Chapter 2

LITERATURE REVIEW

Utilisation of forest products for energy and other needs

In tropical developing countries, forest products play an important role in the rural economy. Rural populations extensively use fuel-wood, fodder and green manure for their daily needs and these products support the livelihood of the rural poor. Poffenberger et al (1996) have estimated that about 50% of the world’s poorest people are dependant on forests resources for survival and utilize forestlands to graze their livestock.

In India, forest related activities are the major source of income for the landless and the marginal farmers living around protected areas (Singhal et al. 2003). About 350 million people in India living in and around forests are dependent on non-wood forest products (NWFPs) for their sustenance and thereby earn an annual income of about Rs. 400 billion, i.e. more than Rs.11/year (Tewari 1994). Some 35-40% of the Indian population earns just enough to feed itself and has no purchasing power to meet other needs from the market place (Gadgil 1993).

Fuel wood is the most commonly used and is the staple energy source of the 75% of the population of the developing countries (Desai 1991). Rural areas account for about 85% of the total fuel wood consumption (Anon 1988). Fuel wood is the major energy source for the rural people and it fulfills about 68% of the total energy demand (Maheswari et. al 1997). A large portion of the rural energy demand is met from the locally available fuel wood, cow dung and agricultural residues (Natarajan 1997). The fuel-wood requirements for domestic purposes in rural areas are enormous (Rai and Chakrabarti 2001).
About 300 million tons of fuel-wood are used annually of which only one third is extracted sustainably (Kumar 2000). Fuels such as kerosene and Liquid Propane Gas (LPG) are not popular in rural areas for cooking food and its use is limited for making tea, coffee, and rarely to heat water. People living around protected areas use fuel wood and fodder from the forest due to ‘actual’ and ‘traditional’ dependency (Badola 1998, Badola et al. 2000). It was estimated that about 173, 412 K tons of fuel wood are being used in India annually (Anon 1997), of which 62 % is derived from forests (Leach 1987).

Accurate estimates of fuel wood demand in developing countries are not available (FAO 1997). The National Commission on Agriculture (NCA) had estimated that the fuel wood requirement in India would be 112 tons (225 million cubic meters) in 2000 AD (Dayal 1989). The National Fire-Wood study committee in 1982 estimated that the fuel wood requirement of India was 133 million tons but availability was only 49 million tons. Haripriya Gundimada (2004) estimates that about 88% of households surveyed in India use fuel-wood for their energy requirements. Data are not available regarding removal of forest resources by rural people (Singhal et al. 2003), and it has been estimated that unrecorded harvesting will be 17 to 20 times greater than that of the recorded removal from the forests (Dwivedi 1994).

This widespread fuel-wood use from forest areas has resulted in the degradation of the forest in all the states in India, as shown by the vegetation map prepared by the National Remote Sensing Agency (NRSA) in 1980-82.
Impact of resource extraction on forest cover and vegetation

There is a considerable pressure on the forests in India, as the per capita area of forest is only 0.109 ha against the average of 1.0 ha for the rest of the world (Krishnamurthy 1999). Collection of fuel wood, fodder and green manure from the forests in a non-sustainable manner has had a drastic effect on the forest ecosystems in India (Anitha et al. 2003, Rai and Chakrabarti 2001, Singh et al. 1992). Besides this, commercial harvest of timber over the past centuries has caused about 40 million ha of Reserved Forests to be degraded (Gadgil 1991, Gadgil and Guha 1992). In India, non-sustainable extraction of forest resources such as fuel wood is one of the causes of deforestation, loss of wildlife habitats (Jha 1999), and loss of species and diversity (Kakati 1999, Ramesh 2003, Verma et. al. 1997). Studies carried out in the Biligirirangaswamy Temple Sanctuary on vegetation have shown that highly disturbed sites have lower stem densities, species diversity and basal area than moderately disturbed sites (Murali and Hegde 1998, Shanker et al. 1998, Sekar 1999), and resource collection adversely affected the regeneration of the target plant species (Murali et. al 1996, Sekar 1999). These studies show that unregulated resource extraction has an adverse impact on the forest.

Conservation and sustainable management of forest resources

Management of forest resources has been practiced through history (Wells and Brandon 1993). In order to meet the requirements of the Indian population in terms of fuel wood, fodder, medicinal plants and other products, it is necessary to increase the forest cover to 33% (Singhal et al. 2003). It is also important to examine the links between the ecological socio-economic...
and cultural dimensions to manage the natural forest and to rehabilitate the degraded forests (Ramakrishnan 2003).

Conservation of biodiversity and wildlife will not be possible in the long term unless the local people support it (Cock and Koch 1991). Involving the local population in forest management and sharing of resource collection can help to maintain forests (Srivastava 2000). For example, villagers in southern W. Bengal received 25% of the share of timber and minor forest products in return for helping the Forest Department to protect the forests (Poffenberger and McGean 1996). The village forest of Kallabbe, managed by the local people supports a larger standing biomass and a greater variety of trees when compared to reserve forests in the vicinity (Gadgil 1993). Similarly, the villagers living around the Buxa Tiger Reserve and the neighboring Jaldapara Wildlife Sanctuary, West Bengal are cooperating with the Forest Department to protect the forest against illicit tree fellers (Karlsson 1999). *Eriochrysis rangachari*, a rare endemic grass was considered to have become extinct, however it was maintained by the Todas of the Nilgiris because of it importance in their tribal culture (Puyravaud et al. 2003).

It is also important to examine the local needs in terms of energy requirement and have policies to address these requirements. For example, energy plantations are one way to reduce the pressure on natural forests (Patel 1985).