Climate change effect on gender roles and practical and strategic gender needs

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ABSTRACT

A proper understanding of practical and strategic gender needs and gender roles can help formulate appropriate extension interventions to address various issues including the implications of climate change. The study identified practical and strategic gender needs and changing gender roles among households pursuing crop and dairy enterprises in the three villages one each from Karnal, Yamunanagar and Sirsa districts of Haryana adopted under the Technology Demonstration Component of the National Innovations in Climate Resilient Agriculture (NICRA) Project. A majority of female respondents (53.33 %) expressed the need for information related to access to inputs, followed by financial needs expressed by 41.11 per cent. Nearly all women respondents (97.78 %) voiced the need for collective organization into women's groups / SHGs. The addition of roles for females and males (80.56 %) and increased demands on both (94.44 %) were reported due to greater involvement of women in agricultural activities such as sowing, transplanting, harvesting and threshing, while men required information development related to and skill changing crop patterns, new varieties and seed management. The identified gender needs require targeted interventions at both districts and aggregate level to enhance resilience and reduce gender based household vulnerability.

Key Words: Gender Role, Crop and Dairy Enterprises, Practical and Strategic Gender Needs

Introduction

Crop and dairy farming play a vital role in the livelihood and nutritional security of India. These farm enterprises are highly sensitive to climate change and climate variability which pose serious long term challenges to productivity and profitability. Small holder farmers bear the major brunt of climate change due to limited resources for adaptation. Projections suggest potential yield reductions of 9-18 per cent, posing serious threats to food and livelihood security (Pathak, 2023). Dairy farming too, faces direct and indirect impacts such as heat stress

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in animals resulting in reduced feed intakes and milk production, increased disease incidence, decreased reproductive performance and shortage of feeds and fodder (Ponnusamy and Devi, 2017; Ponnusamy et al, 2019).

Every segment of the population is potentially vulnerable to climate change and gender-differentiated risks significantly affect access to resources, decision-making processes and division of labour among men and women (Bhuyan et al, 2018). Evidence suggest that vulnerability to climate change tends to differ within countries, within communities and even within households (Bhange, 2024). Men and women farmers often perceive and respond to climate change differently, in their efforts livelihoods and food security (David et al, 2019). This has important implications for gender specific capacity and resilience in crop and dairy enterprises (Chakravarty et al, 2021a). Therefore it is to understand gender roles along with practical and strategic gender needs, and gender differences must be incorporated into of vulnerability assessments into planning adaptation strategies.

Materials and Methods

Sampling

The present study was conducted in Karnal, Yamunanagar, and Sirsa districts of Haryana, under the Technology Demonstration Component (TDC) of the NICRA project as these locations were the implementation sites for climate resilient agricultural interventions aimed at addressing the farming vulnerabilities. Three villages, one from each district adopted under TDC-NICRA were purposively selected. From each village, 30 households engaged in crop and dairy farming were selected, resulting in a total sample of 90 households.

Data Source

Primary data were collected from the selected households through personal interviews using a structured and pre-texted schedule that included information on socio economic characteristics and variables related to exposure, sensitivity and adaptive capacity. Prioritization of gender vulnerability issues was carried out using a gender vulnerability issue ranking matrix through Participatory Rural Appraisal.

Assessing the effect of climate change on the existing roles of men and women in farm and family

The effect of climate change on the existing roles of men and women in farm and family was envisaged through Gender Planning Framework as suggested by Moser (2005). This framework is based on the collection and analysis of gender disaggregated information on the roles performed, women's practical and

strategic needs and control and access over resources and benefits. Information was collected based on the developed schedule using standard procedure from male and female respondents. Gender planning framework divides gender roles into three categories viz., productive, reproductive and community roles. Each of these categories consists of a number of activities. The productive role comprises activities related to production of goods for subsistence and income generation, while the reproductive role consists of activities related to household care such as bearing and rearing children, food preparation, cleaning, marketing etc. i.e., concerned with provision of future labour force Community role comprises of community activities performed as a member of the community. The existing roles performed by the male and female respondents were initially recorded and the changes were captured in three ways viz., "Addition" i.e, role not performed earlier, "Substitution" i.e., substitution of male for female or vice versa for the role performance, and, "More time claim" i.e., role was performed earlier, but now more time is required to be spent on it by men, women or both. The changes captured with respect to the roles performed were analysed using frequency and percentage.

Results and Discussion

Effect of climate change on existing roles of men and women in farm and family

The existing gender roles, practical and strategic needs of women, and the changes in gender roles are presented as follows:

Gender role activity profile

The gender roles are the roles performed by men and women under three broad categories viz., Productive role, Reproductive role and Community involvement role (Moser, 2005). As depicted in Table 1, activities under the productive role were mostly performed by men.

Table 1: Gender Role Activity Profile of Respondents

Roles / Activities	Females (n=90)		Males (n=90)	
	f	%	f	%
Productive Role				
Crop farming	53	58.89	87	96.67
Dairy farming	86	95.56	71	78.89
Income generation	30	33.34	82	91.11
Employment	4	04.44	74	82.22
Irrigation water in the field	4	04.44	75	83.33

Fuel related	5	05.55	69	76.67
Cleaning & repair	16	17.78	75	83.33
Market related	11	12.22	82	91.11
Reproductive Role				
Fetching water	81	90.00	33	36.67
Fuel related	83	92.22	47	52.22
Food preparation	89	98.89	5	05.55
Childcare	88	97.78	25	27.78
Health related	85	94.44	36	40.00
Cleaning and repair	78	86.67	36	40.00
Market related	47	52.22	82	91.11
Community Involvement Role				
Attendance at meetings	63	70.00	89	98.89
Religious activities	84	93.33	84	93.33
Recreation	21	23.33	76	84.44
Community activities	29	32.22	79	87.78

In crop farming, 96.67 per cent males were found to be engaged against 58.89 per cent female respondents. However, in dairy farming the situation was reverse, 95.56 per cent females performed the dairy related activities as compared to 78.89 per cent males, due to the existing traditional gender roles in the villages. This draws support from the findings of Bhange, (2024, who reported existence of clearly defined gender roles within agriculture; while women were responsible for sowing, weeding and tending cattle, men concentrated on ploughing, irrigation and pest control. The roles performed by women respondents in income generation and employment (33.34 and 4.44 %, respectively) were significantly less compared to the same roles assigned to men (91.11 and 82.22 %). This could be due to the traditional gender concept of men being the 'Breadwinner' of the family and women were designated as the 'Caretaker' (Chakravarty et al, 2021b). This observation is in accordance with that of Bhuyan et al (2018) who reported that males have been traditionally understood as 'providers'. The care taking role of women is also evident from the reproductive role performance, which was assigned mostly to the women. In all activities, a majority of the women respondents were actively involved, 98.89 per cent in food preparation, 97.78 per cent in child care and only 52.22 per cent in the marketing role, men were more active than women. (91.11 % men compared to 52.22 % of the women respondents). The community involvement

role was again performed to a larger extent by the male respondents while women were equally involved in religious activities of the community (93.33 % each, of male and female respondents). The evident existence of gender roles was also reported by Bhuyan (2018), who found that the community has gender roles that are socially embedded and every person is recognized through these roles. They further stressed that this stratification makes adaptation a big challenge to the community and also increases gender vulnerabilities.

Women's practical and strategic felt needs

Women's practical felt needs are directly related to their role performance however, these needs do not challenge the gender division of labour or the gender roles performed in the farm and family. Perusal of Table 2 reveals that majority of the female respondents (53.33 %) expressed the need for information related to access to inputs, followed by financial need felt by 41.11 per cent and training need perceived by 36.67 per cent women respondents. Investigation of specific needs pertaining to climate change adaptation revealed that 40 per cent of the respondents required information related to climate change adaptation, followed by training perceived by 30 per cent of the respondents. This draws support from Daze (2011), who has reported that adaptation is a process requiring availability of appropriate, timely and locally relevant climate information.

Table 2: Women's Practical Felt Needs (n=90)

Women's practical needs			
Broad needs	**Specific need**	**F**	**%**
Access to inputs	Finance	37	41.11
	Training	33	36.67
	Information	48	53.33
	Veterinary medicines	14	15.55
	Mineral mixture	22	24.44
	Animal husbandry support	25	27.78
	Mobile phones	12	13.33
Needs related to CC adaptation	Training	27	30.00
	Information	36	40.00
	Technical support	11	12.22
	Adaptation options	9	10.00

	Hand holding support	21	23.33
Improved ovens/ cooking stoves	LPG	8	08.89
Marketing of products	Training on market intelligence	13	14.44
	Tie up with NGOs etc. for home/ farm pick up of products	13	14.44
Specific training (Income generating activities)	Value addition of milk	23	25.55
	Computer literacy	21	23.33
Access to insurance	Linking up SHGs with insurance schemes/ benefits for family members and dairy animals	47	52.22
Access to equal wages	Same as paid to men	14	15.55

Further perusal of the table reveals that hand holding support was required by 23.33 per cent of the respondents. More than half (52.22 %) of the respondents expressed the need for linking up the SHGs with insurance schemes to improve woman's access to insurance. The need for equal wages to men and women was voiced by 15.55 per cent of the respondents although gender parity in terms of wage in NREGA is already reflected in this scheme of the Government.

The strategic felt needs are the needs that challenge or alter the gender division of labour, for their fulfilment. These needs bring about structural changes in the position of women. The needs brought out by the investigation are revealed in Table 3. It can be observed that nearly all the women respondents (97.78 %) voiced their need for collective organization into women's groups / SHGs. Compulsory education for girls was the need expressed by 83.33 per cent of the respondents followed by security for girl students to provide a safe environment to pursue their education in tates like Haryana. Patron support was required by 22.22 per cent of the respondents for moral and psychological motivation.

Table 3: Women's Strategic Felt Needs (n=90)

Women's strategic needs			
Broad Needs	**Specific need**	**F**	%
Collective organisation	Women group / SHG	88	97.78
Skills in leadership and leadership positions	Training in leadership skill development	11	12.22
	Patron support	20	22.22
Education	Compulsory education for girls	75	83.33
	Higher education facilities for girls near to village	47	52.22
	Security for girl students	59	65.55
Property rights	Strict enforcement of property rights for women and girls	7	07.78
Observance of purdah	Should be left to the will of the women/ girls	9	10.00
Access to employment	More opportunities for women	16	17.78
	Creche in the village	43	47.78
	Elderly day care support	12	13.33
Family Support	Family approval and support	42	46.67

Besides requiring more opportunities for themselves (17.78 %), the women also expressed the need for enhanced access to employment through village level support facilities such as a crèche (47.78 % of the respondents).

Changes in productive roles of men and women in farm and family

The productive roles performed by men and women are oriented towards production of goods for household consumption and also for income generation. Since production is impacted by climate change, the productive roles, too, are likely to change or shifts in roles may occur. The shifts in productive role performance captured by this investigation are presented in Table 4.

The crop farming roles of men and women were found to be changing in terms of addition for seeking more information on adaptation options (66.67 %), substitution of male's role by female role performance (26.67 %) and more time claim in role performance reported by cent perfect of the respondents. Addition of roles for females and males (80.56 %) and more time claim for females and males (94.44 %) was opined due to more involvement of women in agricultural activities such as sowing, transplanting, harvesting, threshing and the males for information and skill building on changing crop patterns, new varieties and seed management. The results are in accordance with the findings of Ngugi (2014), who found that while men have been forced to go out and look for water and fodder crops during drought periods, and are spending a lot of time in the fields, women are working for longer hours in their households. The study further revealed that recent changes in climate have altered the roles that men and women play in their households.

In dairy farming too, information seeking on resilient dairy farming practices was reported to be an additional role activity for both, men and women (87.22 %), substitution (male for female) for 32.78 per cent respondents and cent percent of the respondents opined that this role performance was claiming more time. As men were engaging in off-farm livelihood options, the burden on women to supplement family income was found to be increasing in the wake of impact of climate change on livelihood security of family. This was reported to claim more time for women (57.78 %), substitution (female for male) to the tune of 22.78 per cent and additional role activity performed by both females and males, by 71.67 per cent of the respondents (Chakravarty et al, 2021a).

The above findings were found to be in line with those of Babugura et al. (2010) who reported that women had extra workloads when faced with climatic stressors and were working longer hours than men which affected them physically and emotionally.

Irrigation of fields required additional role performance for women (32.78 %) and more time claim for men as reported by a large majority of the respondents (90.00 %). Further, marketing of perishable products like milk was reported to be additionally performed by women (56.67 %) and as a substitution of female role performance for male, as reported by 27.78 per cent of the respondents.

The care giving role of women for family members and dairy animals was opined to be claiming more time by (95.56 %) respondents and protection of animals from heat stress was reported as substitution (male for female) of role, by 25 per cent and to be claiming more time by all the respondents, as revealed in Table 4.

Table 4: Effect of Climate Change on Productive Roles of Men and Women in Farm and Family (n=180)

Traditional Roles in the Farm	Change in roles performed			f (%)	Climate related Reason /issue causing change
Females & Males	Females	Males	Addition /Substitution / More time claim		
Crop farming	Storage of farm produce for household (HH) consumption	More information seeking on adaptation options	Addition (F & M)	120 (66.67)	CC is impacting Crop Farming adversely
			Substitution (F for M)	48 (26.67)	
			More time claim (F)	180 (100.00)	For resilience in farm production, adoption of drought resistant varieties, salt tolerant varieties, fodder multi cut varieties is essential
	More involvement in agri. activities such as sowing, transplanting, harvesting, threshing	Information & skill building on changing crop patterns, new varieties, seed management	Addition(F & M)	145 (80.56)	When agriculture work is given priority due to climate forecasts and sowing, harvest time are altered
			More time claim (F&M)	170 (94.44)	
Dairy farming	Information seeking on resilient DF Practices	Information seeking on resilient DF Practices	Addition (F & M)	157 (87.22)	CC is impacting Dairy Farming adversely
	Value-addition of farm products, specially milk		Substitution (M for F)	59 (32.78)	
			More time claim	180 (100.00)	
	Animal health management		More time claim	129 (71.67)	Disease incidence and pest attacks increase
	Storage of feed for animals	Storage of feed for animals	Substitution (M for F)	45 (25.00)	Unseasonal rainfall
	Fresh water for animals	Fresh water for animals	More time claim (F & M)	180 (100.00)	Dry spells and drought conditions

	Protection of animals from heat stress	Protect animals from heat stress			Heat stress periods : milk yield decreases, fertility decreases
Income Generation & Employment	Load on W increases to supplement family income through skill building and income generating options	Off-farm livelihood options	More time claim (F)	104 (57.78)	Due to CC, yields decrease, diseases in crops and dairy animals increase, benefits decrease and livelihood security is challenged
			Substitution (F for M)	41 (22.78)	
			Addition (F & M)	129 (71.67)	
Water related	Irrigation of fields	Irrigation of fields	Addition (F)	59 (32.78)	During droughts, more irrigations are required and irrigation water is available for limited time period, so, women of the family are also involved
			More time claim (M)	162 (90.00)	
Cleaning & repair	Cleaning of fields	Cleaning of fields	Addition (F)	50 (27.78)	In the events of dust storms or sand storms etc.
			More time claim (M)	134 (74.44)	
Market related	Marketing of perishable products like milk		Addition (F)	102 (56.67)	When men are attending NICRA meetings, trainings, other prioritized crop farming activities
	More Climate vigilant role	More Climate vigilant role	Substitution (F for M)	50 (27.78)	
			Addition (M & F)	180 (100.00)	

Figures in parentheses indicate percentages

Table 5: Effect of Climate Change on Reproductive Roles of Males and Females in Farm and Family

Traditional Roles in the Family	Change in roles performed			f (%)	Climate related Reason /issue causing change
Females & Males	Females	Males	Addition/Substitution /More time claim		
Fuel related	Gathering fuel wood And making dung cakes	Booking LPG	More time claim (F)	34 (18.89)	More awareness to use LPG
			Addition (M)	129 (71.67)	
			More time claim (M)	67 (37.22)	
Food preparation	Special meals for sick persons	-	More time claim (F)	157 (87.22)	More family members fall sick due to CC/ Variability/ Extremities
Childcare and Health related	Simultaneous with other productive and reproductive role activities	-	More time claim (F)	159 (88.33)	In the wake of climate events, child care and other prioritized activities are to be carried out simultaneously, leads to double burden
	Care giving role for family members and dairy animals	-	More time claim (F)	172 (95.56)	Increased incidence of diseases in inclement climate conditions
Cleaning and repair	Cleaning	Cleaning	More time Claim (F &M)	120 (66.67)	In the events of dust storms or sand storms etc.
Market relate	-	Buying medicines etc	More time claim	121 (67.22)	Disease incidence increases

Figures in parentheses indicate percentages

Table 6: Effect of Climate Change on Community Involvement Roles of Males and Females in Farm and Family

Traditional Roles performed	Change in roles performed			f (%)	Climate related Reason/ issue causing change
Females & Males	Females	Males	Addition/ Substitution/More time claim		
Attendance at meetings	Attending meetings for NICRA Project	Attending meetings for NICRA Project	Addition (M & F)	161 (89.44)	Discussion about CC impacts and adaptation measures
			More time claim (M & F)	180 (100.00)	
Recreation	Additional work load has reduced recreation time	Recreation time is also combined with information gathering	Addition (M & F)	99 (55.00)	CC impacts have resulted in decreased yields, farmers are always seeking information from fellow farmers
Community activities	Community involvement in Programmes: Awareness programmes, adoption of adaptation measures	Community involvement in Programmes: Awareness programmes, adoption of adaptation measures	Addition (M & F)	123 (68.33)	Sensitization to CC impacts and to build skill in climate change adaptation
			More time claim (M & F)	165 (91.67)	
	Involvement in Groups: SHGs, VCRMC	Involvement in Groups: SHGs, VCRMC	Addition (M & F)	39 (21.67)	Male and female farmers opine that group membership will help them in coping with CC impacts and climate variability
			More time claim (M & F)	65 (36.11)	
	NRM Programmes such as Manure pits, Seed bank, etc.	NRM Programmes such as Manure pits, Seed bank, etc.	Addition (M & F)	42 (23.33)	Natural resource management is imperative to cope with future CC impacts.
			More time claim (M & F)	96 (53.33)	

Figures in parentheses indicate percentages

Changes in reproductive roles of men and women in farm and family

The reproductive roles that includes for bearing and rearing children, household management etc. are known to claim a large share of women's time and women are defined based on the reproductive role performance. Table 5 depicts of climate induced changes captured in reproductive role performance. Though 18.89 per cent respondents reported that women had to spend more time in fuel wood gathering and making dung cakes, it was observed that fuel related role performance of males was an additional role performed by them, as reported by 71.67 per cent of the respondents. This could be due to increased use of LPG as cooking fuel in most of the rural households and the males were arranging the refilling of cylinders. Due to climate change variability and extremities, more family members were falling suffering with various ailments. The care giving role of women was therefore claiming more time, as reported by 88.33 per cent of the respondents.

Further, the food provision and preparation role of women was reported (by 87.22 percent respondents) to be claiming more time as they had to prepare special meals for sick family members, too. This observation is supported by Lambrou and Nelson (2010), who found that 61 per cent women and 50 per cent men reported increased pressure for provision of food during climate stress periods in Andhra Pradesh, India.

Changes in community involvement roles of men and women in farm and family

The roles played by men and women as members of a community are important as, responses to climate stresses are not entirely individual oriented. Many actions by the community are called for while coping with climate change impacts. A perusal of Table 6 indicates that the community involvement roles of men and women in farm and family was reported to be varying in terms of addition (89.44 %) and more time claim by all the respondents for attending meetings related to NICRA Project.

In the case of women, additional workload (reported by 55 % of the respondents) had reduced their recreation time and recreation time was also combined with information seeking on resilient production, in the case of men. The involvement of respondents in Natural Resource Management (NRM) programmes was reported to be an additional role performance by males and females (23.33 %) and claiming more time by 53.33 per cent of the respondents.

Conclusions

The study revealed that women expressed substantial practical and strategic needs aligned with current agro-climatic and socio-economic conditions. Climate variability and extreme events have increased the incidence of illness

among family members, thereby increasing the care given responsibilities of women and the time required for these activities. Awareness programmes and collective organization of women should be strengthened to address climate-sensitive vulnerabilities in the study area. To enhance adaptive capacity, factors such as farm size, access to weather advisories, per capita off-farm income, and availability options should be incorporated into climate change adaptation programmes.

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