Introductory Example:

1. The image is of a critically endangered plant called ilex khasiana, having medicinal properties against parasitic diseases. It is endemic to Khasi Hills, Meghalaya, and Aizwal, Mizoram. <An Endangered Medicinal Plant, Ilex khasiana Exhibits Potent Antiparasitic Activity Against Intestinal Tapeworm | Pharmacognosy Journal (phcogj.com)>
2. As one of the threatened species and endemic, its viable growth is naturally slowed due to prolonged dormancy of seedlings to germinate, or due to undeveloped embroys.
3. This requires human intervention to artificially promote germiplasm micropropagation via nodules, shoot and even callus induction <(PDF) Micropropagation of Ilex khasiana, a critically endangered and endemic holly of Northeast India (researchgate.net)>

The vision is laid by the United Nations Environment Programme 2021

Principles:

1. Global Contribution : Ecosystem Restoration contributes to SDG goals to end poverty, conserve biodiversity , combat climate change and improve livelihoods for everyone.
2. Broad Engagement : Inclusive participation by all members that agrees on a transparent governance with impartial conflict resolution to identify food security, livelihood, rights, needs and concerns, fair and equitable distribution of benefits etc.
3. Restorative Activities : reduction of negative environmental & societal impacts; employ remediation of pollutants; rehabilitation of degraded sites; recover undegraded areas susceptible to environmental change
4. Benefits : restorative projects checks climate-check mitigation; human health; biodiversity; ecosystem health; ecosystem goods and services balance
5. Degradation Identification: Both direct and indirect sources of degradation are identified such that sustainable practices can help and contribute to reduction of environmental impact
6. Knowledge sharing & gap identification : to incorporate indigenous, local, traditional and scientific approach in restorative works, and facilitate information sharing

<adapted from **PRINCIPLES FOR ECOSYSTEM RESTORATION** TO GUIDE THE UNITED NATIONS DECADE 2021–2030>

Initiatives taken by Indian Institute of Bio-Social Research and Development <Current Research Projects - Indian Institute of Bio - Social Research And Development (ibradindia.org)>

A. Livelihood & Women Empowerment- The image shows women empowerment (protagonist is Kalaboti from Dhulkidonga, Jhargram of WB who depended on mono-cropped rainfed farming of Mahua (usage: edible flowers and oil seeds) for livelihood. Climate change and soil deterioration affected farming. Trained on vermicomposting, the vermipits initiative driven by local women is helping to sustain such challenges.
B. Protection of Native Seeds - Community seed bank by Baiga tribal community of Ghogra and Burbhspani of Kabirdham Chhattisgarh. The seed banks are of rare indigenous grains native to the region which provides food security beside improvement of soil health and showing resilience to climate change and pest attack.
C. Groundwater Recharge & Multipurpose use of stream water through community participation – Installation of check dams by use of boulders to impede rapid flow of water. It also allows water storage and diverts it to the irrigation fields. The pool of water shared by 5 tribal families is also used as fish pond. Moreover, it allows groundwater recharge during the wet season instead of dissipation as runoff. (Baiga

tribe of Bhurbhuspani)

SIDHI AS A CASE STUDY

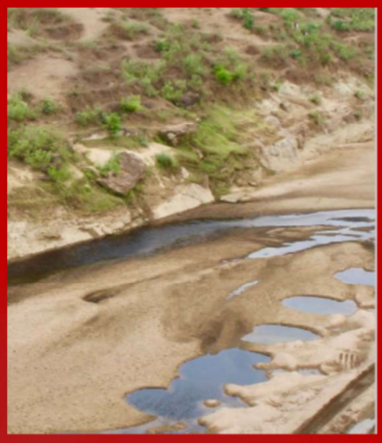
PROBLEMS

- Decrease in forest cover
- Land Degradation
- Rising Temperature
- Desertification

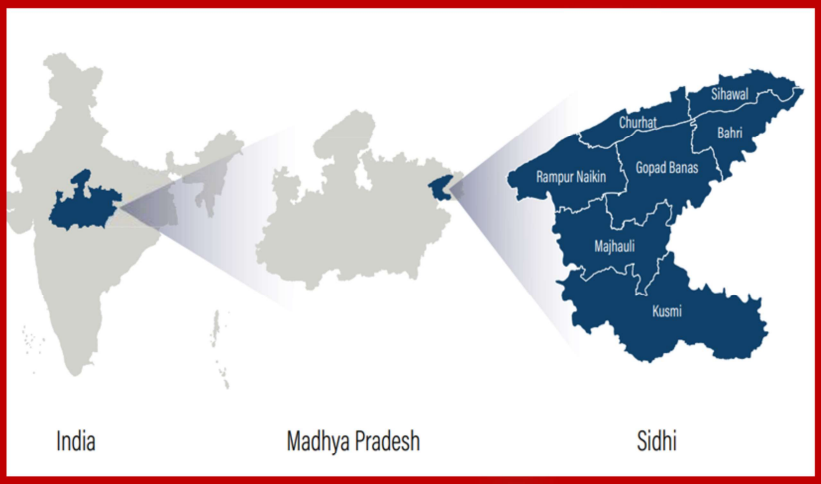
INDIA's CHALLENGE

The Government of India has committed to a landscape approach to restoration under various international initiatives. Under the Bonn Challenge, India aims to restore 21 million hectares by 2030 (Bonn Challenge 2017); India's nationally determined contribution to the 2015 Paris Climate Agreement commits to achieving an additional cumulative carbon sink of 2.5–3 gigatonnes of carbon dioxide equivalent ($GtCO_2e$) by 2030 (UNFCCC 2015). India has also set national targets to help meet the UN Sustainable Development Goals, and its National Mission for Green India aims to restore forests and enhance tree cover over 10 million hectares.

<Landscape Restoration in Sidhi and the Way Forward | WRI INDIA (wri-india.org)>
<Equitable land restoration in rural India means listening to every level of the community - Global Center on Adaptation (gca.org)>



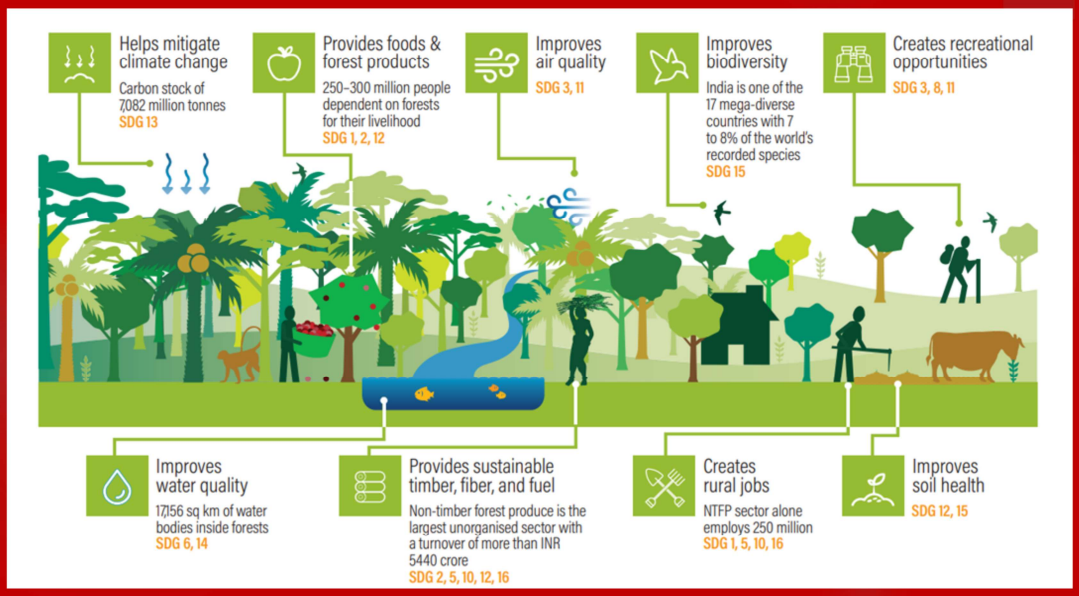
SIDHI AS A CASE STUDY



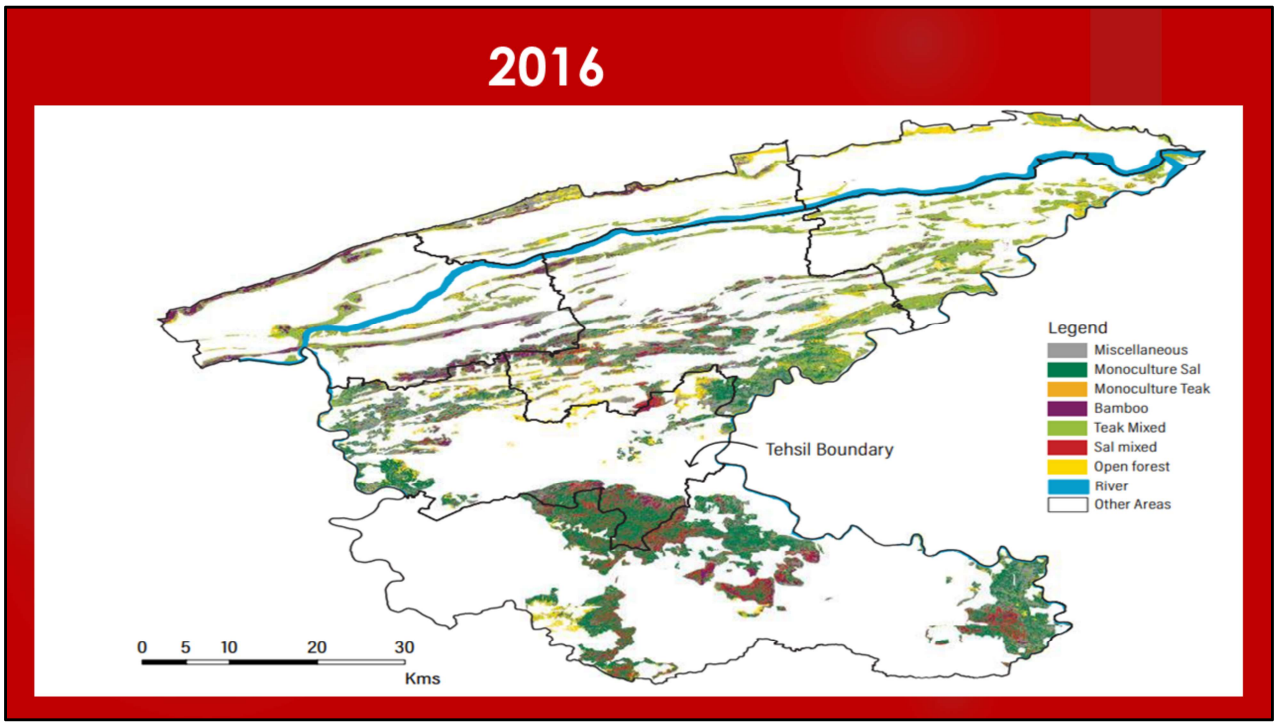
About Sidhi district of Madhya Pradesh :

1. Rich in natural resource, with large forest cover and three important rivers, namely – Gopad, Banas, and Son
2. It also has three protected areas – Son Ghariyal Sanctuary, Sanjay Dubri Tiger Reserve, and part of Bagdara Wildlife Sanctuary
3. 43% is agricultural land and major source of livelihood

LANDSCAPE RESTORATION,SIDHI, OBJECTIVES

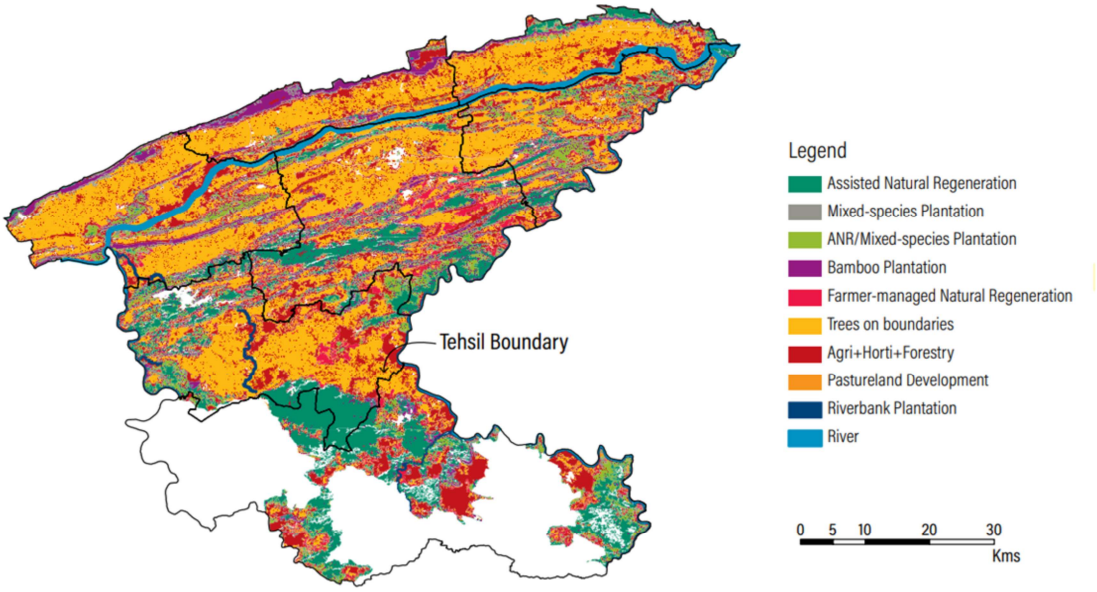


The landscape restoration project aims to protect both environment and livelihood, Summarizes land-use challenges to ecosystem services through restorative initiatives.
Opportunities:
Restoring 75% of the District's land could create 3.75 million paid working days for local people and almost $19 million of extra income.
Planting and growing 40 million trees could sequester more than 7 million metric tons of carbon in forest areas alone, over 10-20 years.
Building 3,000 restoration microenterprises that sell high-value tree crops like bamboo, jackfruit and moringa, could create 30,000 jobs.
A healthy landscape can fulfil critical local demands by providing food, fuelwood, fodder and non-timber forest produce for dependent communities, controlling soil erosion and conserving biodiversity.
People from traditionally marginalized groups, including women, unemployed youth, and landless people, stand to benefit.
< adapted from **Restoring Landscapes in India for Climate and Communities** by Ruchika Singh, Karishma Shelar, Rohini Chaturvedi, Marie Duraisami and Rajendra Singh Gautam - December 2020>



Land Deterioration of Sidhi

LANDSCAPE RESTORATION POTENTIAL EXPECTED



Success ongoing: Local communities together with the forest department have already restored 2400 ha (or 5930acres) of bamboo forests. <[Equitable land restoration in rural India means listening to every level of the community - Global Center on Adaptation (gca.org)]>