



(A) Severe Lantana infestation in selected area; (B-C) Lantana removal and stacking; (D) Nursery preparation with selected grass species; (E-F) Plantation using direct planting and seed ball methods.



(G) Regeneration of grass species at the site.



(H) Restored area post intervention showing regenerating grasses.

LONG-TERM MANAGEMENT OF GIR GRASSLANDS: A PERSPECTIVE

The conservation and scientific management of grassland habitats are fundamental to maintaining ecological balance and long-term wildlife sustainability in Gir. Preserving the ecological integrity of Gir requires not only scientific management by the Forest Department but also the active participation of local communities, such as the Maldharis. Such coordinated efforts are essential to ensure that Gir continues to be recognized for its rich biodiversity in the future.



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Photo Courtesy: **Project Team**



Restoration of Lantana-invaded landscape in Gir Gujarat



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INTRODUCTION

Gir National Park represents a region of biogeographical significance for the dry deciduous ecosystems of western India. The park constitutes a rich ecological landscape spread across the districts of Junagadh, Gir Somnath, and Amreli in the state of Gujarat, covering an area of approximately 1,410.30 sq. km. It is recognized as the only natural habitat of the Asiatic lion.

CLIMATE AND TERRAIN

The climate of the area is characterized as tropical monsoonal, with three principal seasons: summer, monsoon, and winter. During winter (December to February), minimum temperatures may decline to around 10°C, whereas in summer (April–May), temperatures can rise to 40–43°C. Rainfall distribution across the region is uneven. The western part receives an average annual rainfall of approximately 1,000 mm, while the eastern part receives about 600 mm annually.

From a geomorphological perspective, Gir comprises a combination of hilly and plateau terrains formed primarily of magmatic-origin Deccan Trap basalt and dolomite formations. Black cotton soils are predominant over the uplands, whereas the riverine tracts are characterized by gravelly and sandy loam soils.

ECOLOGICAL SIGNIFICANCE OF GIR

The importance of Gir extends beyond the conservation of the Asiatic lions; its geographical location renders it vital for maintaining regional ecological balance and contributing to climatic regulation. From the standpoint of floristic diversity, Gir constitutes a highly significant region, supporting a wide range of forest types and vegetational formations. Its vegetation plays a crucial role in soil conservation, nutrient cycling, and the maintenance of hydrological cycles, while simultaneously providing habitat and sustenance for a wide range of faunal species. Grasslands within Gir particularly serve as the principal forage base for key herbivores such as chital, sambar, nilgai, and chinkara, thereby sustaining viable prey populations essential for the survival of the Asiatic lion and other carnivores. Beyond their trophic significance, grasslands provide habitat for ground-nesting birds, small mammals, reptiles, and numerous invertebrates, contributing substantially to overall biodiversity.

INVASION OF GIR BY LANTANA: AN ECOLOGICAL THREAT

Invasive proliferation of *Lantana camara* has emerged as a significant ecological concern in Gir National Park. Lantana is a perennial shrub known for its vibrant flowers and ability to thrive in various climates. The species forms dense, impenetrable thickets in the understorey of dry deciduous forests, particularly in disturbed sites, open canopy patches, and along roadsides and riverine tracts.

Its aggressive colonization outcompetes local flora, suppresses native grasses and regeneration of indigenous tree species, thereby altering habitat structure and reducing forage availability for wild herbivores. Its seeds are dispersed easily by birds, aiding their rapid spread. Over time, lantana invasion can modify fire regimes, impede natural succession, and affect overall biodiversity and ecosystem functioning within the Gir landscape. The dominance of Lantana alters habitats significantly, reducing plant diversity and affecting the animals that depend on native vegetation for food and shelter, leading to broader biodiversity loss.

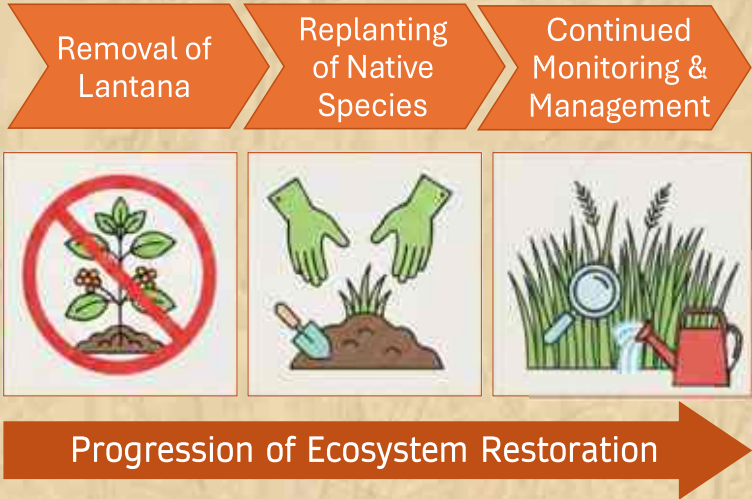


REMOVAL OF LANTANA FOR REVIVAL OF LOCAL ECOSYSTEM

An effective strategy for ecological restoration involves the systematic removal of *Lantana camara* to eliminate competitive pressure on native vegetation, followed by the replanting of indigenous grasses and shrubs to restore habitat structure and ecological function. Continuous monitoring and adaptive management are essential to prevent reinvasion, assess vegetation recovery, and ensure long-term ecosystem stability.

Under the CAMPA-funded project “Mapping, Monitoring and Management of *Lantana camara* through utilization for improving livelihood of people in forest fringe villages of India”, ICFRE-AFRI has selected 101 ha area in the Visavadar Range of Gir West Forest Division for the removal and restoration of Lantana-invaded areas and monitoring of eradicated sites.

PROGRESSION OF ECOSYSTEM RESTORATION



1) Removal of Lantana

Manual removal was undertaken to control *Lantana camara* infestations in affected areas. Dense thickets were cleared through cut rootstock method. The removed biomass was stacked upside down to ensure effective control of the species.

2) Replanting Native Species

The selection of native plant species that are well adapted to the local environmental conditions promotes biodiversity and strengthens ecosystem resilience by providing suitable habitat for indigenous fauna and supporting pollinator communities. Recognizing the ecological significance of grasses within the Gir landscape, native grass species such as Jinjvo grass (*Dichanthium annulatum*), Shaniyar, (*Sehima sulcatum*) Ratad grass (*Heteropogon contortus*), and Gadhio grass (*Themeda triandra*), among others, were identified in consultation with the Gujarat Forest Department (GFD) for grass-assisted restoration initiatives. An on-site nursery was established for the propagation of the selected species. Plantation was carried out using both direct planting techniques and the seed ball method in the designated restoration areas.

3) Regular Monitoring and Maintenance

Periodic evaluation of key indicators, including plant growth performance and biodiversity status, enables early identification of constraints encountered during the restoration process and facilitates timely corrective interventions to facilitate native species regeneration and ecological stability. Such adaptive management practices are critical for ensuring the long-term sustainability and functional integrity of restored ecosystems.

The site in Gir is being monitored regularly, and at present, more than 25 species of native grasses have been recorded, reflecting a significant revival of indigenous flora. Furthermore, recent observations by officials of the GFD associated with the project indicate a marked increase in wildlife movement within the restored area following the collaborative restoration efforts.

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