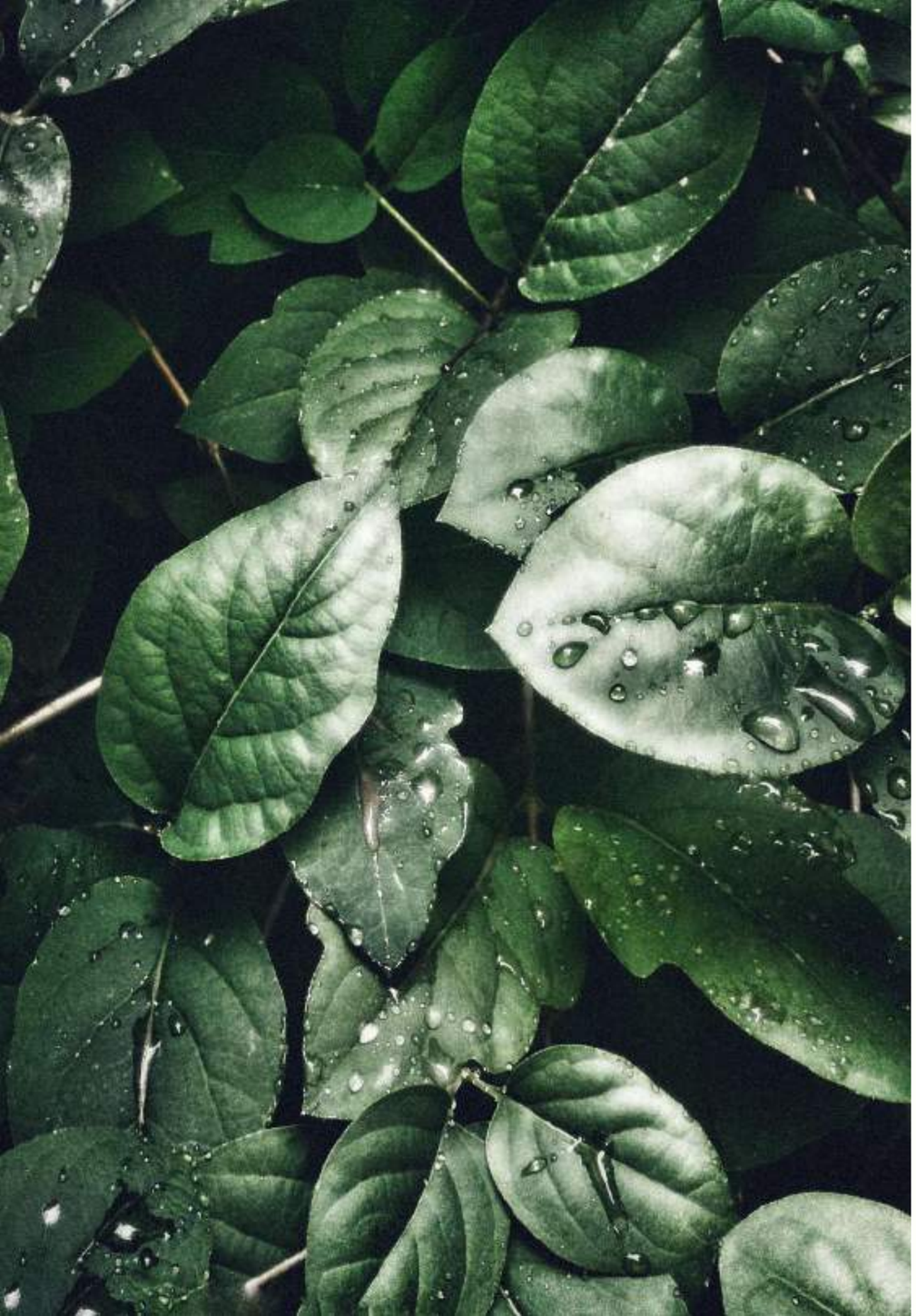


Past, Present and Future of Forest and Biodiversity Governance in Kerala

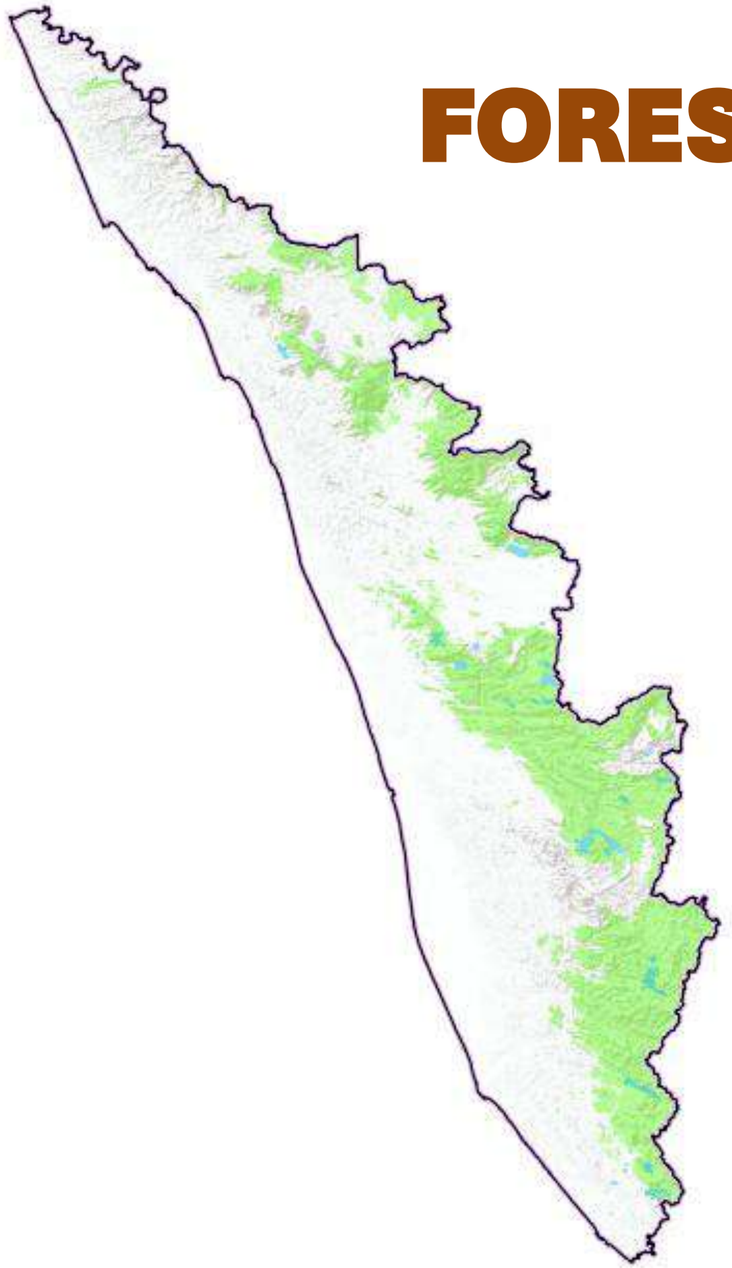
Dr. Pramod Krishnan IFS

Chief Wildlife Warden, Kerala

VISION 2031

AN INTERNATIONAL CONFERENCE ON DEVELOPMENT AND DEMOCRACY

FORESTS OF KERALA



Total extent of forests	**11,524.411 m^2 (29.65% of the State)**
Reserved Forests	9,339.186 km^2
Proposed Reserve	284.218 km^2
Vested Forests & Ecologically Fragile Lands	1,900.979 km^2

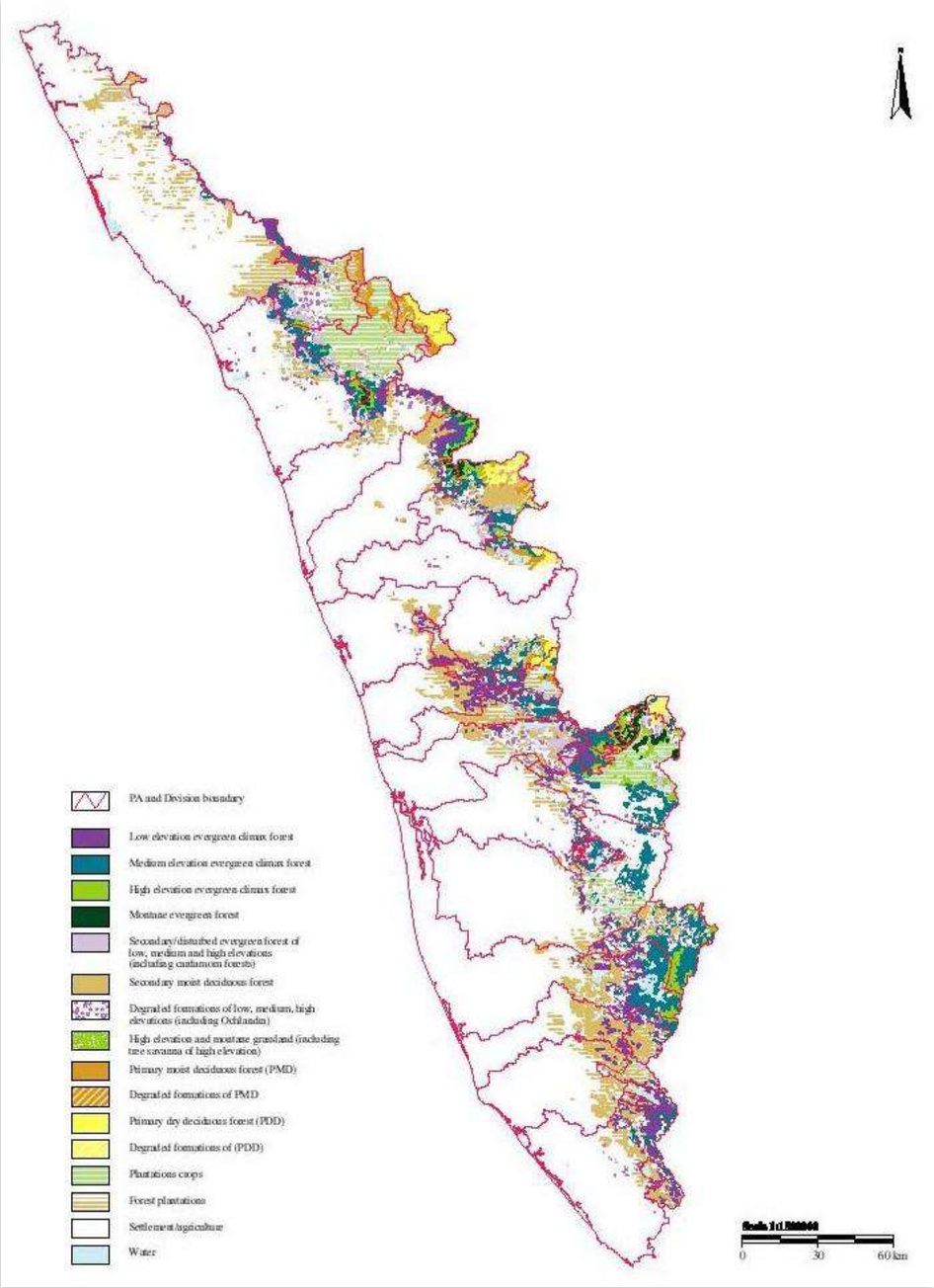
Territorial Forest Divisions 25

PAs	24 Nos. (27.88% of total forest area)
Wildlife Sanctuaries	17 nos.
Community Reserves	1 No
Tiger Reserves	2 Nos
Elephant Reserves	4 Nos

Natural forests	78.38%
Plantations	13.46%
Lease & FCA, 1980	8.16%

FOREST TYPES

Forest type	Area (km²)
Tropical Wet Evergreen & Semi Evergreen	3,877.44
Tropical Moist Deciduous	3,615.98
Tropical Dry Deciduous	391.36
Montane Sub Tropical Temperate Sholas	386.42
Grasslands	501.09
Plantations	1,477.39
Others	1,274.73
Total	**11,524.411**



FLORA

1,286 species of endemic flowering plants

Estimated flora – **11,840 taxa**

- Angiosperms – **4,968 species**
- Endemic to WGs - **900**
- Endemic to Kerala – **252**

Flowering plants - **3,800** species

- **1,272** species are Western Ghats endemics

- Algae - 866
- Fungi - 4,800
- Lichens - 520
- Bryophytes - 350
- Pteridophytes - 332
- Gymnosperms - 4
- Leguminosae - 413
- Orchidaceae - 265

FAUNA

Birds – 502 species
(16 endemic to WGs)

Fresh-water Fishes – 210
(189 endemic to WGs)

Reptiles – 171 species
(50% endemic to WGs)

Mammals – 145 species
(15 endemic to WGs)

Amphibians – 120 species
(80% endemic to WGs)

HUMAN FOREST ECOLOGY

Scheduled Tribes in Kerala - 4,84,839 (1.45% of population)

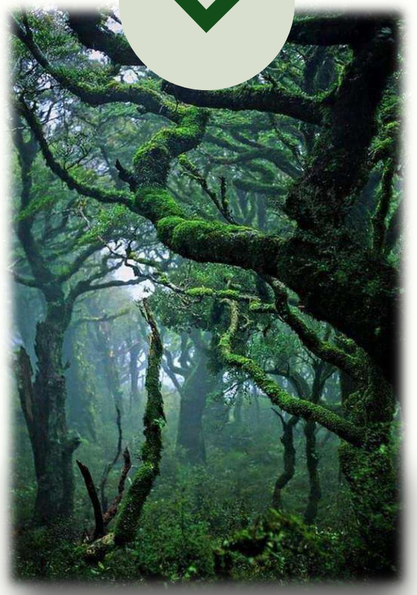
- **36 tribal groups**
- **725 forest settlements**
- **Heavily dependent on forests for livelihoods**
- **NTFPs**
- **Ecotourism**
- **Wage labour**
- **Agriculture**

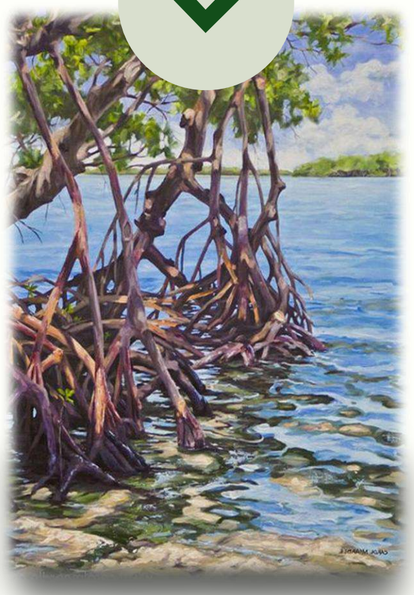
FOREST GOVERNANCE - DIVERSE BASELINES

- Striking range of biological diversity
- High population density
- High Human Development Index
- Ambitious developmental imperatives
- Contradictory sectoral directives
- Contesting land-use assertions
- Multitudes of actors & aspirations
- Active PRIs and civil society
- Increasingly violent human-forest interphase

KERALA OVER THE YEARS

- Proximity to the tropics
- Straddling oceans and mountains
- Years of geological stability
- Anthropogenic interventions
- Diverse biological diversity





NATURE OF ENVIRONMENT IN KERALA

55,000 YEARS AGO..

Habitat types

- Tropical forests
- Temperate and sub-tropical ecosystems
- Large swamps, littoral forests
- Mangroves

Major determinants of environment

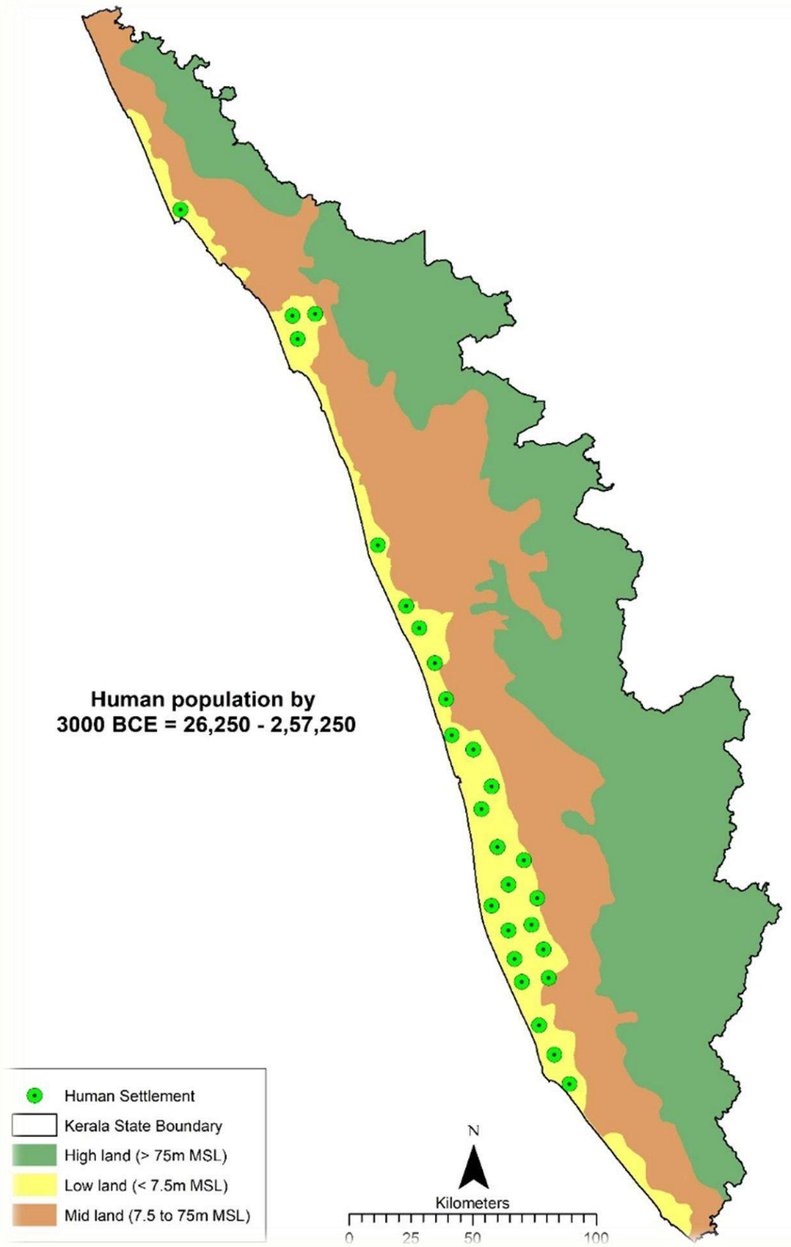
- Climate & climate change
- Fire
- Ecological fluctuations
- Human interventions
- ICE age (MIS 2 (14,000 yrs) and MIS4 (71000 yrs))

- Archaeology
- Linguistics
- Genetics

PRE-HISTORIC PHASE

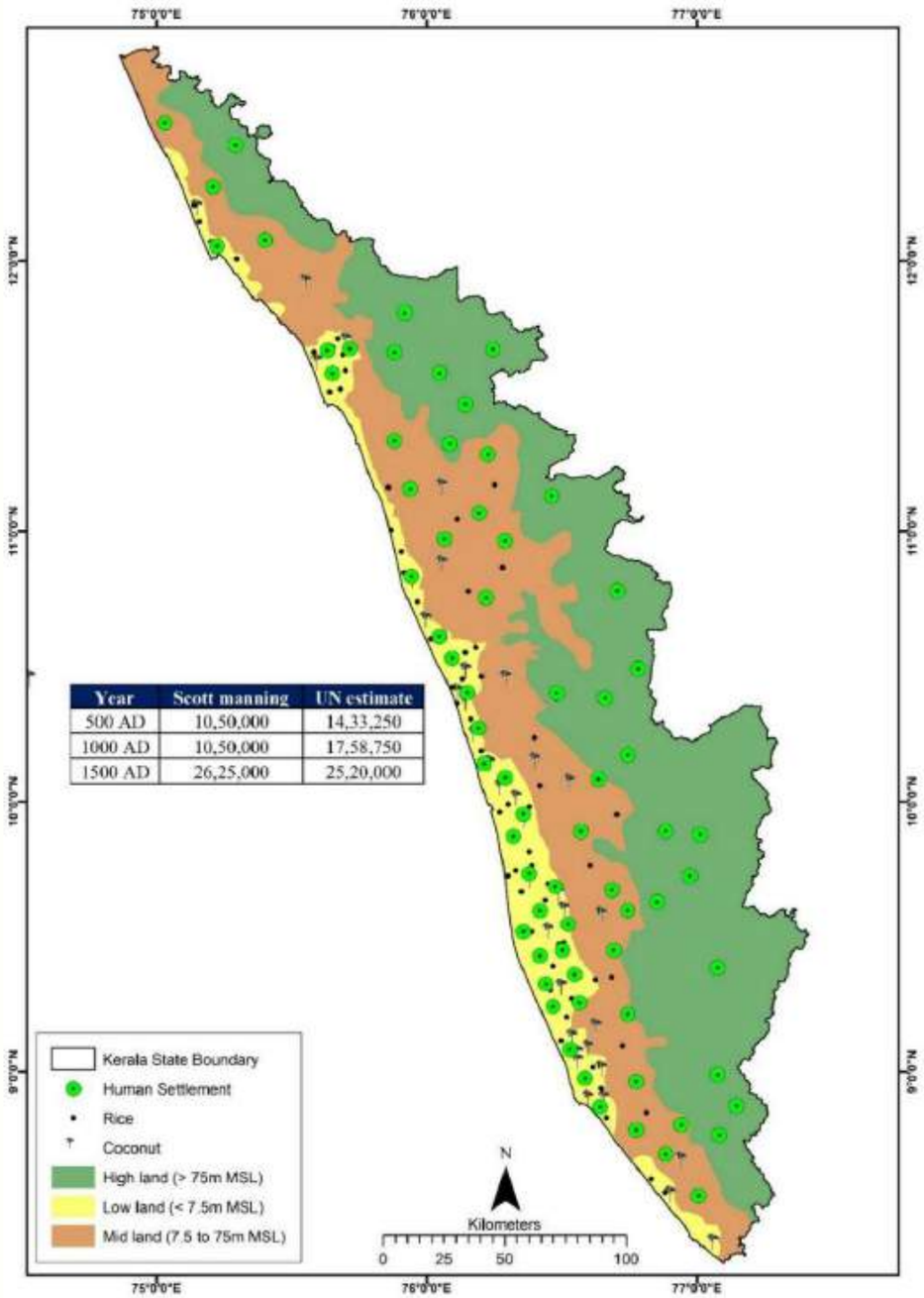
(55,000 BCE-3000 BCE)

- Small, scattered and foundational population
- Hunting and fishing as way of life
- No major impacts on natural resources
- Eastern sides of the Western Ghats populated by the *Homo sapiens* only by around 40,000 years ago
- Large-scale ecosystem changes due to climate change
  - Emergence of sub-montane habitats in the High Ranges
  - Submergence of coastal vegetation etc.



EARLY HISTORIC PHASE (3000 BCE-600 ACE)

- ‘Thina’ concept of Sangham literature
  - Coastal (*Neythal*)
  - Cultivated areas (*Marutham*)
  - Forested areas (*Kurinji*)
  - Grasslands (*Mullai*)
  - Dry lands (*Palai*)
- Food gathering and hunting - continued
- Limited extent of shifting cultivation
- Agricultural labour mostly from family relations
- Increase in population and natural resource use
- Collection of wild pepper for international trade
- Use of iron and draught animals not rampant
- Evolution of Sacred Groves (Buddhist/ Jain culture)



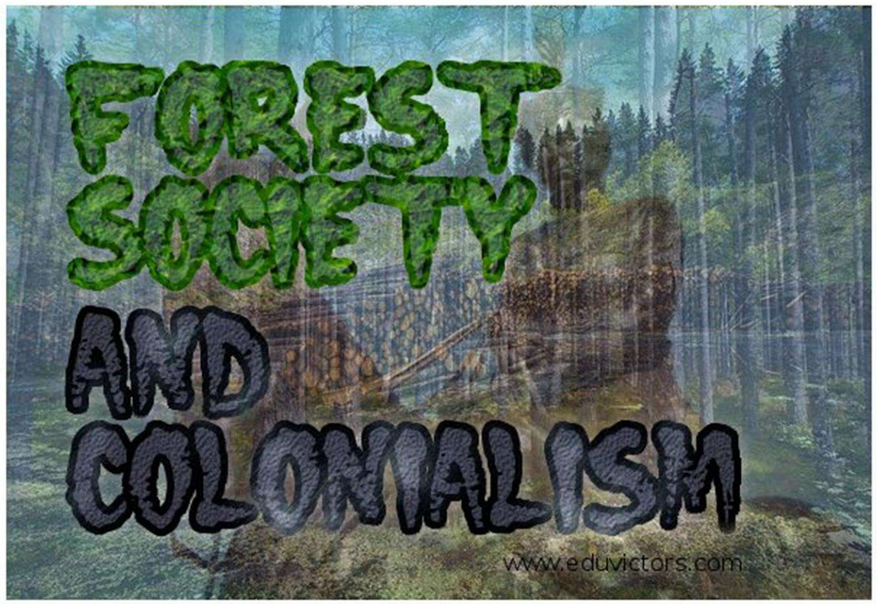
EARLY HISTORIC PHASE (600 ACE – 1800 ACE)

- Coconut and wetland paddy arrives 2000 years ago,
- By around 1500 A.D, the coastal and mid-land habitats dramatically altered.
- 'Vedic migration' – around 6th Century A.D.
- Agricultural expansion around places of worship.
- A new form of production system emerged
- Large supply of land, labour and capital
- Large extent of wetlands/ low-lying areas/ swamps were converted.
- Extensive coconut cultivation by 15th century
- Coffee (18th Century AD) to Wayanad region

Era of 'forest-dominated' to 'human-dominated' landscape

ERA OF TECHNO-CAPITAL IMPERIALISM

(1800 ACE- 1947 ACE)

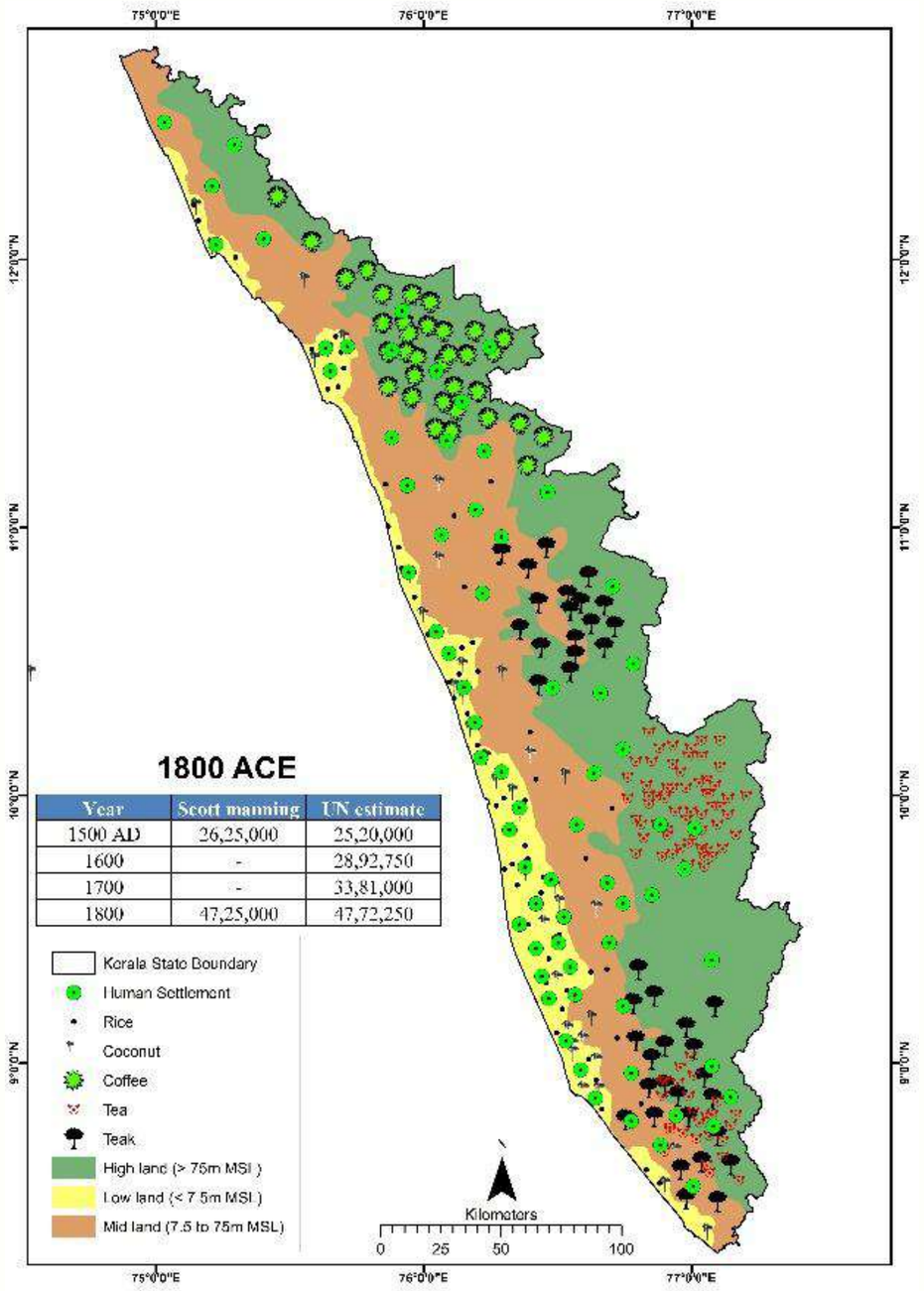


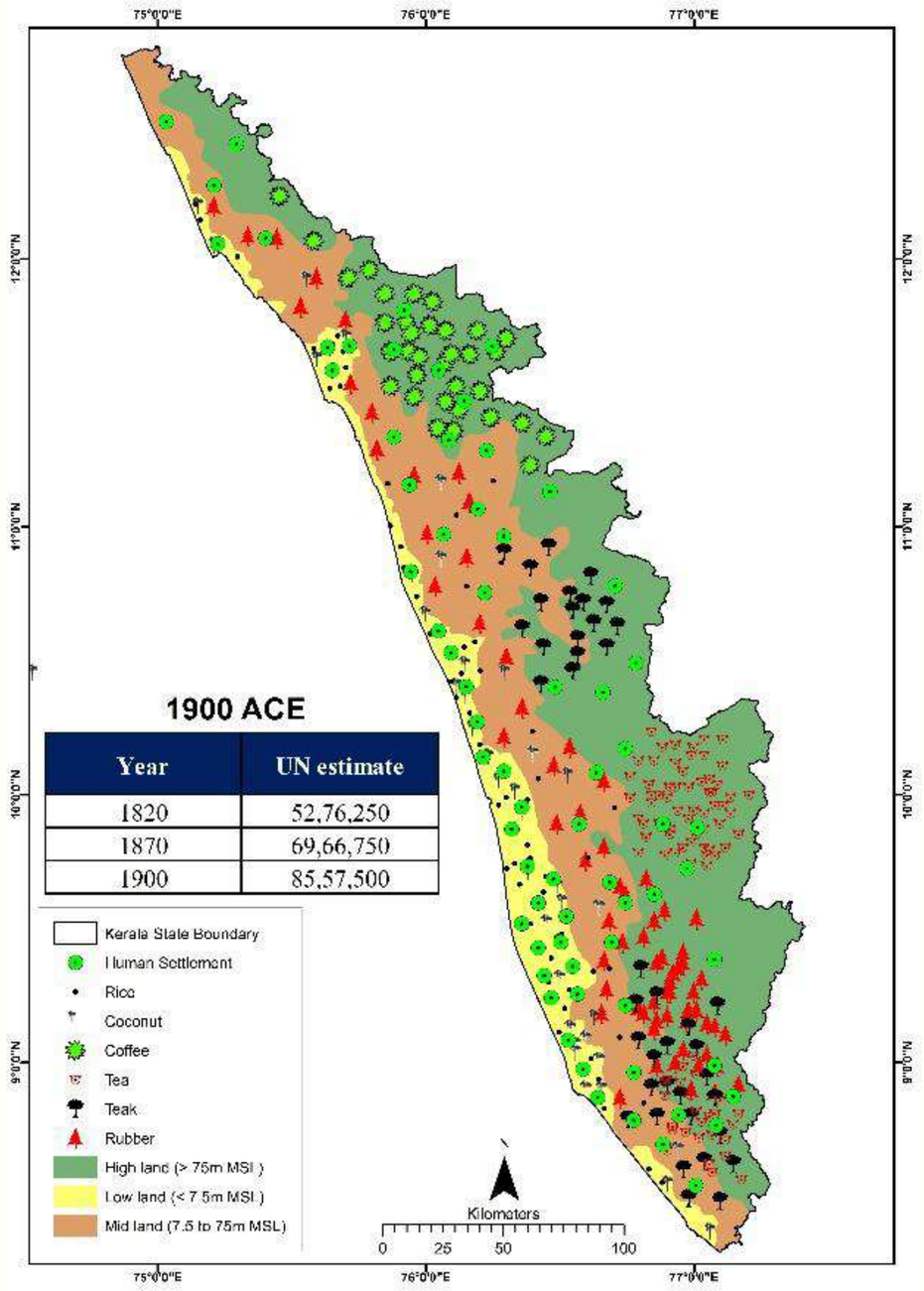
- Invention of steam engine
- Surplus production and colonialism
- Ships, Railways and Artefacts
- Forests for timber and governed by mathematics
- Massive conversion for agriculture
- Evolution of Protected Areas (hunting and inventorying)
- Legal framework and people exclusion (1878 and 1896)
- Supportive Forestry Research and Education
- Tea, Teak and Rubber and human migration
- Human altered landscapes

"Bio-mathematical & people-exclusive framework to forestry"

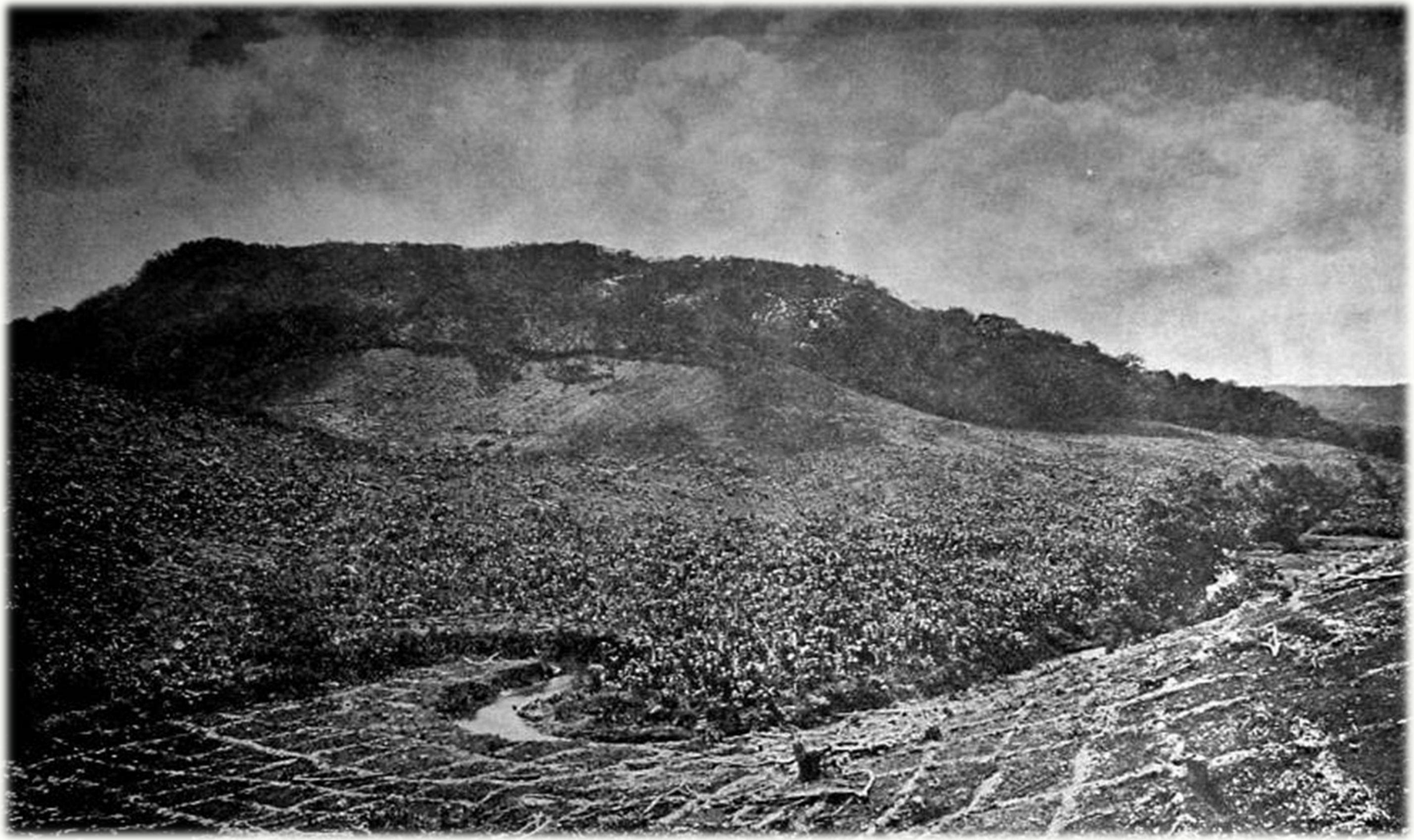
ERA OF TECHNO-CAPITAL IMPERIALISM

(1800 ACE & 1947 ACE)





Teak Plantations raised under Taungya system.



“Vayakara plantation of 1924 at Konni in Central Division 2-1/4 years old. Just handed back to the Department after 3 crops of paddy and 2 crops of horse gram.”

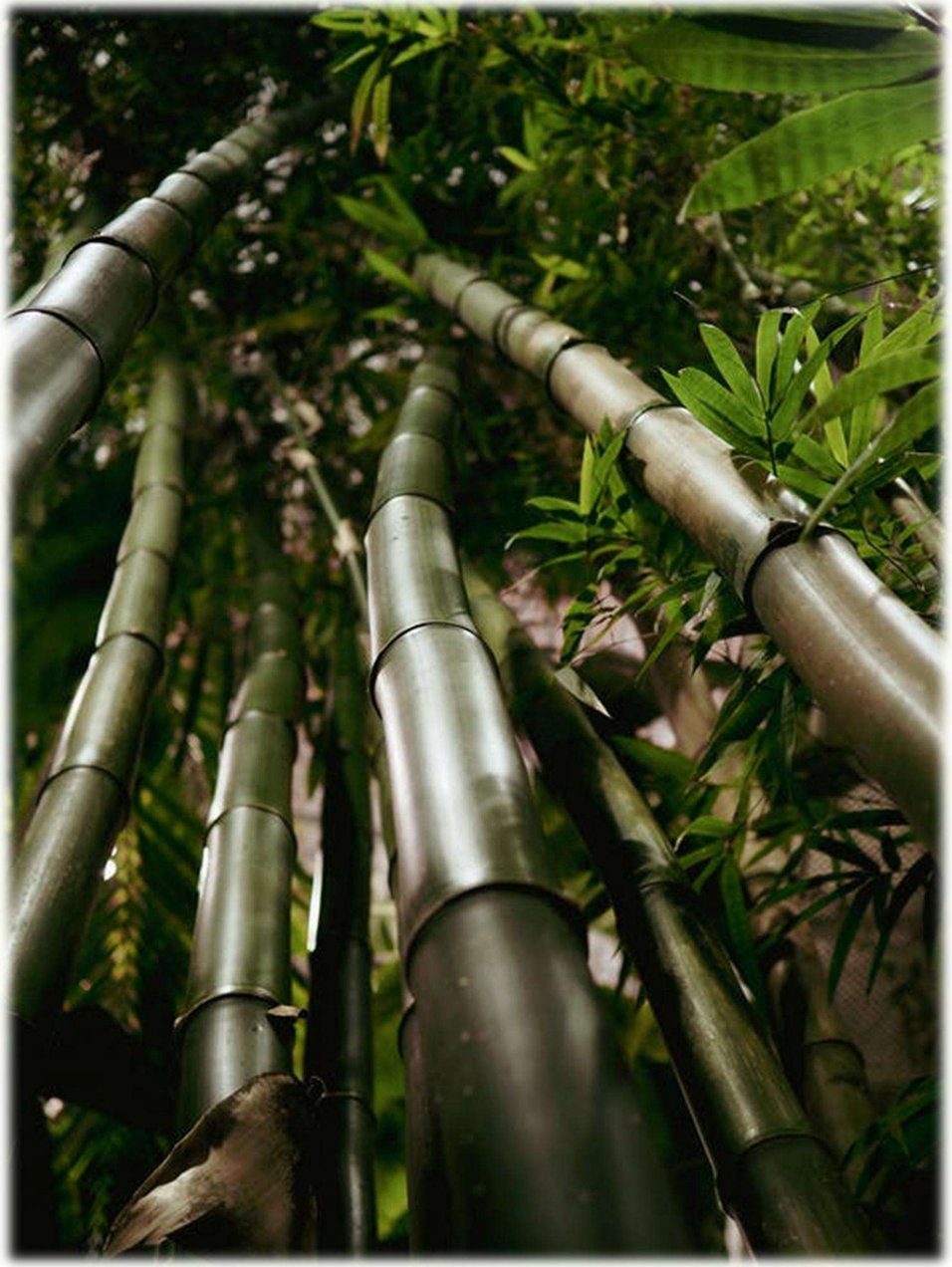
Vayakkara plantation by Vivekananda Society in 1925

“Bulldozers were used for making roads in thick jungle.”

POST-COLONIAL PERIOD

ERA OF COMMERCIAL FORESTRY (1947-1975)

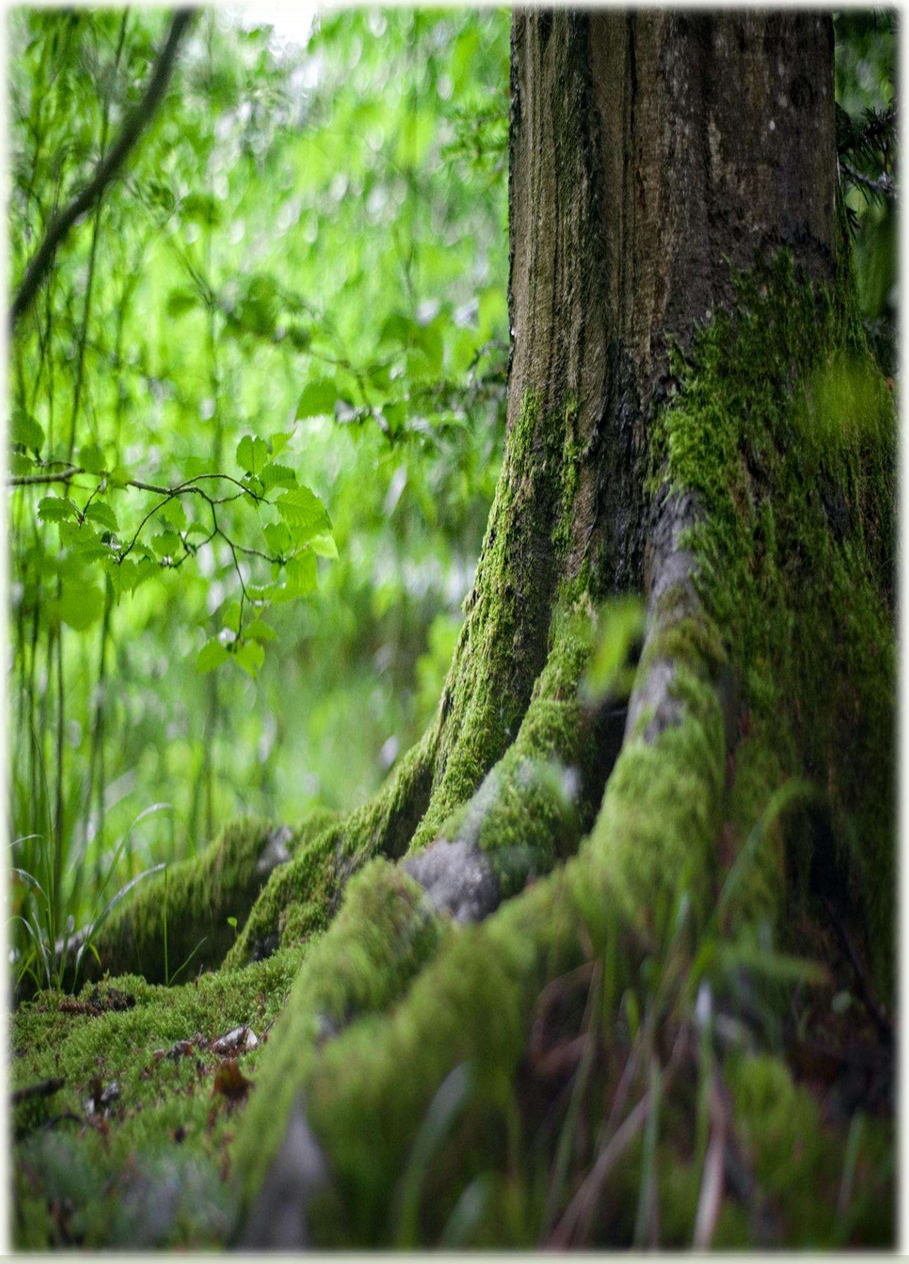
- 1952 Forest Policy
- Conformity to Five Year Plans
- Large-scale bamboo extraction
- Monoculture plantations
- Commercial felling in natural forests
- Protected Areas for catchment protection
- People exclusion
- 1/3rd concept of forest cover

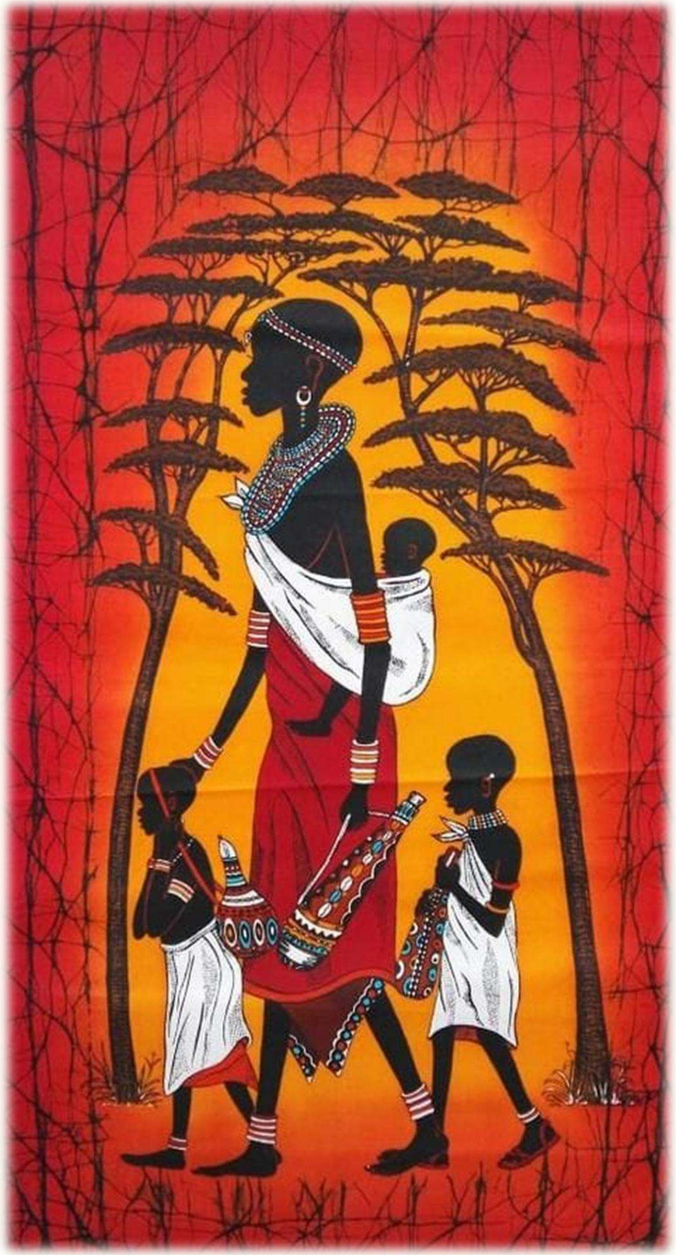


POST-COLONIAL PERIOD

ERA OF ENVIRONMENTALISM (1975-1995)

- Silent Valley agitation (deep ecological movement)
- Chaliyar river conservation agitation (popular ecological movement)
- Resonance of global/ national events (Earth Summit, Silent Spring, Project Tiger etc).
- Forestry in Concurrent list
- Establishment of large number of PAs





POST-COLONIAL PERIOD

ERA OF LIMITED PARTICIPATION (1995-2010)

- Policy Imperatives of Planning Commission
- Decentralized Planning in Kerala
- Joint Forest Management
- Biological Diversity Act, 2002
- Forest Rights Act, 2006

POST-COLONIAL PERIOD

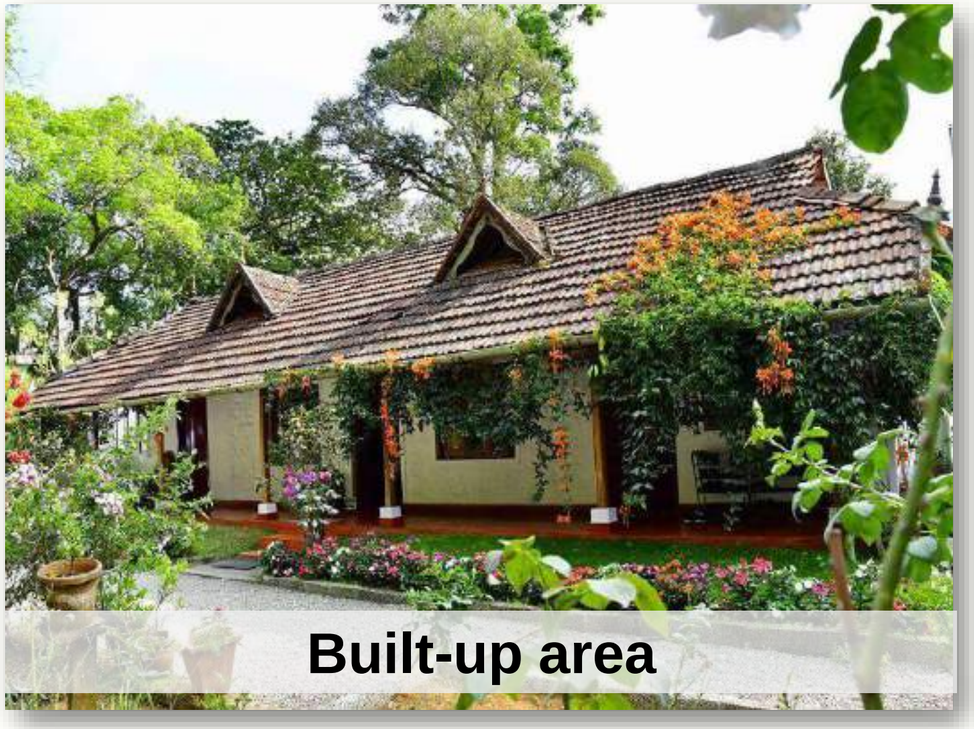
ERA OF FORESTS V/S FARMER NARRATIVE (2010-2018)

- Gadgil Committee Report
- Emergence of Social Media
- New dimensions of environmental activism

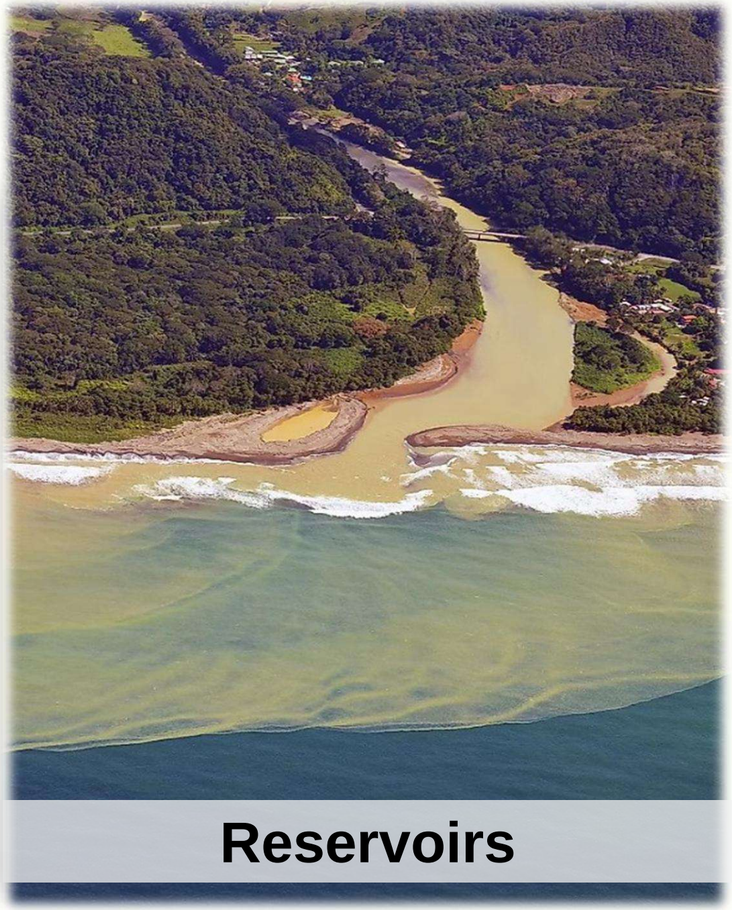
POST-COLONIAL PERIOD

ERA OF HYDROLOGY & ECORESTORATION (2018 FLOODS)

Wetlands



Built-up area

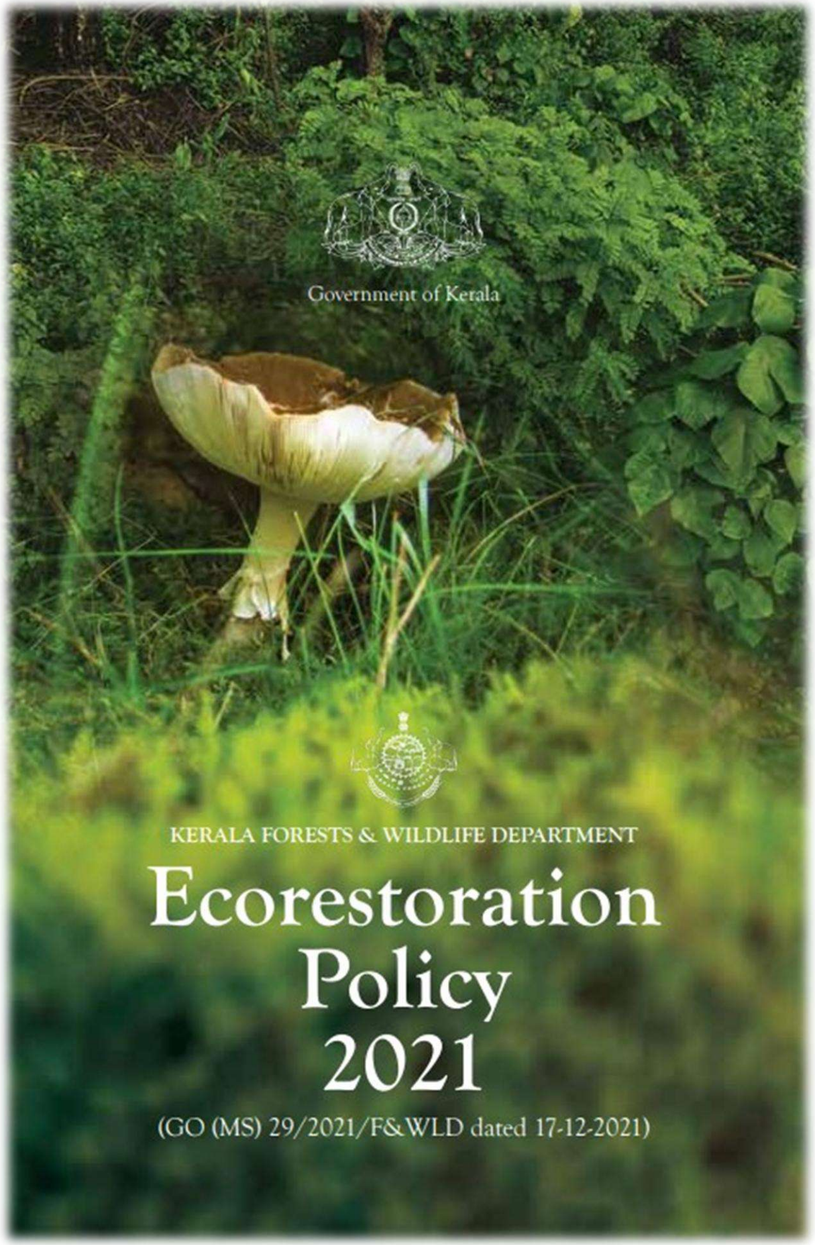


Reservoirs

Forest Health

ECORESTORATION POLICY 2021

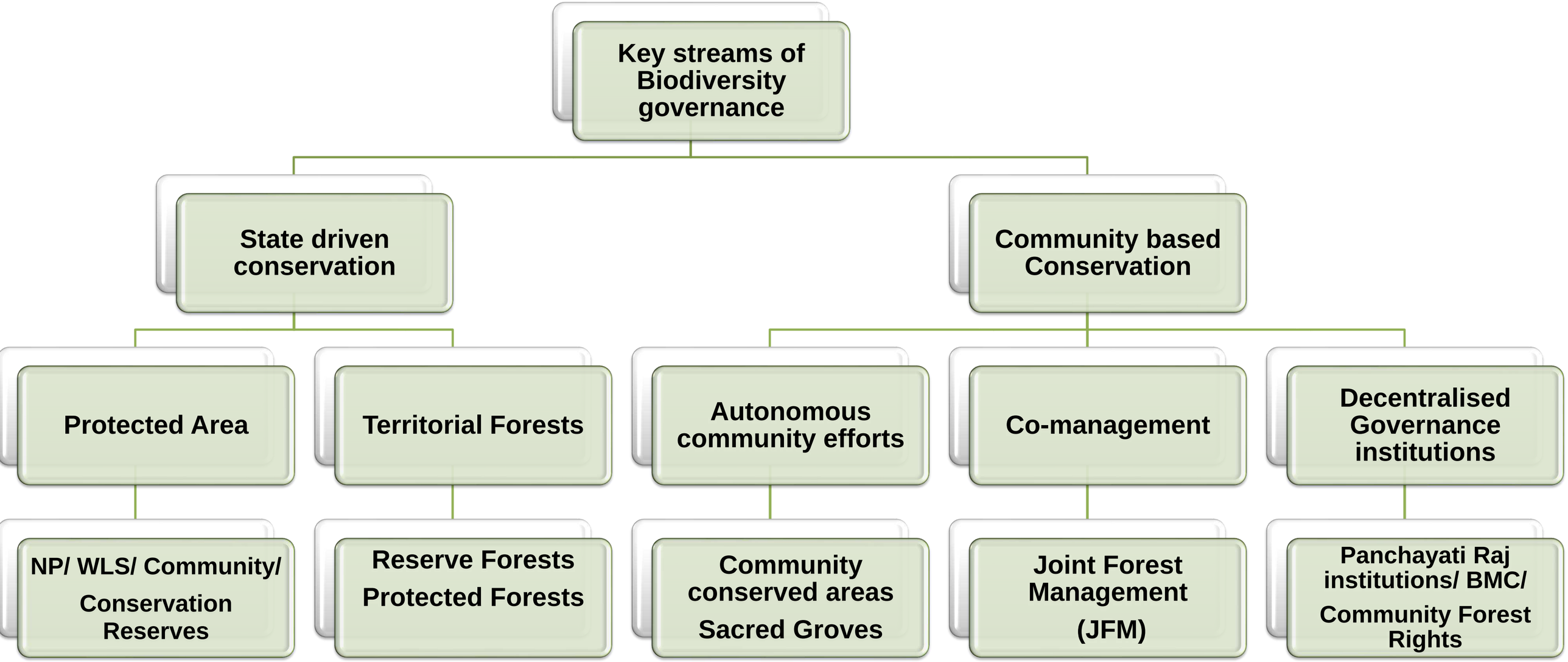
- Phasing out of Acacia and Eucalyptus
- Rationalization of Teak plantations
- Voluntary Relocation of human settlements
- Climate resilience
- Eradication of Invasive Alien Species
- Conservation of mangroves
- Increasing the productivity of forest plantations



CHANGING OBJECTIVES OF FOREST GOVERNANCE

- Ensuring hydrological security
- Safeguarding biodiversity conservation
- Ensuring climate resilience
- Providing livelihoods
- Reinvigorating production forestry

VARIOUS MODELS ON NATURAL RESOURCES GOVERNANCE IN KERALA



CURRENT STATUS OF NATURAL RESOURCE GOVERNANCE

NATURAL RESOURCE GOVERNANCE – CHALLENGES

- **Large-scale human intervention** (commercial tree plantations, cash crops, roads & river valley projects, migration, urbanization, mass tourism etc.)
- **Over-exploitation**
- **Diminishing livelihoods from natural resources**
- **Weakening capacity on sustainable resource-use**
- **Poor assessment of ecosystem services**
- **Climate change impedes ecosystem functionality**

NATURAL RESOURCE GOVERNANCE – CHALLENGES (CONTD...)

- Rapid land-use changes
- Resource planning continues to be sectoral
- Sectors pursuing competing and contradictory objectives
- Production imperatives overriding conservation considerations
- Unfavourable practices in production sectors

FUTURE OF BIODIVERSITY GOVERNANCE IN KERALA

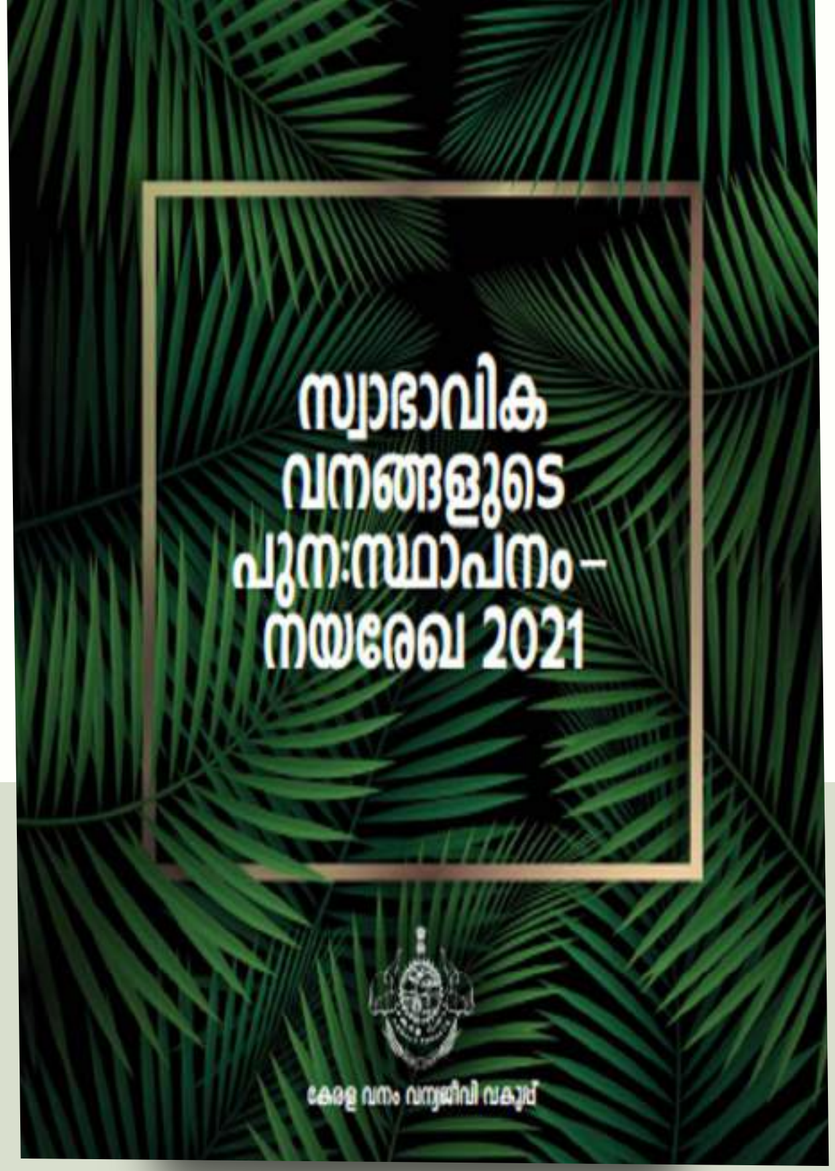
- Heavily human-modified landscape
- Leaning on various governance models of natural resources
- Compatibility of these governance models with contemporary challenges.
- Forestry practices were built on ‘Bio-mathematical and People-exclusive Framework’.
- The need is to transform Forestry to ‘Ecological, socio-economic & people-inclusive framework’ with multi-sectoral collaboration.
- For this, an integrated Landscape level approach is needed.

RADICALLY CHANGING LANDSCAPES

- Ecological changes
- Demography changes
- Political changes
- Cultural changes
- Socio-economic changes

VISION STATEMENT

To build a biodiversity-rich, water-secure and climate-resilient Kerala where natural forests thrive, human–wildlife conflict is minimized, and communities progress sustainably in harmony with nature.



1 ECORESTORATION & FOREST PROTECTION

Focusing on

- Ecosystem services
- Fire resilience
- Sustainable productivity
- Boundary Integrity
- Control of IAS
- Modernized marketing

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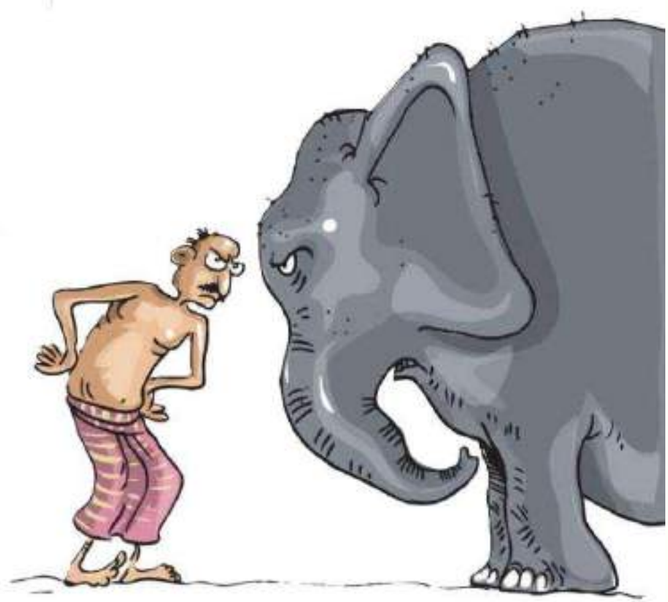
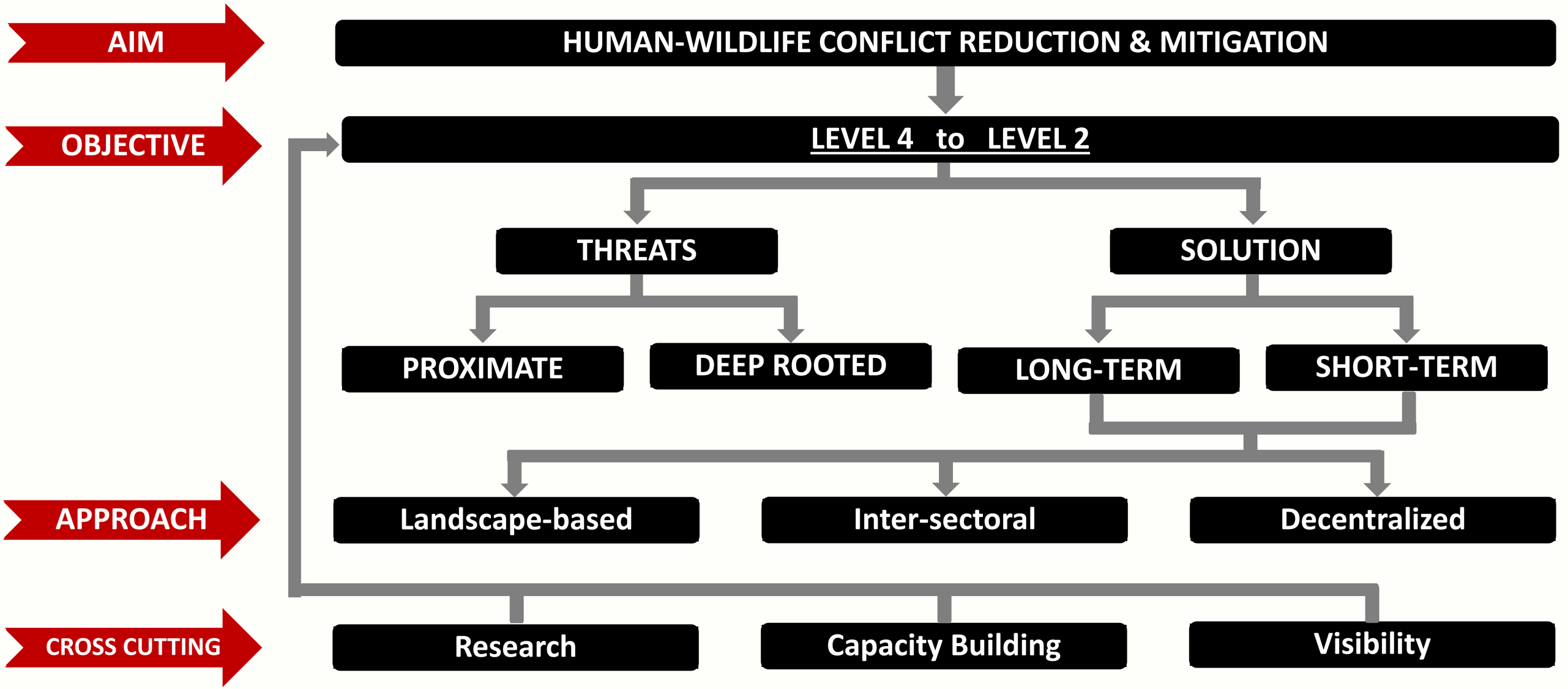
2 WILDLIFE CONSERVATION & MITIGATION OF HUMAN-WILDLIFE CONFLICT

Focusing on

- Zero Fatality Goal
- Inclusive approach
- Landscape connectivity
- Interdepartmental Synergy




AIM
HUMAN-WILDLIFE CONFLICT REDUCTION & MITIGATION
OBJECTIVE
LEVEL 4 to LEVEL 2
THREATS
SOLUTION
PROXIMATE
DEEP ROOTED
LONG-TERM
SHORT-TERM
APPROACH
Landscape-based
Inter-sectoral
Decentralized
CROSS CUTTING
Research
Capacity Building
Visibility

DECENTRALISED RESOURCE MOBILISATION

The Section 44 of the Biological Diversity Act, 2002 provides for this as below:

"41.(1)Every local body shall constitute a Biodiversity Management Committee within its area for the purpose of promoting conservation, sustainable use and documentation of biological diversity including preservation of habitats, conservation of land races, folk varieties and cultivars, domesticated stocks and breeds of animals and micro organisms and chronicling of knowlwdge relating to biological diversity.

.....

41.(3) The Biodiversity Management Committees may levy charges by way of collection fees from any person for accessing or collecting any biological resource for commercial purposes from areas falling within its territorial jurisdiction."

3 PFM & UPLIFTMENT OF FOREST-DEPENDENT COMMUNITIES

Focusing on

- Livelihood Diversification
- Economic Empowerment

4 SOCIAL FORESTRY & IT'S POTENTIAL

Focusing on

- Green Urbanism
- Enhanced Tree Cover
- Integrated Urban Planning

5

ECOTOURISM: A SUSTAINABLE APPROACH

Focusing on

- Responsible Tourism
- Experiential Diversification
- Strategic Partnerships

6 MODERNIZATION & EFFICIENT PUBLIC SERVICE

Focusing on

- Digital Twin - Geospatial
- Next Gen Surveillance
- Digital Transparency

7

INFRASTRUCTURE & HUMAN RESOURCE DEVELOPMENT

Focusing on

- Advanced Forensics
- Strategic Workforce optimization
- Leadership excellence

8

CLIMATE CHANGE & FUTURE OF FORESTS & WILDLIFE CONSERVATION

Focusing on

- Resilient Forestry practices
- Carbon Asset Management
- Green Economy Framework

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THANK YOU