

## Wasteland Improvement through Trees and A Forestation Activities

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Wasteland is a degraded lands as a result of inherent or imposed disabilities such as chemical and physical properties of environment, soil, location, financial or management constraints. It includes area affected by sheet, ravine and gully erosion, salinity, water logging, extreme moisture deficiency, wind erosion, riverine lands and shifting cultivation etc. Due to complete loss of top soil these degraded lands are ecologically unstable and unsuitable for cultivation. Many factors are responsible for wasteland development like over grazing, deforestation, industrialization activities and shifting cultivation etc. In India socioeconomic and rural development by the development of wasteland and forest apart from its role in maintaining ecological stability. Barren wasteland turning into that is fertile and suitable for habitation and cultivation and wasteland can be reclamation by the planting suitable tree species. Suitable trees species of economic value on degraded land are growing that has been unutilized. Various management practices are used for reclamation of degraded land and wasteland such as aesthetic forestry, farm forestry, community forestry, social forestry, commercial forestry, extension forestry and agro forestry etc. Wastelands are two types' cultivable wastelands and uncultivable wasteland.

### Causes of wasteland

The main reasons of land degradation are increasing biotic presence, deforestation, absence of adequate investments, faulty land use practices, overgrazing, improper irrigation, over cultivation and appropriate management practice high incidence of poverty in rural areas. Shortage of drinking water, land degradation, groundwater depletion, soil erosion, reduction in species diversity, depletion of natural resources, pressure on forestland and lower or almost zero productivity which is for our ecological security and increase in the extent of wastelands all are the results of wasteland. The problem are high incidence poverty in rural areas, over exploitation of national resources, faulty land use practices, appropriate



management practices, absence of adequate investments, high rate of population growth and increasing biotic pressure.

### **Afforestation activities**

Join Forest Management (JFM), farm forestry, social forestry and agro forestry etc. are the management practices with the help of local people in this practices overcome the degradation of wasteland through afforestation of suitable species in the management of lands and the planning suitable species such as Acacia, Prosopis, dalbergia, Neem, Pipal, Ficus etc. Under different agro forestry models like alley cropping/hedgerow cropping, multipurpose farming, block plantation, boundary plantation etc. to reduce water and soil erosion we can adopt farming system to mitigate these problems. A large scale plantation should be done for making a good and clean environment on the hilly and plain areas. Reclaiming the degraded lands that is unfertile land, barren land and wasteland with the help of large scale suitable plantation of suitable tree species. Afforestation means establishment of forest and trees in that area where there was no forest present. Wasteland reclamation are depends on the type of wasteland. For growing trees, shrubs and grasses within a reasonable cost can only be made suitable and not for agriculture crops in some kinds of wastelands also can be made fit for the development of agriculture. By adopted some afforestation activities such as silviculture, agroforestry and social forestry etc. to protect agricultural lands from further deterioration arising out of degradation processes. In agro forestry model, enhancement of soil nutrient status, microbial population dynamics and better yield productivity which plays a major role to maintain ecosystem in nutrient cycling through a suitable combination of nitrogen fixing trees and multipurpose with field crops are played a major role. The many factors prevailing in the region for plantation the selection of species is made taking into consideration. By the surviving indigenous or local species under afforestation a clear indication of the species which may be most suited for the area. Fast growing species can survive under the adverse condition of the locality. For afforestation work pits, patches and contour trenches etc. work is done for soil preparation.

### **Role of trees for wasteland improvement**

For reducing run-off and erosion losses the potential role of trees is very beneficial. By natural forest communities a multilayer defence against the impact of raindrops. Tree canopy strata helps in reducing the adverse effect of its impact on the soil and also in the

reducing the force of rain. On the soil surface the humus layers and the litter act as a cushion against erosion. In highlands areas undulating topography and with steep slopes soil conservation is particularly important which are increasingly being brought under cultivation. From the hedgerow species loppings and prunings also provide mulch in preventing sheet erosion to aid between trees. By removal of vegetative cover from the soil generally results in an increase in bulk density reduction in infiltration rates and a decrease in porosity. By the use of trees and other woody perennials to protect agricultural fields from these adverse effects is a widespread practice. Trees acting as windbreaks and shelter belts and also assist in regulating the eco-climate within the tree stands. These also reduce evaporation and temperature. The clearing of vegetation affects not only destroys the water catchment areas causing rapid silting of dams and flooding of rivers but also the farmlands in the immediate vicinity.

#### **Criteria for selection of species**

- Highly drought resistant
- Fast development of fibrous root system
- Deep root system to reach lower and moisture regime of the soil
- Capacity to sustain high wind velocity
- Net exacting in moisture of nutrients
- Provides multiple benefits

#### **Suitable trees for saline and non-saline alkaline soils**

*Prosopis juliflora, Tamarix articulata, Prosopis piagera, Tamarix aphylla, Acacia nilotica, Casuarina equisetifolia, Butea monosperma, Leucaena leucocephala, Azadirachta indica, Eucalyptus hybrid, Melia azadirach, Pongamia pinnata.*

#### **Suitable trees for lateritic Areas**

*Acacia auriculiformis, Albizia lebeck, Bambusa arundinacea, Holoptelia integrifolia, Pterocarpus marsupium, Dendrocalamus strictus, Madhucal longifolia, Shorea robusta, Dalbergia latifolia,.*

#### **Suitable trees for Sand dunes**

*Acacia Arabica, Prosopis picigera, Prosopis juliflora, Dalbergia sissoo, Tamarind auriculata, Eucalyptus spp.*

#### **Suitable trees for in mined out areas**

*Acacia auriculiformis, Dalbergiasissoo, Eucalyptus camaldulensis, Grevillea robusta, Albizia lebeck, Cassia siamea.*

**Suitable trees for coastal areas**

*Pongamia pinnata, Avicennia officinalis, Acacia auriculiformis, Eucalyptus tereticornis, Salvadoria persica, Salvadoria obovata, Simarouba glauca, Prosopis spp.*

**Suitable trees for hilly areas**

*Eucalyptus globulus, Eucalyptus grandis, Eucalyptus tereticornis, Acacia mearnsii, Acacia decurrens, Acacia dealbata, Acacia melanoxylon, Pinus roxburghii.*

