Health and Nutritional Issues of Hill Farm Women: 
A Socio Economic Paradigm

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Abstract

Agriculture and rural economic activities are essential for growth, 
poverty reduction and food security especially for the poorer farm 
families in Uttarakhand hill region. The hill and mountain areas have a 
unique feature in respect to topography, climate and production 
system. The undulated topography, rugged terrain, unfavorable cold 
climate and lack of production and marketing infrastructure have made 
the area poorest in terms of production and productivity of the crops. A 
cross-section study was conducted in Almora District of Uttarakhand 
during 2010-2011. Data was collected with precoded interview 
schedule containing information about cropping pattern, role of women 
in hill agriculture system, nutritional status and drudgery level in 
various farm operations. A woman in hills works for about 14 to16 
hours per day. Various field operations (weeding, fodder cutting and 
harvesting) were evaluated for analysis of drudgery prone activities. 
Rate of Perceived Exertion (RPE) was recorded on a 10 point Borg 
Scale. The fodder cutting activity was found to be causing very strong 
exertion followed by harvesting (strong exertion) and weeding 
(somewhat exertion). The information pertaining to the food 
consumption pattern of the farm women in hills was collected from 
institute’s adopted and non adopted village suggests that intake of 
cereals and pulses were less than Recommended Dietary Intake (RDI). 
This could be due to the scarcity of these food items during the winter 
months. Consumption of all the food groups except fats and oils was 
found to be higher among the women of adopted village than non-
adopted village in both the seasons. Milk consumption was more than RDI in adopted village. Though the consumption of green leafy vegetables and other vegetables was more during winter months due to seasonal availability but it was still significantly lower than the RDI. It is found that consumption of pulses, green leafy vegetables, other vegetables, fruits and fats & oils was lower than suggested levels in both the category of villages during both the seasons.

**Keywords:** Hill farm women, Drudgery, Nutrition, Socio-economic status.

1. **Introduction**

The Uttarakhand state faces the challenge of promoting livelihoods to retain people through local employment and income generation and to enhance their quality of life (Surabhi Mittal et al., 2008). Agricultural production patterns affect the timing of peak labour demands and the nature of the tasks involved. Woman is the molder and builder of any nation's destiny (IUCN, 2003). Rural Indian women are extensively participated in agricultural activities. However the nature and extent of their participation differs with the variations in agro production systems. In the Indian Himalayas a pair of bullocks works 1064 hours, a man 1212 hours and a woman 3485 hours in a year on a once hectare farm, a figure that illustrates women’s significant contribution to agricultural production. (Shiva FAO, 1991) Women’s contribution in agricultural labour force in developed countries is 36.7% while, it is about 43.6% in developing countries (FAO, 1999).

The dominant features of hill farming in N-W Himalayas are small land holdings, sloping marginal land, and rainfall-dependent farming (Gupta, 2003). Hill farming is subject to a number of serious constraints as undulating topography, small fragmented and scattered land holdings, with very limited use of inputs, poor and shallow soils (prone to erosion), which is aggravated by heavy migratory grazing which has also led to soil degradation. Hilly rural areas in India suffer from very high male temporary and permanent urban-to-rural migration; women farmers have increasingly found themselves becoming major contributors to the agricultural labor force, the majority of who work for very long hours all year long as unpaid family’s labor.

Drudgery of farm women is an important aspect that has attracted wide attention of researchers. If measured by the extensiveness and intensiveness of their involvement, farm women shoulder much more burden than men. Importantly, women are involved in more strenuous activities as compared to men. Studies on agricultural operations show an increasing involvement of women in crop production (Gite et al., 1997). Many of such activities are drudgery prone to varying degree. Even women suffer from different health problems which adversely affect their working efficiency and family welfare. Women have shorter time to rest than men and environmental degradation is increasing women’s workload. (Mariama and Janet, 2000). Uttarakhand
is one of the few states in India where an overwhelming number of women have always been a part of the active work force due to their total involvement with agriculture, forest protection, cattle care, and dairying. Present study is an attempt to know the food consumption and dietary intakes of hill farm women in hills of Uttarakhand. The literature indicates that rural women face higher risks of morbidity and mortality because of strenuous physical work (Rawat, 1995). Women with poor health and nutrition are more likely to give birth to unhealthy babies. With poor health they are also less likely to be able to provide food and adequate care to their children. While malnutrition is prevalent among all segments of the population, poor nutrition among women is much more as, it begins at infancy and continues throughout their life. Pant (2002) in a study reported that overwhelming population of hill women were in grip of severe to moderate malnutrition. Upadhyay et al. (2011) reported that nutritional status as well as nutritional knowledge of hill women is unsatisfactory and needs interventions. Concern over women's nutritional status is mostly confined to pregnant and lactating women. Their nutritional and health status prior to and after these stages receives little or no attention. Considering the multiple roles of agricultural women, the present study is an attempt to explore the drudgery involved in farm operations and nutritional status of hill farm women.

2. Methodology

Various field operations were evaluated for analysis of drudgery prone activities. A total of 50 farm women (in the age group of 30-35 years) with random sampling technique were taken for data collection. Data on weeding, fodder cutting and harvesting operations were collected with the help of structured interview schedule. The activities were carried out with 3 replications and time bound for 30 min without rest break for analysis of various research parameters. Borg General Scale (1982) was used for assessing the perceived exertion (RPE) of subjects while performing various activities. Biomechanical stresses during performance of activities were measured by recording the incidence of body pain experienced by hill women in different body parts by administering body map (developed by Corlette and Bishop in 1976) Pains in different body parts due to faulty work practices were measured with the help of a suitable body map. In order to ascertain the degree of severity of pain, a five point scale given by Verghese et al., (1996) for women was used. For the nutritional assessment data was collected on daily dietary intake. The average daily intake of foods by individual respondent was computed and compared with the suggested levels of intake (ICMR 1981). The nutritive values for the quantity of raw foods consumed by the individual respondent were calculated by using food composition tables (Gopalan et al. 1989) and compared with the recommended Daily Allowances (RDA).
3. Results and Discussion
3.1 Fatigue Analysis during Agricultural Activities
To study the effect of various activities on the subject’s perception of exertion they were asked to give ratings on a 10 point scale after completion of task. Fig. 1, envisaged the mean exertion perceived by women workers. It was found that the mean rating of perceived exertion ranged from 3.77 to 5.8 on the basis of verbal expression of fatigue.

![Graph showing exertion ratings for different agricultural activities]

3.2 Work Related Muscular Stresses Perceived by Respondents
The problems pertaining to illness, injuries and disorders related to muscular stress in the neck, shoulder, arms and hands are well recognized (Anderson, 1984; and Bhattacharya and Meglothlin, 1996). A cursory glance into Fig. 2 revealed that in the weeding activity moderate to severe pain in all body parts was reported by farm women. However in the ankle region maximum pain (severe) was reported due to adoption of unnatural posture (squatting). Elisjistom and Nachemson (1970) also found that unnatural postures lead to several musculo-skeletal problems.

![Graph showing pain ratings for different body parts during agricultural activities]
There are certain risk factors like awkward posture, force, repetitive activities and inadequate rest (Mukhopadhyay et al., 2007). Further during fodder cutting activity moderate pain was perceived by women in shoulder, upper back, lower back and knee region and mild pain in neck and ankle region. During harvesting activity severe pain in shoulder and lower back was reported by the women.

### 3.3 Nutritional Status of Hill Farm Women
The average energy consumption per capita per day in adopted and non-adopted village was 2054 kcal and 1739 kcal respectively which is 7.7 and 21.8 per cent less than recommended level (2225 kcal). Energy consumption by respondents in adopted village was significantly higher than in non-adopted village at 1 percent level (Table 1). Pant (2002) also reported the average energy intake by the rural women of the Central Himalaya below the standard requirement. Dobhal et al. (2003) also reported that average intake of energy was lower than RDA among women of Uttarkashi. The average protein consumption by women in non-adopted village was less than recommended level. It was found that the coarse grains i.e, ragi and barnyard millet which are rich in calcium content being the part of the diet contributes towards higher intake of calcium, β-carotene and ascorbic acid. The average iron consumption by respondents in adopted and non-adopted village was 18 mg and 16 mg respectively which is 40 and 46.6 per cent less than recommended level (30 mg). In India nearly 70 per cent of women are estimated to be iron deficient. Iron deficiency can exist without anemia. Iron Deficiency Anemia (IDA) is very late manifestation of iron deficiency because iron deficiency is very well tolerated. Anemia does not develop till storage iron is exhausted (Shah, 2004). The main reasons for IDA have been determined to be inadequate intake of iron, low bioavailability (1-6 percent) of dietary iron from plant foods (Rao et al., 1983).

<table>
<thead>
<tr>
<th>S. No</th>
<th>Average intake of nutrients (per day)</th>
<th>RDA</th>
<th>'t' value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Adopted Village</td>
<td>Non-Adopted Village</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>mean</td>
</tr>
<tr>
<td>Protein (g)</td>
<td>58</td>
<td>8.0</td>
<td>45</td>
</tr>
<tr>
<td>Energy (kcal)</td>
<td>2054</td>
<td>274.1</td>
<td>1739</td>
</tr>
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<td>Calcium (mg)</td>
<td>682</td>
<td>202</td>
<td>523</td>
</tr>
<tr>
<td>Iron (mg)</td>
<td>18</td>
<td>3.2</td>
<td>16</td>
</tr>
<tr>
<td>Thiamin (mg)</td>
<td>1.6</td>
<td>0.24</td>
<td>1.3</td>
</tr>
<tr>
<td>Riboflavin (mg)</td>
<td>1.1</td>
<td>0.16</td>
<td>0.8</td>
</tr>
<tr>
<td>Niacin (mg)</td>
<td>14.5</td>
<td>2.02</td>
<td>12</td>
</tr>
<tr>
<td>Ascorbic Acid (mg)</td>
<td>99</td>
<td>42.5</td>
<td>60</td>
</tr>
<tr>
<td>B-carotene (µg)</td>
<td>3040</td>
<td>2286</td>
<td>2104</td>
</tr>
</tbody>
</table>

** = Significant at 0.01 level  
SD=Standard deviation
Table 2 clearly illustrates that majority of respondents of adopted village (65.8%) were adequate in protein but inadequate in calorie and 11.4 per cent were inadequate in both protein and calorie. In non-adopted village 82.9 per cent respondents were inadequate in both protein and calorie. It is clear from table 5 that inadequacy of both nutrients was higher in respondents of non-adopted village. According to Reddy and Rao (2000) without correcting the existing calorie gap, the provision of protein concentrates will not prevent protein-calorie malnutrition.

Table 2: Protein calorie adequacy (%) among farm women in hills.

<table>
<thead>
<tr>
<th></th>
<th>P+C+</th>
<th>P+C-</th>
<th>P-C+</th>
<th>P-C-</th>
</tr>
</thead>
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<tr>
<td>Adopted Village</td>
<td>22.8</td>
<td>65.8</td>
<td>-</td>
<td>11.4</td>
</tr>
<tr>
<td>Non adopted Village</td>
<td>-</td>
<td>17.1</td>
<td>-</td>
<td>82.9</td>
</tr>
</tbody>
</table>

P+C+ = protein adequacy- calorie adequacy, P+C- = protein adequacy- calorie inadequacy, P-C+ = protein inadequacy-calorie adequacy, P-C- = protein inadequacy-calorie inadequacy

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