



Mapping of women and men empowerment in Chinese potato cultivation in Tamil Nadu: A comparative analysis

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Abstract

The study mapped the profile characteristics, participation level and empowerment of women and men in Chinese potato cultivation in Tenkasi and Tirunelveli districts of Tamil Nadu. A simple random sampling technique was employed to select 132 respondents covering 66 women and 66 men and data were collected using structured interview schedule. Descriptive and inferential statistics were employed for data analysis. The study revealed that 37.88 percentage of men and 30.30 percentage of women had more than 20 years of experience in Chinese potato cultivation. Majority (87.88%) of the women cultivated Chinese potato in marginal farms of less than 2.5 acres. The mean participation score of women was 1.53 whereas for men it was 2.21. Women empowerment index in Chinese potato was estimated to be 0.55 and empowerment index for men was 0.80. It is suggested that women should be empowered by providing access to education, extension services, information, land, credit facilities, resources, and modern technologies in Chinese potato cultivation.

Keywords: Gender Analysis, Chinese potato, Women empowerment, Mapping

Introduction

Women are the backbone of agriculture, and they contribute either directly or indirectly to the growth of our country. Even though women are not literates as that of men, their multifaceted role in the society can never be undermined as they have the capability to do multifarious work in a synchronising way. Research studies have upheld the fact that women participate more in agriculture (ICAR-CIAE, 2014). Agriculture opens avenues for women to improve their living standards and earn on their own. Women produced 60 to 80% of food in developing countries and 43% are involved in agriculture (FAO, 2011). Women participate in various agricultural operations including production, post-harvest processing and marketing. Both genders have their own tasks and do not have similar level of say

over the crops (Kakuru et al. 2018; Okonya Kroschel, 2014; Iradukunda et al. 2018; Rietyeld and Farmoth, 2018). Few crops are designated as 'male or 'female crop' based on the control over production and its sale (Doss, 2001). Research evidence suggests that women dominate over subsistence crops and men had control over commercial crops (Nakazi et al. 2017). A study in Nigeria reported that after the introduction of cassava crop with good markets and processing opportunities, men took over it from women (Nweke and Enete, 1999). In India, women's role in tuber crops cultivation is more witnessed in southern states of India, Odisha and North eastern states. Among the minor tuber crops, Chinese potato (*Plectranthus rotundifolius* (Poir) Spreng.) is grown commercially in some parts of the country particularly in Kerala and Tamil Nadu. Most of the farmers in

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Tirunelveli, Tenkasi, Thoothukudi and Virudhunagar districts in Tamil Nadu are involved in its cultivation. Chinese potato is delicious with aromatic flavour and is native to tropical Africa. Tubers are rich with minerals and certain vitamins (Jayapal et al., 2015). Considering the importance of this crop, this research was attempted to analyze the gender participation, empowerment and constraints in cultivating Chinese potato.

Materials and Methods

Ex-post facto research design was used in this study. Two districts *viz.*, Tenkasi and Tirunelveli in Tamil Nadu were purposively taken, as Chinese potato is largely grown in these areas. Using the simple random sampling technique, 33 females and 33 males from Tenkasi district and 33 females and 33 males from Tirunelveli district were selected thus making a total sample of 132. Data were collected during September-December 2021, on various dimensions using a structured interview schedule. The women empowerment as compared to men was arrived at using the Women Empowerment Index in Agriculture (WEAI) by assessing women's participation in five domains (Table 1).

Table 1. Domains (5DE) of women empowerment

Sl. No.	Domains (Indicators*)
1	Production Input in productive decisions (1/10) Autonomy in production (1/10)
2	Resources Ownership of assets (1/15) Purchase, sale or transfer of assets (1/15) Access to and decisions on credit (1/15)
3	Income Control over use of income (1/5)
4	Leadership Group membership (1/10) Speaking in public (1/10)
5	Time Workload (1/10) Leisure time (1/10)

*Weightages of each indicator are given in parenthesis

The Women Empowerment Index in Agriculture (WEAI) developed by IFPRI, 2012 and modified by Alkire et al. (2013) was used to assess the empowerment of women. Respondents' participation was measured on a 3-point continuum scale as mostly participated, participated and never participated and evaluated against 15 practices in Chinese potato cultivation and processing. One to one interaction using structured interview schedule was done and data were recorded. Statistical tools *viz.*, percentage, mean, standard deviation and Chi-square analysis were used for interpretation of the results.

Results and Discussion

Profile characteristics of the respondents

Majority of the men (81.82%) and women (77.27%) were middle aged, and 40% men and 36% women had high school education. The women's education level was similar to men and it indicates the access to education for women. Agriculture was the prime occupation of men (98.48%) and women (96.97%) as it might be their traditional occupation. Nuclear family system was observed (65.15%). Joint family system was showing a declining trend. Most of the women (69.70%) had 4-6 members in their family. Only 9.09% of women had more members in family indicating a big family system.

Forty percentage of women and 48.48% of men had longer experience in agriculture of 20 years or more. Women are having almost similar experience as that of men. The reason might be that basically the families in the area depend on agriculture and they start doing agriculture from childhood. Majority (51.52% men and 54.55% women) had 10 to 20 years of farming experience in Chinese potato cultivation as it is a commercial crop and a livelihood crop.

More than forty percent (43.94%) of women had small farm of 2.5 to 5 acres with an average land holding of 4.33 acres. Fragmentation of land within families contributes to this result. Majority (87.88%) cultivated Chinese potato in marginal farms of less than 2.5 acres with an average area of 1.54 acres, where 10.61% had small area (2.5 to 5 acres) under Chinese potato cultivation and only 1.52% had semi-medium farms of 5 to 10 acres.

Majority (51.52%) of them had livestock through which they earn supplementary income. Access to credit for women was low and more women (74.24%) had no access to credit. More than seventy per cent of both men (74.24%) and women (72.73%) had medium aspiration and innovativeness as reported by men (83.33%) and women (63.64%).

Participation of gender in Chinese potato cultivation

Participation level of both genders in Chinese potato cultivation was calculated, and the respondents were classified into three categories as given in Table 2 using mean and SD. The data indicated that 83.33% women and 71.21% men had medium participation with a mean score of participation of 23.03 and 33.23, respectively. Medium level of participation might be due to their household activities and the distance of the farms. Due to their multipronged activities, they might have time constraint to actively involve in Chinese potato cultivation. Interventions through women friendly machineries could increase their participation.

Table 2. Distribution of respondents according to overall participation in 15 practices

Sl. No.	Category	Men (n = 66)		Women (n = 66)	
		F	%	F	%
1.	Low	11	16.67	4	6.06
2.	Medium	47	71.21	55	83.33
3.	High	8	12.12	7	10.61
	Total	66	100	66	100
	Mean	33.23		23.03	
	SD	3.84		3.23	

Regarding the practice wise participation, the chi-square test revealed that there existed significant differences between both genders in their participation. Table 3 depicts that starting from land preparation to harvesting, the participation of men and women had significant differences. Even in pest and disease management, there existed significant difference between the genders. Erbaugh et al. (2003) reported that women applied pesticides to crop in Uganda and women less likely adopted Integrated Pest Management (IPM) practices as it requires more labour. However, they assisted to get water to mix the chemicals (Zseleczy, 2012). Yuvaraj et al. (2020) stated that women were involved in almost all production and processing activities, and there were

significant differences between the genders. The mean participation score of women was 1.53 whereas it was 2.21 for men. Even though the involvement of men was more, women also had medium level of participation in all the activities, with a meagre difference. This might be due to the fact that men have agriculture as their main occupation, and they earn income from cultivating Chinese potato. Sikod (2007) stated that family members' participation contributed to household welfare and decision.

Empowerment index in Chinese potato

The Women's Empowerment Index in Agriculture was developed by International Food Policy Research Institute (IFPRI) and USAID's Feed the Future had sub indicators to measure their empowerment. The mean empowerment index of men was more than women in areas like input in productive decisions (men 2.89 and women 1.65), autonomy in production (men 2.68 and women 1.67), ownership of assets (men 2.82 and women 1.29) and control over use of income (men 2.20 and women 2.20). Significant differences were also observed in group membership, workload and leisure time. Empowerment index of women was 0.55 and for men was 0.80 (Table 4). The overall empowerment index between men and women was significant.

Table 3. Extent of participation in cultivation of the crop

Agricultural practices	Mean participation score		Chi ² statistics	p Value
	Women respondents (n=66)	Men respondents (n=66)		
Land preparation	1.39	2.86	88.3727***	0.000
Selection of variety	1.42	2.65	74.5710***	0.000
Selection/planting of vine cuttings	1.52	2.38	50.7275***	0.000
Treatment of planting materials	1.26	2.21	53.9756***	0.000
Application of organic inputs	1.52	2.21	34.6531***	0.000
Application of chemical fertilizers	1.47	2.29	49.1541***	0.000
Irrigation	1.53	2.47	53.5111***	0.000
Intercultural operations	1.92	2.14	11.0357***	0.004
Cropping system/crop rotation	1.68	2.27	28.7793***	0.000
Identification of pests and their management	1.26	1.79	24.9804***	0.000
Identification of diseases and their management	1.18	1.80	34.4317 ***	0.000
Harvesting	2.11	2.62	31.8944***	0.000
Grading and marketing	2.02	2.32	9.5089***	0.009
Value addition	1.14	1.38	9.3977***	0.009
Storage of planting materials	1.62	1.83	7.2883*	0.026
Extent of participation (Mean)	1.53	2.21	100.9381***	0.000

***, ** and * shows 1%, 5% and 10% level of significance; Chi² test was used for categorical variables and t test was used for continuous variable (mean extent of participation).

Table 4. Empowerment index in Chinese potato

Empowerment indicators	Mean empowerment score		Chi ² statistics	p value
	Women respondents (n=66)	Men respondents (n=66)		
Input in productive decisions	1.65	2.89	97.0352***	0.000
Autonomy in production	1.67	2.68	61.3489***	0.000
Ownership of assets	1.29	2.82	92.7158***	0.000
Purchase, sale or transfer of assets	1.47	2.62	66.3161***	0.000
Access to and decisions on credit	1.73	2.29	35.2108***	0.000
Control over use of income	1.67	2.20	35.8351***	0.000
Group membership	1.97	2.24	9.2540***	0.010
Speaking in public	1.74	2.18	17.4372***	0.000
Workload	1.67	2.09	20.5333***	0.000
Leisure time	1.64	1.98	13.0093***	0.001
Empowerment index	0.55	0.80	-0.25***	0.000

*** at 1% level of significance

The targeted interventions such as women friendly technologies, access to education, provision of land ownership to women, access to extension services, access to credit facilities, decision making power, access to information source and formation of SHGs/FPOs need to be given emphasis for empowering women in Chinese potato cultivation (Fig. 1).

Employment generation

Table 5 indicates that the man-days generated by men were 31.40 for intercultural operations, which was more for women when compared to men. Grading and packing also provides more (46.90) man-days for women. The total man-days less for men (119) when compared to women (319). This indicated that Chinese potato cultivation provides more employment to women than men.

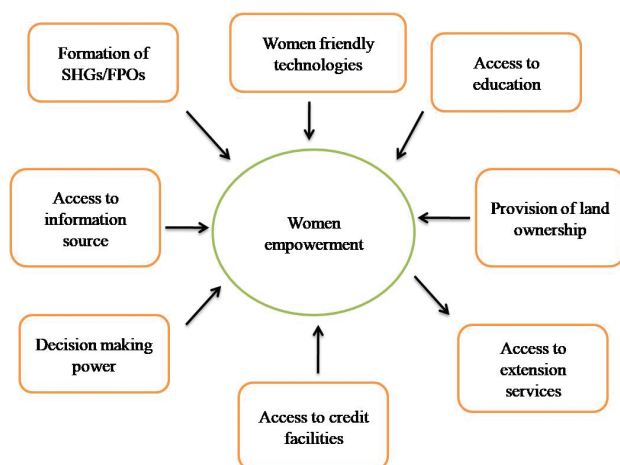


Fig.1. Strategies for empowering women in Chinese potato cultivation

Table 5. Man-days generated for Chinese potato cultivation (in 1 ha)

Farming practices	Men (man-days)	Women (man-days)	Total (man-days)
Land preparation and nursery raising	2.96	5.93	8.89
Ridge and furrow making	32.10	-	32.10
Transplanting	-	31.40	31.40
Intercultural operations/weeding/earthing up	31.40	59.3	90.70
Harvesting	14.1	171	185
Grading and packing	27.9	46.9	74.80
Application of fertilisers, manures, chemicals/ irrigation	10.6	4.94	15.6
Total man days	119	319	438

Economics of Chinese potato cultivation

Table 6 depicts that in nursery raising the share of both the gender was equal. In ridge and furrow making, women were not involved whereas the percentage share of women in transplanting was cent percent and they derived income. In harvesting, the percentage share realised by women was more than men. Out of the total labour charges, 57.29% was realised by women whereas it was 42.71% for the men. So, Chinese potato cultivation offers more employment and income to women than men.

Table 6. Income received by men and women
(₹ ha⁻¹)

Farming practices	Men	Women	Total
Land preparation and nursery raising	1482 (50)	1482(50)	2964 (100)
Ridge and furrow making	16055 (100)	0	16055(100)
Transplanting	0	7842 (100)	7842 (100)
Intercultural operations/weeding/earthing up	15685(51.42)	14820 (48.58)	30505 (100)
Harvesting	7040 (14.14)	42750 (85.86)	49790(100)
Grading and packing	13956 (54.33)	11733 (45.67)	25689(100)
Application of fertilizers, manures, chemicals/irrigation	5311 (81.13)	1235 (18.87)	6546(100)
Total	59529 (42.71)	79862 (57.29)	139391(100)

*Values given in parenthesis indicate percentage participation

Conclusion

Chinese potato provides ample opportunities for women to sustain their livelihood. Even though their participation is less compared to men their participation can be increased by introducing few women oriented small machineries. Providing access to educational access, extension and information support, land, credit resources, and advanced technologies will attract more women thereby minimising their poverty level. The problems of the women may be given due consideration by the policy makers and other government departments to mitigate their problems. Summarising the assessment of the role of gender in the cultivation of Chinese potato gives a vivid picture about the women's immense contributions.

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