

GROUP IV

ENHANCING RESILIENCE OF FORESTS TO CLIMATE CHANGE

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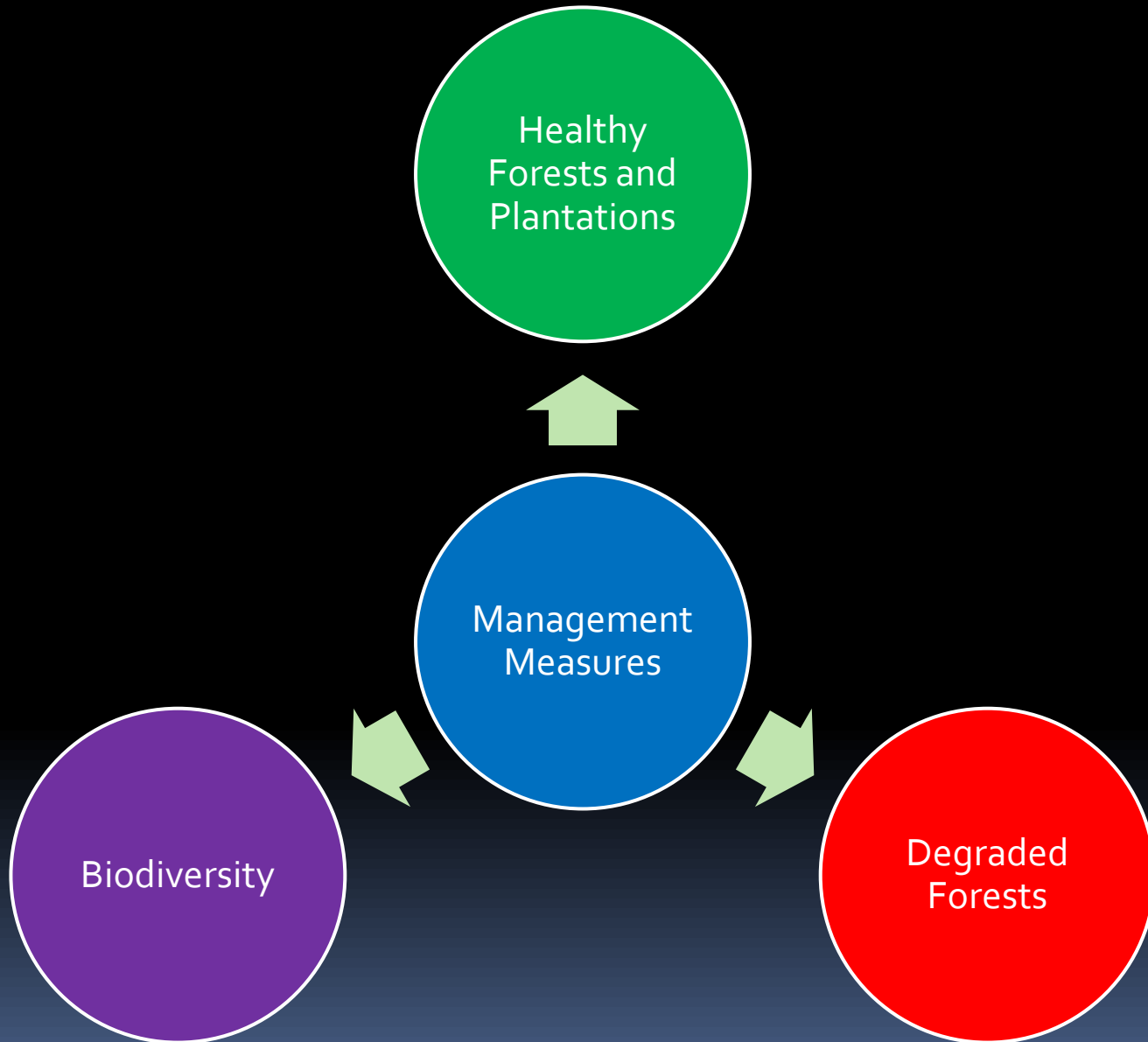
Ruthren

Resilience

- Ability to cope up with stress
- Ability to adapt to the stress
- Ability to recover from effects of stress

Strategy – Sustainable Forest Management

- SFM enhances resilience of forest to climate change by Maintaining and enhancing the environmental , economical and social resources of forest



Biodiversity

Management
Measures

Healthy
Forests and
Plantations

Degraded
Forests

Measures in Healthy forest & plantations

Tackling decreased productivity

- Healthy forests

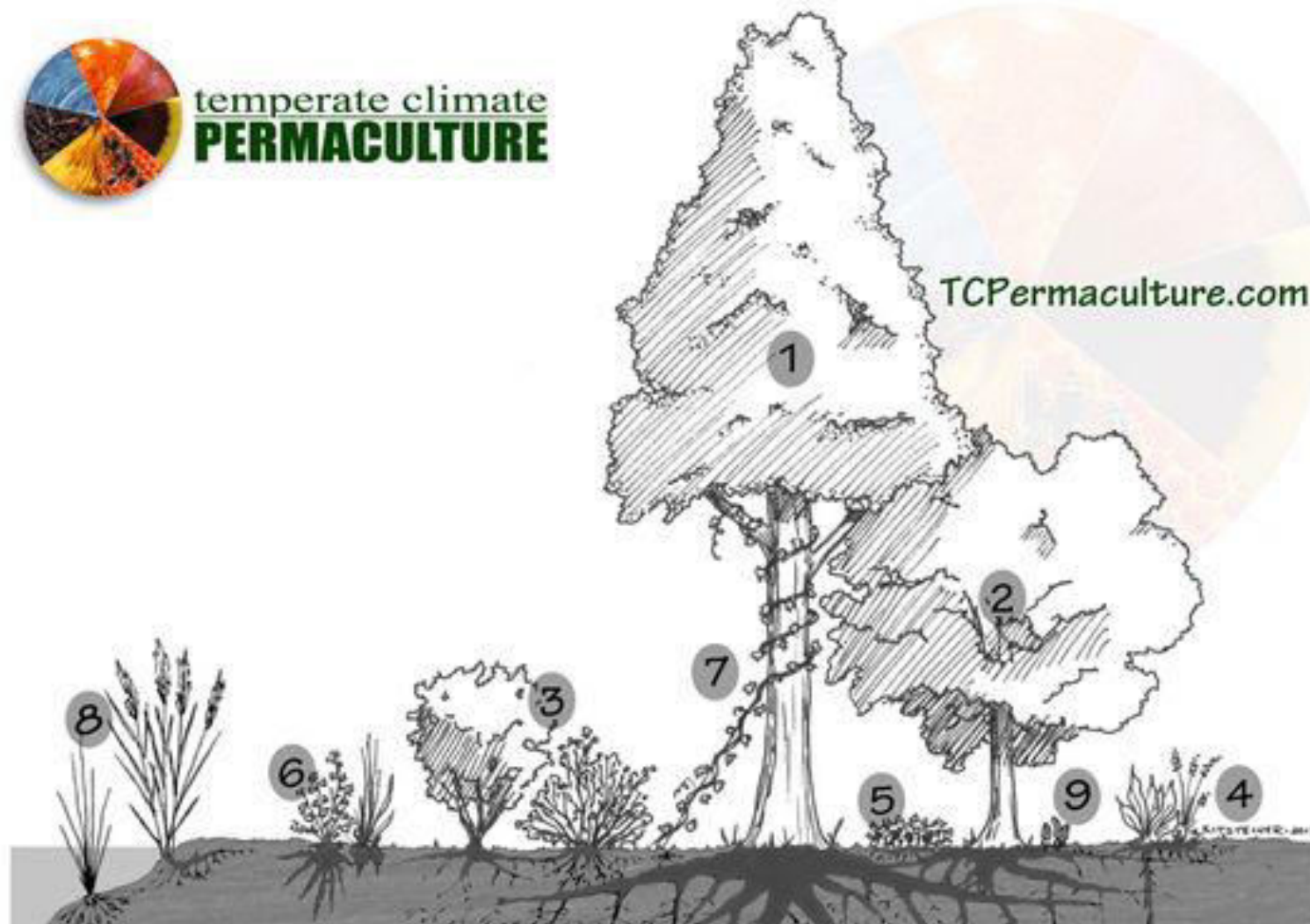
- Following suitable silvicultural practices
- Planting in open spaces
- Eradication of pests , diseases , weeds , invasive species

- Plantations

- Opting for short rotation crops
- Following layered crops than monoculture (permaculture)



temperate climate
PERMACULTURE




Nine Layers of the Edible Forest Garden

1. Canopy/Tall Tree Layer
2. Sub-Canopy/Large Shrub Layer
3. Shrub Layer
4. Herbaceous Layer
5. Groundcover/Creeper Layer
6. Underground Layer
7. Vertical/Climber Layer
8. Aquatic/Wetland Layer
9. Mycelial/Fungal Layer



Tackling Drought

- Healthy forests
 - Building water conserving structures (check dams & storage tanks)
 - Plantation
 - Using drought resistant varieties
 - Increasing drought hardiness of seedlings in the nursery
 - Effective water utilization
 - Mounds & depressions
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Tackling sea level rise - Mangroves

- Acts as buffer b/w land and sea and protects land from sea level rise
- captures Co₂ 100 times faster
- Protection of already existing mangrove forests
- Plantation of mangroves across 7500 km long India's coastline

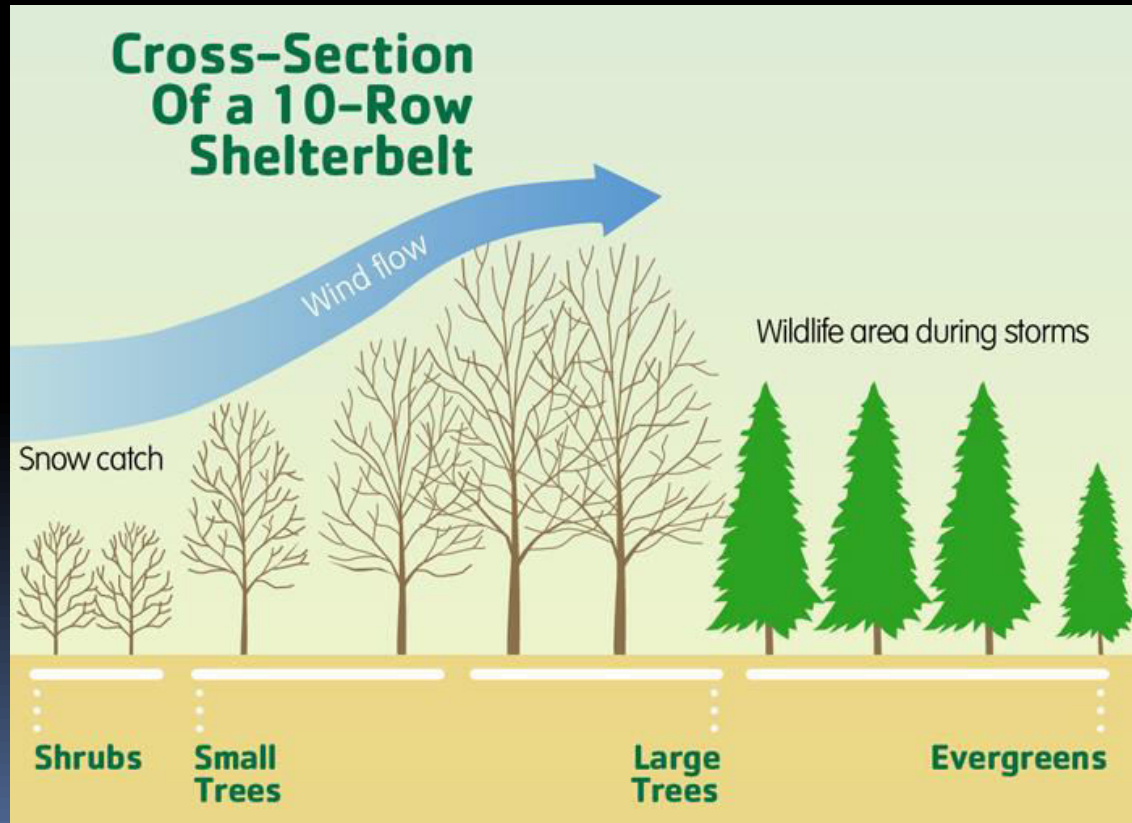
Tackling soil erosion

- Healthy forests
 - Slope stabilization using brushwood
 - Gabion structures
- Plantations
 - Close spacing of trees



TACKLING WIND EROSION

- Healthy forests
 - Effects of wind erosion will be less
- Plantation
 - Close spacing
 - Shelter belts
 - wind breaks




Climate change and pest/disease

Climate change, particularly extreme weather events, can affect forest pests and the damage they cause by:

1. directly impacting their development, survival, reproduction and spread,
eg. Warmer temperatures have resulted in range expansions of pests such as pine and oak processionary caterpillars
2. altering host defences and susceptibility;
3. indirectly impacting ecological relationships such as changing the abundance of competitors, parasites and predators.

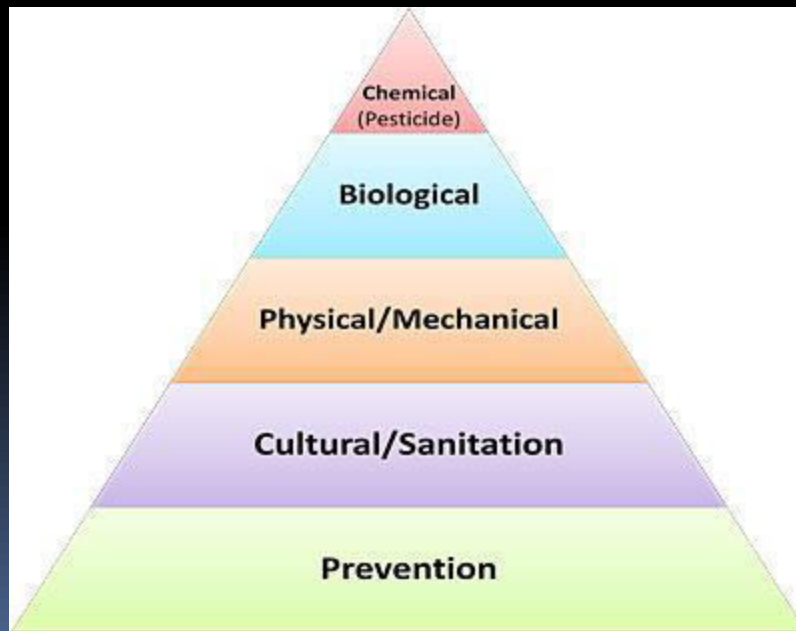


Managing Pests & Diseases for Healthy Forests

1. Early detection : Network of trained volunteers appointed by forest dept (ex : Britain)
 2. Silvicultural methods – ex: Hoplo attack in Sal
 - Regulate timing of felling (winter-no pests)
 - removal of logging debris
 - monitoring to detect infested trees
 - trap tree method
 3. Data collection & research on new diseases and pests
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Managing Pests & Diseases for Plantations

- Using pest and disease resistant varieties
- Using Bio-insecticides and Bio-pesticides
- Integrated Pest Management




Release of predators of pests

Physical barriers to control pests

Quarantine measures , planting certified seed, cleaning field equipment



Dealing with Shortage of resources for people


- Agro forestry
 - Social forestry
 - community reserves
 - Conservation reserves
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Restoring degraded forests

- Re-establishing ecosystem functions- a major strategy for increasing resilience.
- Sustainable management of degraded forest
 - Passive restoration – protecting the site & allowing natural succession
 - Enrichment planting – introducing key species & enhancing plant density
 - Plantations after mining in mining areas
- Integrated Landscape Approach towards sustainable management of Forest
 - increase the quality and diversity of land resources
 - provide additional socio-economic and environmental benefits in large territorial units
 - improved resilience

Restoring degraded forests...

- Managing Root-Cause of Forest Degradation
 - Regulate Grazing
 - Fuel Wood Efficiency
 - Improved chullahs
 - Fuel-wood substitution (biogas, rice husk)
 - Alternate Energy Sources- Solar, Wind
 - New wood use technologies- Particle boards, Engineered woods, Bamboo
 - Enhancing life of wood products
 - Recycling Paper



Management measures for Biodiversity

For biodiversity conservation to be effective in the long-term, it is critical that practices address new climatic conditions and that efforts to reduce non-climatic stresses continue.

- Encouraging a move away from static targets for biodiversity conservation
- Ensuring climate change adaptation activities are integrated across as many sectors/ministries as possible, whilst avoiding conflicting targets
- Incorporating climate change predictions and vulnerability assessments into national and local Protected Area policy and land-use management policies

To reduce the negative impact of climate change on biodiversity we recommend:

- Creating natural resource policies that address the interconnected impacts of climate change across separate ministries such as forestry, water, fisheries.
- Incorporating adaptation into National Biodiversity Strategies and Action Plans (NBSAPs), to ensure that vulnerable ecosystems are addressed in National Adaptation Programmes of Action (NAPAs) and National Adaptation Plans (NAPs) and that these plans are integrated into other policies
- Ensuring that any impacts are understood in terms of ecosystem services losses so that they can be incorporated into National Poverty Reduction Strategies