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WOMEN'S PARTICIPATION IN DEVELOPMENT OF RURAL ENVIRONMENT: A CASE STUDY OF RURAL DELHI

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Abstract

Environment denotes all the resources, which make up the totality of the productive base of a region, which is inhabited by people. These resources include land, forests, water, livestock and people. The real meaning is in the interaction between people who are the users of the environment. While all human beings interact with the environment, the people who are closest to it, both as users and as nurturers are women. The direct and critical relationship between women and natural resources draws its strength not from biology-that is, not because women are born female-but from gender, and the socially created roles and responsibilities that continue to fall to women in households, communities and ecosystems throughout the world. Women have primary responsibility for rearing children, and for ensuring sufficient resources to meet children's needs for nutrition, health care and schooling. In the rural areas they are also the main managers of essential household resources like clean water, fuel for cooking and heating and fodder for domestic animals. Women grow vegetables, fruit and grain for home consumption and also for sale. The present study brings into focus the systematic pattern of discrimination against women at every level. It also emphasizes the decisive role played by traditional cultural norms in determining the position of women in agrarian society. Women have the responsibility for managing household resources, but they typically do not have managerial control. Given the variety of women's daily interactions with the environment, they are the most keenly affected by its degradation.

Keywords

Women, Environment, Development, Sex Ratio, Land Rights.

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1. INTRODUCTION

The direct and critical relationship between women and natural resources draws its strength not from biology—that is, not because women are born female—but from gender, and the socially created roles and responsibilities that continue to fall to women in households, communities and ecosystems throughout the world. "Women have primary responsibility for rearing children, and for ensuring sufficient resources to meet children's needs for nutrition, health care and schooling. In the rural areas they are also the main managers of essential household resources like clean water, fuel for cooking and heating and fodder for domestic animals"(Masamha, B.2018). Women grow vegetables, fruit and grain for home consumption and also for sale. The term environment means whole sum of the surrounding external conditions within which an organism, a community or an object exists. All the components of the environment are interrelated and mutually interdependent. The environment includes components of land, water, air, climate, soil, forests and fauna and biogeochemical and gaseous cycles (Hussain, 1996). More people are using more resources with more intensity than at any point in human history. Utilization of natural resources is the interaction between two systems – the natural and human. In course of the utilization, sometimes the very resource base is eroded leading to devaluation or diminution of environment, or some sort of disturbance is triggered in the ecosystem functioning and structure causing ecological imbalance. Environmental degradation is qualitative and quantitative decline/ impoverishment/ decrease/ devaluation/ degeneration/ diminishment in the ecosystem potentiality/ productivity affecting habitat of man, plant and animal (Hussain, 1996). Smith (1972) has called 'degraded environments' as 'endangered category, for life of the biotic community and existence of abiotic elements are threatened. Lately man has realized that loss or decline in

environment is his loss as well. That's why; expression of extreme concern for environment by man is stemmed from his sense of fear about the deteriorating health of environment, because its further decline is a threat to his very survival itself. Women have primary responsibility for rearing children, and for ensuring sufficient resources to meet children's needs for nutrition, health care and schooling. In the rural areas they are also the main managers of essential household resources like clean water, fuel for cooking and heating and fodder for domestic animals. Women grow vegetables, fruit and grain for home consumption and also for sale.

"Environmental problems begin with people as a cause and end with people as victim. They are usually born of ignorance and apathy. It is the people who create a bad environment and a bad environment brings out the worst in people. Man and nature need each other and by hurting one we would wound the other. There is much that needs to be done to halt the destruction of our world environment, so many prejudices and so much self-interest to be overcome"- Sir Edmund Hillary (As quoted in Sapru and Bhardwaj, 1990)

It is important to study women's work because:

- A substantial part of women's time and energy is spent in working.
- Women's work is most of the time invisible and unrecognized, primarily because in the accepted capitalist paradigm any 'economic' activity is synonymous with 'market' activity and much of women's work is done outside the realm of the market. It's also usually undervalued since the unpaid element is not taken into consideration while computing national income.
- A number of issues confronting the women's movement today, particularly in developing countries such as in India, are related to different aspect of women's work.
- In the contest of globalization women's work is probably one of the most important areas that are being affected by the changing situation.

2. STUDY AREA

The research work was done in rural Delhi based on old administrative structure. It is spread over an area of 783.23 square kilometers and is administrated by 2 Tehsils – the Delhi Tehsil and Mehrauli Tehsil. Clubbed together these tehsils, encompass 209 villages which are further divided among 5 community Blocks. These are: Alipur Block, Kanjhawala Block, Najafgarh Block, Mehrauli Block, Shahadara Block. Two major community Blocks: Alipur and Najafgarh were selected for the primary survey. In Alipur Block 4 villages were surveyed, namely, Bankauli, Hiranki, Qadi Pur and Sanoth. Alipur block is located between 28^{o} 42' N to 28^{o} 52' N latitudes, while its longitudinal extent is 77^{o} 2' 30" E to 77^{o} 13' 50" E. It is located in the north east part of National Capital Territory of Delhi. The Yamuna demarcates its eastern boundary. A total of 131 households were surveyed in Alipur Block. Overall, there has been an increase in the population of the villages. In Alipur block Bankauli and Hiranki village being nearer to Alipur town are more developed as compared to the other two villages i.e. Sanoth village and Qadi Pur village. Alipur Block has fertile soils, especially near the river, and the quality of groundwater also makes the area quite suitable for cultivation. The main road running towards Amritsar (GT Road) separates the block into an eastern and a western part. The eastern part has relatively more land under intensive cultivation and yields better harvests, including horticultural crops. Sanoth is a cosmopolitan village having a mixture of all castes and religious i.e. Jats, Brahmins and lower castes along with Muslims. This is the only village with a Muslim habitation. These are engaged either in carpentry or are masons (Fig. 1.1).

While in Najafgarh Block the 4 villages were surveyed: Dhansa, Dichaun Kalan, Kair and Ujwa. Najafgarh is located at the outskirts of New Delhi, India. Najafgarh has the distinction of being the most populous electorial region in the National Capital Region of India. In Najafgarh block Dichaon kalan village is a sample of urban land use change. It is the largest village in terms of area as well as in population. Dichaon Kalan has 1853 main workers which is the highest among the surveyed villages. It also has maximum number of cultivators. Najafgarh Block occupies 1st position in literacy among all the rural blocks, with 84.1 per cent of males and 59.6 per cent of female's literate. Distance is one of the chief reasons for the lagging behind of Dhansa in the race for urbanization. Dhansa is a village undergoing agricultural land use change.

In Najafgarh Block, Kair is the only village, which has multiple sources of irrigation. The availability of educational facilities is available in Kair village. Recently a woman's college was opened in Kair for the rural girls. Many young girls from Dichaon Kalan village, Najafgarh towns study in Kair College. There are very few villages in Delhi's fringe which are purely rural in character. But what is essentially missing from a few villages is the daily interaction with the city. Lack of proper bus service is one of the main reasons for the lesser development and neglect of the village from urban forces. Being away from the main road Ujwa is one of the classic examples of a rural village in urban vicinity.

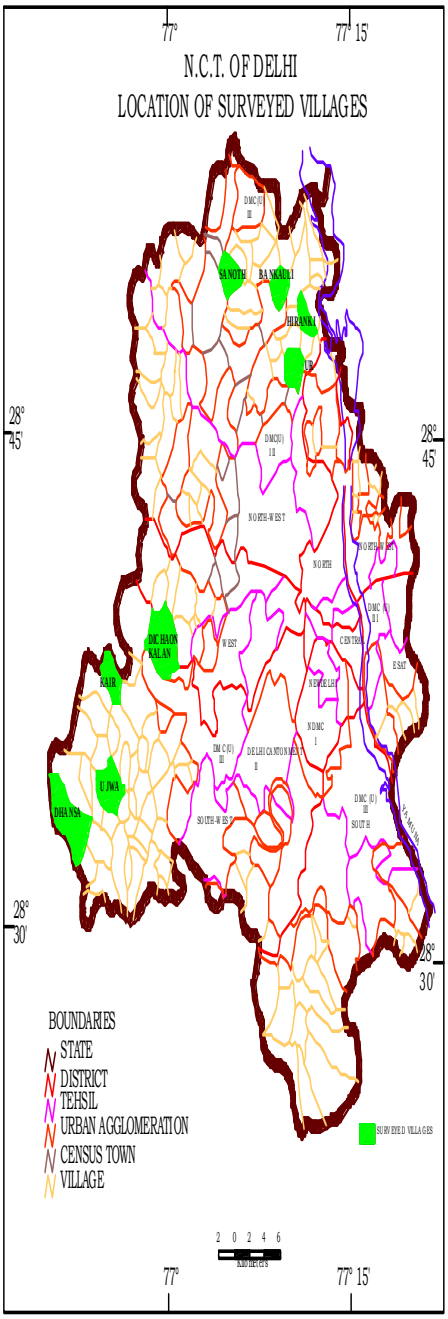

Figure 1.1: Surveyed Villages of Rural Delhi

- **SEX RATIO** In 2001 census the total population of N.C.T. of Delhi was 138, 50,507. The rural population of N.C.T. of Delhi has grown from 17, 44,072 with 304 inhabited villages in 1951 to 138, 50,507 with 165 inhabited villages in 2001. Sex ratio is the number of females per thousand males. The sex ratio of N.C.T. of Delhi was 821 females per 1000 males. But the sex ratio of Alipur block was 799 and Najafgarh block was 784

only (Table 1.1, Figure 1.2). The literacy rate was 81.97 per cent. The total rural population was 963215 and the share of rural population was 7 per cent.

Table 1.1 Rural Delhi Sex Ratio 2001 (Block and Village wise)

AREA	**Sex Ratio**
NAJAFGARH BLOCK	784
1. DHANSA	875
2.DICHAUN KALAN	830
3. KAIR	839
4.UJJWA	863
ALIPUR BLOCK	799
1.BANKOLI	648
2.HIRANKI	879
3.QADIPUR	795
4.SANOOTH	898

Source: Census of India, 2001

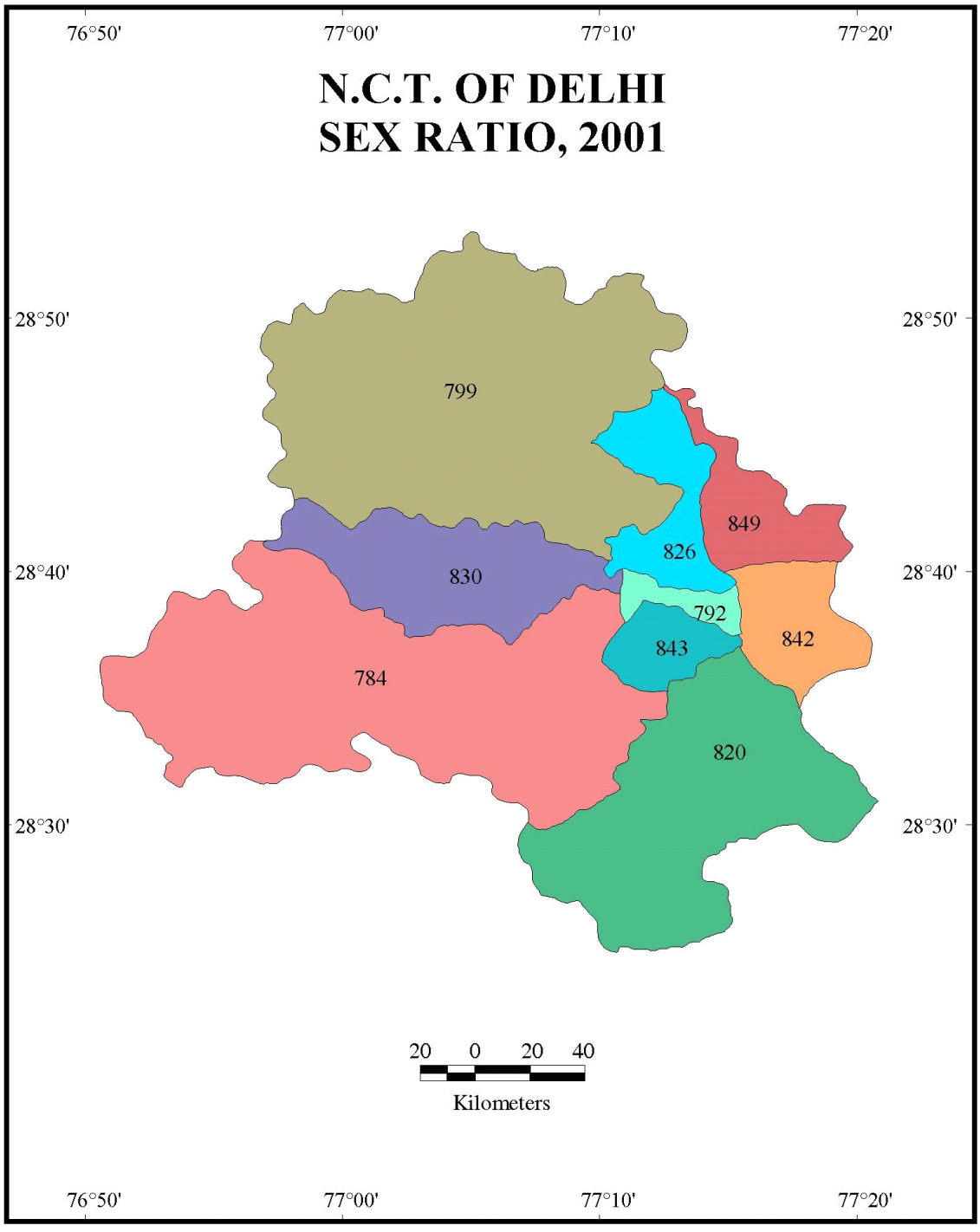

Figure 1.2 Sex Ratio of Delhi

4. WOMEN AND LAND

4.1 Influence of Land Resources and Agriculture on Women In rural economy, agriculture occupies a place of pride. Almost all the persons living in the village are in one way or the other connected with agriculture. It can be considered to be the pivot or focus of rural economy

(Sharma, 1979). Of the total Indian population of about 1028 million (Census of India, 2001), nearly 827 million live in villages. Women constitute 49 per cent of the rural population. About 75 per cent of the rural women belong to the families of small and marginal farmers. The average hour's daily work for the agriculture is about 12· On an average a women devotes between 11-12 hours a day to her work in fields, in addition to her normal household activities. Farm labourers have often to work with the farm owners for which they receive inadequate payments. A women worker not only works for 8-10 hours at her place of work, but on reaching home, she devotes another 5- 6 hours to house work and the care of children and the sick. It means that the duration of a woman worker's normal work - day is 14-16 hours. Such a situation arises because a woman worker is required to play a dual role namely, that of a housewife and mother on the one hand, and of a worker, on the other (Sethi, 1982).Women play a vital role in the rural economy. However, their socio-economic status remains marginal. Agriculture is the major economic activity for women. The landless households have no land to guarantee subsistence and the men's income is not sufficient to meet the family's needs therefore, it becomes necessary for the women to supplement the income and become agricultural labourers. Some households have sufficient land for their own subsistence. They do not hire labour but the women are engaged in agricultural work on their own farms. Large cultivators have more land than they need for their own subsistence and so they can afford labour force from outside. In upper castes the concept of not working of women as a symbol of status still exists.

The main occupation of the females is agriculture. They work on the farms as cultivators or as agricultural labourers. Woman work in the farms mainly during the sowing and harvesting season. In Alipur block 52 per cent of the females do agricultural work. And 44 per cent of the females work 5 to 10 hours daily on the farms.

	Ploughing	**Sowing**	**Weeding**	**Harvest**	**Threshing**	**Winnowing**	**Storage**	**Milling, Cooking**
Elderly Men(> 50 yrs)	•	•		•	•			
Young Men (15-50)	•	•		•	•	•	•	
Child (< 15)	•				•			
ElderlyWomen (>50 yrs)					•		•	•
Young			•	•	•	•	•	•

Women (15-50)								
Child(< 15)						•		•

Table 1.2 Division of Labour in Agriculture

- Division of labour Source: Field Survey

Among the different communities 19 per cent Jat females work on the farms, 11 per cent of the Brahmin females work on the farms, while 8 per cent of the scheduled castes work on the farms. And 22 per cent of the females work more than 10 hours daily on the fields. The scheduled castes work as agricultural labourers for 5 to 10 hours daily. Woman prepare field for sowing, breaking clods and wallets, making embankment of the fields, follow the plough dropping seeds during sowing seasons, managing water applications in the fields, hoeing , weeding, harvesting , threshing and winnowing. In the upper caste the concept of not working of women as a symbol of status still exists. The differential in land holding could also be a factor in longer hours of work the female of a particular caste. In Bankauli, Sanoth and Qadi Pur villages a women work for more than 8 hours daily on the farms, while in Hiranki they work between 4 to 8 hours (Figure 1.3).

Female labour force participation is conditioned by several factors; these are child - care and other domestic duties, nutrition, local customs, other social and economic factors, and the family subsistence needs. Other factors influencing the supply of female labour are: the extent of mobility allowed to women, the availability of suitable jobs, the desire on the part of women to avail job opportunities, educational attainments and income levels and the husband's occupational status. Interplay of these factors determines the overall participation rates for the community as a whole and for the women specifically. Rural women are primarily involved in land based activities - agriculture and forestry. They were the early practitioners of agro forestry. They worked with the hoe, axe to turn the earth and prepare the nurseries for the paddy seedlings. They carried out transplantation; weeding, harvesting, and irrigation were organized by women. They were skilled in land and water management. Mixing cow dung with leaf mould in specially constructed ditches produced organic manure. The women applied the manure when the fields were prepared for planting. Crop rotation was known and practiced and contemporary authors listed a large variety of crops, including several varieties of paddy.

Figure 1.3 Women's Working Hours on Farm (ALIPUR BLOCK)

Female participation rates in the farm work are high as they perform every kind of field labour except ploughing and carting. The main occupation of the females in Alipur block is agriculture, service and agricultural labourers. A total of 65 per cent of the females are engaged in agricultural work as cultivators on their own land. And 21 per cent of the Jat females are involved doing agricultural activity or animal husbandry or both the activities. Only 10 per cent of the Brahmins are involved in agricultural activities. The scheduled caste females were employed as agricultural labourers. They worked 8 to 10 hours daily on the farms of Jats or Brahmins and were paid Rs 25 to Rs 40 per day. The major crops grown here are - *Wheat,*

Bajara, Jowar, and Mustard. A total of 30 per cent of the females do household chores and most of these females belong to the scheduled caste. The lowest percentages of women are confined in the service class.

In larger land holdings Grain farming is important which has mechanized, so role of women in farming is less, like in Hiranki. Whereas in Qadi Pur which is located very near to urban Delhi, 60 per cent of the women respondents were engaged in farming and animal husbandry activities. There is more Floriculture in Qadi Pur so more women are engaged in farming with 27 per cent of women working more than 8 hours on farm. In Hiranki which is located nearby river Yamuna, 80 per cent of the women were engaged in farming and animal husbandry activities. Here more than 40 per cent women were landless as the population of Scheduled Caste was more. The Jat community had only 2-4 acres of land with 30 per cent respondents. And about 45 per cent of women worked more than 4 hours per day on farms. In Bankauli near Alipur 64 per cent of women were employed in farming and animal husbandry of which 60 per cent were landless as Bankauli has Scheduled Caste and Other Backward Class families who were employed as agricultural labourers. In Sanoth 65 per cent of the women were engaged in farming and animal husbandry activities with 46 per cent landless with Scheduled Caste and Other Backward Class families as agricultural labourer. About 30 per cent had less than 2 acres of land (Plate 1.1).

In the Najafgarh block agriculture and animal husbandry is main occupation of the female population. A total of 75 per cent of the females are engaged in agriculture, animal husbandry or both or as agricultural labourers. Within the Jat community 42 per cent women are doing either agricultural activity and animal husbandry or both. And in the Brahmin community only 12 per cent is engaged in agricultural activity or animal husbandry or both the activities. The scheduled castes have 9 per cent females doing agricultural activity. The scheduled castes female agricultural labourers work on the farms of the Jats and Brahmin family. They work during the sowing and harvesting season and are paid between Rs 25 - Rs 50 per day depending on land owner. Wheat, Jowar, Bajara, Mustard are the main crops grown here. Only 2 per cent of the OBC's are engaged as potters and some as agricultural Labourers. The female potters make 10 to 15 pots a day and sell them at a price of Rs 10 to Rs 14 per pot. Mostly the villagers bought these pots and that too in summers only. During the winter season when no pots were made or purchased these potters work on the farms of Jats and Brahmin. Nearly 20 per cent of the females were doing household work. Agriculture and animal husbandry is the main occupation of females in Dhansa, Dichaun Kalan, Kair and Ujwa. Animal husbandry is dominant in Dhansa village only (Plate 1.2).

In Najafgarh block, Dhansa village which is located near Haryana border has more than 60 per cent of women engaged in agriculture and animal husbandry activities. The size of land holdings was small i.e. 2-4 acres only with more than 50 per cent landless. The percentage of female respondents working on farms was also low with only 25 per cent . Dichaun Kalan village which is located near Najafgarh has more than 80 per cent of women engaged in agriculture and animal husbandry activities. About 25 per cent have 2-4 acres of land with more than 70 per cent women working on farms. In Ujwa more than 75 per cent of women are engaged in agriculture and animal husbandry activities. Here more than 25 per cent have more than 4 acres of land and 50 per cent women worked more than 4 hours per day on farms. In Kair village located near Haryana border 65 per cent of women are engaged in agriculture and

animal husbandry activities with more than 40 per cent women working 4-8 hours daily on farms. About 40 per cent women were landless (Figure 1.4).

In Najafgarh block a female works 8 to 10 hours per day in the fields. Nearly 53 per cent of the females work on the farms from morning till the evening. And 38 per cent of the females work nearly 5 to 10 hours daily on the farms, while 15 per cent females work more than 10 hours daily (Figure 1.5). About 32.5 per cent of the Jat females work daily on their farms as they have sufficient land of their own subsistence and they do not hire labour from outside as it is too expensive and the farms too small. Since they depend entirely on the family labour force the woman are engaged in agricultural work and normally for longer hours. Only 8 per cent of Brahmin females work on the farms, rest of the families are quite well- off and have employed agricultural labourers on their farms. These households have more land than they need for their own subsistence, the farm is profitable undertaking and can therefore afford labour from outside. The woman belonging to this stratum of rural society has supervisory functions only. About 5 per cent of the scheduled caste and the OBC woman females work as agricultural labourers on the farms 5 to 10 hours daily. Such houses are landless households and have no land to guarantee subsistence and the men's income is not sufficient to meet the family's need and therefore, it becomes necessary for the woman to supplement the income and become agricultural labourers.

Figure 1.4 Women's Working Hours on Far
(NAJAFGARH BLOCK)

4.2 Land Rights The single most important economic factor affecting women's situation is the gender gap in command over property, an issue virtually neglected in research, policy and grassroots action. In rural Delhi, the most significant form of property is arable land, a critical determinant of economic well-being, social status, and political power. Yet few women possess a field of their own. Despite the symbolic association between women and land and the widespread cultural perception of earth as mother, women hardly own any land. Women produce majority of the food, but they share limited control over, ownership of, and access to land (Sachs, 1996). Rights are defined here as claims that are legally and socially recognized and enforceable by an external legitimized authority be it a village-level institution or some higher-level judicial or executive body of the State. Rights in land can take the form of ownership. Today most arable land is privatized; in India, about 86 per cent is private and 89 per cent of rural households own some land.. Inheritance laws vary by religion and region, and although they give women today much greater rights than did custom, significant inequalities remain. Even more important is the enormous gap between women's rights in law and their disinheritance in practice. This has critical implications for welfare, efficiency, equality and empowerment.

Evidence shows "a systematic bias against women and female children in the intra-household allocation of resources controlled by men, including resources for health care and food. The bias is strongest in northern India. Further, where both women and men control resources, women especially in poor households are noted to spend their incomes mostly on the family's basic needs and men in greater part on Field needs. Direct access to economic resources would thus reduce both women's own and the children's risk of poverty. Indeed, even women of rich households can face poverty following marital breakdown. For Female -headed households with little or no male support (estimated to be about 20 per cent of households in India and

Bangladesh), the link between direct resource access and physical well-being needs no emphasis."(Agarwal, B. 2002)

Among female-headed rural households a lack of land titles reduces access to credit, inputs, and information on new technologies. Land titles could motivate and enable women farmers to increase output by adopting improved technique and practices. Titles for women become especially important given a growing feminization of agriculture, as more men shift to non-farm employment. Supporting women farmers would also enlarge the information base of farming in many regions. Women know more than men about indigenous seed selection and cultivation methods. Apart from gender equality being a measure of a just society, more equal property rights would enhance women's bargaining power within the family and community. Women owning even small plots, in contrast to landless women, feel more respected by family members and by villagers, are better able to challenge social inequities, and have a greater say in public decision-making bodies. In other words, equality in land rights is linked with women's empowerment, defined here as a process that enhances the ability of disadvantaged ('powerless') "individuals or groups to challenge and change (in their favour) existing power relationship that place them in subordinate economic, social and political positions"(14)

"Advancing gender equality, through reversing the various social and economic handicaps that make women voiceless and powerless, may also be one of the best ways of saving the environment, and countering the dangers of overcrowding and other adversities associated with population pressure. The voice of women is critically important for the world's future—not just for women's future."

-Amartya Sen

5. WOMEN AND LIVESTOCK MAINTENANCE Women perform a vital role in animal care that is, feeding and cleaning, milking and cleaning cattle sheds. Feeding and cleaning include bringing fodder from the fields, preparing feed, feeding and bathing animals, especially the buffalo. Cleaning cattle sheds included removal of cow dung from cattle sheds, making cow dung cakes and managing their storage in the open yards of the family mostly located on the outskirts of the village. Women have been the Field experts in animal husbandry as well as the food processors in the traditional dairy industry, making curd, butter, ghee and butter milk. But also with the dwindling population of milch cattle that expertise is not fully utilized now (Shiva, 1988). Women's role in livestock management has been given in detail in Table 1.3. Women's contribution to the economy of the village through their work with cattle has been very significant. In Alipur block 60 per cent of females spend some time during the day looking after their livestock. Only 16 per cent of the female respondents spend less than 4 hours daily, 34 per cent females 4 - 8 hours daily and 11 per cent spend more than 8 hours daily looking after their livestock's. While 40 per cent of female respondents spend no time as they don't have livestock's (Figure 1.12). And 8 per cent of the Jat females spend more than 8 hours daily looking after the livestock, while 7 per cent of the Scheduled Caste females spend less than 8 hrs looking after livestock, because they usually have small animals like goats as compared to Jats or Brahmins who have bigger animals like cows or buffaloes that need more time in maintenance. Some of the female respondents who owned livestock looked after the maintenance of the livestock entirely by themselves. Usually a household had 2- 4 Buffaloes and a female spent nearly the whole day in this activity
(Plate 1.3 & 1.4).

"Women possess good knowledge of various aspects of livestock production management and particularly of feed resources. They know each animal's production characteristics, temperament and feeding behaviour. Most women were aware of the need for good quality feed to achieve better production"(Suman, M. et.al 2017) but felt that feeding a non-productive animal with quality feed was not necessary. In any case such cattle make up the deficiency on their own while they were herded in the jungle. Women perform a vital role in animal care that is, feeding and cleaning, milking and cleaning cattle sheds. Though women play a significant role in livestock management and production, women's control over livestock and its products is negligible. They need to have more control over sale and purchase of cattle and their milk and milk products. Around 25 – 30 per cent of the milk is sold collectively both by men and women. And 30 to 40 per cent of cattle is sold and bought collectively.

Table 1.3 Women's Role in Livestock Management

ACTIVITY	GENDER	TIME
1.Clearling of Shed	Female	Daily
2. Bathing Animals	Female	Daily
3. Feeding Fodder	Female	Daily
4. Milking	Female	Daily
5. Grazing	Male / Female	Daily
6. Storage of Milk	Female	Daily
7. Taking Animals in & out of Shed	Female	Daily
8. Giving Water to Animals	Female	Daily
9. Care of Lactating Animals	Female	Daily
10. Care of Sick Animals	Female	Daily
11.Selling Milk	Male / Female	Daily
12. Making Cow dung Cakes	Female	Daily
13. Storage of Cow dung Cakes	Female	Daily

Source: Guhathakurta and Sarin in Venkateswaran, S., 1995

In Alipur block 54 per cent of the females collected fodder for their animals. Among the Jat community 21 per cent of the female respondents collected fodder. A total of 15 per cent of Scheduled Caste women collected fodder. In the Najafgarh block 70 per cent of the female respondents collected fodder, while only 2 per cent males of the house is involved in this activity. Only 2 per cent of the servants in the households collected fodder. Among the Jats 43 per cent of females went for collection of fodder and only a per cent of servants were involved in this activity. In the Brahmin community 11 per cent of the females of the household collected fodder, only one household had a servant. The Scheduled Caste and OBCs, all had females of the households collecting fodder for their animals. The purpose of raising cattle in Alipur Block was mainly domestic with 29 per cent of respondents, while in Najafgarh Block it was 45 per cent households. Livestock in India plays multiple roles in the village economy by providing products for consumption and sale such as milk, milk products, meat and wool, draught energy in agricultural activities, domestic energy for cooking and manurial inputs for crop lands.

Ecologically, the cow has been central to Indian civilization. The integration of livestock with farming has been the secret of sustainable agriculture (Shiva, 1988). "Livestock are not only a part of the farming system in India but are also closely linked with religion and culture. Most of the work involving livestock management is considered the traditional responsibility of women. Livestock are not only a source of employment, income and food but are also critical to strong socio-cultural linkages in countries like India. These animals were given a place of importance by the society in recognition of their contribution to human welfare"(Suman, M. et.al 2017).

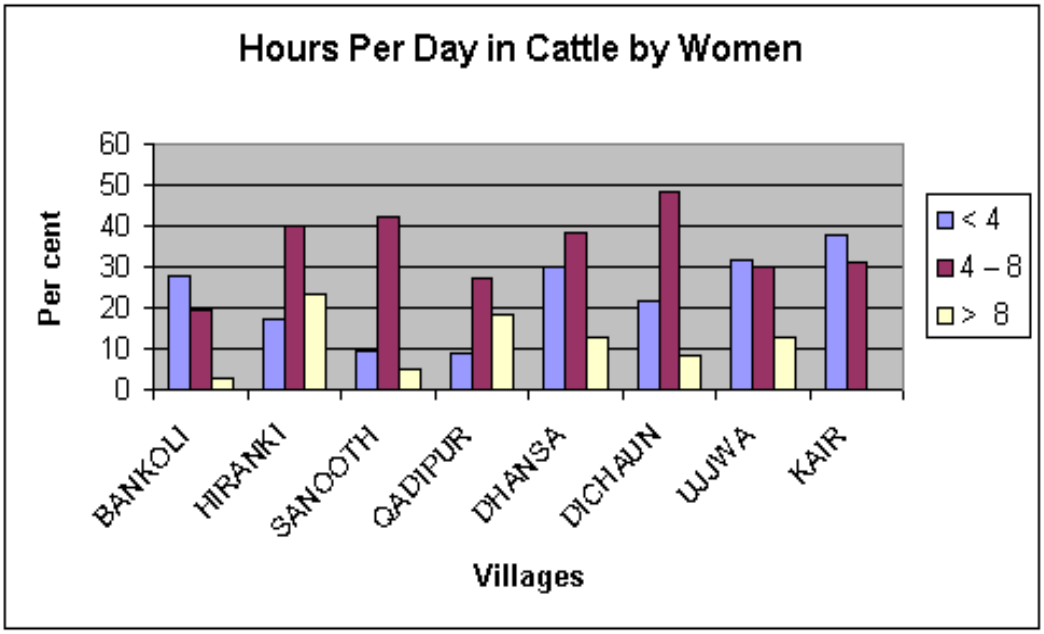

Figure 1.5 A Women's' Time Spent in Cattle Care (hours per day)

Like most other activities, women's role in livestock management varies across class. Women of landless and small-peasant households perform all the activities listed in above table, whereas women of medium farmer households perform tasks confined to the house, such as feeding and milking. Women of rich farmer households, on the other hand, perform mainly supervisory functions (Venkateswaran, 1995). In the Najafgarh block 77 per cent of the females spent 4 -8 hours daily looking after their livestock. Almost 43 per cent of the females of the Jat community spend time maintaining their livestock. While 5 per cent spend more than 8 hours daily. But only 13 per cent of the females of the Brahmin community spend time looking after their livestock (Figure 1.5).

Figure 1.6 Collection of fodder

Conservation of feed and fodder is usually discussed by most technicians as a new technology (to be transferred to the farmers). However, while studying the traditional "practices of feeding animals it was noticed that conserving supplementary feeds for use during the dry season is a traditional practice. Through their experience, women have identified supplementary feeds beneficial to animal productivity. Most of these are available seasonally and are generally dried and stored for use in the dry season" (Suman, M. et.al 2017). Collection of fodder for animals is primarily the activity of a women only in the rural households (Fig. 1.6).

6. MANAGEMENT OF DOMESTIC ENERGY BY WOMEN Self-reliance in energy supply is a vital factor in the development of any nation. Energy from biomass holds a promising scope under Indian conditions because this sector encourages self-reliance through efficient use of indigenous resources and employment of simpler technologies consistent with minimum pollution hazards. Energy consumption is an index of a country's economic development. In rural areas, firewood constitutes to be the major source of fuel, followed by animal dung.

The disposal rate of dung collected in the household varies from season to season. In rainy season, 85 per cent of the dung collected is diverted into manure pits and only 13 per cent is converted into dung cakes vis-à-vis 58 per cent diverted into manure pits and 40per cent converted into dung cakes during winter. This is because in winter, the requirement of domestic fuel is high and the cultivators find it a cheap fuel. In rainy season, it becomes difficult to prepare and dry the dung cakes. During summer, about 1/3rd of the total dung is converted into cakes to meet the fuel requirements (Plate 1.5).

6.1 Cooking mode in the Households Domestic energy for a vast majority of rural homes derives primarily from biomass fuels as by products of forestry, livestock and agriculture. Biomass fuels comprise of wood, crop residue and dung cakes. A substantial proportion of firewood is collected from local forest. Rural households commonly used twigs and small branches for fuel. Women labourers often take part of their wages in agricultural residues that can be used as fuel (Venkateswaran, 1995). The major source of collection of firewood is the own farms of the respondents with 65 per cent of households, and forests with only 10 per cent. Source of wood fuels consists of stems, branches, twigs, saw dust and other residues from logging and wood processing activities.

Apart from wood, agricultural land produces biomass residues, part of which is available as fuel on an environmentally sustainable basis. Villagers rely predominantly on twigs, roots and thin branches, gathered mainly by women and children. Firewood is a biomass resource, but it is being extracted in a non- renewable manner. The origin of the problem lies in the fact that the bulk of the firewood is consumed in the poorest households for cooking and heating (Reddy, 1983). Traditionally women have gathered products from the trees and other plants, products which have provided them with the basic three 'Fs' of fuel, food and fodder, and for variety of other uses. The source of most of domestic energy used in rural households is provided by the burning of biomass and it is the women who are mainly responsible for its collection. To do so, the women walk long distances and carry heavy loads. The time spent will depend on the availability of the supply (Rodda, 1994).

Women cooking in rural kitchen with biomass fuels are exposed to pollutants found in biomass smoke, such as carbon monoxide, nitrogen oxide and suspended particulates. Prolonged exposure to these pollutants has adverse impact on the health of women, who spend between 3 to 5 hours daily cooking with biomass fuels. The burning of the cooking fuel envelops the indoor environment with heavy smoke. As women have to do all the cooking daily the effects could include eye problems, respiratory problems, chronic bronchitis, and lung cancer (Sugumar, 1990). Many studies conducted by World Health Organisation (WHO) have revealed that the concentration of pollutants inside the Indian kitchen is much higher than the prescribed standards. Most of the women keep their children in the kitchen/cooing area while they are busy in cooking, thereby exposing the children to the prevailing pollutants there.

7. WOMEN AND WATER

"Water, water everywhere, yet not a drop to drink".
Samuel Taylor Coleridge (As quoted in Rogers, and Feiss, 1998)

The Ancient Mariners immortal lines have a nightmarish reality in today's world. Water as is well known is one of the five basic elements of Nature held sacred by our own scriptures. While all environmental concerns are important, there is a growing realization that water is the most important common element in environment. In a very real sense water is life.

7.1 Water Collection Women are the main carriers of water. It takes up much of the women's energy intake, as they have been reported to carry as much as 5 to 10 Kg weight of water in a single trip. The women of the household collect the water for household consumption i.e. for cooking, washing and bathing only. Tap within the house is the main source of water. In addition hand pump is also the source of water for household consumption. But the villages generally do face an acute shortage of water. The respondents reported that some times supply of water was suspended for as long as three days and the females had to travel 2 -4 kms. daily to collect water for household consumption. In one of the villages, to meet the water shortage, the Jat community had ordered a water tanker separately for their community only. There were frequent fights over water. Majority of the women i.e. 88 Per cent in Alipur Block collected water daily from their household taps or hand pumps. But 12 Per cent of the female respondents had to travel up to 3 km. daily to fetch water for household consumption. In the summer season the region faces acute water shortage when the taps of the households go dry. At this time the higher class communities like the Jats, Brahmins and Rajputs arrange for Water Tankers of the Delhi Jal Board. It is a typical sight to watch village women, children carrying buckets, cans, jars etc. to gather around the tank hustling to collect water. Sometimes there are little disputes also over who will collect water first and how much. But the poor communities like the Scheduled Castes, Scheduled Tribes and Other Backward Classes have to face acute drinking water shortage as they cannot afford to call water tankers (Plate 1.5 & 1.6).

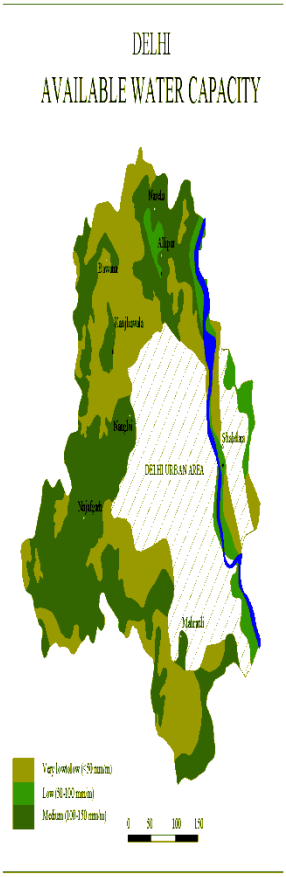

Figure 1.7 Available Water Capacity in Delhi

Women play an important role in domestic water provisioning, but a gender analyst is also interested in relations between women and other women and here we find that relation of power between women in households frequently gives rise to patterns of delegation of water work within the households. Older women characteristically shift the more strenuous tasks to

younger women, daughters before their marriage and young wives of sons, who are expected in many cultures to obey their mother-in-law (Merry, and Bainskar, 1998,). In Najafgarh Block 77 Per cent of women collected water from a source within their house itself, but 23 Per cent of them had to travel 3- 5 km. every day to find and collect water for the household.

All the female respondents of Alipur Block and Najafgarh Block complained of decrease in water availability in their respective villages. Regarding the quality of drinking water 63 Per cent respondents in Alipur Block said that it was good and 34 Per cent said it was tolerable and only 4 Per cent described it as poor. Whereas in Najafgarh Block 30 Per cent women said the quality of water was good, 22Per cent as tolerable, a substantial 48 Per cent responded that the quality of water was poor.

The impact of water availability can be gauged through the lower female literacy rate and almost an absence of working rural women. The awareness levels of women from both Alipur and Najafgarh were found to be high because of the accessibility of Cable T.V. The women of Alipur had a higher literacy rate, because of easy availability of water which le ft them with enough time to engage in education and other vocations. In Delhi's fringe area, it was observed that there is a direct relationship between the water availability and income levels of the farmers as well as their general social development. Four parameters have been chosen to study the socio-economic implications of ground water degradation. These are: family size, ownership of tube wells and other luxuries like telephones, cars, etc. along with the income levels in the studied villages.

CONCLUSION

In recent years, although many gender-sensitive groups have emerged, only a few have focused on women and land. The issue of gender equality in land rights - not only in law but in practice-well call for a much more multi prolonged effort at the national level than undertaken so far on any other gender related issue.

- Develop programmes to train *Panchayat* leaders in gender-integrative participatory approaches and local planning.
- Develop programmes for rural women to build leadership skills for managing agriculture community-based development activities.
- Support agriculture extension in-service training programmes and other relevant agricultural curricular activities to support gender-sensitive extension agents.
- Support women-managed rural production and marketing ventures in horticulture, floriculture and post-harvest processing in commodities.
- Provide technology training and input support to women to take advantage of emerging high-value agribusiness sector including bio-technology and forest products.
- "Given the diversity of the agro-ecological system and the resulting wide varieties of farming systems, it is important that state level efforts in gender planning are supported by gender/sex segregated data pertinent to local situation". (https://shodhganga.inflibnet.ac.in/jspui/bitstream/10603/127254/7/07_chapter%202.pdf)
- "Agricultural education institutions and training centers should develop regular curricula"(UGC Approved - HOME AIIRJ : AAYUSHI INTERNATIONAL INTERDISCIPLINARY RESEARCH JOURNAL (AIIRJ) (aiirjournal.com)) to integrate a gender approach in all technical areas of agricultural sector.

- Review of the land right policies and implementation of land distribution for gender equity and women's land rights. Farmer's right initiatives should explicitly address concerns of women farmers.
- There is need for adopting roof- top rainwater harvesting and augmenting ground water storage. Rainwater harvesting is the collection of rainwater and channeling the water into and underground storage tank or reservoir.
- Along with adequate sewage treatment plants to recycle water, it is also necessary to have pipes laid to carry the recycled water to consumers.
- The issue of local ownership and knowledge, which can be defined as ecological democracy, is fundamental to our understanding of water issues. That peoples' knowledge based, non-technocratic solutions are the need of the hour. Uproot concrete surfaces, and re-lay them with more permeable material.
- Create percolating tanks, revive dead tanks, recycling waste water, rotation of crops, reduce dependence on chemicals/fertilizers, promote sensible water conservation/ management, and achieve balance between cash / food crops.
- The need of the hour is to use low cost appropriate technologies, "efficient use of surface and ground water, optimum utilization of water for irrigation, careful use of fertilizers to avoid contamination of drinking water source through nitrate and strict introduction of ground water legislation, financial management of water sources needs to be also rationalized" (Agarwal, B. 2002)
- It is not enough to provide drinking water supply in rural areas, the crucial need is to generate awareness among the people about health education and sanitary aspects of drinking water from the stage of collection, storage handling and consumption.
- For spot sources, hand pumps and small installations at village level, village committees should be formed and motivated to operation and maintenance.
- As water is withdrawn from agriculture, more attention must be given in the management of irrigation systems to water needs for multiple uses —not only for agriculture, but for other domestic uses, and for environmental needs.
- Policies and institutions must be developed and cost-effective management practices adopted to halt the environmental degradation caused by overexploitation of groundwater resources.
- Women's right to own and inherit land should be enforced. Individual and communal security of land tenure should be guaranteed. Women should have access to credit, and to agricultural extension and resource management services, and they should be included in decisions about the services' organization and content.
- Women's involvement must extend to information, education and services for reproductive health and rights. Choice about fertility is a step towards equality: women thus empowered can intervene in other decisions in the household and the community, for example, education and health care for girl children. The use of common resources and the development of economic opportunities. Women's involvement in health and environmental decisions works to the benefit of individuals, society and the environment itself.
- Raise local value-per-drop of water. New technologies and production systems can promote the manufacture of high-value products locally. Programs can maximize

employment through developing a range of productive enterprises and involving local people in construction and operation of systems. Planners can use water systems as "growth points" where services, markets, and employment are also stimulated. New methods are under development for assessing the value of water to small producers, including "water and well-being" indicators.

- Create and manage community-based water assets through small water points, water harvesting, or better soil and water management. Initiatives can also build disaster preparedness; use short-term relief measures that build water assets, and work to break the link between ill-health and poor water management.
- Allocate water in a way that creates roles for and empowers excluded groups, with a special focus on opportunities for women. Techniques to assess water use and value at the system and basin levels can aid decision-making about remaining water development options.
- Make use of various mass media to create environmental awareness in rural areas. Rural people should be made aware of various sources of pollution and its bad effect on health and life.
- Conduct mass immunization and inoculation programmes, cleaning of village ponds and wells, construction of *gobar* gas plants.
- Environment Impact Assessment (EIA) to evaluate adverse impact on human developmental activities on environment should be done.

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Plate1.1: Rural Women working on Farm in Najafgarh Block

Plate 1.2: Agricultural Labourers in Bankauli Village (Alipur Block)

Plate 1.3: Women taking Buffaloes to the Pond

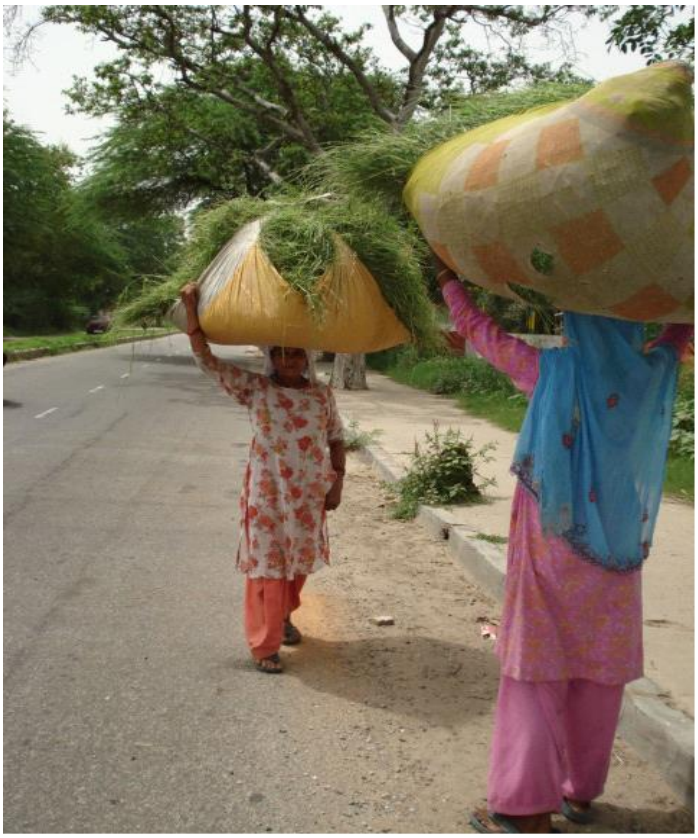

Plate 1.4: Women Carrying Fodder for Animals

Plate 1.5: Women making Cow Dung Cakes

Plate 1.6: Women Fetching Water from Water Tankers

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