GENDER ROLES IN FARMING SYSTEMS IN HARYANA STATE, INDIA: IMPLICATIONS FOR FOOD SECURITY

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Local and Global Dimensions of Food Security

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INTRODUCTION

Since the 1970s there has been concern expressed regarding the gap between women's actual economic participation and public perception of it. Women constitute about half of the world's population, their labour contributes to 60 per cent of the hours worked, contributing up to 30 per cent of official hours. Yet women receive only 10 per cent of the world's income and own less than one per cent of the world's property (Gupta, 1987).

An analysis of international statistics (ILO, FAO, NPC) was carried out by Dixon (1982), which showed that women constituted 38 per cent of the agricultural labour force in developing countries. For nineteen countries of South and South East Asia, Dixon (1982) estimated that 45.3 per cent of the agricultural labour force consists of women. Even this figure is an underestimate, due to defects in data collection methods which included undercounting of the contribution of unpaid family labour, underestimate of seasonality of women's labour and the self-reporting bias of the interviewees who are by and large male. One reason for continuing research in this area is that despite their significant involvement in agricultural work, women have not received appreciation and recognition of their extensive economic contribution. By and large, they have remained as "invisible workers". Throughout the 1980s and 1990s many researchers have attempted to overcome this invisibility through gendered empirical research studies focusing on gender analysis and gender roles.

In India, there are 406.30 million women (48.15 per cent of the total population) and in the state of Haryana women constitute 46.38 per cent of the population. Out of the total main workers population, female workers comprise 9.72 per cent more than the comparative national figure of 16.46 per cent. About one third of the female population of the state is engaged in agricultural activities which is three times higher than the comparative national figure of the female work force (34.18% against 11.69%). In field activities, women in Haryana state do more field work than men (Manekar, 1990).

This paper results from an empirical study carried out in 1997 which was designed with the following objectives :

- To study the gender roles in the farming system in terms of operations and time spent.
- To suggest implications for food security.

A second study, also conducted in 1997, attempted to measure the impact of training on behaviour and practice in relation to food storage.

There is a substantial research literature on intra-household issues and inter-relationships in African agriculture (Low 1986; Gayer 1986; Peters 1990; Okali and Sumberg 1986) some of which traces the negative effects on women of modernisation, mechanisation and new technologies. Much of the hoeing, weeding, harvesting, storage, transporting, processing etc. is done by women, as 50-70% of African farmers are female (McGuire & Popkin 1989). With growing feminisation of agriculture, it has become clearer that the problems of food production are not just limited to those of producing enough food: the whole food system - production, processing, packaging, storage and distribution - suffers from losses at each stage, losses which result in reduced nutritional status.

METHODOLOGY

Haryana state is divided into three zones, ie. hot-arid, hot-semi-arid and hot-humid on the basis of agro-climatic conditions. Two districts from two regions, ie. hot-humid and hot-semi-arid of the state were purposively selected for this study. Two villages from each district were selected randomly for collection of data. Twenty-five men and women from each of the four selected villages were randomly selected for interview through a structured interview schedule.

THEORETICAL BACKGROUND

Indigenous technical knowledge can provide techniques for improved storage and reduced loss.

Indigenous technological knowledge of agriculture is a valuable resource and an essential foundation for the development of agriculture. It is an unwritten body of knowledge; there is no systematic record to describe what it is, how it might change, its operations, its boundaries and its applications. Knowledge is held in different brains, languages and

skills in as many groups, cultures and environments. Indigenous knowledge since the evolution of mankind reflects needs in relation to the available resources and the context of agriculture, animal husbandry, ayurvedic medicine, engineering, storage, weather etc.

Post-harvest technology involves the conservation of agricultural produce by eliminating avoidable losses and improving nutritional value of foodstuffs by processing, fortification, packaging, transport and marketing. It encompasses numerous operations. This paper focuses on useful, inexpensive and traditional techniques to improve storage, with the underlying goal of contributing to food security at the local level. Storage loss occurs due to damage by insects, mites, rodents, birds, heat, moisture etc. Post-harvest losses vary from region to region, but currently in India foodgrain loss is estimated at 10% annually, and fruit and vegetable loss at 30-40% of produce. As women are mainly responsible for post-harvest storage, the paper also identifies the gender roles in agriculture in a specific area of India and discusses possible impact of training on women's improved knowledge of storage techniques.

In India women's role in production, processing and storage of foodgrain crop is well known: 60-70% of labour is provided by women, increasing to 80% in crops such as paddy.

SURVEY FINDINGS AND DISCUSSION

Summary

Agricultural activities were found to be clearly gender tasked: pesticide dusting, spade work during field irrigation, ploughing, sowing, manure and fertiliser application, uprooting of seedlings and marketing of grains were exclusively performed by men. Transplanting and storage of grains were exclusively done by women. Other farm activities such as weeding, harvesting, carrying head load, threshing and winnowing were performed jointly but predominantly by women.

There were found to be class differences also. The average work load of men and women of the lower socio-economic stratum were higher than those of high and medium socio-economic strata respondents in farm operations. Women from the low socio-economic

stratum performed more work in crop cultivation than the women of high and medium socio-economic strata. This it is hypothesised may be due to the fact that the respondents of low socio-economic stratum are mainly landless and wage earners, who are left with no other alternative for their livelihood, than to work on others' fields as agricultural labourers.

Animal husbandry is predominantly a male concern among respondents of high socio-economic status, whereas, it is predominantly a female responsibility for farmers of medium and low socio-economic status. On average, a woman devotes 3.5 hours per day to animal husbandry activities against only 1.6 hours per day devoted by men.

Agricultural activities

The data reported in Table 1 indicate that in the case of wheat, cotton and *Bajra* cultivation, there are six operations which were performed exclusively by men namely pesticide dusting, spade work during field irrigation, ploughing, sowing, manure and fertiliser application and marketing of grains. There is only one operation namely keeping parts of grains for consumption which was performed exclusively by women. The remaining six operations namely weeding by *kasola*, weeding by *khurpi*, carrying a load on the head, winnowing, harvesting and threshing are performed by both men and women. Out of these six operations, carrying a head load is predominantly performed by women (over 80%). The other operations; weeding by *kasola* and *khurpi* (over 80%) in wheat, weeding by *kasola* in *Bajra* (81.30%) and in cotton (51.11%) crops are predominantly performed by women. Even in the case of harvesting about 65 per cent of the work load in wheat and *Bajra* crops and more than 90 per cent in the case of the cotton crop is done by women. The heavy occupation of women in these six operations has resulted in substantially higher labour contributions by them in the cultivation of wheat , cotton and *Bajra* crops. On average a women devotes 14.72, 28.42 and 15.37 man days against 14.19, 19.83 and 12.85 man days devoted by a man in the cultivation of one acre of wheat, cotton, and *Bajra* crops, respectively. The data reveal that the major occupation of women labour in wheat, cotton and *Bajra* cultivation is in weeding and harvesting. They spend more than half of their man days (deployed in wheat, cotton, and *Bajra* cultivation) only in

these operations which they carry out either with the help of *khurpi*, *kasola* or sickle. These appear to be the exclusive domain of women closely followed by the on head carrying of the harvested crop. In the case of paddy cultivation the same operations are dominated by men exclusively with the addition of uprooting of seedlings; transplanting and storage of foodgrains were found to be the exclusive domain of women. The remaining four operations, i.e., weeding by *khurpi,* carrying a head load, harvesting and threshing were performed by both sexes but man days of women heavily outnumbered the days devoted by men to these activities. Weeding and carrying harvested crops on the head were predominantly (to the extent of 90%) performed by women. Even in the case of harvesting and threshing, about 70 per cent of the operations are performed by women. These six operations of paddy cultivation showed a higher contribution of labour by women than by men. On average, farm women devote 23.02 man days as against 19.18 man days devoted by men in the cultivation of one acre of paddy.

Attempts were made in this study to find out the significant difference in the involvement of men and women of various socio-economic strata in selected crop cultivation. The mean scores of the involvement (in terms of man days) of rural men and women in wheat cultivation with "t" values have been incorporated in Table 2. The results show that in male dominated operations (ploughing, sowing, manure and fertiliser application, spade work during field irrigation, pesticide dusting and marketing of grains) the mean scores of man's workload in all three socio-economic strata were higher than women. However, in the case of female dominated operations (weeding by *kasola* weeding by *khurpi*,carrying load on head, storage of grains) and jointly operated operations (harvesting, and threshing) the mean scores of women's involvement were higher than those of men in high, medium and low socio-economic strata as well as in pooled data. The data further shows significant differences between men and women's work load in male dominated, female dominated and jointly performed operations. The overall work load of women (in terms of average man days) was higher than that of men in high and medium socio-economic strata whereas, reverse trend was observed in case of low socio-economic stratum. However, pooled data show higher involvement of women than men in wheat cultivation. The

statistical result show no difference between men and women's involvement in wheat cultivation in all the socio-economic strata categories. The Table further shows that the average work load of men and women of low socio-economic strata respondents in all the operations. It may, therefore, be inferred that low socio-economic stratum women performed more work in crop cultivation than the women of high and medium socio-economic strata. The obtained involvement patterns confirms the heavy work load of the women of low socio-economic stratum, probably due to their being landless wage earners. As these womenfolk are left with no other alternative for their livelihood they are pushed into less skilled, low paying, more time consuming and drudgery prone activities.

Animal husbandry activities

Per day participation of men and women (in terms of average man days) in various activities of animal husbandry is reported in Table 2 with inter-sex variations (*"t"* values). The data reveal that in the case of high socio-economic stratum men scored over women in all animal care related activities viz.; bringing fodder from field, chaffing the fodder, feeding the animals, protect animals from ticks, cleaning of animals, milking and offering water. It ranged from 0.03 to 0.65 man days in the case of men as against only 0.01 to 0.27 man days for women. The inter sex differences in these activities were found to be statistically significant at 0.05 level of probability, except in the case of preparation of feed, cleaning and milking.

For both the medium and low socio-economic strata, women's involvement in animal husbandry activities were found to be significantly higher than men in all operations except cleaning animals in the case of the medium group and offering water in the case of the low socio-economic strata respondents.

The results, therefore, clearly reveal that animal husbandry is predominantly a male affair in the case of farmers of high socio-economic status, whereas, it is predominantly a female affair in the case of farmers of medium and low socio-economic status. However, the researcher's experience suggests that this inter socio-economic status variation is quite deceptive. If we take only family labour into account, the result would be uniform across

socio-economic status. But in the case of farmers of high socio-economic status, a majority of them had employed permanent male labour to look after the animals which has in fact off set the result in favour of men in this stratum.

Household activities

The data relating to time spent by men and women in different household activities in the present study have been incorporated in Table 3. It can be observed that in household activities, pre-cooking, cooking, post-cooking, washing clothes, cleaning house, care of children as well as overall, the mean score of men's involvement was negligible in all landholding categories.

It may be inferred that women exclusively perform all the household tasks. On average a woman devotes about 7 hours and 25 minutes to household chores.

The multiple roles of women in agriculture specially in food storage are generally, underestimated and undervalued. By and large, they have remained as "invisible hands". But women play a significant role in grain storage. Therefore, it become essential to transfer appropriate food storage technologies to women at grassroot level so that they can adopt these for their continued use.

IMPLICATIONS FOR FOOD SECURITY

Women are largely responsible for post-harvest care of crops, especially storage of foodgrains and processing. With concern to identify practices related to food security, an investigation into indigenous practices for safe storage of grains identified 24 practices which were found effective after testing in the field situation; these include:

- Use of neem leaves(*azadirachta indica*) after drying in shade for storage of foodgrains.
- Use of match boxes to protect from moisture and insect pests.
- Storing wheat in jute bags under wheat straw mounds to protect from insects, pests and moisture.

- Disinfect the storage structure with neem leaves' smoke before storing food grains to avoid insect attack.
- Use of polythene sheet in jute bags for storing food grains to avoid insect attack.
- Food grains stored with husk to avoid insect attack.
- Tarcoal sheet used in between storage structure to avoid insect attack.
- Neem oil used to protect food grains from insect infestation.
- Powdered drupes and dharak leaves used effectively against insect infestation of food grains .
- Kalongi (Nigella sativa linn) and neem (pogostenon leyreams) against insect attack on stored food grains.
- Mint and Methi leaves can effectively be used in protection of wheat against insects.
- Use of garlic bundle in stored wheat is effective in protecting foodgrains from insects and pests.
- Begonia leaves when stored with paddy and rice found effective in reducing insect infestation.
- Turmeric powder mixed with rice protects against insect infestation.
- Boric powder mixed with rice protects against insect and pests.
- Use of mercury balls as a protectant of food grains.
- Custard apple seed powder used against pulse beetle, could be used as a seed protectant.
- Mixing of olive, coconut, groundnut, mustard, sesame and taramira oil with pulses found effective in reducing insect infestation.
- Mixing neem oil, powder of kernal cake leaves and flower of babulgum (accacia arabica) proved safe against insect pest infestation.
- Mixing ash with whole pulses protects them from insects and pests.

- Multiplication of pests can be stopped after using one centimetre layer of wood ash or saw dust.
- Foodgrains storage in jute bags with bhusa found effective in avoiding insects and pests.
- Use of mint oil vapours in grain storage reduces hatchability and protects foodgrains from insect infestation.
- Sun drying is effective in limiting insect attack.

Indigenous practices of safe storage of food grains are not only harmless but also more effective, cheaper and locally available. These indigenous practices can significantly reduce losses due to insect, pests and moisture and assist women in their practical needs to maintain a safe, adequate supply for household consumption without investment in expensive imported technologies.

RESEARCH STUDY 2: IMPACT OF TRAINING

Another study was conducted in two villages of Haryana State. Sixty women were given training regarding indigenous methods of post-harvest technologies through the use of slides with synchronized tape. An impact assessment was conducted to assess gains in knowledge.

The result of the study revealed that women succeeded in acquiring knowledge at the first exposure level. Sufficient gain in knowledge regarding post-harvest technologies (wheat, rice, pulse indigenous) was recorded for the sub components; importance, different post-harvest technology operations, causes of spoilage, indigenous methods, use of storage structure, advantages, disadvantages and precautions (as shown in figures 1,2,3). Thus, it may be inferred that exposure to information through the side synchronized tape had increased the knowledge of women regarding all components of indigenous post-harvest technologies.

CONCLUSIONS

1. Farm women constitute a significant number of the economically active population not only in India but in other predominantly rural countries. A clearer understanding of their status and roles in the farming and food system is essential to any strategy which focuses on improvements in food accessibility. Studies such as this one provide detailed information on tasks and activities of males and females inside and outside the home where food-related activities strongly depend on the woman's labour contribution and on her level of knowledge.

2. Indigenous or traditional technological knowledge, now often but not always adapted or integrated with scientific knowledge, contributes in a major way to the preservation of food and control over food loss. For many of the rural poor scientific chemical products are unavailable, too expensive and, when used, often prove hazardous. In rural poor areas dissemination of tried and tested traditional methods should be the focus of extension and not the emphasis on purchase of expensive, foreign products.

3. Training and access to information is much needed by rural women, who are often excluded from more formal information networks. Extension agents tend to focus on male farmers, within an essentially male-dominated extension system. The brief report of the second study shows the impact that one training session can have on increased knowledge and understanding.

4. Through appreciation of local knowledge systems, better dissemination of proven traditional practice, with, where appropriate, targeted training on both traditional and scientific technologies, women's capacity to protect and store the foodcrops they produce will be enhanced. This contributes to agricultural development in a broader sense, using women's potential and skills, improved and enhanced, not only to increase productivity but to protect and preserve what is produced, and so improve food accessibility for poor rural producers and consumers.

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