVK is all around associated among the farmers through the utilization of ICT innovation.

Krishi Vigyan Kendra, Uttar Dinajpur: Uttar Dinajpur KVK was built up in 2006 under the managerial control of Uttar Banga Krishi Viswavidyalaya. Among all the KVKs of North

Bengal, this KVK has more extensive availability among the Farm women. Farm women of this district likewise have well networked with this KVK. Special focus was given around nutritional development among the farm women and their children. Various sorts of innovation were applied for drudgery decrease among the farm women.

Krishi Vigyan Kendra, Dakshin Dinajpur:

Dakshin Dinajpur area is situated in the old alluvial agro-climatic zone of West Bengal. This KVK was set up in 2005 under the administrative control of Uttar Banga Krishi Viswavidyalaya. The KVK trains the farm women on food processing, honey beekeeping, nutritional garden, fish cultivation and mushroom production.

Krishi Vigyan Kendra, Malda: The Malda Krishi Vigyan Kendra (KVK) was built up in 2005 under the authoritative control of Uttar Banga Krishi Viswavidyalaya (UBKV). The KVK is situated at Ratua Block. It is one of the innovative centres with the order of giving vocational training to the practising farmers including farm women, rural youth and extension functionaries in improved technology in the field of agriculture, animal husbandry, fisheries and other allied enterprises.

Krishi Vigyan Kendra, CISH, Malda: The CISH-Krishi Vigyan Kendra, Malda was set up in 2017 under the regulatory control of ICAR-Central Institute for Subtropical Horticulture (CISH). This KVK was the recently framed KVK at the time of the study. It covers 8 Block of Malda southern region giving exceptional focus on tribal farmers. Among the tribal farmers, tribal farm women were given special emphasis. The KVK shaped 40 numbers of women group in 40 villages of Habibpur Block. Farm women were trained on value addition and food processing technology. Also, more than 100 SHGs were in contact with the CISH-KVK for farm-related information.

3. RESULTS AND DISCUSSION

There are different types of Agriculture information service provider in North Bengal such as Department of Agriculture, Govt. Of West Bengal, Krishi Vigyan Kendra, Uttar Banga Krishi Viswavidyalaya, different NGO, Farmers club, input dealers, different pesticides, seeds and Fertilizer Company. Different reports showed that the majority of the farm women of North Bengal received agricultural information from nearest fertilizer and pesticide dealer, Farmers Club, Farm Science Centre and State Department of Agriculture. Among different sources of agriculture information Service provider, Krishi

Vigyan Kendras plays an important role in information service provider among the farm women of North Bengal. Table 1 reflects that Cooch Behar District has a low sex ratio and High rural population followed by other districts. It was also observed from that Darjeeling district have a low rural population compared to another district.

Tables 2 and 3 show that Cooch Behar District has the highest work participation rate as well as the highest number of women workers when compared to other districts of North Bengal.

Information dissemination and its adoption:

Cooch Behar KVK disseminated the scientific agriculture information to the farmers and farm women through different training and extension programme. Information is disseminated through different books, booklets, leaflets, models, posters, film shows, mobile phone and social networking site.

Use of ICT: Information Communication Technology is an essential tool for information dissemination among farmers and farm women. Cooch Behar KVK helps to trained different farmers club, SHGs to use the modern ICT tool for information receiving and disseminating to the farming community. Mobile phone now acts as an information dictionary. Farmers and farm women are now getting information quickly through the use of mobile phones. Cooch Behar KVK sends more than 20,000 SMS in a month to more than 5,000 of farmers and farm women. SMS contain plant protection, weather forecasting and other agriculture information related advisory [15].

Extension activities: Extension activities are mandatory activities of Farm Science Centre. Different types of extension activity were done by the FSC such as field days, Kisan Melas, exhibitions, film shows, exposure visits, agriculture-related camps, farmer scientist interactions, farmers club and SHGs conveners meeting etc.

Table 4 represents the information which were registered in the reports of KVK excluding Krishi Mela and exhibition information because this information is hypothetical and less value for the present study. In the last five years, 21.35% of farm women participated in different extension activities of the FSC (Table 4). Participation of SC and General Category farm women increased from 2013-14 to 2017-18 (Figs. 1 & 3) although the participation of ST farm women does not increase (Fig. 2).

Table 1. District wise population information of North Bengal (Source: West Bengal Statistics, 2011-2012)

District	Male	Female	Total	Rural	Urban	Sex ratio (Rural)	Percentage of rural population
Cooch Behar	1453590	1369190	2822780	2533480	289300	938	89.75
Jalpaiguri	1980068	1889607	3869675	2825001	1044674	954	73.00
Darjeeling	934796	907238	1842034	1123859	718175	968	61.01
Uttar Dinajpur	1550219	1450630	3000849	2638662	362187	938	87.93
DakshinDinajpur	855104	815827	1670931	1434856	236075	950	85.87
Malda	2061593	1936377	3997970	3446056	551914	947	86.20

Table 2. Work-participation rate in the Districts of North Bengal [12,13]

District	Work participation rate			
	2001	Rank	2011	Rank
Cooch Behar	30.43	2	31.44	1
Jalpaiguri	30.15	3	29.71	3
Darjeeling	29.76	4	28.85	4
Uttar Dinajpur	29.34	6	27.41	5
DakshinDinajpur	31.35	1	31.41	2
Malda	29.39	5	26.35	6

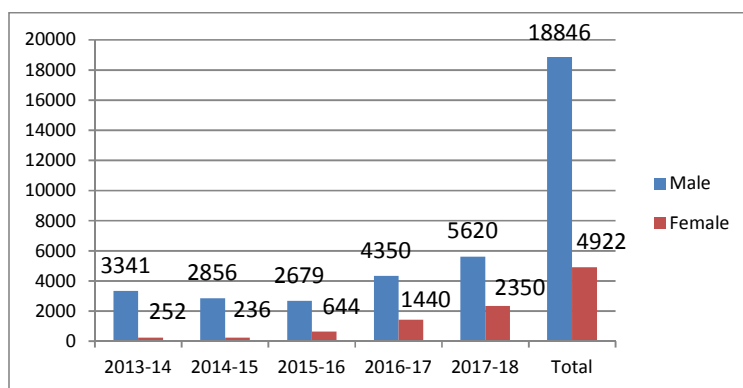


Fig. 1. Participation of SC farmer (Extension Activities)

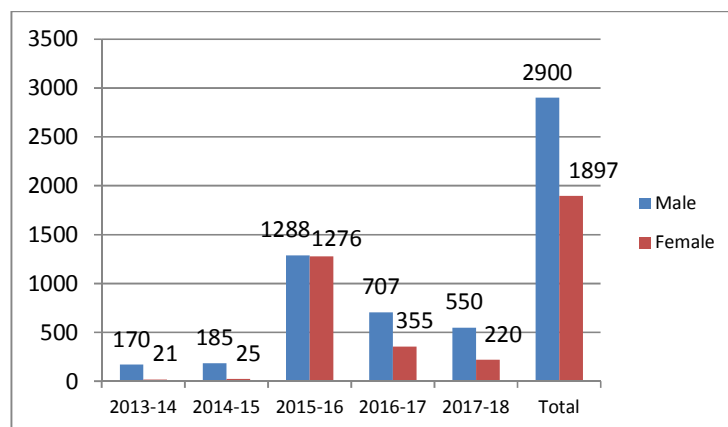


Fig. 2. Participation of ST farmer (Extension Activities)

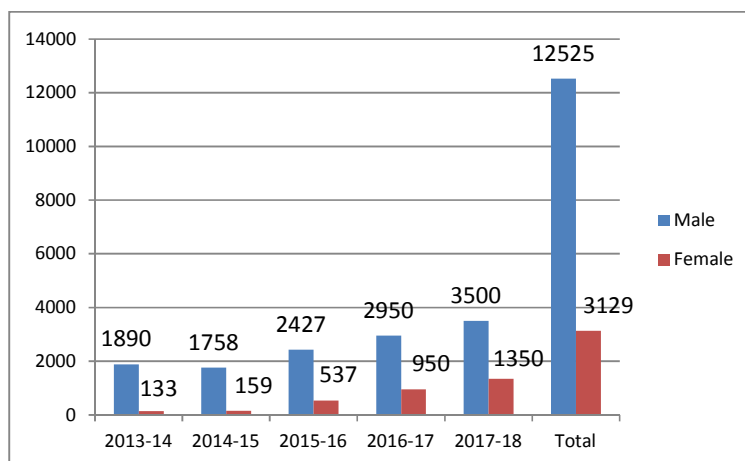


Fig. 3. Participation of general category farmer (Extension Activities)

Training activities: Training is a mandatory activity of Farm Science Centre. Different types of Training were given to the farmers, farm women, rural youth and extension personnel for skill and knowledge development on agriculture allied sectors. Farm women were provided different pieces of training such as kitchen garden, enterprise development, rural crafts, Soil nutrient management, production of organic inputs, livestock management etc.

It was observed from Table 5 that in last five years 23.98% of farm women participated in different off-campus training programmes organised by the FSC. Participation of SC category of farm women was more than General

and ST category of farm women (Fig 5, 6). It was also revealed from above figure no. 4 that participation of farm women increased steadily from 2013-14 to 2017-18.

Table 3. Work-participation rate of women cultivators in the Districts of North Bengal [14]

District	Work participation rate
Cooch Behar	32.57
Jalpaiguri	17.68
Darjeeling	20.29
Uttar Dinajpur	19.23
DakshinDinajpur	19.23
Malda	7.36

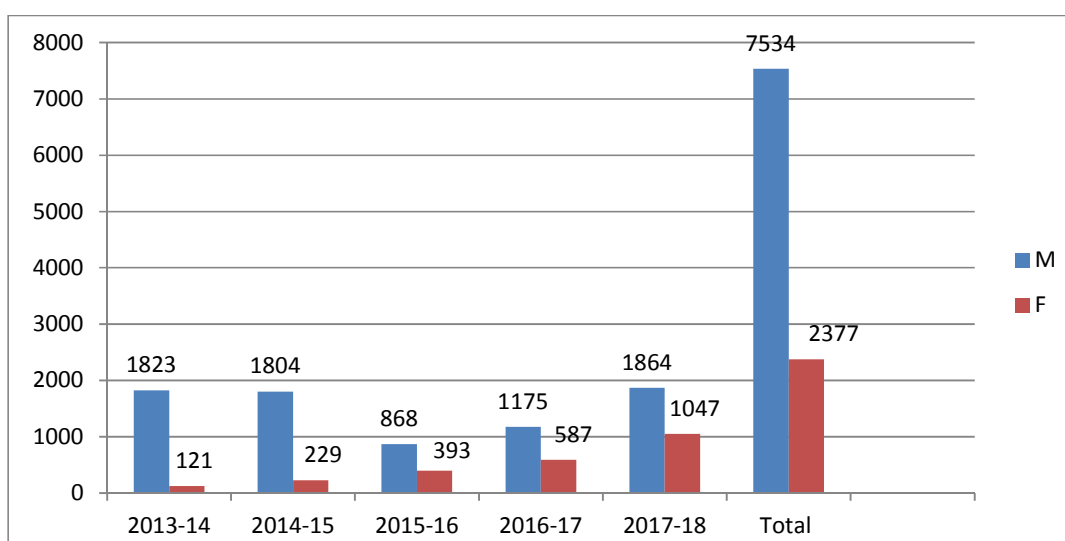


Fig. 4. Participation of all category of the farmer (off campus Training)

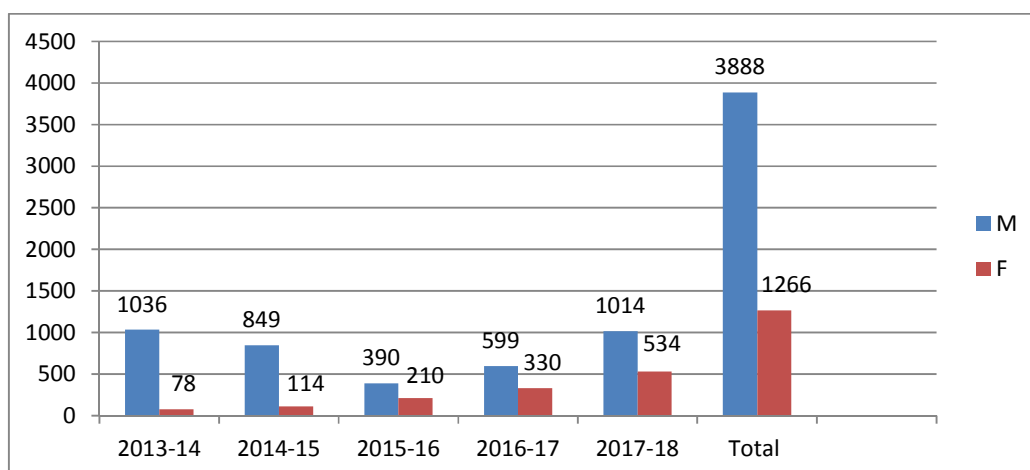


Fig. 5. Participation of SC category of the farmer (off campus Training)

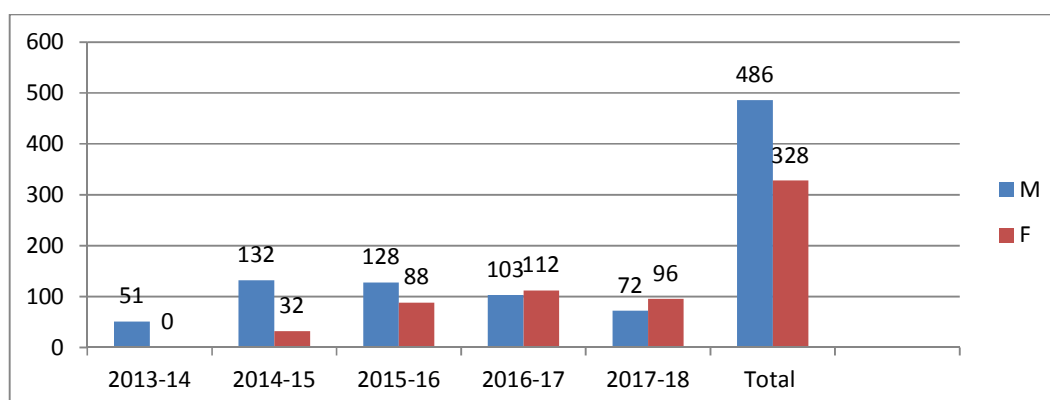


Fig. 6. Participation of ST category of the farmer (off campus Training)

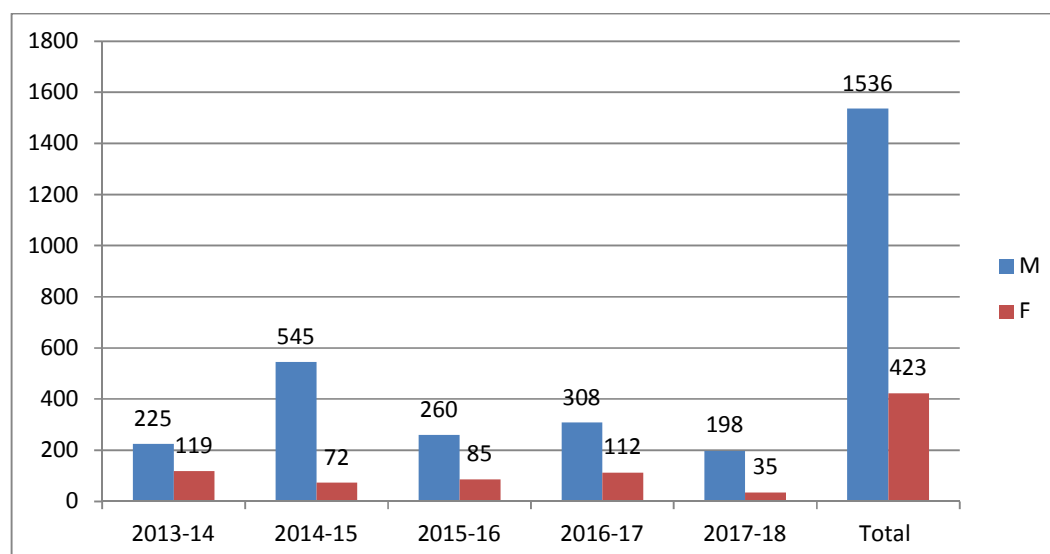


Fig. 7. Participation of SC category of the farmer (on campus Training)

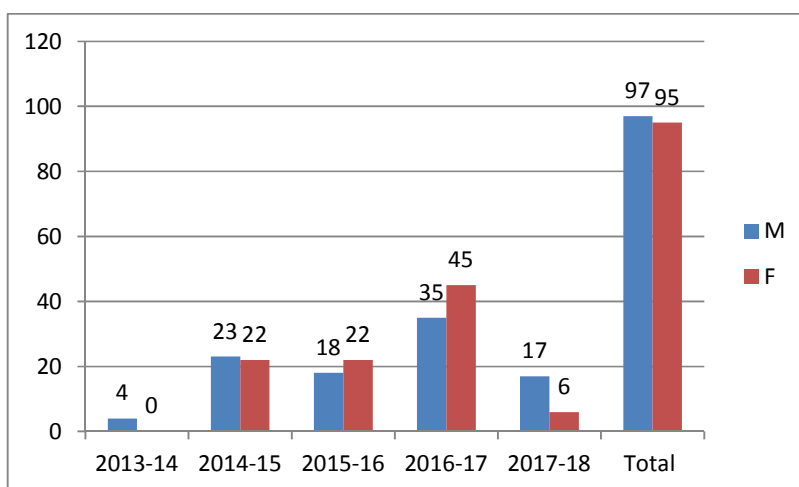


Fig. 8. Participation of ST category of the farmer (on campus Training)

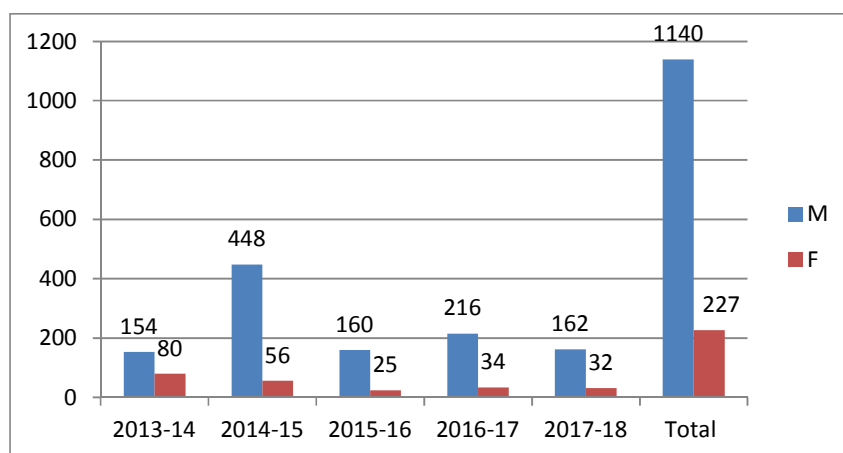


Fig. 9. Participation of the general category of the farmer (on campus Training)

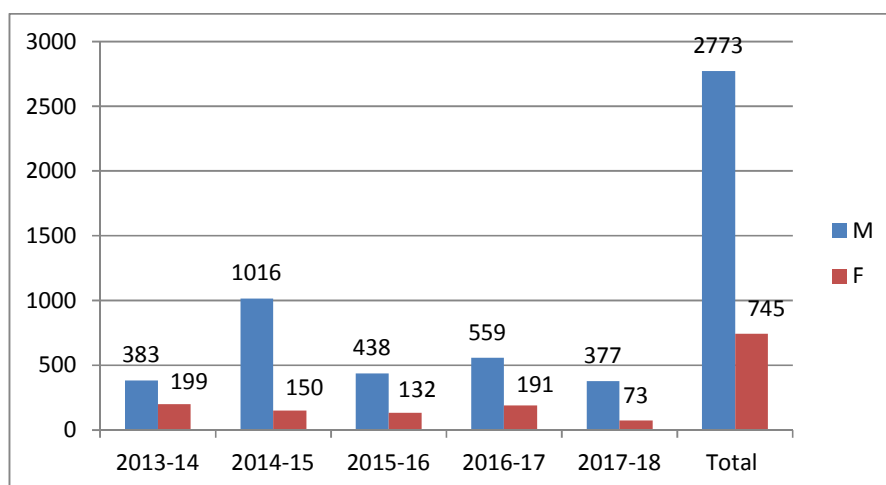


Fig. 10. Participation of all category of the farmer (on campus Training)

Table 4. Extension activities of the Cooch Behar KVK (Source: five-year reports of Krishi Vigyan Kendra, Cooch Behar KVK) [16]

Year	No. of activities	SC		ST		Others		Farmer	Farm women	% of farm women	Total
		M	F	M	F	M	F				
2013-14	1304	3341	252	170	21	1890	133	5401	406	6.99	5807
2014-15	1122	2856	236	185	25	1758	159	4799	420	8.04	5219
2015-16	1821	2679	644	1288	1276	2427	537	6394	2457	27.75	8851
2016-17	3044	4350	1440	707	355	2950	950	8557	2250	20.81	10807
2017-18	3496	5620	2350	550	220	3500	1350	9670	3920	28.84	13590
Total	10787	18846	4922	2900	1897	12525	3129	34821	9453	21.35	44274

Table 5. Off campus Training activities (Source: Five-year reports of Krishi Vigyan Kendra, Cooch Behar KVK) [16]

Year	No. of activities	SC		ST		Others		Male	Female	% of farm women	Total
		M	F	M	F	M	F				
2013-14	67	1036	78	51	0	736	43	1823	121	6.22	1944
2014-15	71	849	114	132	32	823	83	1804	229	11.26	2033
2015-16	28	390	210	128	88	350	95	868	393	31.16	1261
2016-17	37	599	330	103	112	473	145	1175	587	33.31	1762
2017-18	77	1014	534	72	96	778	417	1864	1047	35.96	2911
Total	280	3888	1266	486	328	3160	783	7534	2377	23.98	9911

Table 6. On campus training activities

Year	No. of activities	SC		ST		Others		Male	Female	% of farm women	Total
		M	F	M	F	M	F				
2013-14	19	225	119	4	0	154	80	383	199	34.19	582
2014-15	38	545	72	23	22	448	56	1016	150	12.86	1166
2015-16	20	260	85	18	22	160	25	438	132	23.15	570
2016-17	24	308	112	35	45	216	34	559	191	25.46	750
2017-18	16	198	35	17	6	162	32	377	73	16.22	450
Total	117	1536	423	97	95	1140	227	2773	745	21.17	3518

It was observed from Table 6 that in last five years 21.17% of farm women participated in different on-campus training programmes organised by the FSC. Participation of SC category of farm women was more than General and ST category of farm women (Figs. 7,8 &9). It was also revealed from above figure no. 10 that participation of farm women decrease from 2013-14 to 2015-16 and it has certainly increased in the year 2016-17 but again decreases in 2017-18.

Table 7. SHGs formed by the KVK (Five-year reports of Krishi Vigyan Kendra, Cooch Behar KVK) [16]

Year	Number of SHGs formed
2013-14	02
2014-15	02
2015-16	08
2016-17	21
2017-18	05
Total	38

Cooch Behar Krishi Vigyan Kendra has developed Agricultural Information Networks among the farm women through formation of Self Help Groups. According to Table 7, 38 number of SHGs were formed by the FSC which are well connected with the FSC. These SHGs act as grassroots level extension institution for farm information dissemination among the farm women of rural area. FSC provides different inputs and farm information through these SHGs.

Formation of Farmers Club: Cooch Behar KVK helped to form more than 110 farmers club in Cooch Behar District which now act as grassroots level extension organisation for information collection and dissemination to farmers in their locality. Among 110 farmers club, 3 farmers club were specially formed for women where the members of farmers club are only farm women. The farmers club are now networking with different SHGs and NGOs, Microfinance organisations, Banks, Govt. Departments, Private Companies, Research Institutes, agricultural universities for agriculture development in their locality.

4. CONCLUSION

It may be concluded from the above study that Farm Science Centre (KVK) plays an important role for capacity development among the farmers and farm women and it also acts as an information networking hub. Farm Science centre

disseminated agricultural information through the formation of different grassroots level extension organisation such as Farmers Club, Self Help Groups etc. Information was also disseminated through different extension activities though there may be a chance of information bypass through male farmers. Participation of farm women in training and extension programme was medium. But again their participation in extension activities and off Campus training programme is increasing day by day. A study to analyse the information networking system among the farm women may be needed for greater emphasis in this area of study.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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