CONSERVATION AND PROTECTION OF FOREST HERITAGE IN SINDH

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Sindh province has a total of 1.088 million hectares under forests, out of which 0.261 million ha. comprise of the riverine forests and 0.0704 million hectares are irrigated plantations, while the rest of the 0.756 million ha. constitute mangrove forests (0.288 million ha) and range lands (0.467 million ha), only about 30% of the total forest area falls under productive category while the rest of the area is of protective nature. Riverine and irrigated forest plantations, the productive category constitute about 2.3 percent of total land area of the province.

Forest heritage of Sindh needs to be protected, preserved and developed against various types of adverse biotic and abiotic factors. The Government of Sindh have given due recognition to the gravity of situation in its 7th Five Year Plan and accorded priority to the forestry sub-sector. Great emphasis is being laid on industrial and energy plantations as well as on social and farm forestry on private lands. In additon to these, rehabilitation of riverine forests and irrigated forest plantations and conservation of mangrove forests are also being given due attention.

BIOTIC FACTORS

Some of the main biotic factors adversely affecting the conservation and protection of existing forest resources are:

i. encroachment on wood lands and forests

ii. demand of forest land for agricultural cultivation leases

iii. damage to forest through illicit means

ENCROACHMENTS

Due to increasing population and dearth of means of livelihood in the rural areas, settled population resorts to illicit means for earning their livelihood by encroachment upon adjoining forest lands for cultivation purposes. This practice is commonly exercised by local people in case of 'Kacho' lands (newly formed land in riverine tract), pending its award to Forest Department by revenue authorities.

AGRO CULTIVATION LEASES

The pressure for such leases is also increasing. Forest Department although wants to keep agro cultivation leases restricted to such lands where development of land is beyond its financial resources but the people are now becoming increasingly habitual of obtaining leases from Forest Department for a certain period and then keeping it in their possession even after expiry of lease period through political pressure and filing suits and obtaining stay orders from the courts on one or the other pretext. This is evident from the increase in lease area from 51,673 acres to 68,800 acres.

DAMAGE TO FORESTS

Illicit cutting of forests has become a regular phenomenon. Main reasons are socio-economic condition of the people living in their vicinity forest staff posted for protection duties is

often threatened though their implication in many cases cannot be ruled out. In Sindh, about 90% of domestic fuel requirements in rural areas are met from wood, charcoal, animal-dung, and agricultural residues. The prices of fuelwood are increasing on account of large gap between demand and supply. Most of the poor people cannot afford to buy fuelwood and timber for their domestic needs. Damage to forests, besides loss of wood for fuel and timber, is also common for fodder and grazing of livestock whereby young saplings and regeneration is greatly damaged in the forests.

ABIOTIC FACTORS

Amongst abiotic factors, following factors contribute towards depletion and destruction of forest resources:

1. River erosion and accretion processes in riverine forests
2. Reduction in the duration and intensity of flood water in the riverine forests
3. Topographical changes in the riverine tract by river's typical form of flow
4. Decreasing discharges of fresh water in mangrove forests areas in the Indus deltaic region

RIVER EROSION

Indus river has a typical flow. The riverine forests are Sindh's main forests which grow within the earthen embankments along the river banks and produce most of fuelwood and timber. Average annual production from these forests in about 48,000 cubic meters of timber and 1,50,000 cubic meters of fuelwood. Due to the continuous process of erosion by the river Indus, considerable area with mature trees growth is eroded each year.

REDUCTION IN DURATION AND INTENSITY OF ANNUAL INUNDATION

1. RIVERINE FORESTS

The fluctuation in duration and intensity of inundation or flooding by Indus river has adversely affected the forest resources of the province. At present, with the discharge of 0.50 million cusecs in the river 50% of the riverine forests gets innundated, 60% with 0.65 million cusecs 80% with 0.80 million cusecs and all forests get innundated with 1.00 million cusecs. Normally 50% to 60% area is innundated every year. According to a survey conducted by the Forest Department, almost 50% of the area of riverine forests e.g. 1,30,000 hectares, have degenerated to the extent that they have lost their economic value. If this position of dwindling inundation in riverine forests is not controlled and effective measures to regulate water supply to Sindh forests are not immediately taken then the main forest resource heritage of Sindh will disappear resulting in serious ecological imbalance, acute dearth of timber, firewood and other wood products.

2. IRRIGATED PLANTATIONS

Inland forests situated out-side river embankments receive water supply from existing irrigation systems. During construction of 3 barrages or weris at Sukkur, Kotri and Guddu in Sindh, it was planned that 0.280 million acres of the inland forests will be converted into irrigated plantations. Original afforestation plan could not be implemented on account of land and water demand for food production. Therefore, only 82,226 hectares for raising irrigated plantation alongwith irrigation water at the rate of 1 cusec for

60 hectares were allocated. A total of 1335 cusecs of water was required out of which only 1270 cusecs was made available to Forest Department and thus only 13,760 hectares could be planted up. This water supply has proved to be a handicap in improvement and development of forest-resource in Sindh.

TOPOGRAPHICAL CHANGES IN RIVERINE TRACT

Extensive topographical changes on the land and composition in the riverine forests have also been observed over the years. Due to increase in population and hunger of land for cultivation in the upper reaches/catchment areas of Indus river, huge quantities of silt and sediments are transported by the river and continuously depsoited in Indus plains, resulting in the formation of high lying forest-areas, beyond the reach of normal innundation. This topographical change is further depleting forest resources in Sindh.

DECREASING FLOW OF THE RIVER IN MANGROVE FORESTS OF INDUS DELTAIC REGION

Mangrove forests exist in the deltaic region of river Indus and cover an area of 2,88,750 hectares. The existance of these forests depends upon receipt of fresh water in the deltaic area as forests grow on a mix of sea and river water. Sweet water is provided by river Indus during its flood season, from July to September each year. Importance of mangrove forests cannot be over-emphasized because of their maintaining a balanced ecological system, where besides trees, fish/shrimp and other marine-life also play an important role. The role of these forests in protecting the coastline and two sea-ports of Karachi in Sindh is also obvious.

It has been observed that due to decreasing flow of river water in the deltaic region of Indus, the forests are also diminishing. New blanks devoid of any vegetation have become a common feature of mangroves on account of decrease in the required amount of fresh water for these forests. Thus the continuous decrease in the discharge of Indus river in these forests is another damaging factor to the forestry resource of Sindh.

2. PROTECTION AGAINST FIRES

Not many cases of fires in Sindh Forests are reported but in view of the arid conditions prevailing in and around forests, and on account of shortage of water supply, fires are becoming a regular feature especially in the irrigated forest plantations where due to paucity of funds or shortage of water, plantations could not be raised.

3. ENVIRONMENT

Forests play an important role in maintaining balanced ecological conditions which are absolutely necessary for keeping a check on deterioration of environment and control pollution. The riverine forests also play an important role in arresting sediments and silt in the three barrages constructed in Sindh. The irrigated plantation contribute in checking wind storms, improving soil fertility, and checking extremes of climatic changes, besides covering the soil which otherwise would accelerate the pace of desertification, leading to extreme arid conditions in Sindh. Mangrove forests also help in maintaining balanced coastal/marine ecosystems comprising of fauna and flora in deltaic regions of Indus and Arabian Sea. The forests also control damange of increasing water salinity and sea wind erosion of coastal lands. The sea breeze coming from the direction of these forests controls the climate of adjoining urban and rural population centres. The mangroves protect the two sea-ports from siltation

as well as erosion.

4. GENETIC RESOURCES

Improvement in tree growth and its resultant by-products is also considered to be an important factor for better development and improvement of forest resources. Better seeds, better soils and better techniques in forestry operation would yield better results. Introduction of exotic species of improved genetic characteristic would increase production of forestry products. In Sindh, *Eucalyptus* was introduced in 1958 and its various species like *E. camaldulensis*, *E. microtheca*, *E. globulus*, *E.rostrata* and *E.citriodora* were grown. Amonst these, *E.camaldulensis* and *E. citriodora* have established quite well. There is a need for improvement of genetic stock of these species to suit climatic and land conditions and to allow their natural regeneration, which does not exist at present. The seed of these species has since been mixed up with other varieties and it is essential that genetic research should be conducted to solve this problem and develop pure seed of these species to obtain their full potential in the problematic areas. Similarly, research for obtaining natural regeneration is needed in the case of another promising tree i.e. *Conocarpus lancifolius* (Ethopian-teak) which grows quite well in a range of soil and climatic condition i.e. in dry and water-logged soils.