



## THE HISTORY OF SOCIAL FORESTRY IN PAKISTAN: AN OVERVIEW

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### Abstract

*Social forestry is the planting of trees or shrubs aiming at the well-being and betterment of local communities. This specific branch of forestry is capable of ensuring the economic, ecological, and social benefits to the people. In reality, forests can be managed in much more sustainable fashion by involving rather than alienating local communities. The research findings indicate that more can be done to make sustainable forest management—an economically attractive option for poor local communities. Adverse ecological changes influence communities to move from non-supporting habitats to fertile. The mountain communities of Pakistan largely depend on natural resources to earn their livelihood. Therefore, poverty in these areas is causing depletion of forests. Economic pressures on households near forests and rangelands compel communities to cut trees and overgraze fragile areas. The critical review of forestry history of Pakistan indicates that most of the projects launched from 1970s to 1980s focused on the establishment of plantations but did not address holistic natural forest management. It is positive to report that from the early nineties, the focus changed to “social forestry” whereas in recent years it has shifted to institutional strengthening and reforms, both policy and structural. The review of the country’s forest policies have relied mostly on wishful thinking with almost no role allocated for communities to play rather they have ranged from being negative to neutral for community participation. To devising viable strategies, there is need to review and re-examine the limitations of past programs, learn the lessons from the previous shortcomings in order to alleviate poverty in the country and turn the deprived rural masses into prosperous sustainable communities. The article is an endeavor in this direction.*

**Keywords:** *history, social forestry, Pakistan.*

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## **Introduction**

### ***The Forests and Forestry in Pakistan***

Pakistan forests and planted trees cover an area of about 4.2 million ha which is equivalent to 4.8 percent of the total land area (Govt. of Pakistan 2005). Eighty-five percent of this is public forest under the legal categories of state reserve and state protected forests, which has implications for community rights and user participation (Nizamani & Shah 2003). Over 40 percent of these forests are coniferous and scrub forests on the northern hills and mountains. The balance is made up of riverine forests and irrigated plantations along the Indus River and its tributaries on the plains, mangrove forests on the Indus Delta, and trees planted on farmland. The total area under the control of provincial forest departments in Pakistan is 10.06 million ha, of which 6.1 million ha is rangeland. Most of these forests are found in the northern part of the country (40 percent in the North West Frontier Province, 15.7 percent in the Northern Areas, and 6.5 percent in the AJK (State of Forestry in Pakistan 1999/2000, Nizamani & Shah 2003)

The statistics on forests of Pakistan indicate that area covered by forests is quite low when compared with 30 percent for the world (FAO 2001) and 26 percent for the developing countries. The country suffers far more severe forest scarcities than most countries in South Asia. Its natural forest assets are small, with forest area and national land utilization figures ranging from 3.1 percent (State of World Forestry 2003) to 3.6 percent of total land area (Akhtar Hameed Khan Centre for Rural Development 2002). Pakistan has only 0.03 ha of forest per capita while corresponding figures for the developed and the developing countries are 1.07 and 0.50 respectively (FSMP 1992, Nizamani & Shah 2003).

Apart from an annual take off that is unfortunately higher than the annual growth of the forests, regeneration is visibly absent in most of the forests (Khattak 1994). In addition, the forest trees of the country are slow-growing and demands on its forests and other natural resources are extremely high (Nizamani & Shah 2003). These forests are not enough to meet the nation's demand of wood and wood based products. In 1998, the wood consumption in Pakistan was 33,018 thousand cubic meters and the total wood produced was only 350 thousand cubic meters leaving a large gap between production and consumption.

### ***The Emergence of the Concept of Social Forestry***

In Pakistan deliberate and planned attempts under the umbrella of social forestry are made to improve the declining natural resources. Social forestry is one of the best strategies adopted by the planners to engage local community participation in the drive towards reforestation. Social Forestry conceptually meets the wood and food feed needs and requirements of the local population

and is a wide-scope activity, where widespread plantations providing fuel wood and other wooden goods. It also promotes environmental stability and ultimately results in the generation of income and employment in the rural community.

### **The Rationale for Social Forestry**

#### ***Why Social Forestry?***

According to Sheikh (1997) Pakistan is virtually facing a wood famine. Prices of construction timber and fuel wood have increased during the last few years. According to national statistics, (Govt. of Pakistan 2006-07) the country ranks the 7<sup>th</sup> most populous country with a population of more than 155 million. Their current annual demand of wood will increase at the same rate, if not faster due to an increased standard of living. One possibility to bridge this gap between supply and demand could be to put more area under both the state and as well as the local forests. Currently, it seems rather difficult because of the paramount claim of agriculture on land and water and also the attendant financial constraints. Another possibility could be to intensify the forest management practices for better yields per unit area but that would also require heavy inputs.

#### ***The Scope of Social Forestry in Pakistan***

Approximately 75% of the total geographical area of the country, comprising mountains, watersheds, land and deserts is uncultivated (Hafeez 1998). This area is either underutilized or not in use. Most of it is uncultivable due to steep slopes, waterlogged soils, salinity or the absence of adequate irrigation facilities. This huge land resource has never been put to appropriate use. It is next to impossible to divert any area, water or other resources from crop husbandry to make up the deficiency of forests and trees. In the situation, these wastelands can best be utilized for wood production. Incidentally, the wood production activity will improve the ability of the country's watersheds to produce a sustained supply of water for hydropower production and agriculture. The wastelands include mountainous areas, deserts, plains without irrigation, ravine tracts, "uncommanded" areas in the irrigated plains, saline, sodic and waterlogged lands, all of which have a great potential for raising trees of suitable species for fuel, fodder, fiber, food etc (Khan 2001).

#### ***Potential of Social Forestry on Wastelands and Degraded Areas***

In Pakistan there are large wastelands and degraded areas that for several reasons are not being effectively utilized under agriculture. However, these lands can be gainfully utilized for wood production. Once the area is

reclaimed, it ultimately starts improving the soil conditions. Table 1 identifies the most suitable areas for social forestry, including communal lands.

Table 1. The Most Suitable Areas for Social Forestry in Pakistan

No.	Land Types	Description
1.	<i>Guzara</i> forests	Ownership is vested in local people, either as individual property or joint property. <i>Guzara</i> literally means "subsistence" and are private forests held either individually (by families), or jointly (by communities).
2.	Communal forests	It is a sub-category of the <i>Guzara</i> forest, where entire village owns the forest. The proper management of such lands through participatory and Joint Forest Management techniques can help enhancing wood supplies for future needs.
3.	<i>Shamlats</i>	It is a very common term used for a piece of lands owned by the state but managed and used by all the villagers for the collective purposes of the community. The village common lands ( <i>shamlats</i> ) are deteriorating due to lack of proper management.
4.	Village pastures	If these lands are managed on proper scientific lines they can contribute to wood production.
5.	Public waste lands	These lands are often lying without vegetation and can be used for energy plantations along with crops.
6.	Linear plantations	All linear plantations present large areas often suitable for plantation of trees for woodfuel production.
7.	Farm forest areas	These are linear or compact plantings of trees on private farm lands, owned individually or jointly by locals and are not subject to forest department authority.
8.	Canal side land strips	-
9.	Roadside land strips; Railside land strips	-
10.	<i>Auqaf</i> lands	Large <i>auqaf</i> (government) lands are available for growing of trees for wood fuel production.

Source: Khan (2001).

### The History of Social Forestry in Pakistan

Based on the scenario and the rationale presented in this paper and to overcome the wood deficit, combat environmental issues, rehabilitate natural resources and elevate the economic conditions of people living on farms, in and around forests, the government designed and successfully launched many developmental projects associated with social forestry in 1975 (Punjab Forest Department 2005). The history of plantations in Pakistan is linked with the need for more fuel wood and the urge for quick results which all pointed towards hybrid Poplar and Eucalyptus species. Accelerated growth experiments on hybrid Poplar, *Eucalyptus camaldulensis* and *Eucalyptus*

*tereticornis* were conducted in 1972 to establish the comparative merit of the two genera. The research findings identified that hybrid Poplar and some species of *Eucalyptus* are considered the best broad-leaved trees.<sup>4</sup>

It was observed that the *Eucalyptus* species receiving canal irrigation had a very fast rate of growth, produced large quantity of fire wood and showed outstanding performance.<sup>5</sup>

The idea of planting *Eucalyptus* was to get the maximum value production on a short rotation. *Eucalyptus* planting in the problem areas produced encouraging results for realizing economic yields and also helped reclaiming problem lands. The versatile qualities of the genus *Eucalyptus* coupled with its remarkable adaptability to various climates has made it a multipurpose species for planting. The superior traits of *Eucalyptus* made it the predominant planting species of Malakand Agency and other parts of the country.<sup>6</sup>

### ***Historical Initiatives Taken in Social Forestry in Pakistan***

In Pakistan, many forestry projects, with most claiming to follow participatory management principles have been launched. A large number are predominantly donor financed, a few are NGO driven and some have been initiated by the communities themselves.

An overview of the forestry related initiatives is presented in Table 2. The critical review indicates that most of the projects in the 1970s to 1980s were focused on the establishment of plantations but did not address holistic natural forest management. It is pleasant to report that from the early nineties, the focus changed to “social forestry” whereas in recent years it has shifted to institutional strengthening and reforms, both policy and structure. But unfortunately, the overall investment in forest related projects has been drastically reduced and bi-lateral arrangements have almost dried up (EC and UNDP 2002).

Table 2. Overview of donor funded forestry related initiatives in Pakistan (1975 to 2006)

No	Donor	Period	Investment (million \$)	Focus
1.	USAID	1982-1995	50	Plantation/Farm Forestry
2.	WFP	1975-2001	150	Watershed Management
3.	UNHCR	1987-1995	40	Plantation/Income Generation
4.	FAO	1985-1998	15	Watershed Management
5.	GTZ	1981-2000	25	Forest Management /Joint

<sup>4</sup> <http://www.agp.gov.pk./so-forst.htm> (accessed on January 06, 2008).

<sup>5</sup> <http://www.agp.gov.pk./so-forst.htm> (accessed on January 06, 2008).

<sup>6</sup> <http://www.agp.gov.pk./so-forst.htm> (accessed on January 06, 2008).

				Forest Management
6.	SDC	1981-2005	20	Integrated Development/ Resource Inventory
7.	ADB	1996-2004	14	Institutional Strengthening
8.	RNE	1987-2000	12	Social Forestry/Institutional Strengthening
9.	EC	1997-2005	30	Integrated NRM/Rural Development
10.	UNDP/GEF	2002-2006	19	Conservation and Ecosystem Management

Source: EC and UNDP 2002

The first project in Pakistan, the Siran Forest Development Project (GTZ) involved JFM under legal covenant. Other efforts such as the Malakand Social Forestry Project (Dutch), Kalam Integrated Development Project (SDC), and Watershed Planning and Management Project (FAO) also had a strong community component at each stage of the project cycle. This was also true for the World Food Program projects in the North West Frontier Province and Azad Jammu and Kashmir and the WWF, Social Forestry Program in Kohistan (SINDNET 2007 - Support Institution Development Network for Sindh).

Yet, the government of Pakistan and the state forest department did not understand the role local people may have in the forestry related initiatives until 1974. According to Ali (2007) the Forest Policy of 1975 first acknowledged people living in and around forest areas as relevant stakeholders. This recognition in the policy remained confined to statements, since the attitude of an average official of the forest department remained as authoritative.

Thereafter, the forest policy of 1980 called for the involvement of local people in tree plantation campaigns but at the same time limited their rights by bringing more land under the control of state and establishing national parks, to which locals were denied access (Ali 2007).

Started in 1981, the Kalam Integrated Development Project with the Swiss assistance was among the pioneer social forestry programs. A key part of the project was the formation of community-based organizations thus helping communities to organize themselves for collective action (LEAD 2004).

All the social forestry projects were completed at the provincial level to overcome the wood and energy crisis and explore the possible alternatives. To achieve this goal, in July 1984, the government initiated countrywide project for a period of 7 years. Later it was extended for another period of 3 years (Punjab Forest Department 2005). Pakistan's first nation-wide social forestry project was jointly funded by the government of Pakistan and the United States Agency for International Development (USAID) in 1985. It was

designed to redress the ill effects of deforestation in Pakistan. Its ultimate goal was to expand tree planting and, thus, the production of fuel wood, fodder, and timber on farmlands in Pakistan, thereby improving rural welfare and sustaining the long-term economic and ecological viability of small farms. Its immediate goal was to assist the Pakistan Forest Service to develop the institutional capacity to work with farmers toward realizing these longer-term goals. The government believed that by reorienting the forest service from focusing on protecting the state forests from the rural population, to serving as extension agents to this same rural population, these goals can easily be accomplished. Public service on private lands appears to offer the greatest opportunities for future development of the department, given a steady decline since partition in the area of state forests (Dove 1992).

With these objectives, in 1985 the government of Pakistan launched a 10-year social forestry program in all the provinces of Pakistan. The most important lessons learned were: the farmers become interested in tree planting provided some incentives such as payment for seedlings raised and cash awards for the best tree farmers are provided to give them a start; sustained on-site demonstrated technical help is essential; workshops and seminars are useful; the species planted should have a ready market and a high degree of cooperation is required between the wood producers and wood users to make the program sustainable.

In 1991, the first forest policy was revised and the goals of the new policy included the feature of promoting social forestry (FAO 2000). A donor driven forestry policy recognized the relevance of forests in providing livelihoods to poor communities. This policy established forestry extension services and appointed forest extension workers to promote farm forestry (Ali 2007). Concurrently, some development agencies have helped formulate evidently sustainable approaches towards forest management.

In 1992, the German aid agency GTZ initiated a social forestry project for natural resource management on self-help promotion in NWFP. Known as the Siran Forest Development Project (SFDP), its sought participation of local communities along with forest department to form joint forest management committees. It was the success of SFDP that encouraged the federal government to modify the Forest Act of 1927, known as Hazara Protected Forest Rules, 1996. This modification mandated the formation of Joint Forest Management Committees (JFM), including operational guidelines and production-sharing agreement with the provincial government (Ali 2007).

### *The Social Forestry Project in Malakand*

The Social Forestry Project in Malakand worked with rural women to enhance productive capacity. This was done through capacity-building via integrated training on the use of new and appropriate technology transfer

(such as the use of new fuel efficiency cook-stoves), techniques in improved farming methods for sustainable agriculture, and help in acquiring food preservation techniques (LEAD 2004). To improve women's status, in the NWFP, various development initiatives were undertaken in this region in the past 10 years and these activities did help in reducing the restrictions on women's participation. Therefore, women were able to participate in the training sessions on health and hygiene, basic economics, social forestry and nursery management (Dohmen 1992, LEAD 2004). These activities enable women to increase food production, ensure food security and increase household incomes. Women managing local nurseries are invested profits into new initiatives. The program has played a significant role in the overall women's development of the community (Dohmen 1992, Schwennesen 1996).

Despite these achievements, women's empowerment, particularly in the tribal and traditional areas, has not yet reached to the same level of the women living in other parts of Pakistan. The Integrated Rural Development Project (IRDP) in Mardan, as mentioned above, has initiated activities in all of the surrounding villages to raise awareness on basic health and hygiene; develop skills in embroidery, kitchen practices and gardening; and to train women to become traditional birth attendants (IRDP 1994, LEAD 2004). The latter has been particularly successful in minimizing the death-rates due to pregnancy-related complications.

#### ***Master Plan for Forest Sector Development (MPFD)***

Like other developing countries, the government of Pakistan has emphasized revenue generation from forests. The issues of watershed management, social forestry and environmental protection have received secondary attention. However, some changes are underway to reverse the fate of Pakistan's forests. In 1992, Pakistan published its "Master Plan for Forest Sector Development" for the next 25 years. This plan proposed strategies to manage forests and farmlands by encouraging farmers to plant trees. For the NWFP, the plan has set the objective of planting 3.95 million acres by the year 2018. From 1992-1996, only a total of 164,525 acres (4 percent) have been afforested (Khan *et al.* 1997). The implementation of FSMP started in the fiscal year 1993-94.

On April 18, 1993 in Islamabad, a donors meeting (International Round Table) was held to discuss the Master Plan for Forestry Development (MPFD). The meeting was attended by several donors like ADB, FAO, IUCN, ODA, WFP, FINNIDA, AIDAB, UNDP, USAID, The World Bank, The Netherlands, Switzerland, Japan and representatives of the federal and provincial governments.

### ***Afforestation, IRDP and the Provincial Forest Department***

According to IRDP (1994), the afforestation efforts made in the past could not keep pace with the increasing demand for timber and fuel wood in the country. The thrust of social forestry development projects in NWFP has been afforestation of denuded hills and farmlands. There are currently a number of grass-root development initiatives underway in the Peshawar and Swat Valleys that have achieved notable success.

In the case of the Integrated Rural Development Project (IRDP) in Mardan, for example, over 900 acres of land were re-planted with native species in plains and mountainous terrains (Ali 1999). While the Forest Department, the project's main partner, initially provided local residents with seedlings for the plantation program, residents are now growing and managing their own nurseries in order to continue with the program and to provide community members with fuel wood. The provincial forest department has provided training to local residents on the management of nurseries and other technical assistance. It is heartening to note that the community representatives view this initiative quite successful and the members are happily continuing with the plantation program by using seedlings from their own nurseries.

### ***Joint Forest Management***

The concept of community participation was introduced through "Joint Forest Management" around 1996 for the first time in Pakistan. Moreover the devolution/decentralization plan has added an additional dimension to the forest reform process. The efforts of private sector and NGOs to restore natural resources and improving social capital have been quite successful.

### ***Project on Environmental Rehabilitation in NWFP and Punjab (ERNP)***

In the year 1997, European Union (EU) initiated a project titled as Environmental Rehabilitation in NWFP and Punjab (ERNP). The project has gathered various lessons related to forest management and has mobilized communities in the project area to actively participate in the management of their renewable natural resources (EC and UNDP 2002). The components of social forestry like plantation of trees, orchards, nursery plants were taken into account.

### ***Social Forestry Project in Amlookdara***

The Social Forestry Project in the village of Amlookdara implemented a management plan and a variety of strategies to rehabilitate the natural environment. Among the activities, residents have started close-herding of livestock and limited grazing in certain areas (LEAD 2004). Planned routes for water needs and feeding stalls have also been included in the management

plan (Kingdom of the Netherlands and the NWFP Forest Department, 1997). While these activities may eventually allow the natural area to recover from the past degradation, introduction and implementation of a natural resource management plan was not easy. Locals were not well-informed about threats and consequences or on how to improve the situation. Many workshops and meetings had to be held with community members for them to understand and learn how to apply the management plan. The experts believe that if local residents continue to apply the plan's strategy and their acquired knowledge, the initiative will be sustainable (LEAD 2004).

### *Promotion of Social Forestry and Rain Water Conservation Technology*

Another project on the "Promotion of Social Forestry and Rain Water Conservation Technology" was being launched by "Society for Up-gradation of Knowledge, Health and Infrastructure" - SUKHI (Non-government Organization) for a period of 2 years (2006 to 2008). SUKHI works on poverty alleviation through different interventions focusing on improvement in living conditions and infrastructure in the project area.

SUKHI recently entered into partnership with another organization namely CASMA (Communities Association for Sustainable Development of Murree Areas) and mutually decided to achieve the overall objectives of the two organizations. Both primarily focused on creating the awareness amongst the communities against brutal cutting and burning of forests, promoting social forestry (plantation of fruit trees in the terraces, livestock rearing. The project successfully involved local communities' academia, civil society organizations, private sector and the concerned government departments. The project has produced the several positive outcomes and which are presented below:

- A group of well motivated/trained activist is now available in all villages of the project area.
- Sustainable biological resources have flourished in the area.
- Soil erosion caused by burning of trees, bushes and flora of area through accidental fire has been checked.
- The aesthetic value of the area has been improved.
- Regular flow of drinking water from springs has become available.
- Increased protection for natural fauna/wildlife in the area is visible.
- Rain water conservation technology in the area has been introduced.
- The income generation activities through the plantation of fruit plants and setting of orchards as a means of poverty alleviation have been carried out.

## **Mangrove Forest Development**

### ***The Indus Delta***

The Indus Delta is situated on the borders between Pakistan and India. It is a typical fan-shaped delta, built up by the discharge of large quantities of silt washed down the Indus River from the Karakoram and Himalaya mountain ranges. The present Delta covers an area of about 600,000 hectares and is characterized by 17 major creeks and innumerable minor creeks, mud flats and fringing mangroves. Recent satellite imagery indicates that about 160,000 hectares of the Delta are covered with mangroves (IUCN 1994, IUCN 1995, Vistro 2000, Qureshi 2007)

Mangrove forests in the Indus Delta as the sixth largest in the world (Vistro 2000, Nizamani & Shah 2003), occupying nearly the entire south-eastern coast in Sindh province from north of Karachi to the Indian border in the southeast. To a much lesser extent they occur along the Baluchistan coast. Due to being subjected to human pressure and ecological changes, however, Sindh's mangrove forests have been irreversibly degraded. By comparison, those in Baluchistan are in almost pristine condition. Regional ecological changes and selective heavy exploitation, however, have already depleted tree cover, caused stunted growth, and eliminated three of the original eight tree species. According to the latest international publications, the mangrove forests in Pakistan have shrunk from 345,000ha in 1980 to 176,000 ha in 2000 (IUCN 1994, IUCN 1995, Vistro 2000, Nizamani & Shah 2003). Also diminished freshwater flow from the Indus River into the estuary has caused salinity along the coast to rise above what some mangrove species could tolerate. Additionally loss of silt from the Indus has also deprived the mangroves of their main source of nutrients (Nizamani & Shah 2003).

*Avicennia* produce an inferior quality of firewood but with the reintroduction of *Rhizophora mucronata*, an increase in wood production in the Indus Delta has been observed. The mangrove ecosystem is dominated by a single species, *Avicennia marina*, which makes up over 90% of the trees, though a few stands of *Ceriops tagal* and *Aegiceras corniculatum* exist. *Rhizophora mucronata* used to grow in the Indus Delta, but they have since died out, due possibly to selective over-exploitation and degrading conditions. Recently Sindh Forest Department and IUCN - Pakistan successfully reintroduced *Rhizophora mucronata* in over 5,000 hectares of the Indus Delta (IUCN 1994, IUCN 1995, Vistro 2000). Greater efforts are required to encourage the local population to raise woodlots in the mangrove areas in order to reduce pressure on the natural mangroves stands (Vistro 2000).

### ***Mangrove Firewood***

Mangrove wood is used as an energy source by rural communities and is used for cooking daily family meals and for energizing small and large

industries. The Indus Delta mangroves are used directly for fuel wood by the coastal villagers. Although *Avicennia* wood does not make such a good fuel wood as other mangrove species such as *Rhizophora*, *Burigenia* etc, it is still used extensively by local people for their own use (IUCN 1994, IUCN 1995, Vistro 2000).

### ***Forage from Mangroves***

In the mangrove forests, the most promising species *Avicennia spp.* are able to survive in sea water without regular freshwater input. *Avicennia* leaves are excellent fodder for animals (Vistro 2000) and are collected regularly by the villagers for their cattle, sheep and goats. In addition, about 16,000 camels are also herded into the mangroves at certain times of the year (IUCN 1995, Vistro 2000).

### ***IUCN-Pakistan's Korangi Ecosystem Project***

The first phase of IUCN-Pakistan's Korangi Ecosystem project was set up in 1987 in an attempt to pull together available information about the ecosystem in a particular area of Indus delta on the Karachi coast. The second phase started in 1991, funded by NORAD which aimed at developing a coastal management plan for sustainable use of the mangroves along Karachi coast.

Although multi-sectoral in its approach, the project focused on the mangroves replanting and their management. IUCN-Pakistan worked with the Sindh forests department who carried out replanting of blank areas with mangrove species, especially *Rhizophora mucronata*. The choice of this species was based on the reintroduction of an indigenous species and to improve the commercial aspect of mangrove forestry in Indus delta. Together with *R. mucronata*, other species including *Avicennia marina* were planted as mud flats and in back water as shelter belts, linear and block plantations (IUCN 1994, IUCN 1995, Vistro 2000).

### ***Social Forestry Approach Adopted for Mangroves Forests***

Social forestry was the second component of the project, already jointly initiated by IUCN-Pakistan and the Sindh forests department. Seedlings of fruit, fodder and fuel wood producing trees were distributed among the local villagers to take pressure off the mangroves. The social forestry program also encouraged management of village mangrove plantations to grow both the species: *Avicennia* and *Rhizophora* for fodder and the fuel wood respectively. Such village mangrove forestry initiatives had not been tried before in Pakistan. Consequently the project managers came across a number of factors such as management control of the mangroves by the villagers and training of

techniques in mangrove management which they handled successfully (IUCN 1994, IUCN 1995, Vistro 2000).

The packages which were socially and economically attractive to villagers were also devised to make the project a success. This approach was helpful in establishing the importance of the mangroves and their preservation. IUCN-Pakistan in collaboration with Sindh forest department replanted over 6000 hectares with various mangroves species in Indus delta successfully. The most important part of this work was the innovative planting and nursery techniques which were being developed and applied (IUCN 1994, IUCN 1995). Community development remained important aspect in the sustainable management of the mangrove ecosystem. The project also focused on the community development, the local needs in the villages and environmental education program.

#### ***UNDO/UNESCO Regional Mangroves Projects***

The project was being launched during 1987-1989. The experimental plantations were raised in the entire Indus delta. The results of these experiments showed that indigenous species like *Rhizophora mucronata* and *Avicennia marina* were the most promising plantations under the existing conditions (Vistro 2000).

#### ***IUCN Korangi Phitti Creek Mangrove Project***

In 1994, IUCN initiated a mangrove rehabilitation project with the assistance of the Sindh Forest Department. Under this project 400 hectares have been re-stocked with the species like *Rhizophora mucronata* and *Avicennia marina* (Vistro 2000).

#### ***Rehabilitation and Replanting of Indus Delta Mangroves Project***

Sindh Forest Department implemented a mangrove rehabilitation and replanting project from 1993-94 to 1998-99 with the assistance of the World Bank. Program in social forestry in the coastal area to create an alternate resource of fuel wood and fodder were also implemented. Similarly another research program for sustainable management of mangrove resources with the participation of the local community was launched. Mangrove regeneration was achieved on 16,000 hectares (Vistro 2000).

#### **Conclusions**

Pakistan has a poor forestry resource and one of the lowest proportions of forest area in the world. Existing forests cannot meet the growing needs of wood and wood-based products. Forest resources in the country are depleting due to commercial overexploitation, whereas indiscriminate cutting and felling of trees is more than replanting and regeneration rates. The stagnated

and low output from the state forests is not sufficient to fulfill the demand for timber and fuel wood, raw material for industries, energy requirements of agricultural sector and fodder and forage for livestock. In order to reclaim degraded forest lands, ensure sustainable use of marginal lands, protect good quality land fulfill the nation's needs, tree planting on farm lands has great potential. Among all the available options, the practice of social forestry seems to be the most feasible and viable option in improving forests and forestry situation in Pakistan.

Although the desirability of tree planting on farmlands is recognized, both in the academic government policy, fewer efforts have been made than the anticipated. There are two explanations for low participation by locals in farm forestry: (1) most social forestry projects primarily focused on biological and technical concerns, (2) very little emphasis was laid on understanding the perceptions of local people or beneficiaries of the projects. Sustainable use of natural resources entirely depends upon how the people living in the villages nearby treat them. There is a need to convince locals to conserve the environment and natural resources whose livelihood often depends upon it. Many efforts have failed to secure local support because project planners and implementers did not take the time to understand the local situations, culture and social values (Awan 2000).

Many issues and problems were experienced in launching the social forestry program in Pakistan. It is assumed that if following strategies are being put into practice, the wood production in the country can be enhanced through successful social forestry projects.

- Make all the possible, dedicated and devoted efforts to create the awareness of benefits of the social forestry program among all the sects of the society. The adoption of tree planting for wood production is not very easy therefore, all the stakeholders must make concerted efforts to create social awareness and devise effective social forestry strategies.
- People's participation at all stages of social forestry project formulation must to be ensured to give them the sense of ownership.
- Before launching a social forestry project in a area, the study of socio-economic and demographic conditions should be carried out.
- The adoption of tree planting needs strong and individual motivation.
- A credit facility over the gestation period of the plantations should be made available to the participating farmers.
- All the wastelands available along the railsides and roadsides public areas in addition to other degraded lands for wood production should be utilized.
- Considering the immediate needs, short-rotation, fast-growing, and coppice character species should be propagated.

- Educational and extension activities and services should be backed and supported by research. Research on raising trees should be carried out since the social forestry is relatively a new discipline.
- Efforts are required to motivate and encourage the local population to raise woodlots in order to reduce pressure on the prevailing woody stands.
- Identification and breeding of suitable fast growing, coppicing tree species of high calorific value for different agro-climatic zones should be carried out.
- Information regarding marketing should be gathered and very clearly communicated to the farmers. The fear of the unknown and suffering from a market surplus of wood fuel has to be removed from their minds.
- The existing trends of wood production and utilization, including the alternatives being used, have to be considered.
- The corporate sector should be encouraged and involved for the successful initiatives.

Social forestry program will meet success when people's participation is ensured in planning, execution, selection of area, choice of species, management, harvesting and distribution of produce and benefits. The country needs national strategy to develop wastelands for wood production through participatory joint forest management in the public and private sectors. For this purpose policy issues also need to be addressed.

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