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Women in Forestry in India

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Women play a much greater role in forestry in India than has previously been documented — and their involvement in forestry should be strengthened.

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This paper — a product of the Women in Development Division, Population and Human Resources Department — is part of a larger PRE review of women and development in India. Copies are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Audrey Sloan, room S9-121, extension 35108 (78 pages, with tables).

For projects to succeed, it is essential to document women's relationship to forests — in the context of their roles in different farming and food supply systems, domestic tasks, and income-earning activities. Such documentation would reveal ways to generate employment and income for women.

The minor forest product economy, for example, which is dominated by women, has never been the focus of government policy or a specific component of social forestry projects. Social forestry projects tend to be oriented to cash crops, which mostly benefit men.

The fuelwood and fodder crisis has focused on problems of domestic subsistence; planners have been blinded to women's equally important role in the nondomestic forest economy. Forest-based activities are often poor women's main — sometimes only — source of income, particularly where women have no property rights in land. Women who have property rights only in livestock also depend on fodder, a product of forests and common property resources. Forests also provide food, medicines, and other products useful to poor people, especially in times of famine.

The urban poor bear the brunt of the fuelwood crisis, especially as fuel prices rise. But the headloading of wood (collecting wood for sale) by rural women partly reflects their lack of jobs and income. Headloaders meet a crucial

energy need but also contribute to the degradation of forests. This degradation can be reversed only by increasing biomass production and generating more jobs and income for women. Social forestry programs must be broadened to include women, watershed management, the management of common property resources, and such related enterprises as animal husbandry.

Women can and do carry out most forestry tasks, even such arduous ones as pit digging, watering, and soil work. Women involved in small-scale forest-based industries — such as bidi-rolling (indigenous leaf cigarettes) and basket-making — must be helped to improve their skills and to learn to manage the entire process from collection to processing and sale. Rights to forest produce must be more clearly delineated.

Women have successfully organized groups, reclaimed degraded land, planted forests on it, and managed forests jointly. Rights in degraded land allotted for afforestation can most easily be enforced and protected by organized women. The most important help nongovernment organizations can provide is to strengthen existing women's organizations and help build new ones. Collective organizations seem best adapted to exploit such development facilities as credit, extension advice, and access to new technology, raw materials sold in bulk, and the purchase and maintenance of labor-saving devices.

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Executive Summary

The Fuelwood Crisis and Women's Involvement in Forestry

i. The increasingly visible impact of the fuelwood and fodder crisis on the household has called attention to the need to involve women in forestry planning. It has highlighted women's dependence on forests both to supply basic household needs and as a source of necessary income.

ii. In this paper, women have been classified into four groups, based on farming system and habitat: tribal women (shifting cultivation and the collection of MFP); hill women (practicing terrace agriculture and animal husbandry); plains women (agriculture and animal husbandry); and poor urban women (those who are dependent on fuelwood for cooking energy).

The Fuelwood Crisis and Social Forestry

iii. Social forestry projects, though expressly designed to address the fuelwood crisis by providing fuelwood, fodder and small timber to rural people, did not make women the focus of their strategies aimed at providing household fuel. This was surprising since women's predominant role in the subsistence fuel supply and use system in most parts of the world is well known. The role of women in livestock rearing, which revolves around grazing and gathering of fodder, should also have alerted planners to the need to involve women centrally in forestry projects.

Need to Pay Specific Attention to Women

iv. The failure to do so can be attributed partly to the fact that traditionally little attention has been paid to gender issues in the planning and execution of development projects. Women, when they have been seen at all, have been seen as beneficiaries of development projects at a very general level: neither their knowledge, nor their widespread participation in various spheres of the rural economy has been acknowledged.

v. If attention is now being drawn to women's relation to forests, it is also partly as a result of their participation in movements for forest protection and regeneration. The much-publicized Chipko movement has thrust women into the forefront of forest conservation activities. Voluntary organizations have found it much easier to work with women than with men to achieve environmental goals.

Roles of Women in Diverse Farming Systems and Their Relationship to Forest Resources Within Each System

vi. This paper attempts to make a few basic points. First, it is essential to document women's relationship to forests both in the context of the household and the outside economy. For projects to succeed the linkages must be drawn between women's roles in the different farming systems, the food supply system, domestic tasks and their income-earning activities.

vii. Such gender-specific information should substantiate women's dependence on forest resources and the extent of their participation in the forest-based economy. As a result, previously unexplored ways of generating employment and income for women would be revealed. For example, the Minor Forest Produce (MFP) economy, which is dominated by women, has never been the focus either of government policy or been a specific component of social forestry projects.

viii. In spite of their professed goals, social forestry projects have turned out to be cash-crop oriented, and thus mostly benefit men. This could have side advantages in terms of enhancing wood resources, but also may be seen as another instance where new technology or innovations or development efforts are male-oriented. Except for improved cookstoves, no new technology designed expressly for women has been introduced as a part of social forestry programs.

Women's Use of Forest Resources for Earning an Income

ix. A second major thrust of the paper is to demonstrate that an overriding concern with the impact of the fuelwood and fodder crisis on women as actors in the domestic subsistence economy has blinded planners to their equally important role in the non-domestic forest economy. Few planners realize that women's forest-based activities are often a major and sometimes their only available source of income. Where women have no property rights in land, forest products and common property resources (CPRs) provide the only sources of income for poor women. In many communities the only property that women have sole ownership rights to is livestock. But, for livestock to be a source of income, fodder must be available. This again is derived from forests and

CPRs. Studies have shown the importance of animal husbandry for women in the hill districts of India, in the desert region of Rajasthan and among the tribal peoples.

Importance of Forest Products for Household Subsistence

x. The paper also points out how important forest resources are for poor households and as a source of income for resource-poor women. Forest food contribute to household nutrition, especially during periods of food scarcity (their role during famines is documented in a forthcoming paper by Agarwal), and medicines derived from forest products promote physical well-being where health facilities do not exist. Numerous other items of household use are derived from the forest.¹

What "Headloading" Signifies

xi. Women's perceived difficulty in acquiring fuelwood for the home has caused them to be seen mainly in their role as fuelwood and fodder gatherers. That women derive an income from forests, often from the very activity of gathering fuelwood, is only now being recognized. What has been seen as household drudgery disguises a real need--the need for income. The fact that two to three million people, most of them women, are headloading wood

¹ Comprehensive quantitative estimates of the contribution of forest products to household welfare are as yet lacking. (Some quantitative estimates of the contribution of CPRs to household income have been made by Jodha for Rajasthan and Madhya Pradesh: broad estimates of extent of dependence exist for various tribal communities.)

(collecting wood for sale) suggests that the fuelwood crisis is not the only crisis they face. Headloading areas are characterized by extreme poverty and chronic employment. In fact, most rural women when questioned, do not see fuel as their greatest problem; lack of work and their consequent inability to buy food is seen as the main problem.

Firewood Crisis: An Urban Problem

xii. The headloading of wood and its sale to urban areas points to another important dimension of the problem. The urban poor bear the brunt of the fuelwood crisis. They are too poor to buy substitute fuels yet, with no forest from which to collect firewood, they are forced to buy firewood for cooking and other household purposes. The Planning Commission Fuelwood Study Committee (1982) noted that 73.7% of the firewood consumed in urban areas is purchased. According to one study, the poor in Bangalore city spend 17% of their income on firewood (Reddy and Reddy, 1983). Agarwal and Bhatt's studies on the rural-urban firewood trade (1983) show that this percentage might be going up as firewood prices rise due to the increasingly greater distances firewood must travel to reach cities.

Women's Unintended Contribution to Forest Degradation

xiii. Although headloaders fulfill a crucial energy need, while acquiring an income for themselves, they also contribute to the growing degradation of forests. This degradation can only be reversed by pursuing the twin goals of increasing biomass production and generating greater employment and income.

These goals can be partly achieved through a reorientation of social forestry programs that involves women centrally in conception and execution. The scope of the programs must also be broadened to include watershed management, management of CPRs, and to bring within their purview such related enterprises as animal husbandry.

Women's Work in Forestry

xiv. Women can and do carry out most forestry tasks, even arduous ones like pit digging, watering and soil work. They are especially adept at nursery work. Besides creating jobs for women under social forestry programs, their role in forest management must also be strengthened.

xv. A National Review Paper (NRP, 1988) on Small Scale Forest Enterprises estimates employment for women in forest based enterprises at approximately 571,851 million womandays. This estimate is probably on the low side as women's involvement in all small-scale forest-based enterprises has not been fully evaluated. And it does not include figures for the match industry, sericulture, and employment in the rest of the forestry sector. However, it is an indication that substantial improvements can be made.

xvi. Women involved in small-scale forest-based industries, like bidi-rolling (indigenous leaf cigarettes) and basket-making must be helped to improve their skills and to learn to manage the entire process from collection to processing and sale. To do this, rights to forest products must be more clearly delineated for local dwellers.

Role of NGOs in Helping Women to Organize for Development

xvii. Accounts of various non-governmental organizations testify that women have been successful in organizing groups, reclaiming degraded lands, afforesting them and managing them jointly. Elsewhere they have successfully operated joint protection measures against grazing and illegal felling. The most important role of NGOs seems to lie in strengthening existing women's organizations and helping to build new ones. Collective organizations seem best adapted to exploit development facilities like credit, extension advice, access to new technology, raw materials sold in bulk, purchase and maintenance of labor-saving devices, etc.. Rights in degraded land allotted for afforestation can most easily be enforced and protected by organized women.

xviii. Further, interventions must take into account domestic chores and their structuring throughout the day and over the seasons. To this end, time allocation studies among women of different income groups and in different regions must be carried out. New technology must be evolved with women's requirements in mind and with their help, as attempts to introduce improved fuel-saving cookstoves show.

xix. Finally, through an examination of women's roles in different farming systems, the paper shows women's substantial involvement with forests and makes the case for strengthening their involvement in the entire forestry sector.

SECTION I

Introduction

1.1 Interest in the role of women in forestry and the forest economy has been sparked by a number of factors: a) the increasingly visible impact of the fuelwood and fodder crisis on the household economy, b) the dominant role women have played in movements to protect forests; c) the consequent realization that numerous forestry projects can only partially succeed if they do not involve women, and d) an emerging understanding of the importance of so-called "minor forest produce" (MFP) and women's participation in the forest-derived economy.

1.2 Development experts have rarely analyzed gender issues in the course of project preparation. However, evidence shows that men and women are affected differently by changes brought about by economic and social development. Gender-specific plans might be needed to cater to the welfare of women who are usually ignored by development projects and whose interests are assumed to be common with those of men. In forestry projects, evidence to the contrary is abundant. For example, when new, fast-growing "improved" species are introduced, these usually provide a cash crop, often at the expense of the multipurpose species that women use for food and fodder production and as a source of income. The products that women derive from forest resources are rarely recognized as important, or profitable; so their loss goes unnoticed by planners and foresters (both usually men), and even the men of the community. Women often depend on so-called useless scrub or on Community Property Resources (CPRs) for additional sources of food, fodder, medicines and raw materials for the households. When these disappear under the pressure for

cash tree crops, women's ability to provide a security buffer to the household disappears.

1.3 Major Focus. The paper will argue that preoccupation with the impact of the fuelwood and fodder crisis on women as actors in the domestic subsistence economy (in terms of the increasing drudgery in firewood collection, with its resultant impact on the nutrition, health and education of family members as well as women's increasing workload) has obscured the equally important role women play in the non-domestic forest economy. Deforestation has vitally affected the "working" and "earning" lives of millions of women, who shoulder a major part of the responsibility for the survival of the household. Yet, because of this "domestic" bias, attempts to involve women in social forestry programs are peripheral or restricted to such components as improved chulahs (cookstoves). Projects/programs have not focused directly on increasing income and employment for women. The programs for afforestation in India must be given a new direction. This paper documents evidence to argue the case for involving women more broadly in forest development as actors in both the subsistence and the market economies.

1.4 The extensive literature reveals that women's relationship to forest management and resources has been considered exclusively in relation to the household economy. The focus has been on women's problems within the household. As a result, women have been seen mainly in their role of fuel and fodder gatherers. Although the literature alludes to the fact that women also derive income from the forests, often from the very activity of gathering

fuelwood which has been seen as the epitome of household drudgery, this is only now beginning to be highlighted.

1.5 The significance of "headloading" (the phenomenon of women collecting bundles of firewood from the forest for sale in the market) as an important income generating activity for a large number of women (and sometimes even for men), needs to be developed. A series of reports by the Centre for Science and Environment link headloading to the increased urban demand for firewood (Agarwal and Deshingkar, 1983, 1&2, Agarwal and Bhatt, 1983, 1&2). This phenomenon, increasingly documented in many of the Central states of India, and even in the cities, points to a number of conclusions. First, it indicates that these women are not collecting firewood merely for subsistence or household needs. They are also doing it when poverty and unemployment make this the only source of income available to them. As long as there is a market for firewood, and some forest, however distant and depleted, there will be people to ply this trade. Second, time devoted to collecting fuel is not perceived as unremunerative. If women have to buy fuel, they have to part with a substantial portion of their family income. In fact there is evidence that, with the commercialization of wood, people are beginning to buy fuelwood even in the rural areas.

1.6 This strongly suggests that women's relationship with the forest extends beyond the domestic domain to productive activities. This "unrecognized" sphere of women's lives has been equally affected by deforestation and the ecological crisis. If both aspects of the problem--the domestic and the economic--are recognized, the kinds of policies and programs designed to

increase women's share of benefits from investments in forestry would be differently oriented. The role of forests in providing for household subsistence needs and for employment and income should be emphasized equally. A byproduct of such measures would be women's increased interest in forest protection and regeneration.

1.7 Although there is no doubt that a rural energy crisis exists, accounts of it, in terms of the increasing drudgery for women of collecting fuelwood, when evaluated from an all-India perspective, seem to be somewhat exaggerated. The paper examines time allocation studies and concludes that they highlight the more extreme figures. Nor is the fuelwood shortage the only serious impact of forest degradation. The paper attempts to evaluate other dimensions, among them the fodder crisis, given the importance of livestock raising for women's income earning activities, and the loss of numerous other forest products that traditionally contribute to household welfare.

1.8 It is impossible to exaggerate the need to document and understand women's close involvement in the use and management of forest resources, both in the household and the non-household sectors. Such evaluation would dispel the myth that the forest is a "male" domain.¹ Fortmann (1986), contends that "whatever the product and whatever the use, subsistence forestry is practiced primarily by women. In a profession where masculine images predominate, this may be a startling fact." If one looks at women's role in the tribal and hill

¹ On the other hand, one cannot uncritically accept the contrasting stance that women are "naturally" closer to the forest, that they have an intrinsic sense of forest preservation (for such a viewpoint see Shiva, 1988). A related myth which does not stand up to scrutiny in many areas is that of men as "providers" and women as "dependents."

economies, in the latter especially where male migration is occurring, it is obvious.

1.9 Women's roles in shifting cultivation, settled agriculture, wage labor and the collection of minor forest produce need to be considered. Even where women are not the main farmers, (as in villages in the plains) their dependence on forest produce is frequently greater; hence their involvement and knowledge of the forest is likely to be greater. Ignoring this valuable knowledge often adversely affects project development (see section on social forestry). Also, with increasing loss of forest species due to degradation and introduction of monocultures, this knowledge with its potential for innovative, cost-effective solutions to the domestic energy crisis may be lost.

1.10 Women's Intimate Knowledge of Forests. Women's knowledge of forests is often found to be qualitatively different from that of men. Fortmann (1986) argues that their extensive contact with the forest may give local women a more detailed understanding of forest resources than local men or foresters from other localities. This is partly because women relate to the forest in a number of contexts. They are more likely to make daily trips into forest areas in different seasons for food, fodder and fuel. Examples abound where women have identified many more species than local men or agricultural extension agents and foresters. Even children often have such detailed knowledge; Shiva (1988) mentions an illiterate Irula boy from a tribal settlement near Kotagiri in Karnataka, who identified 37 different varieties of plants, giving their Irula names and their different uses.

1.11 Local women can differentiate among species that provide a long-lasting, low heat, a quick high heat, or those which smoke and so on. Where wood is the main energy source for cooking, knowing such characteristics is important for planning. Fortmann argues that without the benefit of women's knowledge, foresters could produce a plantation of quick-growing wood that would not meet local needs (Fortmann, 1986).

1.12 Brar's study of the commons in Rajasthan reveals that when consulted about species to be planted on the village pastures, women were interested in a large range of the naturally occurring grasses, herbs and trees that they used as forage, fuel and vegetables. The majority of men, by contrast wanted to plant trees that had a market value (Brar, 1987).

1.13 It has become increasingly clear that illiterate village and tribal women are aware of the importance of maintaining the ecological balance; that much more than men they see the damage done by the degradation and destruction of forests. This is partly because they are the first to face difficulties in finding food, fuel, fodder, water and other household essentials. Women, of course, play their part in depleting forest stock (mainly through sale of firewood), but usually they have no alternative to fulfilling their household needs nor do they have other ways to earn subsistence income. Under such conditions, women are "forced" to ignore their knowledge of the long-term consequences of ecological imbalance to satisfy their immediate need.

SECTION II

2.1 The primary issues relating to women and forestry are outlined above. The remainder of this paper will document, in detail, the available evidence on these issues. The paper is divided into five sections: 1) Depletion of Forests; 2) Forests and the Household Economy; 3) Employment and Income for Women in Forestry; 4) Role of Individual Women, Informal Local Groups and Non-governmental Organizations (NGOs) in Forest Management, Protection and Regeneration; and 5) Recommendations and Conclusions.

2.2 Depletion of Forests. The environmental impact of deforestation has been extremely well-documented. The Centre for Science and Environment (CSE), in its reports on the State of India's Environment (1982, 1985) has brought together evidence on the extent of forest resource depletion. Department of Environment statistics reveal that despite the stipulated requirement of 33% forest area, the actual coverage is only 10.63%. Further, the National Remote Sensing Agency confirmed in mid-1984 that India's annual loss of forests was 1.3 million hectares. From 1974 to 1984, India is estimated to have lost 34% of its forest area (Agarwal and Narain, 1985a, p. 80).

2.3 Theories as to who is responsible for this massive destruction of forest resources have been widely debated. The Forest Departments and the official bureaucracy blame people's insatiable demand for fuelwood and fodder. (The impact of population pressure on forest resources cannot be discounted, although often analysts do not give it sufficient importance for a reasoned viewpoint see, Gadgil, 1985).

2.4 Environmentalists consider the Government the main agent of destruction, arguing that the Government sees forests simply as revenue-generating resources and therefore sacrifices local welfare to the interests of industry and other elitist groups. Scholars have traced the depletion of forest resources to colonial practices of forest management that are seen to be continued by the National Government (Guha, 1983; Gadgil and Guha, 1984; Singh, 1986; Kulkarni, 1983, etc.). Gadgil and Guha believe that the solutions offered by each side (the environmentalists who support forest-dweller's and other poor user's interests and the Forest Departments and Government who are seen to support elite interests) have been in keeping with their respective biases. Thus the Forest Departments advocate stricter control over access to forests while the environmentalists seek a radical reorientation of forest policy. Activist organizations are pressing for a forest policy that takes the forest users' interest into account in their belief that further degradation can only be prevented when users have a vested interest in preserving forests. They maintain that forests are being depleted at a much faster rate by industrial interests in collusion with the Forest Departments, than by the activities of local people.

2.5 There is evidence to support either contention. On their part, the Forest Departments have fought against encroachment of forest lands for agricultural purposes and are recognized to have preserved some areas (Gadgil, 1985, 119). It cannot be denied that encroachment for satisfying agricultural demands is a major source of forest depletion in India. The States of Punjab and Haryana are prime examples of this phenomenon. In West Bengal, Uttar Pradesh and Bihar too, natural vegetation has been replaced by cultivation in

many areas (A Social and Economic Atlas of India, 84). Dams for irrigation and power generation have also entailed large-scale deforestation. The depletion of forests for railway sleepers is well documented. Large-scale deforestation for industrial and commercial uses is also a major cause. Traditional (colonial) management practices have tended towards managing forests for commercial and industrial purposes, often changing the character of multipurpose forests, resulting in large-scale deforestation.

2.6 Various studies confirm that the impact of deforestation is exacerbated by the privatization and depletion of common property resources (CPRs), (Jodha, 1983, 85, Brar, 1988). It would require a more detailed study than has been done to date to ascertain and understand all the causes of forest depletion in India.

SECTION III

Forests and the Household Economy

3.1 The role of forests in maintaining the ecological balance, in preventing soil erosion, desertification, conserving water resources, maintaining fertility of the soil and preserving the micro-climate in general is well-established. The depletion of forests and the reduction of forest cover is harmful for the entire population, as well as detrimental to future generations. Directly or indirectly, forests affect everyone, although in this paper we are concerned only with a subset of the population, i.e., women and their involvement with forests.

3.2 At the outset, it is important to clarify what is meant by forests, since the definition will influence the context in which the relation between women and forests is discussed. Forests are usually thought of as continuous stands of trees or those tracts that are classified as forests by the Government (into categories of reserved, protected, village and private forests). In non-industrial regions, trees are inextricably woven into the rural and household economies, therefore, for our purposes, we will deal with trees wherever they grow, whether in the so-called "proper" forests, or on wastelands, village settlements, private farms or those included in common property resources on pastures. Trees found in urban areas and in cities also come within the purview of this definition. This ample definition makes it possible to consider the relation of women to forests not only in forest-dwelling communities, or afforested hill areas, but also in the plains

agricultural regions which have poor forest cover and even in urban areas where poor women are dependent on biomass for cooking purposes. Under this broad definition, forest-dependent animal husbandry and other such occupations which are central to women in the sparsely forested areas can also be discussed.

3.3 The relationship between women and forests varies considerably depending on whether one is looking at: (a) tribal women in forest-dwelling communities, (b) hill women in various parts of the country, (c) peasant women (land-owning and agricultural laborers) in the plains, or (d) the urban poor. This section analyzes how the women in each of these categories use or depend on forests for direct satisfaction of household needs.

3.4 Farming Systems and Women's Role. Women play a dominant role in food production in some farming systems, such as the tribal system of shifting cultivation. In the states of Maharashtra, Madhya Pradesh, Bihar, Orissa and Andhra Pradesh (and the north-eastern hill states)--home for most of the Indian tribes--the subsistence economy is entirely dependent on the forest (Table I gives forest area and tribal population by State). Shifting cultivation, described as a female farming system by Ester Boserup (1970), persists in these areas. Several thousand hectares are still under this system of farming in the hilly parts of Assam, Tripura, Manipur and Orissa (Agarwal, 1985, p. 31). In Orissa, bogodo, or shifting cultivation is carried out by women with some help from the men.

Table I

Forest Area and Tribal Population by State: 1980

<u>State</u>	<u>Forest Area</u> (<u>'000 has</u>)	<u>Forest Area</u> <u>as Proportion</u> <u>of Total Area</u>	<u>Adivasi</u> <u>Population</u> (<u>'000s</u>)	<u>Adivasi Pop. as</u> <u>Proportion Total</u> <u>Population</u>
Andhra Pradesh	6,409	23.2	2,226	4.2
Assam	3,071	39.1	1,607	8.1
Bihar	2,923	16.8	4,933	7.1
Gujarat	1,952	10.0	3,757	11.1
Haryana	164	3.7	--	--
Himachal P.	2,119	39.1	142	3.4
J and K	2,189	9.9	n.a.	n.a.
Karnataka	3,787	19.8	262	0.7
Kerala	1,112	28.6	193	0.8
Madhya P.	15,389	34.8	9,815	18.8
Maharashtra	6,408	20.8	3,841	6.1
Manipur	1,515	67.8	334	23.3
Meghalaya	855	38.0	814	61.3
Nagaland	288	17.4	n.a.	n.a.
Orissa	6,767	43.4	5,057	19.3
Punjab	243	4.8	--	--
Rajasthan	3,491	10.2	3,135	7.3
Sikkia	260	35.6	--	--
Tamila Nadu	2,179	16.8	450	0.9
Tripura	593	56.6	451	21.9
Uttar Pradesh	5,139	17.5	199	0.2
West Bengal	1,184	13.5	2,603	4.8
Andaman and Nicobar	714	86.1	18	9.6
Arunachal P.	5,154	61.7	n.a.	n.a.
Others	838	31.0	--	--
Total	74,743	22.7	39,855*	5.8*

* Excludes the tribal population of Nagaland and Kashmir.

Source: Commander, 1986.

At the height of the agricultural season women are extremely busy. They burn and clear areas and dig, weed and sow; they harvest and thresh the crop. They also grow vegetables, and collect and process minor forest produce (details in Fernandes and Menon, 1987). In a detailed study of the Ho tribe of Singhbhum,

Madhu Kishwar (1987) comes to similar conclusions about the greater role of women in this agricultural system.

3.5 The hill areas in India, consisting mainly of the Himalayas, cover 514,000 sq. kms or over 16% of the country and account for about 8% of the total population. These hill areas can be divided into two broad regions: the western Himalayas, comprising the states of Jammu and Kashmir, Himachal Pradesh and hilly areas of Uttar Pradesh (Kumaon and Garhwal); and the eastern Himalayas, which consist of seven small states, Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland and Tripura. In most of these areas women play a central role in agriculture.

3.6 In the Western Himalayan regions, crop production and animal husbandry are the main source of livelihood. In a study in Himachal Pradesh, Bhati and Singh (1987) found that women constituted 62% of the agricultural labor force in their sample. The average number of livestock units per farm was 3.35, 5.51 and 8.18, respectively on marginal, small and other farms. The average number of milch animals on marginal farms was 1.47, on small farms 2.26, and on other farms 3.18. Since farmers do not grow their own fodder crops, animal husbandry depends on common property open-access pastures and forests. As a result, animal husbandry is relatively labor-intensive and requires a constant amount of work through the year for grazing and collecting fodder (ibid, WS-7,8). In these regions where tree fodder is predominant, women manage lopping and fodder collection. According to Shiva (1988, p. 66), older women train the younger ones in the art of lopping (pollarding) and of collecting forest produce.

3.7 Male migration characterizes many of these areas, which leaves women with the dual responsibility of looking after both the household and the farm. Subsistence cultivation is carried out on hillside terraces. Bhati and Singh (1987, WS-9) show that most work in hill agriculture is light and hand operated--sowing, weeding, hoeing, harvesting, cutting of grass for fodder, etc. While men perform some of the heavier work like plowing, terracing and leveling, women do most of the other work. They also make a substantial contribution through their involvement in animal husbandry and crop production (87.2% of the working time of women in the sample was spent on tending of animals and 11.9% on crop production, leaving 0.9% for other farm activities).

3.8 Mazumdar (1982) states that in Asia "rural women constitute the single largest group engaged in agriculture and the production of food." Women's considerable contribution to agriculture in peasant farming has been well established. Here we will attempt to delineate only their role in the farming system as it pertains to use of forest and tree resources. This revolves around the village forest and the community pasture or essentially what are known as common property resources (CPRs). Table II shows the extent of dependence of villagers in Rajasthan and Madhya Pradesh on CPRs.

Table II

Indicators of Dependence on CPRs by Different Categories of Rural Households in Selected Villages in Rajasthan and Madhya Pradesh

<u>Indicators of Dependence on CPRs</u>	Categories of Households in:			
	<u>Rajasthan Villages</u>		<u>M.P. Villages</u>	
	<u>Labor, Small Farmer</u>	<u>Large Farmer</u>	<u>Labor, Small Farmer</u>	<u>Large Farmer</u>
No. of Households	58	33	40	20
Proportion of Households:				
- meeting > 70% grazing requirement	97	24	82	25
- collecting food material	41	3	77	0
- collecting fuel	86	0	98	0
- collecting fodder	36	3	55	5
- collecting timber, silt, etc.	12	36	10	45
- getting supplies and wage employment on CPRs during drought	69	0	-	-
- using CPR water for irrigation	0	9	0	15
- consuming CPR-food items only by collection	39	0	50	0
- CPR based income as proportion of per household gross income	42	15	-	-

Source: Jodha, 1983, p. 8.

3.9 Women are central to livestock rearing for which fodder is essential, whether it is gathered from public or private lands. Grazing is also the work of women and children mainly. Jodha's study of villages in Rajasthan showed that households with up to 5 hectares of land had 4 to 12 animal units per hectare and those with between 10 and 15 hectares had from 1 to 3 animal units per hectare (1983, p. 3). However, where fodder is grown on croplands, as in Punjab, women are involved in its harvesting. Some non-farm work relates to auxiliary work like making baskets and ropes used in fodder collection.

3.10 Women in villages in the plains relate directly to forests in other ways as well. Here the relation and dependence is greatest among the poorer village women from marginal farming families or landless agricultural laborers. The latter derive all their firewood and fodder from the forests or from other people's land. Though in theory, most fuels are gathered "free" by household labor, in fact, there is a price to be paid. With increasing scarcity, families reallocated household labor, reduce consumption, enter into barter or labor relationships with owners of fuel-producing resources such as land, trees and animals. They resort to illegal poaching and are subject to harassment and penalties by forest officials in order to obtain scarce household fuel supplies.

3.11 Although poor urban women are not involved in a farming system, they are dependent on fuelwood for cooking purposes. Poor women may derive seasonal income from fruit trees found in cities. Thus mulberry fruit, jamun and wild ber are collected in season and sold on the streets. Since many of the poor live on the outskirts of cities and pursue a semi-rural living style, livestock kept for milk purposes requires fodder collection from public areas.

3.12 Forests and the Satisfaction of Basic Needs. Women everywhere and in India derive a large number of products from the forest. Trees are used not only for fuel, food and fodder; the forest habitat provides innumerable other useful products. Forest-dwelling communities derive the maximum number of products and this dependency decreases as one moves to other habitats, urban women being the least dependent due to lack of access to a forest.

3.13 Food. Women use flowers, fruits, roots, tubers, honey, oil, seeds, leafy wild vegetables, mushrooms, and some edible insects. Small animals and game are also found in the forest, although this source of food is usually exploited by men. Most forest foods are high in calories, proteins and vitamins. For most communities, they contribute to a balanced diet.

3.14 Medicines. Women also use a large number of plants and herbs for medicinal purposes. Where health facilities are few and far between, tried and tested remedies from the forest are the basic ingredients of health care. For example, the tendu tree (*Diospyros melanoxylon*) has an astringent bark used to treat diarrhoea and dyspepsia.

3.15 Building Materials. The household also derives building material in the form of poles, bark, leaves, fencing materials, etc. from the forest.

3.16 Other Household Items. Household furniture is constructed from materials derived from the forest. Utensils such as baskets, plates, water containers are made from forest produce, as are other items of household use including ropes, gum, resin, dyes and handicraft materials.

3.17 Farm Implements. Most farm implements are made from small timber that might be acquired from the forest or from trees on farmland.

3.18 Crematoria. Most Hindu communities use wood to cremate the dead. Vast quantities of wood are used for this purpose in rural as well as urban areas.

3.19 Shade. An important and often overlooked function of trees is to provide shade, whether in the village, or on long treks to collect food, fuel and fodder, or to protect children while the mother works in an adjoining field.

3.20 In a case study of three villages in Ranchi district and eight villages in Purulia district, N.G. Basu lists 16 types of leaves, 8 types of flowers, 26 types of fruits, 9 types of oilseeds, 4 types of bark, 4 types of grass, 3 types of resin, 8 types of roots and tubers and 12 plant species that are used for medicinal purposes (Basu, 1987, pp. 47-48). All these materials are collected primarily for home consumption. His studies in the tribal areas reveal that until today, 50% of the livelihood of local inhabitants depends on forest resources.

3.21 All these products play an essential role in sustaining the domestic economy. Yet most planners do not take into account how many of these items are lost due to deforestation or the introduction of monocultures. The impact of this loss is especially felt by the women. The multifold importance of the sal tree for tribals in various parts of the country is a good example of what is at stake here. Food plates and dona (cups) to serve liquor are made from sal leaves. They are also used as bidi patta (cigarette leaf) instead of the more commonly used kendu leaf. Sal leaves containing a few grains of corn colored with tumeric are used to send marriage invitations. Leaves are used to rear tasar silk cocoons and sal branches are considered to be good fuelwood. The twigs are used to brush teeth. Oil is extracted from sal seed and sal cake is used as animal feed and fertilizer. Incense is made out of

sal gum. The deities worshipped locally are often located under a sal tree. With the denudation of sal forests or restriction of access to them all these uses have to be supplied from alternative sources. The commercial importance of sal to the people is also immense. A similar list can be drawn up for the mahua tree. Several species have multiple uses for the villagers and forest-dwellers. All these are items collected free from the forests by women, the only cost being their own labor.

3.22 From the above it is abundantly clear that forest produce is important for the fulfillment of basic needs. The degree of subsistence dependency varies from region to region and over different classes and income groups. Cultural variations are also found. A knowledge of this diversity would be valuable in project implementation. Irene Tinker (1982, p. 9) reports that conversations with rural women suggest that they are more concerned about the lack of such forest products as berries, leaves, and bark, which they use in sauces, than they are about wood. Often wild foods are used to flavor the main staple and are culturally preferred.

3.23 In the social forestry project for Karnataka state, 2,000 hectares of land in a tribal area were marked for bamboo cultivation. For over two years no progress was made on this component. Then, it was discovered that these particular tribals did not have much use for bamboo in their subsistence system. However, the bamboo was needed by the medar caste in the same region for making baskets to collect mulberry leaves and mats to be used in the cultivation of silkworms. The latter group would have benefited enormously

from a bamboo component especially since now they have to compete with the more powerful paper industry for bamboo (Kaur, 1985).

3.24 Security Aspect of Forests and CPRs for the Household Economy. Social scientists and forestry experts are only now beginning to recognize the importance of the security buffer that forests provide to the household economy, especially to poorer households. This is true of common property resources also. Falconer (1987) argues that forest and farm trees make significant direct contributions to the food security of rural populations. Although forest foods are not dietary staples, they are important supplements which increase the overall diversity and nutritional quality of the diet. Processed and stored forest food products also make essential contributions to the year-round food supply. Falconer analyzes the nutritional components-- proteins, carbohydrates, vitamins, oil and calories--provided by forest foods (ibid). He highlights the importance of snack foods used by people while they are at work, by children while going to school or grazing animals away from home.

3.25 Forest foods can be of crucial importance for seasonally dependent agriculture systems. Bhaduri and Surin (1980, p. 246) report that the headloading tribals of Bihar are dependent on forest food for three to four months in the year. In lean or famine periods, these foods sustain rural people. However, it would be incorrect to assume that the availability of these foods coincides perfectly with lean seasons. Again, it is the women and the children who are most knowledgeable about these plants and responsible for

gathering them. Many of these seasonal foods, especially fruits, are a source of income for women and children who gather and sell them on the roadside.

3.26 Constraints to Access. The major constraints to women's access to forest resources for satisfying household needs are lack of defined rights to forest produce, their socio-economic status and general ecological deterioration. Over the years, access to forest produce, especially for the poor, has been curtailed by legislation which treats forests as the property of the State. Consequently people are allowed only limited rights which often prove useless in the face of large-scale reduction in forest resources. This legislation has most severely affected forest-dwelling tribal communities whose livelihood is bound up with the forests. People who earlier gathered fuelwood and fodder from common property resources now find that most CPRs have been encroached upon, privatized or depleted. In addition, changes in the jajmani system (traditional patron-client relationships between castes) which allowed tenants and landless laborers certain rights, have deprived them of rights to free collection from private lands. Women are most severely affected because they rarely have land rights as such. In the tribal areas where State intervention has changed usufructuary rights to ownership rights vested in men, women are worse off than before. The irony is that even where women play a major role in the economy (whether in subsistence crop production or gathering and processing of forest produce), they have no rights in land.

3.27 Fuelwood and Fodder Crisis. In this and the following paragraphs we will discuss the fuelwood and fodder crisis, since these are basic needs

satisfied from forest resources. These needs are shared by all the four categories of women delineated earlier.

Women's Major Role as Gatherers and Users of Fuelwood

3.28 Women are largely responsible for family welfare and the fuel use and supply system. Women are the main gatherers of fuelwood in most societies and often they are helped by children. The role of men is subsidiary in fuel gathering and almost non-existent in the use of fuelwood, i.e., cooking. Thus family nutrition and health (often even the provision of food) depends on the women. As most studies show, the shortage of fuelwood is especially hard on poor, rural working women. Describing a village in a fuel-scarce area of Gujarat, Nagbrahman and Sambrani (1983) state, "Firewood is now so scarce that even a small weed on the roadside is collected. Women spend long hours trying to dig roots of trees cut long ago." Numerous studies document the increasing amount of time and effort women must spend in fuelwood collection (Agarwal, 1985; Agarwal, 1986; Baltiwala, 1983; Nagbrahman and Sambrani, 1983 and others). Other studies focus on women's burgeoning workload and the impact the crisis has on nutrition, health and the schooling of children.

3.29 Household Energy Demand and Fuelwood Supply. The impact of deforestation on women has mainly been seen in terms of fuelwood scarcity and the consequent increase in women's drudgery. Energy is essential for cooking and other household needs like lighting and heating. In the Third World most of the domestic energy is supplied by firewood. Therefore, fuelwood has to be considered a "basic need." Without fuel, food cannot be transformed for human

consumption so the mere availability of food cannot be translated into better nutrition.

3.30 Data on energy consumption in the household sector indicate that in rural areas, firewood constitutes 68.5% of energy forms. Of this, 12.7% is purchased, 64.2% is collected and 23.1% is homegrown. These figures show how important an adequate supply of firewood is for the rural Indian household and especially for the women who are the main gatherers. Comparable figures for urban areas are : 73.7% purchased, 14.8% collected and 11.5% homegrown.

(Table III gives the source-wise energy consumption in the household sector.)

3.31 The ASTRA study (1981) on rural energy consumption patterns shows an even higher percentage (80%) for firewood consumption of total energy consumption. Of this, 96% is consumed in the home, 82% for cooking and 14% for heating water.

Table III

Source-wise Energy Consumption in the Household Sector

Energy	<u>Rural Per Capita Energy Consumption</u>				<u>Urban Per Capita Energy Consumption</u>			
	% Share of Energy Form	% Share of Source of Supply of Each Energy Form:			% Share of Energy Form	% Share of Source of Supply of Each Energy Form:		
		Purchased	Collected	Home Grown		Purchased	Collected	Home Grown
Electricity	0.6	100.0	0.0	0.0	5.9	97.0	3.0	0.0
Oil Products	16.9	100.0	0.0	0.0	30.2	100.0	0.0	0.0
Coal Products	2.3	65.1	34.9	0.0	13.7	95.6	4.4	0.0
Firewood	58.5	12.7	64.2	23.1	45.5	73.7	14.8	11.5
Animal Dung	8.3	5.1	26.2	68.7	3.2	49.1	12.3	38.6
Others	3.4	8.9	61.0	30.1	1.5	71.2	28.8	0.0
Share of Commercial Fuels	20%		49%					
Share of Non-commercial Fuels	80%		51%					

Source: Report of Working Group on Energy Policy, 1979.

3.32 All-India Demand and Consumption Figures. The Fuelwood Study Committee of the Planning Commission (1982) calculated current demand for firewood at 133 million tones a year. Huria and Acharya (1983) estimated the demand in 1980 at 131 million tons and projected that by 1990 it would rise to 150 million tons a year. The present demand is met 10% from normal forest felling, 70% from treelands and 16% from plantations. The Planning Commission study gives the comparable figures of recorded annual production from forest lands as being around 15 million tons. These figures, however, project only firewood demand and do not take into account cooking energy needs fulfilled

from other sources, i.e., agricultural wastes, bushes, leaves, grass and cow dung.

3.33 Cooking and heating needs of a village household of five members have been calculated to be about 1.25 million kilo calories a year. Of this, 20% is met from vegetative wastes, and 80% from firewood. Thus, of the three important non-commercial sources of energy, (firewood, agricultural wastes and animal dung), firewood is by far the most important. Dependence on traditional fuels like wood, charcoal, animal dung, crop residues is even higher among the rural poor. No estimates of non-domestic use of firewood, in rural industries and agricultural processing, have been made. Firewood demand is considerable in the cities as well. Agarwal and Deshingkar (1983), estimate that 14 million tons of firewood is purchased annually in urban India. In fact the urban poor who depend on firewood for cooking energy are often worse off than the rural poor because, without access to forests, they have no recourse but to buy fuel. In the countryside people rarely purchase firewood but a large number of them collect it for sale to nearby cities.

3.34 Village level studies have been conducted on the amount of fuelwood consumed by households. The following table gives the average fuelwood consumption of households in five different villages.

Table IV

Household Consumption of Firewood Equivalent Per Day in Winter
and Summer in Different Villages
(kg)

<u>Village and State</u>	<u>Winter</u>	<u>Summer</u>	<u>Overall</u>
N. Suriyan (HP)	6.22	4.73	5.47
Sehar (MP)	9.72	7.34	8.53
Malari (UP)	3.86	3.66	3.76
Deokhop (Maharashtra)	10.74	7.50	9.12
Rajpara (Assam)	8.62	6.33	7.47
Overall	7.83	5.91	6.87

Source: Dasgupta and Maiti, 1986, Observations in 1983-84.

3.35 Another study, covering three villages in different habitats in Gujarat, calculated that on an average each household with an average size of seven members consumed up to 10 kg a day of firewood (Nagbrahman and Sambrani, 1983).

3.36 However, estimates are not always comparable as some refer to fuelwood, others only to firewood and still others calculate firewood equivalent, including agricultural wastes and cow dung in the estimate. In the village of Dwing in the Garhwal hills, firewood consumption had the following distribution according to family size (Table V).

Table V

Firewood Consumption According to Family Size

<u>Size of the Household</u>	Consumption of Wood Kg/Day	
	<u>Summer</u>	<u>Winter</u>
0-3	6.0	12.0
3-6	9.3	16.5
6-9	10.3	23.0
9+	18.0	36.0

Source: Swaminathan, 1982, p. 7.

3.37 The above table (V) seems to confirm the general assumption that an inverse relationship exists between family size and the per capita need for fuel. However, some research suggests this is not the case. Dasgupta and Maiti find that very small and very large families have about the same per capita fuel requirement (1986, p. 55).

3.38 Types of Fuelwood Used. The major types of non-commercial fuels used are firewood (split logs and large tree branches), agricultural residues, dung and bushes. Availability affects the type of fuel used. In forest and semi-forest areas, mainly firewood is used; in the hills firewood is combined with agricultural materials and wastes; in the plains, the amount of firewood used goes down and there is a corresponding increase in the use of agricultural residues and animal dung (Dasgupta and Maiti, 1986). The following (Table VI) shows the percentage use of various types of fuel in the five villages.

Table VI

Percentage Use of Type of Fuel in Different Villages

<u>Village and State</u>	<u>Firewood</u>	<u>Twigs & Leaves</u>	<u>Corncoobs</u>	<u>Animal Dung</u>	<u>Others</u>	<u>Total</u>
N. Suriyan (HP)	15.00	19.00	17.00	45.00	4.00	100.00
Sehar (MP)	80.00	16.00	-	-	4.00	100.00
Malari (UP)	5.00	12.00	5.00	75.00	3.00	100.00
Deokhop (Maharashtra)	75.00	20.00	3.00	-	2.00	100.00
Rajpara (Assam)	90.00	10.00	-	-	-	100.00

Source: Dasgupta and Maiti, 1986, p. 54.

3.39 In hilly regions of North India where crop production is low, 85% of biomass energy was found to come from firewood and dung. In hilly regions, the share of these fuels dropped to 72%. While in the plains, where agricultural production is relatively high, firewood and dung contributed only 63% of the total, the rest coming from crop wastes (Agarwal, 1982, p. 6).

3.40 Batliwala (1983) examines the degree of correlation between land ownership (which is very closely correlated with poverty levels in rural areas) and access to firewood and other biomass fuels. One study revealed that families owning less than one hectare of land used no firewood; those owning one to two hectares used a nominal 0.2 kgs per day; but those with more than two hectares used on an average, 2.3 kgs of firewood per day (Agarwal, quoted in Batliwala, 1983, p. 2,227).

3.41 The urban poor often buy firewood; in fact, an estimate for Bangalore city shows that the poor spend 17% of their income on firewood (Reddy and

Raddy, 1983). Cecelski (1984, pp. 48-49) also argues that in developing country cities, as much as 20 to 30% of low income family budgets may be spent on fuel, reducing the money available to buy food and other necessities. A recent study by Jodha (1986) shows similar inequities in access to fuel. His data also shows that differences in domestic fuel consumption between the larger farming households and the small and landless are being further heightened by the deteriorating forest and CPR situation. The following table gives evidence from four States:

TABLE VII

Domestic Fuel Consumption by Household Economic Position and Source of Fuel in Rural India

District/ State	Household's Economic Position	Weekly Fuel Cons.	CPR's	Fire- Wood	Dung	Crop Residues
Mahbubnagar (Andhra P.)	Poor (13)	119	84	-	9	8
	Others (7)	190	13	26	41	20
Akola (Maharashtra)	Poor (13)	104	79	-	3	18
	Others (7)	185	13	20	24	43
Sholapur (Maharashtra)	Poor (13)	119	72	2	12	14
	Others (7)	205	10	18	34	38
Sabarkantha (Gujarat)	Poor (20)	184	66	-	25	9
	Others (10)	213	8	18	28	46
Raisen (Madhya P.)	Poor (20)	185	74	9	11	6
	Others (10)	219	32	24	29	15

Source : Jodha (1986 : 1173)

Notes: 'poor' includes agricultural labourer and small farmer (less than two hectares of dry land) households; 'Others' includes only large farmer households (the top 20% of landowners in the village).

3.42 Time Allocation in Fuelwood and Fodder Gathering. The main forest-based activities women and sometimes children perform for the household are to collect fuelwood and fodder. In a study of two villages in the Garhwal hills, Swaminathan (1982) noted that in 86.3% of the households sampled, only the women went out to collect firewood. In tribal villages men share the task of fuelwood collection with women much more often. Bina Agarwal (1985, pp. 18-19) has assembled data on the time taken and the distance traveled for firewood collection in many regions of India. These figures show that women may have to walk up to 10 kms and spend five hours a day to gather firewood. Often the chore is performed under dangerous conditions as when women carry 20 kg loads in the hills or when they gather firewood in both fear and defiance of the forest guard. Nagbrahman and Sambrani's study (1983) covered villages close to forests as well as those removed from forests and also tribal and non-tribal populations. Frequency of firewood collection varied from daily trips to once in two and once in four days. Fuelwood sources included firewood, cow dung, shrubs, weeds and small plants growing on the roadside.

3.43 A number of factors must be taken into account while assessing estimates of time spent in fuelwood collection. First is the wide discrepancy in data from different parts of the country. Second, the methodology of arriving at estimates has to be clearly set out. This is often not done in studies which highlight the extremes presented by the data. The basic technique used in estimates of time spent on fuelwood collection is the recall method. Answers are likely to vary according to the season in which the

interview is conducted; before the monsoon, trips are often more frequent and more firewood is collected, thus involving a greater expenditure of time. Where firewood is also collected for sale, the frequency of trips is again higher. Often the analysis does not separate out trips made for the purpose of sale.

3.44 Table VII shows the wide variation in time spent in fuel collection in different parts of India. Time spent searching for fuel varies according to location, accessibility, source of fuel and type of farming system. Another factor not taken into account in these estimates is that women often gather several other products on their trips. Fodder is almost always collected together with fuel. Leafy vegetables, fruits and seeds are also often collected. These items may be for home consumption or for the market. The Ho women of Singhbhum collect karonji seeds on their forays into the forest; these are later sold.

Table VIII

<u>Location</u>	<u>Hrs. Per Day</u>	<u>Source</u>
Dwing (UP hills, depleted)	5	Swaminathan, 1984
Pakhi (UP hills, depleted)	4	Swaminathan, 1984
Garhwal (UP hills, depleted)	5	Agarwal, 1985a
Malari (UP plains, cow dung and agricultural wastes)	0.81	Dasgupta and Maiti, 1986
Gujarat (depleted plains)	4-5	Nagbrahman and Sambrani, 1983
Deokhop (Maharashtra, hilly, forest area)	4.13	Dasgupta and Maiti, 1986
Sehar (MP)	2.48	Dasgupta and Maiti, 1986
Karnataka (plains)	1	Batliwala, 1983
Pura (Southern India)	2.6	Reddy and Batliwala
N. Suriyan (HP, animal dung)	0.7	Dasgupta and Maiti, 1986
Rajpara (Assam, forested)	0.86	Dasgupta and Maiti, 1986

3.45 Dasgupta and Maiti's study of five villages in different states reveals that women's time is concentrated on cooking, cultivation and fuel search in that order (1986, p. 36).

3.46 Impact of Deforestation on the Household. Depletion of forest resources affects: a) the availability of products; b) the time required to obtain products as well as changes in cooking time; c) women's workload, at home and on the farm; d) nutrition and health; e) education; and f) the allocation of household income. (The impact on income earning activities, on time taken and products available will be discussed in Section IV of the paper.)

3.47 The demands of a growing population have contributed to the heavy pressure on natural resources. The crisis is reflected in the shortage of firewood, fodder and other necessary items derived from the forests. The

impact is especially visible on poor women who are responsible for meeting their families' basic needs. Since firewood remains the primary source of energy in rural India and among the urban poor, it is important to devise ways to increase biomass supply and to lessen the drudgery involved in firewood collection.

3.48 Where no communal wood resources remain accessible, the poor are forced to burn lower quality crop and animal residues, diverting fertilizer from agriculture. Molnar (1986, p. 28) states that "there is increasing evidence that poor men and women are beginning to pay for non-wood fuel, when fuel is scarce. In Gujarat, for instance, women daily wage laborers may take some portion of their wages in burnable agricultural residues, as well as cash or foodstuffs." Fuel scarcity also leads to loss in women's wage income because of the time they must spend gathering wood. Given the significance of poor women's contribution to household income, this can be a serious liability.

3.49 Time allocation studies highlight the impact on women's time of the fuelwood and fodder shortage. They show that women's workload both in the house and on the farm has increased with deforestation. A major consequence of women's heavier workload may be to impede technological changes in agriculture that require more female labor per hectare. Women's unavailability also means that extension service cannot reach them. Thus hill agriculture which is characterized by male migration and already faces severe seasonal labor constraints in some areas, is likely to remain stagnant.

3.50 Being forced to resort to different kinds of fuels changes the nature of cooking and the time involved in cooking. Such fuels may required constant tending, precluding other work. Less efficient fuels may also need more preparation before use. According to Cecelski (1984), "rural households clearly are making complicated decisions about family labor allocation and alternative fuels in the light of fuel scarcity, in order to maximize family welfare preferences. There is a possibility that the education of children and especially of female children might suffer."

3.51 Fuelwood supply can influence the amount and quantity of food consumed. Evidence shows that poor families have often had to cut down from three to two and from two to one major meal a day. This obviously has an impact on the health of the family. Other evidence shows that poor families shift from more to less nutritious foods, which take less energy and time to cook. Many "lean season" foods like forest roots and tubers may have to be abandoned because they can be made edible only by long cooking.

3.52 Impact of Fuelwood Crisis on Forest Protection and Regeneration. Unless provision is made for an adequate supply of firewood for the rural poor, forest conservation will be difficult. The traditional rights of people in forest and other common property resources need to be restored. Unless the local community has a vested interest in the preservation and regeneration of these resources, harmful exploitation of the forests cannot be prevented.

SECTION IV

Employment and Income

4.1 It has been shown conclusively that large numbers of women work outside the home to earn a living, especially poor women whose contribution to household income is substantial. Cecelowski (1984, p. 16) notes that "rural women also make a substantial contribution to family income, at times more than half, with many working for low wages under highly exploitative wage labor relationships, on plantations and as seasonal agricultural workers, and in the domestic putting-out system." Further, their income and productivity result directly in improvements in nutrition and health of the family. In a study of women's roles in five different villages, Dasgupta and Maiti (1986) show that in the families sampled, women contributed more than one-third of the cash income.

4.2 Sources of Employment and Income. The kinds of employment and income opportunities available to women in the four categories delineated above differ according to the habitat, type of farming system, availability and accessibility of forest resources, traditional skills and socio-economic status. The main forest-based activities from which women derive employment and income are: a) the sale of firewood and fodder; b) rearing livestock which is dependent on fodder from the forest; c) the collection, processing and sale of Minor Forest Produce (MFP); d) forest-based handicrafts and cottage industries; and e) wage labor.

4.3 Types of Employment. Three main kinds of employment are generated in forestry: a) direct employment, with wages paid either in cash or kind;

b) self-employment; and c) secondary employment, based on forest industries. Forest Departments generate direct employment under regular forestry activities in the various categories of forests under their control. It is also generated by special afforestation programs like social forestry. Self-employment revolves around the collection, processing and marketing of forest produce which ranges from wood and fodder to such specialized MFP products as sal seeds. Raising animals for various uses--milk and meat production, draft purposes--also constitutes self-employment. Under secondary employment, work is farmed out to people as part of larger enterprises dealing with forest produce.

4.4 Employment generated in the forestry sector is sporadic and discontinuous due largely to the seasonal nature of most forestry work. As a result, forest-dwellers and others dependent on work in forestry-related activities are forced to find other jobs during the off-season. However, ample evidence exists to show that sustained employment can be generated in the forestry sector, at least for the forest-dwellers and the non-tribal poor.

4.5 Most of the employment in the forestry sector in the small-scale forest enterprises or MFP sector is for tribal women. Self-employment as headloaders extends to other categories of women as well. Rearing of livestock is important for women in the plains and the hills. However, certain enterprises like rope-making from bhabbar grass, bamboo work, basket making and silkworm rearing span all categories except for urban women.

4.6 **Headloading.** The phenomenon of headloading which has been documented from many parts of India, indicates that women are not gathering wood merely for household use. In the majority of cases, wood is being collected on a daily basis for sale. In 1983, Agarwal estimated that two to three million people were headloading wood regularly, which accounted for approximately half of the firewood supplied to urban India. He argues that the actual number is probably much higher because many more people headload wood seasonally. That more and more people are being driven to headloading points to the lack of jobs or alternative sources of income. This also indicates the commercialization of wood. Headloading sites are also characterized by seasonality of employment and acute poverty.

4.7 In her study of employment and income generation in social forestry in Orissa, Gunilla Olsson (1988, p. 60) states:

The organization of this very commonly found type of self-employment is much more complex than recognized. People collect wood for the market and for home consumption. Both women and men take to this activity in a big way to secure an income. Not only headloaders (who are usually women), and shoulder loaders (men), but also bicycle-loaders exist in Orissa. It is mainly people from the scheduled castes and tribes who sell head and shoulder loads. A headload of firewood in Orissa at this time could fetch anything between 4-12 rupees (Nov. 1986). People would normally walk between 4-8 kms every second to fourth day and would either bring the wood to the market to sell themselves or sell to middlemen either in the market or to those who came and collected in the

village. A headload (25-40 kg) would normally last around four days for an average family (5-6 members).

4.8 The phenomenon of headloading was first documented in 1982 in Ranchi district of Bihar. Two researchers, Bhaduri and Surin, conducted intensive investigations among 170 households spread over nine villages where headloading had become the major occupation of the working women (Basu, 1987, pp.96-97). They recorded the entire process by which women collected headloads and transported them by train to Ranchi town for sale. The women carried 20-kg bundles of fuelwood and often had to bribe both forest guards and train officials in the process. The wood was sold either to middlemen or directly to users. In some of the villages, as many as 47.69% of the households were headloading wood as their main occupation (ibid, p. 97).

4.9 Women are driven to headloading because employment is available to them only for a short period during transplantation and weeding. In addition, women are responsible for providing food at home and cannot always depend on male members of the household to help. Shiva and Bandopadhyay (1983, p. 68) report that in one of the villages in their survey, 15 out of 60 households were found to be entirely dependent on the firewood trade. Villagers spent nearly eight hours a day walking 6 to 8 km to the local market where a headload of firewood sold for about Rs 4.00. For their own cooking, villagers used only twigs and shrubs.

4.10 Headloading is not restricted to forest-dwelling communities or to tribals. A sample survey in Bangalore city indicated that about 300 people

bring headloads of firewood into the city daily. Taking an average headload of about 25 kg, the total amount of firewood coming into the city in headloads was 7.5 tons a day (Reddy and Reddy, 1983, p. 1,759). People collecting headloads for sale is not an uncommon sight even in most metropolitan cities. Agarwal and Bhatt (1983) state that in Delhi thousands of tons of firewood are collected every year from forested areas and trees within the city.

4.11 Headloading clearly is not an isolated phenomenon; it may even be on the rise. It stems from and dramatizes the lack of employment and income generating activities. If these economic causes are addressed, there will be far less felling and forest degradation will be slowed. However, headloading also points to a demand for fuelwood that must be satisfied through increased biomass production.

4.12 Employment and Income for Women in Plains and Hill Areas. Women in the plains and the hills derive employment and income from several sources. Livestock rearing is one major source. In the hill areas, animal husbandry is the second most important source of livelihood after agriculture. Bhati and Singh (1987, WS-9) found that in their sample villages (in Himachal Pradesh), women contributed 69% of the time expended in tending of animals. Table VIII shows women's participation in this activity is much greater.

Table .X

Average Farm Work (hrs) Per Worker Day in H.P., 1983-84

<u>Farm Work Performed</u>	<u>Marginal Farm</u>		<u>Small Farm</u>		<u>Other Farms</u>		<u>All Farms</u>	
	<u>Male</u>	<u>Female</u>	<u>Male</u>	<u>Female</u>	<u>Male</u>	<u>Female</u>	<u>Male</u>	<u>Female</u>
Crop Prod.	0.66 (22.6)	0.22 (7.1)	1.20 (29.0)	0.49 (13.1)	1.59 (34.3)	0.70 (17.0)	1.07 (28.9)	0.42 (11.9)
Tending of Animals	1.93 (66.1)	2.84 (91.9)	2.60 (62.8)	3.22 (86.1)	2.74 (59.2)	3.37 (82.0)	2.32 (62.5)	3.07 (87.2)
Other Farm Work	0.33 (11.3)	0.03 (1.0)	0.34 (8.2)	0.03 (0.8)	0.30 (6.5)	0.04 (1.0)	0.32 (8.6)	0.03 (0.9)
Total	2.92 (100)	3.09 (100)	4.14 (100)	3.74 (100)	4.63 (100)	4.11 (100)	3.71 (100)	3.52 (100)

Source: CCS. Agro-Economic Research Centre, Shimla in, Bhati and Singh, 1987.

4.13 A study from the Chattisgarh region (Marothia and Sharma, 1985) shows that the share of female labor in total family labor was highest in fodder collection, followed by farmyard manure collection and dung cake preparation. Women's contribution to farm income was calculated to be 62%, part of which can be attributed to income from livestock.

4.14 These studies show women's substantial involvement in the livestock economy. Income derived from livestock, mainly from sale of milk, can be considerable. Fodder is another money-maker because of the large cattle population of India. The livestock economy is intrinsically linked to CPRs. Jodha's studies (1983, p. 8) reveal that among laborers and small farmers in villages of Rajasthan and Madhya Pradesh, 97 and 82% of the grazing requirements are met from CPRs. He argues that in the Rajasthan villages almost 50% of the income from livestock is attributable to CPRs. Thus

substantial self-employment and income is generated through the use of CPRs for grazing purposes (see Table II).

4.15 Women enter into various arrangements to derive employment and an income from tree products. The following examples are mainly from the author's own fieldwork in a village in the state of Punjab. Often women enter into arrangements with farmers who have trees on their land to get firewood in exchange for labor. Many female agricultural laborers, when unable to get paid employment on a given day, set off for the village forest to gather fuelwood and fodder. At the end of the day, they may sell the fuelwood and fodder to buy food. Many poor women raise animals for wealthier farmers. Under this system, the farmer hands over a new-born animal to a poor woman who looks after it for five or six years for a fixed sum of money. At the end of this period the animal reverts back to the farmer. This arrangement works out to mutual satisfaction--the farmer does not have to pay for fodder or feed the animal while the woman derives some income from rearing it. The cost is the woman's labor in gathering fodder and caring for the animal.

4.16 Another practice prevalent in villages in this region is that of wealthy farmers contracting out their orchards during the fruit season to a poor family. The family protects, harvests and sells the fruit, giving a pre-negotiated sum to the farmer. The family usually constructs a makeshift shelter in the orchard and stays at the site for the entire period. The women and children do most of the work, including the selling, while the man goes off to earn a wage. During lean seasons, poor women collect wild mustard greens and other such items from fields. Often they cook beans and leaves

which are normally kept as fodder for animals in the Punjab. The old jainani (patron-client relationships between landlords and service castes) framework entitled poorer castes to certain rights on the land of their patron landlord (for example, in Punjab, agricultural laborers used to receive cotton stalks free from landlords they worked for, and these were used as cooking fuel). Due to technological changes like the introduction of HYVs, which means that there is less of fodder content from the crop and economic changes like cash crops, the facility of hiring daily wage labor, this access has decreased.

4.17 Some communities specialize in processing of certain types of forest produce for a livelihood. Three examples are: silkworm rearing, rope-making and basket-making. In the Ghad area of U.P., at least 10,000 landless families are engaged full time in baan making (ropes used for a variety of purposes including knitting cots) from bhabbar grass (Study of Baan Industry, ICSSR, 1986, quoted in Gupta and Chaudhry, 1988). Haqadari villages in the area have some rights to forest produce which include: fuelwood, 21 headloads of bhabbar per season (each headload weighs 40-60 kg), wood for making agricultural tools and for household use, and grazing for cattle and other animals. In exchange for these rights, the villagers have to protect forest staff from wild animals, prevent illegal felling and extinguish forest fires. Employment is also provided by cutting bhabbar for sale, for personal use, or under contract on a daily wage basis. In this industry, competition from bulk buyers like the paper industry triggered a protest movement by local producers for the restoration of their rights. Women, major participants in baan making, were in the forefront of this protest. With the help of a voluntary organization, Vikalp, they managed to assert their rights to the grass.

Earlier only the head of the household, inevitably a male, held the traditional rights (ibid, p. 32).

4.18 Tribal Women and the MFP Economy. Of all the income and employment generating activities in forestry, the collection, processing and sale of minor forest produce (MFP) is the most important for tribals and forest-dwelling communities. In India in the early 1970s, minor forest products, despite low prices constituted 25% of the total value of forest production (Chambers, 1983). According to Commander, in 1986 MFP accounted for "nearly two-fifths of total Forest Department revenues and around three-quarters of net export earnings from forest produce" (Commander, 1986). About 70% of minor forest produce collection takes place in the central tribal belt in the five states of Maharashtra, Madhya Pradesh, Bihar, Orissa and Andhra Pradesh.

4.19 Several categories of MFP provide employment; the more important are:

- 1) fibers and flosses (sisal hemp and kapok floss),
- 2) bamboos, canes and grasses,
- 3) raw materials essential for oil,
- 4) oil seeds,
- 5) tans and dyes,
- 6) gums and resins,
- 7) drugs, spices and insecticides,
- 8) leaves,
- 9) lac,
- 10) honey and wax,
- 11) pine oleo-resins,

12) sandalwood,

13) seeds for propagation purposes.

4.20 The majority of workers involved in the MFP-related economy are women. The participation rate of women is higher in forest enterprises that depend on the application of local skills and village level technology for collection, extraction and processing of products and where the production can be pursued as a self-employment venture or as a household enterprise or non-household cottage industry (National Review Paper, 1987). Forest-based handicrafts and cottage industries are both ultimately related to the processing of MFP, with some significant exceptions like the match industry, which, in spite of not being in the MFP category, is often organized at the household level. However, the major beneficiaries may be the private contractors who are given leases by Forest Departments.

4.21 The National Review Paper (1987) shows that the estimated employment for women in forest-based enterprises is approximately 571,851 million womandays. Approximately 90.5% of this employment is created in small-scale enterprises. Although the participation rate of women in some larger enterprises, such as the match industry, may be very high, the total female employment created in such industries is less than half that of small-scale enterprises. Figures on women's participation in MFP-related activities make it clear that women are the mainstay of small-scale forest enterprises. Table IX gives estimates of the proportion of women's employment in all forestry activities.¹

¹ In a recent study Olsson (1986, p. 9) argues that the term MFP is a misnomer and that the term Non-Wood Forest Product (NWFP) should replace it. In this paper the term MFP has been retained and supplemented by SFE (Small-Scale Forest Enterprises), which has been used by the National Review Paper (1987).

Table X

<u>Harvesting Operations</u>	<u>Employment Million Mandays</u>	<u>Employment Million Womandays</u>	<u>Remarks</u>
<u>Major Forest Products</u>			
Coniferous wood	8.9	.089	Husband-wife teams
Non-coniferous	36.6	3.56	
Pulpwood	10.25	2.045	
Firewood	80.67	40.36	Women
<u>Minor Forest Products</u>			
Bidi leaves, coll. drying, packing and manual transport	34.24	23.96	
Bidi rolling	68.48	54.78	
Bamboos, canes and grasses	56.77	39.72	
Cashew nut collec.	3.30	2.31	
Charcoal	24.80	2.48	Husband-wife teams
Essential oils	19.39	9.69	
Fibers and flosses	17.52	8.76	
Gums and resins	26.40	10.56	
Grading of gums	40.00	32.00	
Honey and wax	0.17	.017	
Horns, hides, etc.	2.68	0.268	
Katha and cutch	2.98	1.49	Family labor
Lac	4.15	2.07	Family labor
Medicinal herbs	77.40	42.33	Family labor
Myrobalans	2.30	1.15	
Oilseeds	62.48	42.33	
Pine oleo-resins	9.52	0.00	
Raw tasar and silk	0.66	0.33	Husband-wife teams
Sandalwood	0.08	0.0008	
• Sandalwood dust processing	0.50	0.04	
Seeds for propagation	3.25	29.25	
<u>Plantation Activities</u>			
200-500 mandays including 100-400 womandays per hectare depending upon terrain and area	31.29	15.69	

Source: M.M. Pant(1980)

Note: These figures are limited because they represent only women in direct employment. A comprehensive picture of women's employment is only possible when indirect and self-employment are considered.

4.22 In a study of Chattisgarh and Orissa, Fernandez and Menon (1986, p. 86) found that 28% of the population declared with collection or sale of firewood or MFP as their primary occupation, and 26.7% rated it their second most important occupation. In Manipur, MFP products are the major source of livelihood and sustenance for nearly 87% of the population (Singh and Choudhry, 1980). An FAO/SIDA document (Restoring the Balance) states that in Manipur, of hundred women surveyed, two-thirds collected minor forest produce as their only source of income. Tribals in the Chotanagpur plateau can earn Rs 300 a year cash income from the sale of mahua flower and seeds (Bhaduri and Surin, 1980).

4.23 In Orissa and Chattisgarh, women depend more heavily than men on forest produce for employment and income. In these areas, processing of MFP is primarily women's work, with the exception of liquor-making from mahua flowers which is done almost exclusively by men. Even here women do the drying and cleaning. Materials such as datun (bark used for cleaning teeth) and siali leaves are cut and bundled every evening by women. For planning purposes, it is important to be aware of regional variations. Thus while both men and women among the Scheduled Tribes (STs) collect mahua, among the Scheduled Castes (SCs) only women do. Tasks are differentiated by gender among the SCs much more than among the STs.

4.24 A study conducted in the Hyderabad area (Andhra Pradesh) indicates that agricultural production from tribal lands is inadequate to maintain a household at the subsistence level (quoted in the NRP, 1987). Households with less than 5 acres of land depend mainly on MFP collection in Andhra Pradesh,

Bihar, Madhya Pradesh and Orissa. A study conducted in Gujarat shows that 35% of the total earnings of tribals in Panchmahal district were from MFP. Rope making from bhabhar grass and bamboo products are two items of MFP on which large numbers of people depend for a livelihood. The percentages of total income derived from the sale of MFP in four states is given in Table X.

Table XI

Average Income Derived from Sale of MFP in Four States

<u>State</u> <u>Income</u>	<u>% Income from MFP to Total Income</u>
Andhra Pradesh	10.0 to 55.3
Bihar	7.0 to 41.7
Madhya Pradesh	34.0 to 55.0
Orissa	5.4 to 13.4

Source: National Review Paper, 1987.

4.25 The MFP products collected vary from region to region. Not all produce collected enters the outside economy; often these products are bartered for household necessities. In Orissa and Chattisgarh, oil is extracted from karanj and kusum trees. Lac cultivation, an important secondary occupation for many tribals, uses kusum, palash and ber as host trees. Tasar silk cocoons are reared in sal, asan, arjun and ber trees. Tribals lease land with these trees to rear the cocoons, which provide an important source of cash income. Gum is collected from sal and babul trees. Ropes are made from many types of grasses.

4.26 Two main cash earners are sal seeds and tendu (or kendu) leaves. More than 350,000 tonnes of leaves are harvested annually by some 600,000 women and children.

4.27 Sal. The majority of sal seed collectors are women. Sal seed kernel is important for its yield of edible oil. The estimated potential availability of sal seeds is 6 million tons annually. For Bihar, Madhya Pradesh and Orissa, the estimated employment generated for the primary collectors over the 45-day collection period is 8 million person-days (Tewari, 1981, p. 29).

4.28 Kendu. Kendu leaf, known as tendu in some areas, is used as a wrapper in bidi (indigenous cigarettes) production. In Orissa, 100 leaves fetch from Rs 2.50 to Rs 3, and it is estimated that a small family can collect about Rs 300 worth of kendu leaves in a season (Olsson, 1987). The majority of the work in making bidis is done by women. An agent supplies them with the leaves, tobacco and thread. For a wage of Rs 10 for a thousand bidis, they roll the bidis. A woman working late into the evening can roll up to two thousand bidis. Estimated employment generated in this enterprise including collection and processing, is shown below:

Table XII

Estimated Employment Generated in Bidi-rolling from Kendu Leaf

<u>Occupational Category</u>	<u>Person-days</u>
a) Primary collectors	106.11 million
b) Supervisor level	8.74 million
c) Bidi rolling (@ 1,000 per day all year)	675 million

 Source: Tewari, 1981, p. 27.

4.29 Collection, processing and sale of MFP can either be undertaken by an individual or a family unit (self-employment) or organized through contractors or agents of the Forest Development Corporations (secondary employment). When undertaken in the household, the activity is haphazard and discontinuous and the price obtained is generally "low." Kishwar cites an example where a woman bartered one measure of Karonji seeds for 30 measures of salt, the equivalent of a couple of kilos at most. Karonji sells for about Rs 60 a kg and salt for about Rs 2 a kg. An enormous amount of labor goes into the collection of karonji seeds. It takes a woman several weeks to gather about half a kilo of karonji while she is collecting firewood and leaves (Kishwar, 1987).

4.30 MFP Trade and Forest Development Corporations. Secondary employment involves both wood-based enterprises and small-scale forest-based enterprises. Secondary employment in the forestry sector has traditionally been in the hands of agents or contractors for the buyers of the produce. On the recommendation of the National Commission on Agriculture, the government in 1976 established the Forest Development Corporation (FDCs) to deal directly with the tribal collectors. It was suggested that collection and marketing be

organized through them in order to give reasonable employment and wages. In many states, LAMPS (Large Multipurpose Cooperative Society) has been designated as the intermediary. Some states have nationalized the more lucrative forest products. For example, Madhya Pradesh has nationalized timber, bamboo, khair, sal seeds, harra and gums. Other states have acquired monopoly rights to them. The state's objective is to maximize its revenue, which has not helped the primary workers and forest dwellers much. Despite the establishment of Forest Development Corporations to deal with the collectors directly, the trade remains largely in the hands of middlemen.

4.31 The FDCs have made very little difference because agents appointed by the States usually have been front men for industrialists or contractors. In addition, the state makes a profit from the difference between the sale price and the procurement price. In many cases, the policy of nationalization has been reversed and the old system of working through the contractors has been resumed openly (National Committee on the Development of Backward Areas, 1981 in NRP, 1988, p. 44).

4.32 Prior to the FDCs, some states had introduced Forest Laborers' Cooperatives with the idea of entrusting the work of forest exploitation to cooperatives of local laborers. These have done well in some areas. For example, in Dangs district of Gujarat, all timber extraction is handled by these cooperatives which are paid for their labor, and in addition receive 20% of the net proceeds after marketing the produce through their own depots. In Dangs the societies are entirely controlled and run by tribals (Gadgil, 1983).

4.33 Discriminatory pricing of raw material has also affected the tribals adversely. Thus, at one time in Karnataka the basket makers in Bangalore paid Rs 200 for a ton of bamboo while industry paid only Rs 15.00 a ton.² Such price inequities result from government organizations that insist on selling material only in bulk and small consumers who cannot afford to buy in large quantities. Similarly, in Uttar Pradesh, the U.P. Forest Corporation charged the paper industry a lower price for baan than the baan producers. Further the corporation was not willing to retail bhabbar on a large scale, preferring bulk buyers (Gupta and Chaudhry, 1988).

4.34 Gujarat has devised a more progressive approach to this problem. Under its scheme, the forest department markets the baskets on behalf of the kotwalias, after supplying them with bamboo at a reasonable rate. The entire profit is reinvested in the area. Finally, the Gujarat Forest Department has concentrated on utilizing minor forest produce with the help of adivasis (tribals) with the object of giving the profits back to the local population (ibid, p. 125).

4.35 Where the MFP economy is in the hands of middlemen, traders and agents or even the Forest Corporations, the actual forest dwellers and collectors derive only a wage from MFP or a very negligible income from even the potentially most lucrative items. Under other arrangements, primary producers can make substantial profits.

² The basket weavers may have been further victimized by middlemen who supplied bamboo and bought the baskets, often giving them only a daily wage (ibid, p. 125).

4.36 Constraints to Women's Participation in the MFP Economy. Women suffer from a number of constraints in operating the MFP economy to their benefit. First among them is deforestation which has reduced the supply of MFP and increased the time needed to collect it. Second is the erosion of rights and concessions of village and tribal communities in forest areas which makes gathering raw materials difficult. Further, in the efforts at the regeneration of forests, the needs of women are not taken into account at all. Small-scale forest enterprises, which mainly involve women, have to compete with the organized sector for the same raw material, to the disadvantage of the former. This is seen when women working at home have to pay a much higher price for raw material than industries that are subsidized by the Government.

4.37 Access to Markets. Despite the substantial demand for MFP, the primary producers have access only to local markets and to intermediaries operating in the area. The trade is affected by seasonality as well. Many classes of MFP must be sold immediately after collection, forcing the collectors to accept almost any price that is offered. Unorganized production, inadequate storage facilities and lack of transport are additional constraints.

4.38 Lack of Technical Skills and Know-how. Often the absence of local processing facilities deprives the primary producers of a chance to increase the value of their products and thus derive greater income from them. As the NRP reports, although Bihar is the largest producer of lac, industrial products based on lac are mainly produced by industries in West Bengal (NRP, p. 28).

4.39 Factors that producers may not be aware of can reduce their earnings. For example, in the collection of bidi leaves, the price can drop due to even a small percentage of defective leaves. Or, while the tribals of MP sell chironji fruit with the seed at Rs 3 to 5 per kg to traders, the latter sell it at Rs 50 per kg seeded (Chand and Bezboruah, 1980, p. 136). Also, skilled workers are often imported from outside the area. If an effort were made to train the primary collectors in basic processing skills and if processing units were set up in the vicinity, their chances of improving both income and employment would be considerable.

4.40 A successful example is that of KVIC (Khadi Village Industries Commission), which has been able to maintain and in some cases increase women's participation rate. They have also been successful in introducing credit facilities and organized marketing.

4.41 Impact of Deforestation on the MFP Economy. One result of deforestation and the consequent reduction of MFP has been the increase in the collection of firewood for sale. People who previously earned a living from MFP-related activities are now shifting to harvesting firewood for sale. As noted earlier (para. 4.6), between two and three million headloader families in the country as a whole depend on the sale of fuelwood for survival (Agarwal and Deshingkar, 1983). Since the collection of MFP is a seasonal activity, it cannot be depended upon for the whole year. In fact, with the reduction in forest resources, MFP collection is now restricted to three or four months of the peak season.

4.42 Monoculture by the Government to support industry has also affected the availability of MFP. The composition of forests has changed and species now predominate, which yield few if any MFP items. New afforestation, with its emphasis on wood products, also does not promise to increase MFP. Thus women, the major beneficiaries of MFP, will suffer both in the household and in terms of lost income and employment opportunities.

4.43 Forest Department Employment. Direct employment by FD can be in:

(i) development work (nursery operations, soil working or plantation establishment; (ii) maintenance work (watering, weeding, applying fertilizers and pesticides and protection); and (iii) harvesting. Such employment is generated under regular Forest Department activities and in social forestry projects.

4.44 Wage Labor. Many women earn money as wage laborers in the forestry sector. In three projects, Commander found that 70% of the work was performed by women (in Fortmann, 1986, p. 40). However, this is not a uniform phenomenon. Olsson's figures (1987) on the Orissa social forestry project show that in 1985-86, only 39% of workdays generated in nursery work went to women, despite the fact that women's proficiency in nursery work is widely recognized. In social forestry projects, women have proven to be much better nursery workers--more adept at such tasks as filling in bags, planting the seeds, and watering seedlings. Kisan nurseries, or backyard nurseries, have become much more successful with women's involvement. Also, hourly earnings figures reveal that wood collecting is the least well-paid, while nursery work is the most sought after since it provides regular work.

4.45 Evidence also explodes the myth that men do the heavy work in forestry. Admittedly logging is mainly done by men, but women participate equally in digging pits and in earth work. Men often take on forestry work only when other more remunerative jobs are not available (Olsson, 1988, p. 42).

4.46 Chand and Bezboruah, in a study in Madhya Pradesh, identify the tasks of the Forest Department that men and women carry out (Table XII).

Table XIII

<u>Nurseries</u>	<u>Male</u>	<u>Females</u>
Weeding		X
Sowing		X
Bed making		X
Transplanting		X
Watering		X
Stacking	X	
Couping	X	X
Marking	X	X
Painting		X
Felling	X	
Cutting rosha grass	X	
Earth work	X	X
Road making	X	X
Tendu	X	X
Gum	X	X
Harra	X	X
Mining of china clay	X	X

 Source: Adapted from Chand and Bezboruah (1980).

4.47 The number of women working at the higher levels of the Forest Service can be counted on the fingers of one hand. Hardly any women have managerial

or decision-making positions. The first Indian Forest Service (IFS) graduating class to include women was in 1984.

4.48 Employment Generated in Government-sponsored Social Forestry Projects.

The major components of most social forestry projects consist of:

a) plantations on road and canal sides; b) community woodlots; c) plantations on degraded lands; and d) farm forestry. Women have not been expressly involved in any of these components. Instead, they are targeted for sub-components, like improved chulahs (cookstoves).

4.49 Women have benefited to a limited extent from employment provided by the social forestry programs. According to Forest Department statistics, in the Madhya Pradesh project during 1984-85, two million women worked in nurseries, plantations and other works (CWDS, 1987, p. 99). However, as Olsson's study (1988) of the Orissa social forestry project shows, 70% of the total workdays generated in 1985-86 went to men and only 30% to women. Table XIII gives the percentage of female workdays generated under the different components in 1985/86.

Table XIV

(Percentages)

<u>Dist.</u>	<u>Nursery</u>	<u>VWL</u>	<u>Reforest.</u>	<u>FFRP</u>	<u>FF</u>	<u>Rehab.</u>	<u>Protect.</u>	<u>Total</u>
Balasore	19	9	14	6	11	20	2	13
Bolangir	33	37	38	35	-	18	-	34
Cuttack	25	16	25	11	20	16	7	20
Dhenkanal	23	25	19	27	30	11	-	22
Sanjam	57	54	56	56	55	53	-	56
Keonjhar	23	8	13	1	23	3	-	13
Puri	34	17	21	25	26	24	-	23
Sambalpur	50	35	39	35	42	34	-	39
Average	38	28	34	33	-	25	-	30

VWL - Village Woodlot; FFRP - Farm Forestry for Rural Poor;
FF - Farm Forestry.

Source: Olsson, 1988, p. 14.

4.50 Wages. Work is contracted either on a daily wage-rate or a piece-rate basis. However, daily wages often are not paid on a daily basis. Activities like pitting, fencing and filling of poly-pots can be paid at piece-rate. Other activities like planting, hoeing, weeding, and fertilizing are paid in terms of daily wages. Although women and men are officially entitled to the same wage, in reality women often receive a lower wage than men.

4.51 Women have been recruited as lower-level extension workers in several states, including West Bengal, Karnataka, Maharashtra, Madhya Pradesh, Haryana, Orissa and Bihar. In most cases, they have been recruited as forest guards or as motivators. In Tamil Nadu, they have been recruited as Village Level Forestry Workers. Forest Department statistics state that in MP in 1984-85, 30 women were employed and trained as extension officers or van

sevikas (CWDS, 1987, p. 99). In Madhya Pradesh, the number of women employed as extension officers is 11 out of a total of 234 posts and as van sevikas 54 out of 981 posts (CWDS, 1987, p. 101).

4.52 Molnar (1986), reports that, on the whole, women recruits have been quite useful, especially in carrying out extension duties. Women contact more women than male extension workers, while talking to farmers of either sexes with equal frequency (p. 30).

4.53 Notwithstanding the important relationship between women and forestry documented above, the involvement of women in social forestry projects has been insignificant until now. World Bank Staff Appraisal Reports for various social forestry projects rarely mention women, although tribals are sometimes targeted separately. Only recently has it been thought necessary to hire woman motivators and the forestry equivalent of village level workers. Even at best, thinking on women's involvement in social forestry projects has been piecemeal and marginal. Women have only been noticed when the success of their efforts at afforestation or protection has drawn attention to their potential in this field. Such attention has come more from non-governmental organizations than the forest department or donor agencies. In spite of women's acknowledged role in fuelwood and fodder gathering and use, barely any effort has been made to use their knowledge or incorporate their needs into projects.

4.54 Nonetheless, wherever women have been involved, there have been numerous successes. Thus, in 1985, mahila mandals (women's groups) in the state of

Kerala carried out the entire distribution of seedlings under the farm forestry component. In several states where kisan nurseries have been promoted, women have represented the successful cases. Such backyard nurseries, which can be effectively managed and run by women, are being popularized in many more states. Women's involvement in community woodlots has had some success.

4.55 Gunilla Olsson (1988, p. 22) gives the example of a nursery raised by a Mahila Samity (women's society) which employed former headloaders. The women were so happy with the change of work and the income derived from four months of employment that they convinced the forester to raise seedlings of sal trees in the nursery the next year. They explained to the forester the many ways they could exploit the sal tree. They could collect its seeds and leaves, they could either sell the seeds or extract oil from them and with the leaves they could make plates for sale.

SECTION V

Impact of Afforestation Programs on Women

5.1 Afforestation programs have benefited women marginally, if at all. One reason is because the programs have become oriented toward cash crops rather than providing the fuelwood, fodder and small timber as originally intended. Several other reasons for the negative impact stand out. First, women rarely control the income from trees. Second, with mono-crops like eucalyptus and casuarina, a large variety of the products on which women depend are lost. Third, women's access to private farms for fodder and lops and tops decreases with the commercialization of trees. Fourth, when community wastelands are turned into woodlots where access is restricted or closed, it is women who are excluded. They have to look farther for fodder and fuelwood which adds to their burden.

5.2 Since women are not consulted at any stage about afforestation programs, they cannot make either their knowledge or their needs known. Without women's input and cooperation, projects often do not succeed. It is essential to tap women's intimate knowledge of local flora in order to make projects need and site specific. Women's involvement in many cases will ensure the survival of plantations. Examples: (i) involvement of women is crucial if stall feeding of cattle is to be attempted; (ii) the failure of chulahs designed without women's help and with no knowledge of cooking habits or fuel sources; (iii) women have shown that they are capable of protecting plantations; (iv) they are more likely to ensure better survival rates by organizing watering, weeding and protection. They are also more likely to agree to solutions which are ecologically more sound even if less profitable.

5.3 It is often said that women do not respond to profit-generating ideas, that it is the men who go for cash crops and innovative schemes. Where this is true it is primarily because women do not realize any income from these cash-crop plantations. It is income over which they will have no control. They sense that they are better off with subsistence products which they can use and over which they can have some control. In a study of CPR's in Rajasthan, Brar (1987) shows that women were not enthusiastic about planting kheiri in the commons because its leaf fodder was auctioned by the men and not available for forage. Lopping of kheiri branches for fuel was gradually being disallowed as well. Further, the annual coppicing prevented women from harvesting the kheiri pods, a popular vegetable.

SECTION VI

Role of Women in Forest Management and Protection

6.1 Women have traditionally contributed to forest preservation through sound management practices. They are well aware of the role of trees as a means of increasing soil fertility and of preventing soil erosion so that annual crops may grow better. Most communities had well-defined rules of access to common property resources and even had a system of nominal payments and fines for regulating use and preventing misuse. Various restrictions were woven into the fabric of everyday life and given a religious or social purpose (see Gadgil, 1983). The tribals of Bihar prohibit collection in the forest for two weeks before the festival of sarhul (Bhaduri and Surin, 1980). During the rains, felling of wood and the like is also banned. This enables new shoots and plants to survive. The very nature of shifting cultivation allowed land to regain its fertility naturally. In most communities women do not cut green branches or ground plants. Shrubs are rarely pulled out by their roots; often only leaves are picked. Management practices allowed plants to regenerate on their own. However, under conditions of increasing population pressure and natural resource scarcity, traditional rules and regulations go by the wayside.

6.2 Some trees are protected by common consent. Many trees in India have a religious significance attached to them which protects them. Such trees are usually found in and around village settlements. Examples include the peepul (*ficus religiosa*) and the boad or bargad (banyan). Trees in and around village settlements are highly valued; a clump of trees turns an area into a social space for village gatherings; they are valued for shade and for

products like twigs for brushing teeth. Leaves and fruit of the neem tree are used for medicinal purposes. Women and children put up swings in the trees for certain festivals during the year. Many trees are associated with specific deities and leaves and flowers from these trees are used for worship. Thus, banyan is associated with Shiva. Mango and banana leaves are used in marriage pandals. The tulsi (basil) plant is also worshipped. In the Chattisgarh area of Madhya Pradesh, for instance, the sal and in Orissa, the banyan, peepul, mango, salap,, mahua, sal and sahada are considered to be sacred (Fernandez, Menon and Viegas, 1984, p. 181).

6.3 Since the Chipko movement, women have been in the forefront of activities to protect forests. In Dehradun district of Uttar Pradesh, heads of Mahila Mandals have now been granted identity cards by the forestry department to act as forest patrollers, and the women have requested training in coppicing (Srinivasan, 1982, reported in Cecelski, 1984).

6.4 Women can make important contributions in forest regeneration and conservation, if they are allowed to share in forest management. It is essential that they be given some management role, either in relation to ~~community~~ forests, degraded plots of land or forest-based enterprises.

SECTION VII

Role of Non-governmental Organizations (NGOs)

7.1 Non-governmental organizations have a very important role to play in the whole development process. Their involvement in several forestry projects has been very fruitful. For example, the Chipko movement was spearheaded by a non-governmental organization, Dasholi Gram Swarjya Mandal. This organization was notably successful in involving women in the effort to protect forests from felling by contractors. This initial involvement led women to a broader interest in forest conservation and an understanding of the dangers of ecological imbalance. Women in the Uttarkhand area now are spontaneously protecting plantations by closing off areas to grazing in rotation.

7.2 Several successful examples of involvement of women in forestry activities with the help of NGOs have been recorded (Agarwal, 1985; NGOs and Social Forestry, World Bank, 1986). One success story is from Bankura in West Bengal. Here the women were organized to afforest wasteland. They began with a nine-acre plot, growing arjun and asan trees and rearing silkworms. Ninety-eight percent of plants on this land survived in contrast to a survival rate of 55% on nearby government plantations. The women were organized by a Delhi-based research organization, Centre for Women's Development Studies (CWDS). The initiative, however, came from the women themselves, who were organized into a society, Gramin Mahila Saramik Unayan Samiti (GMSUS). Now the women have diversified their income-earning activities. One enterprise makes traditional sal leaf-cups and plates with polythene lining. Women were eager to learn machine operations and to repair equipment. Within the Samiti, women are also learning organizational, managerial, leadership and other skills.

7.3 NGOs have also been active with tribals in afforestation and other development activities in Ranchi in Bihar and Purulia in West Bengal. Some of these activities are recorded in N.G. Basu's book, Forests and Tribals (1987).

7.4 Two NGOs in Udaipur, Rajasthan--Sewa Mandir and Ubeshwar Vikas Mandal-- have also been working with women in afforestation. These organizations have helped women to acquire and afforest land (Srivastava, n.d.). Other organizations that have done significant work on this front in Orissa are Gram Vikas, Rural Life Programme, PREM, etc. In Yellamanchali, the Bhagvatulla Charitable Trust has led in organizing women in forestry (Agarwal, 1985).

7.5 The real role for NGOs seems to lie in creating women's organizations or helping existing organizations to evolve a balance between the forest economy and their needs for subsistence, employment and income. Hoskins (1980, in L. Pope) contends that indigenous women's organizations can be valuable tools for handling local projects. Groups are often more successful than individuals in gaining access to land for establishing nurseries and tree plantations. Credit, other government subsidies and resources also are more accessible to groups.

SECTION VIII

Conclusions and Recommendations

8.1 Women have rarely been given their due importance in the planning of forestry and other related development projects. For forestry projects to be successful, they must engage women's cooperation and active involvement. And they must be designed with a complete understanding of women's relationship with forests and the forest economy.

8.2 A survey of existing literature reveals that both quantitative and qualitative data need to be gathered urgently. Most needed is detailed information on women's role in the different farming and food supply systems, their domestic tasks and income-earning activities. The subsistence and productive relationship with forests and trees in general needs to be spelt out in greater detail, and with regard to variations by region, cultural group and class. Second, quantitative information must be disaggregated by sex in order to evaluate accurately women's participation in the forest economy and in various government programs like social forestry.

8.3 Unfortunately, the fuelwood crisis and its impact on women has dominated the discussion and confined it to women's use of forests for domestic purposes. However, the data adduced attests that women's involvement with forests spans a much wider range of products than fuel or fodder. These make a substantial contribution to food intake, variety in diet and nutritional value. A large number of other products used in the home are also derived from trees and other forest resources. Detailed data are needed to assess,

women's contribution to household income and welfare as a result of these activities.

8.4 Large numbers of women also derive employment and an income from forest-based activities. Often forests and common property resources provide the only sources of income for poorer households and women. In a study of North Bihar rice-farming villages, Grosvenor-Aslop and Sharma (n.d.) show that the importance of income from livestock production increases as households become poorer. As brought out earlier, women play a large role in livestock raising and often have rights in livestock. Free fodder collection enables them to retain this particular source of sustenance and income even when other options disappear.

8.5 Overall, it is women from low income households who are most affected by deforestation, whether they are in tribal areas or in rural or urban areas. Their household economy and sources of income and employment are most directly affected by depletion of forests and other common property resources. They can be helped through village woodlots, afforestation of degraded plots of land, introduction of agro-forestry or the organization of collection, processing and marketing of MFP. Poor women also will benefit the most from expanded job opportunities made possible by government programs of afforestation.

Recommendations

8.6 Redressing the Fuelwood Crisis. The majority of households in rural areas are dependent on firewood for household energy. In the foreseeable future, this need can only be satisfied by generating more biomass. Social forestry projects which meant to fulfill the fuel and fodder needs of the household have not succeeded in doing so. Part of this failure stems from the fact that women were not made the focus of this program, even though their role in the fuel and fodder use system was recognized.

8.7 Women should be involved in these projects on a number of fronts:

a) women have an essential role to play in planning plantations, choice of species, planting and protection; b) in planning community woodlots and other such plantations, women's reliance on multiple forest products must be taken into account. Planners must capitalize on women's knowledge of the variety of species and their uses. If adequate substitutes for lost forest resources are not available, remaining resources must not be depleted through plantations on commons; c) the case for involving local women in designing and disseminating fuel efficient cooking stoves has already been made (Cecelski, 1984; Molnar, 1986); also fuel-efficient cookstoves might be more effective for poor urban dwellers; d) since women and children are responsible for grazing of animals, it is the women who must be convinced to stall feed animals or close off grazing areas in rotation.

8.8 Agarwal and Bhatt (1983b) argue that the rural-urban trade in biomass-based fuels, if organized properly, could become a massive employment

generation and ecological regeneration program. They suggest a number of solutions:

- a) Legalizing headloading by issuing permits to collect firewood from forest areas, specifically developed for this purpose.
- b) The Forest Departments should hire headloaders on daily wages to collect and deposit firewood in forest go-downs. This wood can then be given to them at a nominal price to sell in the market.
- c) In the case of forest-dwelling tribals, their forests could be detached from the Forest Department and alternative structures set up to help safeguard, develop and exploit their forests. The tribals could replant denuded lands and control the produce of the forests.

8.9 Agro-forestry seems to be a promising approach for poor households and women since it replicates the multiple products of the natural forest. Here production of fuelwood can be combined with food production or other income-generating resources like fodder or categories of MFP. Agro-forestry would be the best approach for women involved in hill agriculture, where animal husbandry is the second most important source of income. Fuel and fodder crops could be raised on degraded lands.

8.10 Because women's need for income-generation activities is not recognized by most project planners, existing sources of income are often lost due to changes in land use in the course of development. For example, the depletion

of forest resources can have a severe effect on women's income because they are the primary gatherers of minor forest produce (MFP).

8.11 A major and sustained thrust of forestry activities in relation to women must be on the employment and income-generation front. In a paper on women's employment and organization modes, Pushpa Sundar (1983) gives several examples where women have benefited through efficient organization of productive activities. She argues that home-based self-employment is not the best mode for women. Women would gain significantly if production or work were organized collectively in a fixed location--a Mahila Mandal building, a community or any other permanently available space. Many MFP-related processing activities can be organized in this fashion.

8.12 More often than not new technology primarily benefits men, sometimes robbing women of a source of employment or income in the process. New techniques are basically aimed at men and whenever technical improvement takes place, men may take over the task even if formerly women were performing it. Sundar argues that "unless women aggregate in critical mass, their technological needs will never get looked into and there will always be a technological gap between men's and women's jobs. Further, it is only when women work outside the home that greater attention will be focused on household tasks such as better water facilities in rural areas, light transport facilities for fuelwood, water, improved chulahs, crop processing equipment, etc." (ibid).

8.13 In a paper on effective policies for stimulating growth through community forestry in forest based economies, R.N. Tewari (1981, pp. 30-31) observes that neither the Government nor the Forest Departments have ever tried to develop a complete marketing system for MFP, from collection to end-users. Such a system would benefit primary collectors enormously. In fact, no national policy governs this important area. He also points out that even the Social Forestry programs have not brought MFP within their purview, concentrating instead on the traditional components of forestry handled by Forest Departments.

8.14 Where new forest assets are created, women's rights to them must be explicitly set out and enforced. (The role of NGOs would be especially valuable here.) Legal rights for women need to be enacted at many levels in the afforestation process. This will necessitate government policy decisions requiring considerable political will. Given women's established participation in agriculture and their contribution to household income, a measure of security regarding the status of productive assets is also essential.

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