REVIEW OF LITERATURE

"While women represent half the global population and one-third of the labour force, they receive only one-tenth of the world income and own less than one per cent of world property. They are also responsible for two-thirds of all working hours" says one United Nations study (Folbre, 1986).

Rajuladevi (1987) in a world's women report brings out the status of rural women in the world as follows. "Women grow half of the world's food but own hardly any land, find it difficult to get loans and are overlooked by agriculture advisers and projects. Women are one-third of the world's official labour force but are concentrated in the lowest paid occupations and are more vulnerable to unemployment than men. Women continue to outnumber men among the world's illiterates by around three to two. Ninety per cent of the countries have organisations promoting the advancement of women but women are under-represented in the decision making bodies of their country".

An overview of status of women in India

Even with the awakening of women and women's liberation movement during the past few decades, the female mortality rate is still in excess than the male mortality rate (Census of India, 1986). If this continues, according to Natarajan (1972), the sex ratio is expected to be woefully disturbed.

According to him the differences in the sex ratios are to be sought in two facts: "First, males and females are not born in equal numbers, and
secondly, they do not die in equal numbers either in infancy and childhood or in old age or in any particular age group or at all ages taken together.

The deteriorating sex ratio reflects on our social health, for it indicates risk to female lives at most ages. Low birth weights among babies (Gopalan, 1987), low life expectancy of the women than men (Census of India, 1988), high frequency and duration of illness episodes among women (Khan et al., 1983), high maternal mortality rate and female mortality rate (UNICEF, 1985-86) speak of the low status of women in India. Thus the low social status, poor dietary intake and poor antenatal care do have a part to play in the poor health status of women in India.

Kutty (1989) indicated that Kerala is justly famous for its low infant and child mortality among the underdeveloped communities in the world. Current figures of IMR in Kerala are 20/1000 (urban) and 28/1000 (rural). The linkages from women's health to child health can be conceived as three interdependent arms of a triangular relationship.  

a. Socio and cultural: better education figures, better position in society, resulting greater decision making power for the female within the family, late marriages, fewer childbirths and better child spacing; 

b. institutional: greater accessibility to institutions and their use in antenatal care and delivery; 

c. the above two acting through the biomedical link; elimination of high risk, teenage and late maternal age pregnancies, prompt intervention, better birth weight of babies, acceptance of immunization etc.

Dasgupta (1987) observed that the neglect with regard to health and nutrition is more predominant in daughters of high birth order. Similarly,
incidence of higher rates of malnutrition among girls and women than among boys and men in the same age groups is also well established (Gopalan, 1985).

The male, female differences in nutritional status are especially great among lower socio-economic/caste groups than among the higher caste/land owners. Levinson (1974) found that gender is the most statistically significant determinant of nutritional status.

Das et al. (1982) reported that sex discrimination has special significance for girls born into families who already have a surviving child, particularly among low socio-economic groups, a finding that is supported by the observation of Dasgupta (1987) that girls of high birth order have a greater mortality risk.

This lower status of women in India can be attributed mainly to the preference for sons perpetuated in the society. Such a "son preference" has its roots in religious, cultural and various social institutions of the country.

Nutrition studies in drought affected areas of six districts of Rajasthan in 1987 (Krishnamachari, 1989) showed that, while 8-10% of the boys below 3 years had grade-3 malnutrition, 11-12% of the girls below 3 years had grade-3 malnutrition. Interestingly, this picture changes at the age of 3. While 8-12% of the male children suffer from third degree malnutrition only 5-7% female children did so. Thus, it explains the differential treatment with regard to feeding practices when the children are entirely dependent on elders. The reason for better status of the three year
olds could be attributed to the possibility of the older children getting access to their own needs during scarcity.

The situation is worse in tribal areas during drought period. Prevalence of teenage pregnancy was 5-6% and the prevalence of severe malnutrition in children below 6 years was already high due to droughts. Malnutrition was higher in females than in males. The women were being treated worse than the cattle, constantly being brought and sold (Patel, 1989).

In general, higher rates of malnutrition have been reported among girls and women than among boys and men in the same age groups (Gopalan, 1985). In the times of food scarcity, females in all age groups had higher rates of malnutrition (Sen & Sengupta, 1983). It also appears that women in poor rural communities seek medical assistance for illnesses of their sons more frequently and promptly than for illnesses of their daughters (Gopalan, 1989). Thus in adulthood, 24% of women in the reproductive period have body weights less than 38 kg and 16% have heights less than 145 cm (NNMB, 1980). These women, according to the generally accepted criteria proposed by WHO, fall into the high risk category i.e., they are likely to suffer from obstetric complications and give birth to off-springs of low birth-weights especially in situation where antenatal care and most obstetric services are below par.

The literature which deals with the link between women’s food related work and the nutritional conditions in the household is limited. Most of the work that has been carried out has been on women’s situations in Africa and Asia. The main issues as the focus of the review here have been: (1)
Constraints and potentialities of women in providing adequate nutrition to their families. (2) Constraints and potentialities for women in catering to their own nutrition and other basic needs. (3) Areas of conflict and congruence between the two facets of the women's role as described in 1 and 2.

Main problem areas related to women's food chain activities

The food chain is defined as the sequence of events that take place around food, from the time it is produced until it is consumed. Fig. 1 illustrates the inter relations between nutrition related activities and nutrition.

1. Women's work load is so heavy that it may be
   a. a constraint to higher productivity in the food chain,
   b. a constrain to adequate child care and nutrition,
   c. a health risk to women themselves and a constraint for fulfilling their other basic needs.

2. Seasonal variations: In lean seasons women experience
   a. that not enough food is available to adequately feed themselves and their families.
   b. periods of extremely stressful work that leave them little time for adequate fulfilment of all their obligations in the food chain, especially for cooking and feeding.
Fig. 1. The Food Chain. Source: Holmboe - Ottesen et al. (1989)
3. Low productivity in the food chain:
   a. Women may be less productive in the food chain than men because they have less access to productive assets, including knowledge, and because of their time constraints.
   b. Women's traditional food-related tasks may be laborious and time-consuming and give low returns to labour.

4. The low status of women: Cultural norms and practices affect. Women's command over resources in the food chain and their priorities in allocation of cash and food.

5. Lack of infrastructure and services for women: Women's activities in the food chain may be hampered by insufficient local infrastructure and social services.

It can be seen from Fig. 2 that the generation of food and cash as well as the total work load of women's food chain activities are considered in relation to household nutrition and women's quality of life.

Micro-indicators of nutritional status of women:

Physiological stress during pregnancy

When classified by weight for age status, the NNMB (1980 & 1984) reports that only 20 per cent of urban and rural girls in India are normal and that the rest have varying degrees of malnutrition. Analysis of data on maternal height and weight in women (both urban and rural) in relation to age at first conception shows that there are no significant differences in the height between the groups. However, girls who conceive before they are 16
Fig. 2. Major relationships concerning women's activities in the Food Chain and nutrition.

Source: Holmboe - Ottesen et al. (1989)
weigh less and have lower mean haemoglobin levels. The stress of extra nutritional requirements of pregnancy coming close after the nutritional requirements for adolescent growth and the food supply is responsible for the poor nutritional status of girls who conceive before they are 16 years of age (Ghosh, 1987). Limited food availability further reduces the share of food to women including pregnant and lactating mothers. Lower maternal body weight, lower pregnancy weight gain and higher prevalence of anaemia and possibly pregnancy induced hypertension among girls who conceive before they are 16 years might account for the lower birth-weight and higher perinatal and neonatal mortality both in urban and rural areas.

As against 37.3% of mothers in the less than 38 kg category whose babies were of low birth weights, there were only 16.9% of mothers in the above 45 kg body weight category who had babies of low-birth-weight. Thus with increasing body weight, there were decreasing proportions of mothers delivering low-birth-weight babies (NFI, 1988).

While it is true, that the lower the maternal weight the greater the risk of low-birth-weights, nearly two-thirds of all low-birth-weights in the community are accounted for by babies of mothers weighing over 40 kg (pre-pregnancy), showing that factors other than low-maternal body weight such as possibly infections, continued physical stress till about the time of delivery, etc. also contribute to low-birth-weights to a significant extent.

**Teenage pregnancy**

Health and nutritional status of adolescent girls is a most neglected area in India and developing countries, despite the fact that 30-40% of
gravidas belonging to poor social class are teenage adolescents. The stress of growth demands of the pregnancy and additional malnutrition due to poverty, deprive adolescent girls reserves resulting in poor pregnancy outcome.

Studies carried out at the menarcheal and nutritional status of adolescent school girls between the age of 10-16 years belonging to different social class suggested that over the decades there has been a declining trend in age at menarche in all the social classes. The decline in age at menarche in poor urban slum and rural poor girls has been found irrespective of their poor nutritional status especially body weight. The incidence of iron deficiency anaemia was higher in rural girls who attained menarche than in urban girls.

Mean body weight and body mass index of adolescent girls who are pregnant are lower than that of the adult counterparts. Though mean birth-weights are not different in the two groups the percentage of intra-uterine-growth retardation is higher in low body-weight adolescents. Also percentage of mothers undergoing caesarian section for cephalo pelvic disproportion as well as difficult labour are higher in adolescents. Perinatal and infant mortality as well as maternal mortality rates are higher in younger age group (Raman, 1980).

The additional stress of lactation during pregnancy results in deterioration of maternal nutritional status especially when the inter-pregnancy interval is less than one year. Among the low income rural women whose dietary intakes are low, continued manual labour in agricultural operations
has an adverse effect on maternal nutritional status during pregnancy (Ramachandran, 1989).

According to NIN (1986-87), while there are no differences between boys and girls below the age of 6 years, beyond this age, females always have higher prevalence rates of anaemia as compared to males. With increasing age, prevalence rates come down in males, while such a reduction does not occur in females. As a result, in the active reproductive age, a substantially higher proportion of women suffer from anaemia.

Thus, position of remaining Indian society is characterised by a declining sex ratio, higher mortality than males from infancy through 35 years of age, high fertility, poor health status, literacy, low participation in the organised work force, increasing concentration in the unorganised sector, near absence of social support measures and increasing social and domestic violence. Atleast 150 million women and girls in India to-day live in conditions of adjunct poverty on the brim of survival.

Any serious attempt to substantially improve the status of women in India should address the following issues: 1. Women must have control of productive resources such as land, cattle and credit; 2. The programme should meet the basic needs of the poor such as potable water, adequate fuel, food and basic and preventive health care; 3. Need for a political will to reallocate resources for the benefit of the most needy (Sundari, 1989).
According to Mathai (1989) the mother's poor nutritional status during pregnancy and delivery impair her future and her ability to perform tasks which are her normal responsibility. It also affects the health and development of her child. The girl child whose growth is retarded in utero and early years of life, arrives at the stage of motherhood in poor nutritional status (Figs. 3 and 4). The vicious cycle thus goes on.

**Maternal education and nutritional status**

Maternal education is associated with decrease in child mortality and improvements in family health (Behm, 1979; Cochrane et al., 1980; Wolfe and Behrman, 1983). It is also believed that educated women make better use of their time and available resources. Caldwell (1979) postulates that the education of women significantly alters the balance of power in the home, making women less fatalistic and giving them greater confidence to take decision making into their own hands. An educated woman, he claims, will allocate a larger share of resources for feeding and caring of her children. Ware (1984), however, argues that there is no direct evidence to indicate a casual sequence of events. Similarly, Dewalt and Pelto (1978), Santo and Salgodo (1981) and Sen and Sengupta (1983) found that the level of nutritional knowledge was not strongly correlated with adequate consumption. Important determinants of household consumption and nutritional adequacy were: material life style (size and construction of house, ownership of appliances, furnishings), household consumption (including the number of wage earners), ownership of animals, occupation of household head, etc.

On the contrary, Levine (1978) and Caliendo and Sanjur (1978) believed that educated women have better attitudes about life and may thus be better
Fig. 3: Cyclical Intergenerational Influences of Maternal Nutritional Status

Source: Mathai, 1989
Fig. 4 Outcomes of Maternal Nutritional Status for Herself and Her Child.

Source: Mathai, 1989
child rearers. Al-Isi (1975) revealed that mothers with higher education differed significantly in nutritional knowledge and practice. Therefore, literate mother uses scarce resources better for her child's welfare than does an illiterate mother from high income group (Bairagi, 1980).

Jain (1984) established that female education and household economic status were important "household level" factors in relation to mortality variations and nutritional status. With increase in the educational level of women, consumption of milk, dairy products, vegetables and fruits was observed to be increased in the meals (Narojek et al., 1981). Therefore, there is evidence that literacy and level of maternal education have a greater beneficial impact on the health and nutritional status of women and children in impoverished environments compared to more affluent ones (Mardones-Restat, 1984; Palloni, 1981).

To assess the contribution of women's education to household decision making and improvements in child health, evaluation of the contributory factors such as income of the mother's parents, maternal health and nutritional status must be considered (Flegg, 1982; Palloni, 1981; Ware, 1984).

Improvements in nutrition cannot be achieved only by increasing the supply of food available to the household. Efforts must be made to improve the utilization and distribution of that food once it enters the home. Nutrition education has commonly been proposed as the most direct means for influencing such behaviour.
There is no doubt that education would provide women with personal and social benefits that could result in improvements in their own-well being and the health and well-being of their families. It is of limited benefit to promote the education of women if women cannot realize basic improvements from this education. If education operates through employment it increases a woman's status and power within the family (Piwoz & Viteri, 1985). There is evidence that participation in income generating activities improve a woman's control over household resource allocation, perhaps because having her own income establishes an economic base for the woman within the household. The degree of control or strength of this base depends on the type of employment, its location (inside or outside home), the salary or wage paid, and control or direct access to income earned. For example, Acharya and Bennett (1981) observe that women working in subsistence farming have little control of resource distribution. When women participate in market work outside the household their decision making power in all household activities increases.

Economic activities of women

Women's participation in economically productive activities outside home is not a new phenomenon. Women have been working along with their menfolk in the fields, right from the dawn of agriculture. More and more urban and rural women in the developing countries are now seeking employment in non-traditional occupations outside the house because of socio-economic and other considerations. It is estimated that in India working women constitute about 12% of the total population and there is a trend towards increasing employment of women. The type of work a woman does
outside the house, availability of domestic help and economic factors might determine the impact of such employment on her (Ramachandran, 1989).

Tables 1 and 2 clearly show that in Asia women are engaged more in agricultural activities than industry or service and are largely employed on own account or as unpaid family workers.

According to UNICEF (1983), women work 12-16 hrs a day and contribute 2/3rd of the world’s economy. Agricultural labour and cultivation are the main source of economic activities of women. In a country like India 83% of women are employed in the primary sector, out of which 51% of them serve as agricultural labourers (Oza, 1975). With regard to the ratios of female employment to male employment in the non-agricultural sector, higher ratios are observed for the States of Kerala, Karnataka, Andhra Pradesh and Tamil Nadu. In all the other States, the ratios are low (1:4). Even when not employed outside home, women in backward villages are more economically active than those in prosperous castes of urban areas (Kumar, 1987).

In South Eastern Botswana women are the main persons engaged in 47.7% of crop activities. Men clear land and do the ploughing. In households without males, women hire labour or rely on older relatives. Both men and women plant, but more men are involved (65%). The person who plants also ploughs. The remaining crop activities are almost exclusively women’s work. Household work takes up half of women’s active day. Men helping wood collection and shopping. Women are the main persons responsible and engaged in house building. Women in these societies have
Table 1. Percentage of female labour force

<table>
<thead>
<tr>
<th>Country</th>
<th>Agriculture</th>
<th>Industry</th>
<th>Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td>82</td>
<td>7</td>
<td>11</td>
</tr>
<tr>
<td>Malaya</td>
<td>79</td>
<td>8</td>
<td>13</td>
</tr>
<tr>
<td>Pakistan</td>
<td>82</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Philippines</td>
<td>44</td>
<td>23</td>
<td>33</td>
</tr>
<tr>
<td>Thailand</td>
<td>90</td>
<td>2</td>
<td>8</td>
</tr>
</tbody>
</table>

International Labour Review, 1978

Table 2. Percentage employment of female labourers in different categories

<table>
<thead>
<tr>
<th>Country</th>
<th>Employers &amp; workers on own account</th>
<th>Unpaid family workers</th>
<th>Employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td>26</td>
<td>60</td>
<td>14</td>
</tr>
<tr>
<td>Malaya</td>
<td>29</td>
<td>23</td>
<td>48</td>
</tr>
<tr>
<td>Pakistan</td>
<td>83</td>
<td>2</td>
<td>15</td>
</tr>
<tr>
<td>Philippines</td>
<td>11</td>
<td>60</td>
<td>29</td>
</tr>
</tbody>
</table>

Barbara (1964)
considerable influence on decision making connected with agricultural activities, even in activities where women's labour contribution is small (Boud, 974).

About 55% of the agricultural force in Thailand are women. Three-fourths of rural girls who are above 11 years old are in the agricultural labour force. These figures show that female labour is very important for food production; but evidence has shown (Viriyasira, 1988) that farm women have never been recognised for their role in agriculture development. Farm women have poor health, little education and work long hours with conventional job tools. They are often excluded from technology development and technology transfer. It prevents agricultural production and rural incomes from raising as fast as they would if women and men are equally taught improved farming methods.

The census of India estimated the all India economic participation rate to be 21% for women and 53% for men in 1981. Nearly 63% of all economically active men were engaged in agriculture compared with 78% of women. Almost 50% of the rural female workers were reported as cultivators and only 24% as agricultural labourers. The female work-force participation rate has been grossly under reported. Women did more field work than men. Spread of modern varieties led to an increase in labour demand (Prasad, 1988).

Swaminathan believes that it was women who first domesticated crop plants and thereby initiated the art and science of farming. Women have played and continue to play a key role in the conservation of basic life
support system such as land, water, flora and fauna. Without the total intellectual and physical participation of women, it will not be possible to popularise alternative system of land management to shifting cultivation, arrest gene and soil erosion and promote the care of the soil and the health of the economic plants and farm animals (Prasad, 1988).

The vital role of women in nearly all stages of food production, processing and marketing was recognised more than 50 years ago in anthropological and sociological studies at the village and ethnic group level. In general, women are responsible for 50% of all food production. While men tend to do the bulk of the heavy intermittent jobs of land cleaning and preparation, it is the women who do much of the crop husbandry, particularly the weeding which is vital to achieve good yields. Almost all food processing and storage is done by women. They make many of the decisions about harvest and when to store grain and hence, measure to reduce post harvest losses need to be addressed more directly to women (Tomilayo, 1981).

The cultivation of pulses and oil seeds seems to be entirely women's work in Norway (Brita, 1982). The most striking difference between men and women, however, is the type of techniques they use to perform the same tasks. For example, while women use wooden sticks for threshing, men use bullock carts and rollers. The data demonstrate that women are left with the heaviest and most repetitive work, such as carrying loads of food crops, fire wood and water, and that the tools and techniques available to women are primitive than those utilised by men, and therefore resulting lower productivity compared to the work of men.
Apart from these, they spend almost 10-12 hours per day during household chores including fetching water and gathering of fuel. About 54% of rural women and 26% urban women are engaged in marginal occupation in order to supplement the family income by collection of fish, small grains, firewood, cow dung, maintenance of kitchen gardens, tailoring, weaving and teaching, but the quantification of the activity, in terms of work hours contributed or its income generating equivalent was not attempted or recorded.

Women in many developing countries like India, spend many hours a week in care of livestock herds, in milking the animals, in the subsequent processing of milk, marketing of various dairy products, where the processing of milk is always the women's job before mechanisation.

While around 40% of females are working in rural areas, it is also a fact that most of women have to carry out certain activities which provide benefits to their households. Such activities are often pursued by women along with and as part of their usual house chores. As high as 65% of rural women categorised as engaged in household duties are engaged in one or more such activities relating to primary sector solely for household consumption. This invisibility of women as workers arises from their multiple employment status varying unpaid family work to wage labour, contract/piece-rate work and independent work.

One of the surveys indicated that over 20% of rural women engaged in the household duties were willing to accept work if it was made available to them at their residence (Solanki, 1988).
Nag et al. (1982) reports that females were withdrawn from the work when household income improved. From the information collected by Saradamoni (1988), it was seen that certain changes in division of labour have taken place recently. In a relatively small place like Kerala, women do not go for harvesting. As it goes Northwards, harvesting becomes more of women's job. At the extreme north only women partake in harvesting.

From the studies of the villages and farm families by Oza and Saxena (1988), it is observed that the rural women generally seem to be engaged in the following agricultural operation and household activities.

- Sowing the seed behind the country plough;
- Transplanting of paddy and vegetable crops in the fields;
- Weeding operations in paddy, vegetable and other fields;
- Field irrigation and water management;
- Harvesting of crops, plucking of fruits and vegetables;
- Threshing of field crops, transporting and feeding of crop to the thresher and grain to the storage;
- Dehusking of maize cobs and decortication of groundnuts;
- Harvesting, transportation, processing of fodder, chaffing of fodder;
- Feeding the animals and milching the cows and buffaloes;
- Milling of pulses, grinding of flour and hand pounding if rice at the household level;
- Drying of grains, vegetables and fruits and their storage and preservation;
- Cleaning, grinding and storage of grains;
- Collection of firewood, preparation of dung cakes, collection of drinking water, cooking, child rearing and animal care.

Devadas et al (1988) revealed that one of the causes for the invisibility of the participation of women in agriculture is the dual role farm women play.

Household work takes away a considerable proportion of the farm women's time, especially for fetching water and collecting fuel (wood) (Table 3). During peak agricultural seasons the time spent on household work gets reduced. According to Singh (1984), women perform about 61% of the total farm work. However, their participation is not at the same level in all the farm activities. The women's contribution was about 39% of the total work whereas in tending animals their contribution was 69%. More or less similar trends are visible all across the country in the rural areas.

Singh and Sharma (1988) reported that women's contribution in various enterprises in rice based farming system were greater than that of men, levels of participation of women in hill in various enterprises was greater than the women in plains. While women performed those activities which required low level skills, which are repetitive and monotonous type like, transplanting rice, harvesting, threshing etc, the men performed the activities like plant protection, chemical weed control and plant preparation which required better skills and are looked upon as prestigious activities. Wherever,
Table 3. Time expenditure pattern of farm women

<table>
<thead>
<tr>
<th>S.No</th>
<th>Activities</th>
<th>Time spent hrs/day</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Farm work</td>
<td>6 - 8</td>
</tr>
<tr>
<td>2.</td>
<td>Cooking food</td>
<td>2 - 3</td>
</tr>
<tr>
<td>3.</td>
<td>Child care</td>
<td>1 - 1.5</td>
</tr>
<tr>
<td>4.</td>
<td>Personal work</td>
<td>1 - 2</td>
</tr>
<tr>
<td>5.</td>
<td>Fetching water</td>
<td>.5 - 1</td>
</tr>
<tr>
<td>6.</td>
<td>Collecting fuel</td>
<td>.5 - 1</td>
</tr>
<tr>
<td>7.</td>
<td>Other household work</td>
<td>.5 - 1</td>
</tr>
<tr>
<td></td>
<td>(Cleaning, washing etc.)</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Cattle care</td>
<td>.5 - 1</td>
</tr>
<tr>
<td>9.</td>
<td>Purchase or marketing</td>
<td>.5 - 1</td>
</tr>
</tbody>
</table>
the operations were mechanised men operated them while, the operations which needed manual labour were done mainly by females. Majority of the farm operations were performed by the women in hill areas while their husbands migrated to plains in search of work.

Both Agarwal (1983) and Mies (1984), noted that the female agricultural labourers were largely casual workers, whereas a large number of male workers were permanent. These differences in employment status were also reported from dry land areas of Andhra Pradesh (Binswanger et al., 1984). In all cases women were more vulnerable to manipulation by landlords, and suffered from greater insecurity of work and lower wages. Mies (1984) reported that men earned rupees 3-5 for all types of agricultural work in 1978, while women only received rupees 1.50-2.50 for an eight hour working day.

Sen (1988) observed that except in the case of peasants with large holdings, women's contribution equalled or even exceeded that of men. In heavy agriculture work i.e., ploughing, weeding, harvesting and threshing, women contributed one-third of the total working hours. With lowering of the economic status of family, there was increased performance of heavy agricultural tasks by women. With the migration of men to the cities especially of poor households, the fate of agriculture was left to the women. The modernisation process in India also affected the agricultural sector. Women were involved in the process of modernisation, but they worked on relatively less skilled jobs.
Recently a declining trend has been observed in the employment of women labourers. Some of the new technologies have misplaced women from many of the traditional activities.

The effects of modernisation had varied impacts on women. The progression from subsistence producer to wage earner in the money economy can reduce the food supply, with women and children suffering most. Conventional animal husbandry and milk production, which has been the classical domain of women, were revolutionized by cross breeding, cold storage depots, automatic milk dispensers in the cities. Traditionally, women cared for an undemanding, robust cow which ate hay and harvest wastes and whose milk they either sold themselves or processed for their own consumption as butter fat. Today women must feed, milk and care for several high yield cows which is more time consuming because these animals are more delicate. Milk is delivered to a collection point designated by the dairy co-operative. Women are thus excluded from the processing and marketing of their own product. Their work load has increased, but their scope of activities has been reduced and are now restricted to the domestic sphere. This process is a too common example of the worldwide trend to displace women from productive opportunities back to the household. Men have taken over the marketing and processing of milk produced by the "white" revolution.

Use of technology and machinery, however, has required new qualifications and employment arrangements. Traditional "female" jobs were turned over to men with the adoption of the new technology. Where women used to distribute cow manure, men now broadcast chemical fertilizers,
where women once dug irrigation ditches, men now install pumps and pipes to irrigate the fields. Mowers, threshers and combines are also replacing women on many farms during the harvesting season. Women are thus pushed to the lowest end of the income hierarchy created by the "green" revolution. The "blue" revolution has also destroyed the basis of the traditional division of labour between men and women. In traditional fishing industry there was job equality: men rowed their catamarans along the coast and brought their catch to the beach where women gathered the fish in baskets, carried them to the nearest market and sold them. Fresh fish were also salted or sun cured for home consumption and/or for sale. Since the fifties, fishing has become more and more the business of private, sometimes foreign enterprises. Fish brought ashore from the motor boats is purchased by wholesalers who transport it to market by truck, where the women then buy a marketable quantity to sell. This not only reduces their profit margin, but women lost control over the trade itself and are subject to a new dependency outside the family and fishing community. The loss of traditional earning possibilities in the fishing industry has not been compensated by the emergence of alternate employment opportunities (Wichterich, 1985). Also women's role as home makers, particularly, in the context of men not sharing household chores has been attributed to be the major cause for marginalising them from application of modern technology. Specifically a considerable proportion of women's time is spent on child bearing and child rearing activities (Bhat et al., 1987).

Women's contribution to family finance and decision making

Women's participation in work alone may not guarantee them higher status in the household or greater decision making power, as men usually
control all household income, including women’s wages (Harris, 1986). In
gainful employment women are often viewed with ambivalence by men,
because it lessens the financial burden and increases the standard of living.
Inspite of it, most men do not want to give their traditionally superior
position in the family (Ramanamma, 1984). Among the tribal and non-tribal
women where the time spent on agricultural work and cattle care is more
than men, finance management is done by the male member of family
(Bhatnagar et al., 1987). Women whether working or non-working do not
have freedom to spend the money.

Although women engage themselves in both productive and reproductive
work according to Sethi (1984), their role in the family decision making is
marginal. Wives have more responsibility for household tasks and child care,
while heads of the households have more responsibility for decision making in
families with children (Steil and Turetsky, 1987; Ronald et al., 1987; Rosalind
and Grace, 1987). Therefore, stress is more for the working women, as they
have to accept full responsibility for work at home and outside (Booth, 1977,
Akbar, 1988). Esther (1987) reports that even in western countries most of
the "female oriented tasks" are performed by women, the only difference
being a matter of degree and frequency. Thus, many mothers in poor
communities are already over burdened by work unsupported by male
dominated societies (UNICEF, 1985, 1986). As a result, significantly greater
degree of overload falls on the wives than on the husbands in both dual
career and dual earner families (Rachlin, 1987), resulting in physiological as
well as psychological fatigue in relation to various tasks. This is confirmed
by Kaur and Punia (1986) who observes that women prefer to stay at home
and perform the routine household work if the family income is adequate.
Even in families with working women, the decision making roles, especially in low socio-economic societies of women are found to be poor except in female headed households (Girippa, 1988, 1989). Only in 30% of the families decisions are made in joint consultation by husband and wife. There too, women's role has been subordinate in nature to that of men folk (Gandhi et al., 1987). According to Khan and Singh (1987) husband and in-laws play a significant role in influencing decisions towards family binding process such as the decision to go for an early pregnancy, decision on family size, use of family planning methods and sterilization.

Though women work inside the home, their productive activities are not valued; they gain power with age and through the bearing of children (especially sons) to carry on the line (Beneria, 1979). Mothers-in-law in these societies wield great amounts of power. New wives are of low status and have very little say in household resource use. Abdullah and Zeidenstein (1982) observed that newly wed women in Bangladesh were expected to do all the heavy and tedious household tasks, while the mother of the house made all the decisions regarding health, the use of food and the provision of child care.

A woman's low status in these societies is perpetuated by her economic dependence on her husband and sons and by the low value ascribed to her time and household work. She in turn, may be more likely to perpetuate this status ascription through rearing and socialization of her children. Boys are probably respected for their future economic role, whereas girls are treated as second class citizen and raised to be non-economically productive in their parental homes and bearers of children in
their husbands' homes. Compliance, obedience and a low degree of self assertiveness are the qualities valued by traditional husband. Resource distribution favours boys over girls and possibly over women.

Khan et al. (1989) showed that plight of the women even when their financial contribution to the family is substantial (1/3 or more of the total household income) is not reduced. The working women are doubly burdened with paid as well as domestic work. Their working hours are longer causing extra metabolic strain. The clinical anthropometric and dietary data show that most of them were malnourished and their caloric intake along with other nutrient was less than the RDA. On all these accounts working women were worse than housewives. The study also shows a distribution of food in favour of males.

Studies in diffusion and adoption of agricultural innovations have shown that farmers take advise of their wives in farming and household activities. Farm women's participation in decision making on agricultural practices also varies from region to region, practice to practice and among the crops. In the case of state of Maharashtra, most of the studies (Wairagade et al., 1988; Kolte and Karle, 1988 and Nandapurkar and Soni, 1988) have indicated that women dominate in certain farm decisions like harvesting, storage, engaging labourers, selection of crop, thinning of seedlings, raising seedlings etc. Whereas in a state like West Bengal, they have hardly consulted or not at all consulted. But, simply consultation of women in farming by men will not solve the problems, unless men respect their advise and consider them in their decisions. Perhaps, making farm women to have access to their
earnings and become economically strong and self-sufficient may confer them with some decision making authority in their families.

The effects of women's employment on the health and nutrition of her family is an area that has received increasing attention. Women, rather than men, are more likely to spend their income on food and other basic necessities for their families (Fazzi, 1983; Nelson, 1979; USAID, 1982) and that women's earnings are associated with a better standard of living (Bryson, 1981).

Dodd and George (1989) found severe under nutrition in the working women while obesity was more prevalent in the non-working group as mean total caloric intake in the non-working (1686 Cals) was lower than in working women (1787 Cals). The higher purchasing power of the working women appears to have made a significant influence in their mean Caloric intake, though in 50% of the working women as compared to 67% of non-working women, the intake was less than 80% of the RDA.

The different spending patterns of men and women have been well documented by Dey (1981), Guyer (1980), Jones (1983), PAG (1979). According to them women have full responsibility for household food production and family expenses. The influence of women's work on household spending and family health may be greatest when women enter the wage labour force out of economic necessity (Carloni, 1984). Under these circumstances, their earnings are more likely to be spent on basic needs for family survival. Men as demonstrated by Stavrakis and Marshal (1978), Myntti (1978) are more likely to spend their earnings on alcohol, tobacco, radios and other personal items.
The type and quantity of food available to a household with no major food base depends on income and budget allocation (Rizvi, 1979). Munoz de Chavez (1974) while comparing the dietary practices of families with malnourished and well nourished children, found that in an economically homogenous population, the variables associated with differences in nutritional status are: differences in the ratio of children to adults within a household, sex differences (68% of the malnourished children were girls while 62% of the well nourished were boys), diet of the mother and weaning history of the child. Food allocation to the individual, according to her is not affected by the size of the family. A small household is not necessarily supplied with adequate food nor does a large household necessarily has an inadequate supply. Household size becomes important when it is viewed in relation to income. Rawson and Valverde (1976) found good nutritional status to be associated with stability of income, land ownership and inheritance and resource sharing among family members.

SAARC (1985) Ministerial meeting on "women in development", Shillong, Govt. of India, came out with following recommendations:

1. No meaningful progress can be achieved without the active participation of women, enhancement of the status of women who form half of the population.

2. Greater attention is required on the promotion of level of literacy, enrollment in school, vocational and technical training, marketing, credit facilities and participation in decision making processes.

3. Special efforts are needed to disseminate appropriate technologies to eliminate drudgery and thus improve the quality of life of women particularly in the rural areas.
Women's activities in the food chain - influence on family nutrition

The current literature on how women's participation in food chain activities affects household nutrition has been approached from three points of view:

a. The relationship between women's participation in food production and household food availability.

b. The relationship between women's control of food and cash and household food consumption and nutrition.

c. The relationship between women's work load and allocation of time in the food chain and child nutrition.

In rural areas of developing countries, like ours, women's daily activities are to a large extent centred around the food chain. Women make the maximum contribution to the total household food supply in many countries, particularly in sub-Saharan Africa and also in some places in Asia, such as Thailand (Okeyo, 1985; ECA, 1984; FAO, 1983a; Safilios-Rotschild, 1980). Women's contribution to the market income may not be large, but becomes substantial when home production is taken into consideration (Safilios-Rotschild, 1980). Women's contribution is not only important for the total food supply to the household, but also for dietary variation. In most rural households women are responsible for growing different kinds of vegetables, roots and fruits (Garibaldi Accati, 1983) for raising small animals, such as chicken, goats, sheep, rabbits and pigs (FAO, 1983b, Safilios-Ritschild, 1983) and for milking and processing of dairy products (Chadingi and Hanssen, 1983; Galvin, 1985; Nestel, 1985). Further more, women in rural households frequently provide an addition to the diet in the form of wild foods, such as green leaves incorporated into relishes or soups, inclose
combination with the staple foods (Skjonsberg, 1981; Wandel and Holmboe-Ottesen, 1984). Dietary diversity is a way to secure dietary sufficiency (Dewalt and Pelto, 1977; Faleuret and Fleuret, 1980).

The point of view that women's participation in food production and income generating activities will have a positive impact on the flow through the food chain is the basis for many development projects designed to improve production or income earning components for women. The question of what types of activities will most effectively contribute to increase food availability is often posed. However, women's participation in production does not always result in increased control over the income in cash or kind or food expenditure.

Intra-familial food distribution pattern

It is widely accepted that the nutritional status of Indian women belonging to the low income groups in unsatisfactory. An important activity in terms of nutrition outcome, is food distribution within household. If priority is given to certain household members, it may have a detrimental effect on the food consumption of other household members, particularly during times of food shortage. Thus, not only food consumption but also general health status is considered a determinant of nutritional status. In traditional households, food is first served to men and children and women usually eat last. These two observations according to Srikantia (1989) have led to the belief that in the matters of allocation of food within a family, the dietary intakes of women are more unsatisfactory than those of men. Even among young children, it is believed that culturally determined
behaviour places the female child at a nutritional and health disadvantage, as compared to the male child.

Several reasons for poor nutritional status of women have been put forth by various investigators. Sen and Sengupta (1983) demonstrated that sex difference is responsible for more frequent severe malnutrition among girls in landless households. Hartog (1972) reported that distribution of food is unequal not only in different regions and socio-economic groups but also within the households. Children and women receive mainly the staple food, but little or no meat, fish, vegetables or fruits. Males receive larger quantities of cereals, fat, milk, sugar and total calories than female children and female adults (Chen et al., 1981). Aligaen and Florencio (1980), Devadas and Eswaran (1983) observed that household heads have more adequate diet than the housewives and males have more adequate diet than the females. According to Khan (1988), in infancy a female child is often deprived of longer breast feeding. Later in childhood, in the distribution of more nutritious foods like butter, milk, eggs etc., sons are given preference. This discrimination continue in the adulthood, where the women are willing partners in giving preference in food distribution to the other family members.

Women throughout their life cycle receive less food than males and also "inferior quality" foods (Khan et al., 1983; Khan et al., 1986) and the intake of nutrients is below the standards by all the women (Khan et al., 1986). Though "heads" who are just moderate workers have an adequate intake of nutrients due to greater share of family diet, women and children
who may be more active receive proportionately less adequate diet (Gopaldas et al., 1983).

Lee and Kolonel (1981) observed that food distribution does not follow the pattern of requirement of the household members. Low intakes of nutrients were observed in the women including pregnant and lactating women and adequacy of energy and protein is highest in the children and males (Ferro-Luzzi, 1981). But male gender preference seems to be significantly positive in the lean seasons while in surplus season this inequality gap is bridged (Behrman, 1988). Also availability of food to a household is dependent on the purchasing power and availability in the region. Female head of the family cook and distribute food giving priority to the male heads and preschool children (Devadas and Eswaran, 1983). Therefore, women show severe symptoms of malnutrition not only due to poverty but also the other important factor of eating food when everybody in the house finishes (Khan et al., 1986; Bal.twala, 1987).

According to Senauer et al. (1988) type of family education and availability of time are the major determinants of the intra household allocation of food.

**Factors affecting intra-household food distribution**

There are two possible ways in which intra-household food distribution is influenced by the household provisioning mechanism. First, by determining intra household distribution of capital (both physical and human), division of labour and resource/income generation, it affects intra household control of resource allocation (including time). Second, it determines preferences
functions for intra household investment in nutrition and health (Kumar, 1983).

Much has been written in recent years about the determination of intra household food distribution (Carloni, 1981; Hartog, 1972; NEG, 1983) and the policy implications such practices have for the design and implementation of nutrition programmes (Andersen, 1983; Rogers, 1983; Esterik, 1984).

One of the models proposed for examining intra household food allocation behaviour is presented in Fig.5.

The intra household food pattern cannot be understood in terms of economic or cultural factors alone. Very little is known about the distribution of food within the family.

Although previous studies have provided much insight into the factors which influence household behaviour, few studies have directly examined household decision making. But no attempts are made to analyse the mechanism by which the impact is transmitted to assess the nutritional status of women (Fig.6). However, it is unknown what has happened inside the black box.

Influence of work load on health and nutritional status of women

Studies dealing with the relationship between women's work load and health, have most often looked at how the work load influences child nutrition and health. This indicates that the nutritional and medical professions have been more interested in women's nutrition from the point of
Fig. 5. Factors and processes influencing food availability, acquisition, and allocation

Source: Pinstrup - Andersen, 1983
view of child bearing and lactation, rather than showing interest in the health of women for their own good. However, many of the studies in relating women's work to child health may also give indications as to the effects of this work on women's own health. For instance, studies relating work load in pregnant women to low birth weight in their children illustrate this point. Low birth weight is not only an indicator of the child's nutritional status but also of the mother's.

It can be assumed that the work load can affect women's nutrition and health status both in a direct and indirect way. The direct effect could be nutritionally related, as when increased energy use in heavy work is not matched by a corresponding increase in food consumption, or it could be "wear and tear" effect causing body pains, arthritis or premature deliveries. The indirect effect could be mediated through changes in women's diet or dietary patterns, which may occur during periods of heavy work.

Several studies have shown that women have a heavy work load, and that it varies with seasons. The work load is especially high in peak agricultural seasons for women who participate in the fields. The total time women allocate to work on a yearly basis, seems to average about 8-10 hrs
a day (Berio, 1984a; Tobisson, 1980, Brun et al., 1979). In peak seasons their total daily work time can amount to as much as 15 hrs (Palmer, 1981). However, time allocation studies do not give a clue as to the energy that women put into their various work tasks. Such information would be necessary to judge the heaviness of women's work burden. Berio (1984b) has calculated the energy expenditure for men and women based on time allocation data from a national survey in the Ivory Coast. Her findings showed that the energy expenditure over a week's period was higher for women than for men. A similar finding was done by Haswell (1981a) in Gambia. More interestingly Berio's computations proved that women in the Ivory Coast spent more energy on the average, than what has been set as the standard level of heavy physical activity for women by the FAO/WHO expert groups on energy and protein requirements. This was so, despite the fact, that the time allocation data were collected in a period which was not considered to be the peak season for agricultural activities (women's total work time being 7 hrs).

Bleiberg et al. (1980) estimated the energy expenditure by season of female farmers in Burkina Faso (Upper Volta). In the dry season the women were found to have a total daily expenditure classified as moderate - very active, according to the FAO/WHO grading system, while in the rainy season their energy expenditure was classified as exceptional active. The results indicate that women have much heavier work in traditional societies than what has been supposed.

It is reasonable to assume that such heavy work burden will affect women's health. A good example of women's hardship is described by
Hasvell (1981b). From her field work in Gambia: when women return from work in the fields they collapsed from over work and lack of food.

The best documentation on the relationship between relating women's work burden and their health, concerns pregnant women. In a cross-cultural study of 202 societies, Jimenez and Newton (1979) show that the most common pattern of work during pregnancy in traditional societies was that of continuing full duties until the onset of labour. However, the authors also point out that there are some traditional societies where women are relieved from performing heavy tasks, as for example, in parts of India and Sri Lanka. The cross-cultural study also showed that in more than 1/4 of the societies women returned to full duties 1-7 days after delivery, while in 1/2 of the societies women returned to full work after two weeks. The traditional Asian societies seemed to be more restrictive in regard to a new mother's resumption of duties, probably because women here are not as involved in field work as in e.g. Sub-Saharan Africa.

Studies on the relationship between women's work load and weight gained in pregnancy or low birth weight in infants indicate that heavy work loads do affect women's health. Thomson et al. (1966) found that all women in a remote village in Gambia tended to loose weight during the peak of the agricultural seasons and to regain this weight in the period with lower activity level. In the period of low activity the average weight gain of pregnant women was 5.5 Kg, while in the peak season it was only half of this. Another study from Ethiopia (Tafari et al. 1980) confirms these results, finding that women engaged in heavy labour had a weight gain in pregnancy of 3.3 Kg, while less active mothers gained 5.9 Kg. The difference in the mother's physical activity also appeared in the birth weight of the children.
being delivered at full time. The "heavy work" children weighed 3060 g, while the "less activity" children weighed 3270 g. A relationship between high work load and low birth weight has also been found in India (Rajagopalan et al., 1981).

It has been shown that low weight gain during pregnancy, low birth weight, and weight losses during seasons with heavy work is caused by a combination of high work load, low food availability and increase in infectious diseases (Hamilton et al., 1984). Schofield (1979) examined data from 25 African villages and found a significant difference between the percentage fulfilment of energy requirements in the peak seasons for agricultural labour and the low season in the village populations. This was related to a difference in energy intakes and not in requirements. The reasons being that the estimates of energy requirements were based on the non-working part of the population. The data indicate an overall reduction in food consumption in the high agricultural season. Haswell (1981) in her study of Gambia found the lowest food intake among the women in the pre-harvest period, the peak season for work, when women's energy expenditure rose fourfold compared to the season with the lowest work. Thus, an energy deficit was created which caused weight losses in women.

Seasonal variations in weight have been shown for many societies (Bleiberg et al. 1980; Chowdury et al., 1981) and also for pastoral societies (Nestel, 1985; Galvin, 1985). Both men and women tend to lose weight, however, women seem to lose more weight than men (Hamilton et al., 1984; Galvin, 1985). Some studies indicate that not only the energy deficit created by a combination of low food intake and high work load may be detrimental to women's health, but that work load in itself may influence their health
negatively. Bantje (1980) showed in a study from Tanzania that even when food was plentiful, but agricultural labour demanding, women had a high risk of giving birth to low weight children. The birth weight appeared to be affected by changes in labour conditions, even as late as just before delivery. This indicates that high labour intensity could lead to premature deliveries. A similar phenomena has been observed in Sierra Leone. Tommy (1980) found that the survival rate of infants born to women operating heavy farm tools while pregnant was lower, than for infants whose mothers had used lighter tools or work less frequently with heavy tools. Data from Thailand show a doubling or a trebling of the incidence of miscarriages in women during the seasons for rice transplanting and harvesting (FAO, 1984).

A heavy work load for women may also lead to a poorer diet, not only for their children and other members of their families, but also for women themselves. The diet may be poor because there will be less time for preparation and cooking. As Schofield (1979) points out, the combination of low food availability and less time for food preparation during peak agricultural seasons, may result in meals that are less in quantity, less varied and less well prepared. Meal frequencies have also been reported to be reduced. Bielberg et al. (1980) found in Upper Volta (Burkina Faso) that lunch was skipped because women were working in the fields at noon. The PAG report (1977) quotes a study by Thompson and Rahman in Gambia where women involved in swamp rice production to demonstrate the detrimental effect of women’s work on child nutrition:

When the mothers were heavily engaged in farming, those who did not cook the morning meal might go for days and almost never see their
children. At times they left early in the morning when it was dark and returned after sunset.

From this account one may really wonder when women theselves had time to eat. It is reasonable to assume that this type of work pattern will not affect the child nutrition, but also have detrimental effects on women's own health.

Frequently all the multiple factors and processes that influence nutritional status, are ignored and only nutritional impact is measured. Therefore, roles and status of women need to be highlighted by answering the following questions.

1. What are the functional consequences of women's social status on their household decision making powers, on their resource distribution practice and ultimately on their own health?

2. What are other variables besides societally prescribed beliefs and values that influence decision making power and resource distribution behaviour?

3. Can change in the attitudes strengthen or modify the covariants of behaviour?

On the basis of past research, it appears that neither sociologists nor nutritionists have examined the operating dynamics of food distribution within the household. Much past research provide indirect evidence for inequality without providing reasonable explanations for underlying causes for food distribution pattern. It is important to note that conclusions cannot be drawn about the determinants of these types of distribution patterns, as all
studies have been carried out independently, utilizing a wide variety of research methodologies to collect and analyse the data. None of the studies has been carried out specifically to examine household distribution and feeding and some studies did not disaggregate information by sex or income.

To sum up, the factors which affect women's participation in the different parts of the food chain are varied. They range from cultural to economic and technological aspects, and from micro level to macro level determinants. Overriding these issues are modifies such as regional differences, socio-economic differentiation and seasonality. The review has also emphasized complexity of these determinants. Many have constraints for women, but there are also potentialities. The complexities of the effect and inter-relationships of these determinants need to be better understood. So far there has been a tendency to compartmentalise the issues and their effects, perhaps because the inter-relationships are so complex.

Ophelia (1980) also stresses the need for more research into intra-household food distribution pattern.