Weeds to Wealth

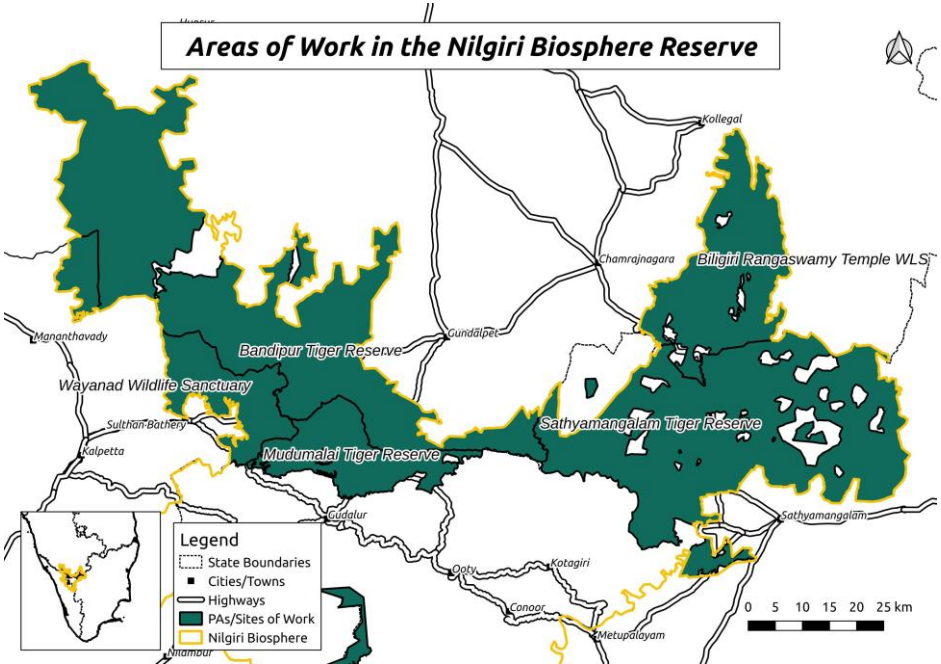
Creating a Circular Economy around Lantana – for Indigenous Livelihoods and Forest Restoration

The Shola Trust

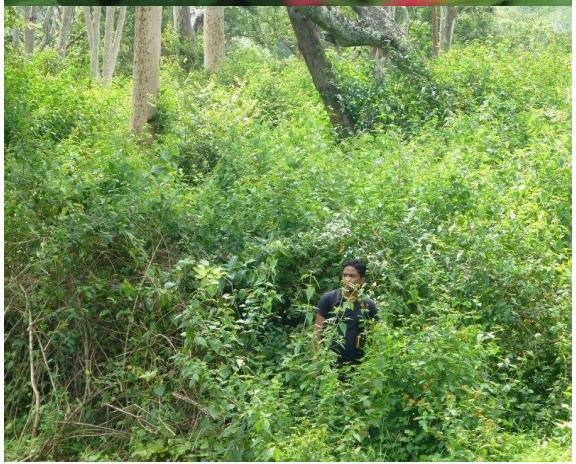
ABOUT THE ORGANIZATION

The Shola Trust (2008), a non-profit based in Nilgiris, working across Tamil Nadu, Kerala and Karnataka on community-led invasive species management, Human-Elephant Coexistence, and restoration of Sholas (mountane forests and grasslands).

Working in Collaboration with The Real Elephant Collective (a social enterprise), various state governments, and a wide range of partner organizations.



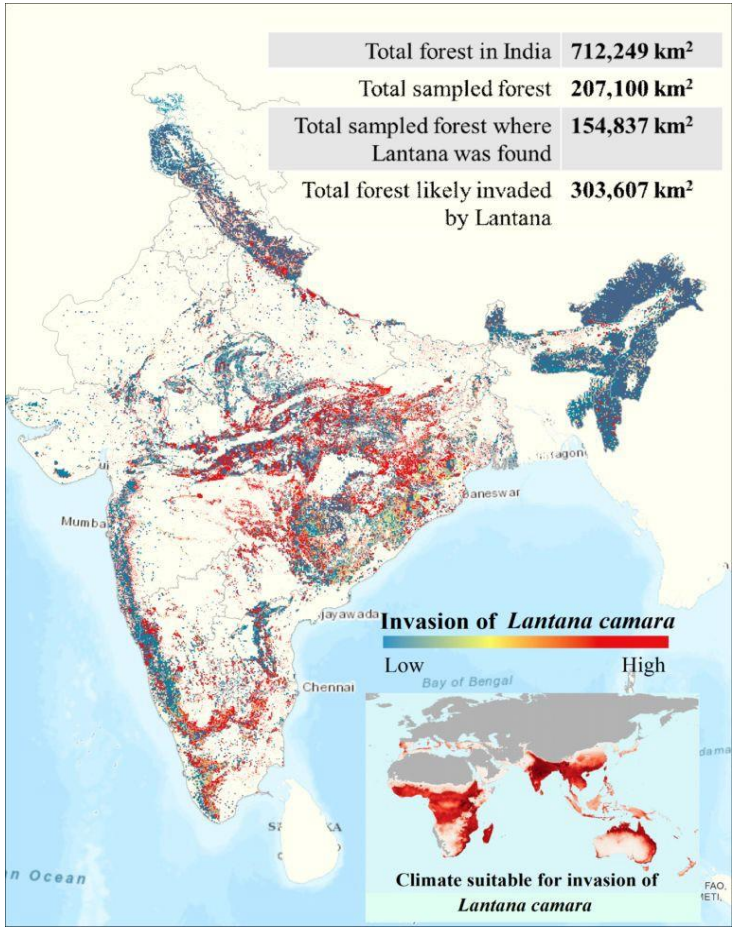
THE PROBLEM – (A) Understanding the Lantana Threat



- Lantana camara is one of the top three problematic invasive species in the world as the 2023 IPBES Report on Invasive species
- It contains the toxins Lantanadene A and B in the leaves, making it inedible for all herbivores, It has allelopathic properties – the plant puts out chemicals that inhibit the growth of other plants, so only lantana takes over entire forests (Achhireddy & Singh 1984)
- so significant biodiversity reduction occurs in forests (Sharma et al. 1981) and **increasing human-wildlife conflict as animals are pushed outside forests**.
- If cut, it coppices vigorously, putting out multiple new shoots that grow back faster/stronger, so has to be removed with roots (Sharma et al. 2005).
- Soil disturbance has to be minimal, as a vibrate seed-bank remains viable under the soil and will germinate if disturbed. Also propagates well vegetatively from pieces of the plant left on ground (Parsons & Cuthbertson 2001, Swarbrick et al. 1998).
- The first eradication plan for India was in 1916, in the forests of Coorg (Karnataka) and Benna (Mudumalai/TN) (Tiremen 1916), and all efforts since then have failed, both in India and around world (Bhagwat et al. 2012).

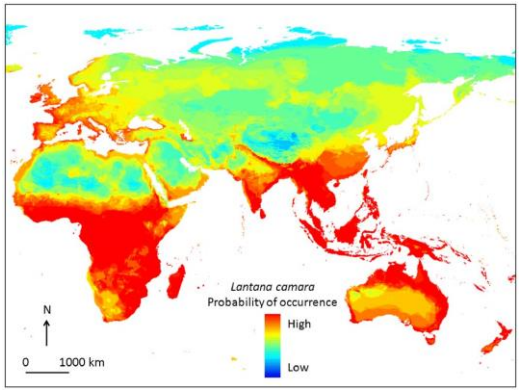
Innovation and shifting of gears is vital to tackle the 200 year old problem.

THE PROBLEM – (B) The Scale of Lantana

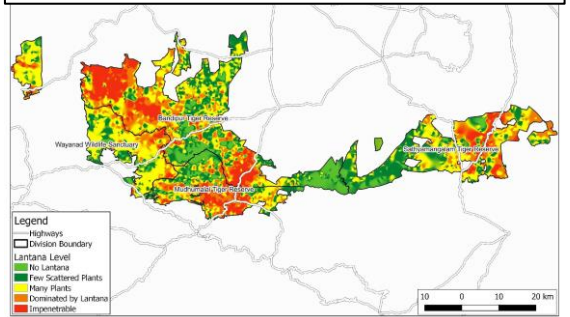


- In forest areas at the National scale, total Lantana infestation is over 3L sqkm, viz. 40% of India's forests, more than 4 times the combined area of all Tiger Reserves combined.
- In the Nilgiri Biosphere Reserve (NBR) at the core of the Western Ghats, the area of dense infestation is around 2000 sqkm.
- Govt. sanctioned costs of removal are 1L/ha (1Cr/sqkm) for dense Lantana, and about 50-60K/ha (55L/sqkm) for Moderate Lantana. This is 2000 crores for the NBR, or 160,000 Cr for the whole country.
- In each park, c. 50-100 ha are removed each year, while the scale of the problem is c. 20K-50K ha, taking min 200 years to clear. No systematic restoration is being done to ensure Lantana does not come back.
- (Sources: Bhagwat et al. 2012, Mungi et al. 2020)

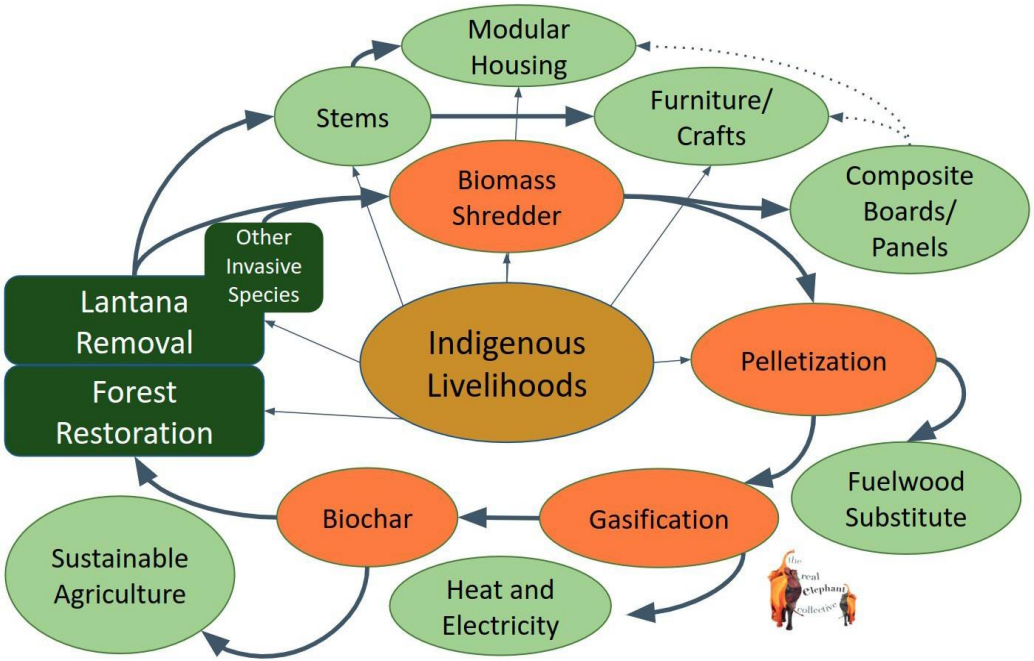
Traditional manual removal mechanism is not feasible/scalable and new removal methods and funding models have to be developed.



Lantana in Mudumalai, Bandipur, Wayanad and Sathyamangalam



SOLUTION: Circular green economy that improves elephant habitat



Community led Conservation

Livelihood Opportunities

Grasslands Restoration

- This opportunity blends Removal , Restoration, Habitat Improvement and creating Livelihoods into a meaningful circular economy generation.
- Ability to use *Lantana camara* in its natural form to make furniture and other high end art products and also in pulverised and powdered form for various applications like Pellets, Boards etc.
- Biochar is a promising product from this to sequester carbon completing this cycle

An economic model is the only feasible solution to scalable lantana removal and restoration.

The Lantana Elephants

4 Cr income for PVTGs, global attention to problem, space for policy shift

Innovation around large scale mechanised removal

Specialized machines for lantana removal ensuring minimal ecological and maximum removal efficiency.

Mini-excavator or tractor-based winch for uprooting lantana depending of labour availability

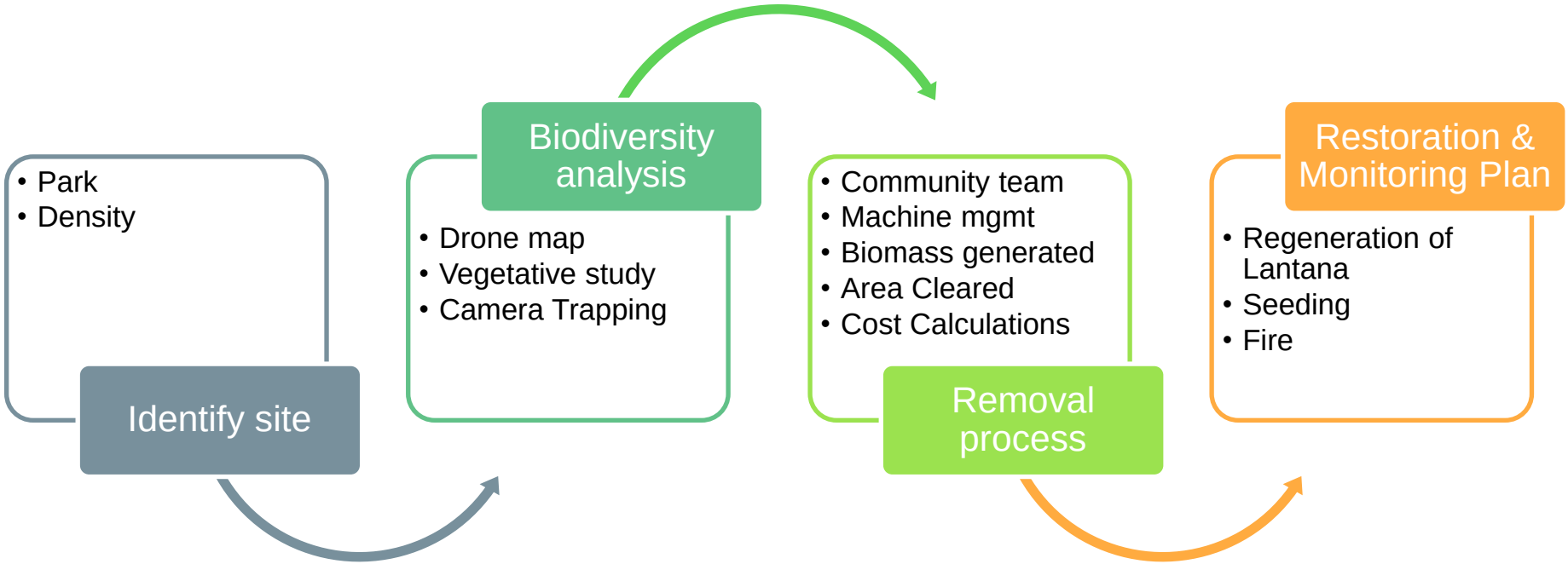
Tractor or pickup based shredder based on terrain.

Process video - https://youtu.be/TwIW3fD3VIw

Mechanised lantana removal is vital, but has to be with ecologically appropriate designs, not causing damage but maximizing restoration potential.

The Challenge

Lantana Extraction Process Map



- Order Assessment
- Drawing
- Flex
- Allocation

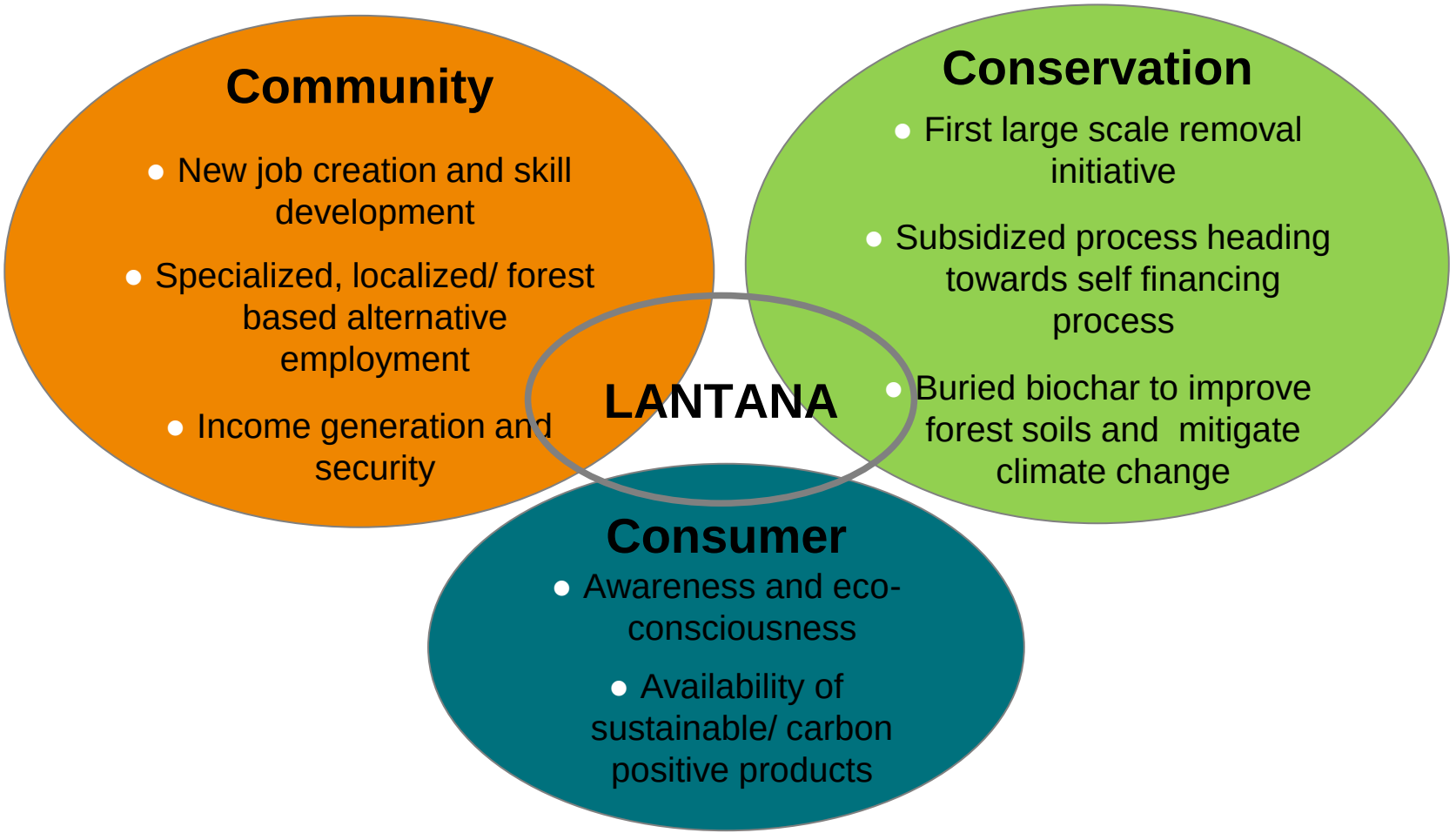
- Bending
- Welding
- Quality Control

Making of the Lantana Elephants

- Approval
- Storage

- Stick procurement & selection
- Stick processing
- Cladding
- Painting
- Detailing

THE 3C IMPACT



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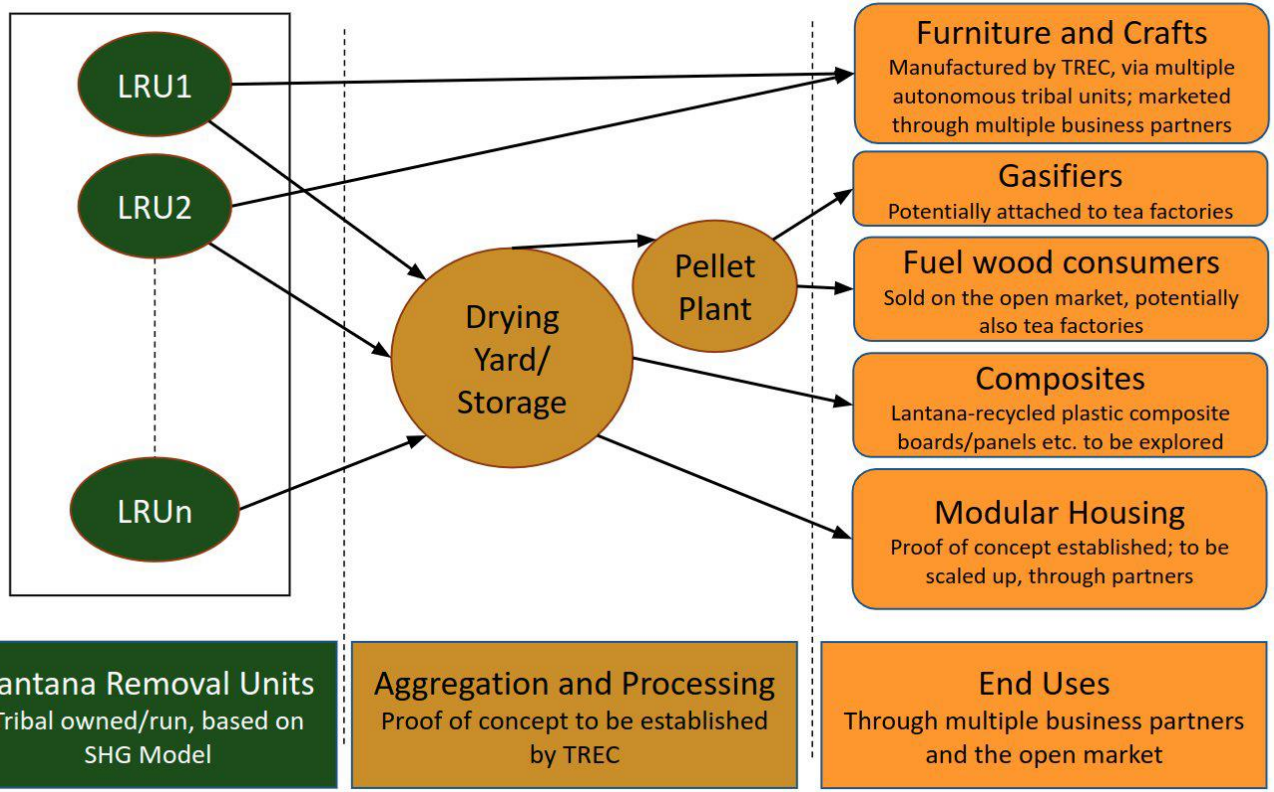
For more information contact:

subhash@thesholatrust.org

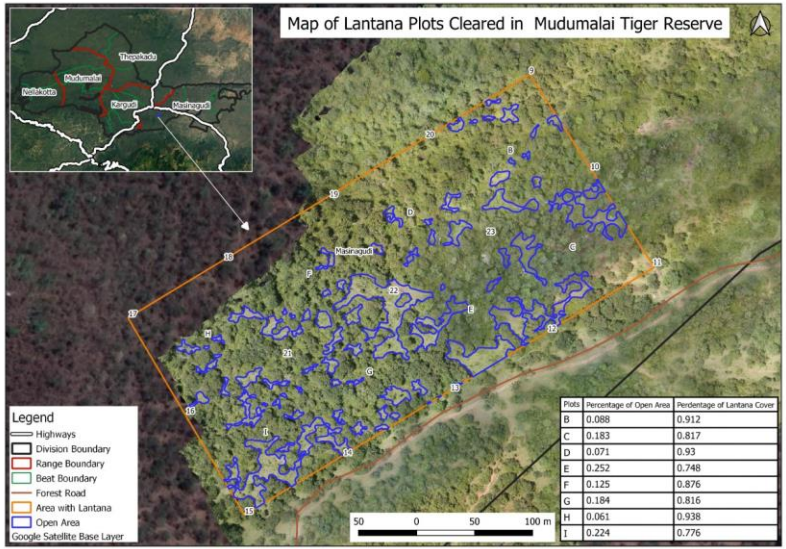
www.thesholatrust.org

Logistical and Institutional Structure for a Lantana Economy

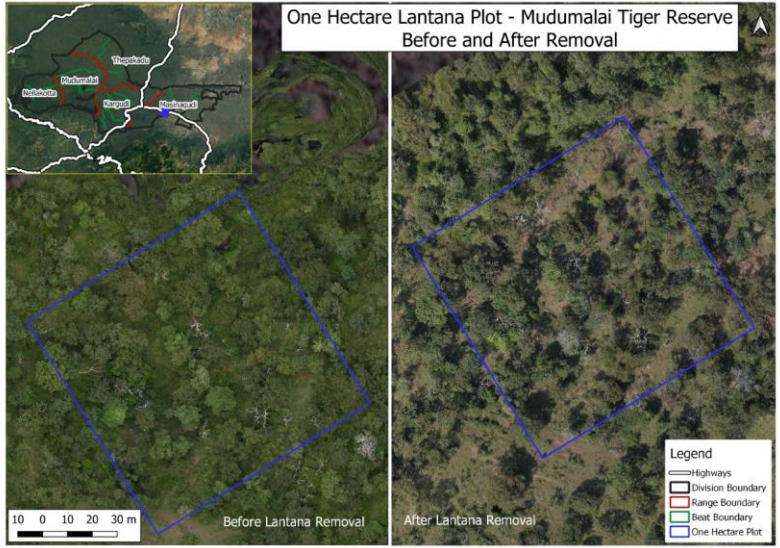


Transportation

MONITORING: Lantana removal and grassland restoration



Plots	Percentage of Open Area	Perdentage of Lantana Cover
B	0.088	0.912
C	0.183	0.817
D	0.071	0.93
E	0.252	0.748
F	0.125	0.876
G	0.184	0.816
H	0.061	0.938
I	0.224	0.776



- Accurate quantification of Lantana infestation for cost estimates
- Drone orthomosaics before and after to ensure no damage to trees and verifiable areas cleared
- Grassland restoration to create fodder for wildlife
- Working towards AI based annual regeneration monitoring.

Drone and AI based Monitoring and Evaluation safeguards are vital before allowing for large scale Lantana removal and restoration