

Nurture With Nature

Restore the Ecosystems - Life Support Systems

Ecologically Sound Sustainable Green Development

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Dr. Leena Gupta
Executive Director
HABITAT

Contact: +91 8200228267
Email: leenapanchi@gmail.com

Potential area for Eco development

- ✓ **Degraded Forest lands – Mountain ridges, Plains, Valleys, etc.**
- ✓ **Pasture lands (on records)**
- ✓ **Panchayat lands**
- ✓ **Common resources – River banks, Sea Shores, Hillocks, etc.**
- ✓ **Revenue Wastelands**
- ✓ **Uncultivable Wastelands**
- ✓ **Fallow lands**
- ✓ **Lands of Gaushala, Panjarapole, Charitable trusts, etc.**
- ✓ **Private land**

Field Experiences:

Eco development projects/studies done/ going on:

- Chhota Udepur Fenai Rewakhand region
- Kachchh region
- Kalpavalli, Anantpur, Andhra Pradesh
- Singhadiya, Ajmer, Rajasthan
- Aravallis of Sourthern Rajasthan, Aravallis of North Gujarat, Corridors
- Wastelands of Gujarat (Food & Fodder Security)
- Mangrove areas (Coastal region Pastures)

Phase II- Eco development project:

- Himalayan Ecosystem restoration & Biodiversity Conservation –
Uttarakhand, Himachal Pradesh, Jammu & Kashmir

Agro-Forestry & Silvi-Pasture Approach

- Indigenous Floral species only (including genetic diversity)
- Multi-storey forest cover with Grass land
- Multi species – habitat diversity approach
- Round the year availability of fodder for animals
- Rich species association for Soil health enhancement, Increase Soil microbes, to arrest Soil erosion
- Security of root stocks and seed bank of the region
- Plantations to enhance Food web & Food chains of ecosystem
- Watershed development, Catchment area treatment
- Soil-Water-Moisture conservation works
- No use of heavy tools & machineries to save the environs
- Use of local tools & technologies (Traditional systems)
- Social & Ecological fencing to save regenerations and ground cover
- Ecorestoration, Development & Management Through Community participation (bylaws, rules, responsibilities, resource use, Co-grazing,...)

Ecosystem condition Indicators...

- **Indigenous vegetation cover (current, changes)**
- **Floral diversity-species composition (inc. history)**
- **Plant residue-leaf litters, dead woods, dry residue**
- **Status of Food web & Food chains**
- **Health of existing ecosystem**
- **Habitat diversity**
- **Status of Legume species**
- **Existing root stocks & seed stock**

Continue...

Ecosystem condition Indicators...

- **Soil density**
- **Soil microbes**
- **Status of Natural soil binders & engineers
(Earthworms, beetles, etc.)**
- **Soil fertility, Soil organic matters**
- **Soil pH**
- **Tolerance of ecological & climatic changes**
- **Different kinds of uses of the land resource**

Species selection for different kinds of Soil conditions

- **Shallow soils**
- **Sand dunes, Sandy soils**
- **Ravines & riverbanks**
- **Marshy & Waterlogged area**
- **Saline soils**
- **Alkaline soils**
- **Dry clay soils**
- **Drought affected arable fields**

Selection criteria of Floral species

- **Indigenous floral species**
- **Easily enhance health of local food web & food chains**
- **Adaptability to local ecological & climatic conditions**
- **Fast growing**
- **Short gestation period**
- **Coppicing ability**
- **Multiple uses**
- **Ability to improve soil health & fix atmospheric Nitrogen**
- **Easy management, conservation & protection**

Ecorestoration activities

- Reconnaissance survey (Status survey, indicators inventory, potential of existing natural elements- indigenous vegetation, root stocks, Plus tree traits, etc.)
- Tree plantation @ border (every 5 meter) & inside area (8 in 1 acre)
- Shrubs/Under shrubs @ border (every 3 meter) & inside area (15 in 1 acre)
- Climbers with trees, shrubs
- Herbs other than Grass species
- Water body deepening, desiltation
- Pits & Trenches digging
- Nursery development, use of well grown seedlings
- Use of Organic manure
- Supplementary irrigation (drip, pot/tin)
- Fire prevention & control- creation of Fire breaks
- Community involvement

Expected outcomes

- **Food – Vegetables, fruits, nuts, Honey, Gum**
- **Medicinal values- Raw material, direct household use, market**
- **Oil seeds -non edible/ edible oil, animal feed, manure, pest-disease control**
- **Fodder – Green fodder, Hay, Leaf meal, Feed concentrate**
- **Fuel – dry woods, charcoal**
- **Honey, Gum, resin, Wax, dyes, lac, fibre, soap substitutes, material for local Craft making, Timber (poles, sticks, carpentry materials, soft woods)**
- **Drinking & irrigation water availability**
- **Water recharge**
- **Economy generation – labour works in project, post development-sustainable economy (as mentioned above)**

Contribution of Biodiversity rich Ecosystem

- **Wild edibles (flora & fauna) – Food & Nutrition security**
- **Medicinal plants (>90% from forest areas, better than cultivated one)**
- **NTFPs/ MFPs (>90% from forest areas, significant in local economy)**
- **Fuel (better-comfortable-viable options- many species availability)**
- **Agro-forestry support (soil binders, local seeds, fruits, climbers, etc.)**
- **Water regime balance thr. forest cover (stop desertification, soil erosion)**
- **Pasture system (cover, abundance, grass diversity, ecological shifting)**
- **Agriculture (low input agriculture, quality production)**
- **Fodder (better quality & quantity, diversity, richness)**

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Contribution of Biodiversity rich Ecosystem

- **Oil yielding plants (edible, economic, species conservation)**
- **Dye yielding plants (traditional, economic, species conservation)**
- **Beverage making plants (tradition, economic, medicine value)**
- **Religious & Spiritual uses of species/ Sacred elements (conservation)**
- **Poisonous plants (hunting, fish catching, species conservation)**
- **Natural-Traditional routes and groves (landscape level relation)**
- **Hut construction material (shelter, safety, storage, diversity, durability)**
- **Craft making (tradition/ culture, diversity, economic, species diversity)**
- **Habitat conservation, protection, cultural diversity, Survival supports**

JOURNEY OF KALPAVALLI (ANDHRA PRADESH)

ECORESTORATION OF KALPAVALLI

&

SUSTAINABLE DEVELOPMENT

(Miracle done by Kalpavalli CBO & Timbaktu Collective)

Kalpavalli before 30 YRS



**Initiation – in 1992 with 125 acres at
Mustikovila village, Chennethapalli mandal**



**Gradually other villages joined in, resulting in
a contiguous patch of regenerated waste land**

Natural Regeneration in 7,000 acres of Revenue Waste lands of 8 Villages of 3 Mandals

Mandal	Village	VSC Name	Acres
CKP	Mustikovila	Aadarsha	1000
	SBR palli	Janachaitanya	500
	G.G. Palli	Seva	1000
	B.G.Palli	B.G.Palli	500
RDM	Shapuram	Tellahamsa	1000
	Bheedanapalli	Dondiralla	300
	Kogira	Kokila	1000
	Kambalapalli	Santhi Swaroop	1000
RMG	Ramagiri	Swarnagiri	700
	TOTAL		7,000

Soil & water conservation works



Farm ponds construction



**Stone wall
Protection &
Boundary
demarcation**

COLLECTIVE EFFORTS



FIRE PREVENTION & CONTROL

Creation of Fire breaks



Formation of Fire fighting groups with youth



Seed dibbling & plantation



Construction of Watch Huts



Training of Watchers

Seed Collection and storage



Mass awareness Environment day celebration





Kalpavalli in 20 years

Dense valleys



Green hills



Healthy streams



Wealthy tanks



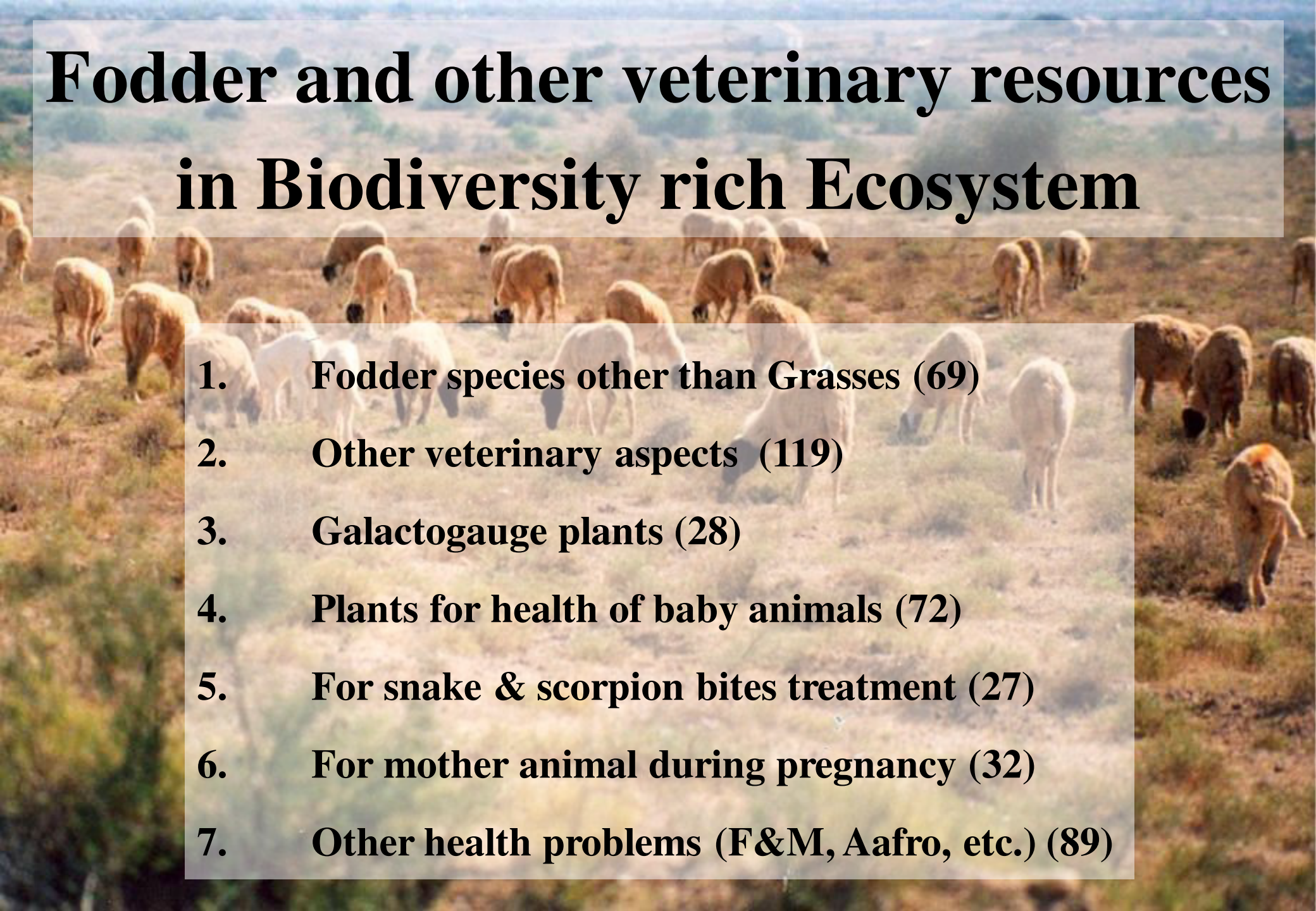
Breezy paddy fields



Pastures lands – Fodder security



Fodder and other veterinary resources in Biodiversity rich Ecosystem

- 
- A large herd of sheep is grazing in a dry, hilly landscape. The sheep are of various breeds, including some with thick, curly wool. The background shows rolling hills under a clear sky.
- 1. Fodder species other than Grasses (69)**
 - 2. Other veterinary aspects (119)**
 - 3. Galactogauge plants (28)**
 - 4. Plants for health of baby animals (72)**
 - 5. For snake & scorpion bites treatment (27)**
 - 6. For mother animal during pregnancy (32)**
 - 7. Other health problems (F&M, Aafro, etc.) (89)**



**Annually about 40,000 sheep & 15000 cattle graze at Kalpavalli.
60 local Shepherds and roughly 30 Shepherds from Rapthadu,
Kanaganapalli, Bandameedapalli also graze their flock in Kalpavalli**

SACRED GROVES



Rich Biodiversity

Floral species: 387*

Faunal species: 143*

Habitat diversity

1. Forest area
2. Pasturelands
3. Dense valley
4. Wetlands
5. Sacred Groves
6. Agriculture fields
7. Windfarm area
8. Goldmine dumps

*** Checklist update going on...**

Wild Flora	Species
Dicotyledons	261
Monocotyledons	71
Pteridophyta	03

WRCP: 4 (under authn.)

Life form	Species
Herb	143
Tree	63
Grass	45
Shrub	37
Under Shrub	10
Sedge	09
Climber	25

Agro diversity: 86 (inc. Var.)

Millet : 19

Rice : 15

Pulses : 16

Vegetables : 18

Spice, condiment: 08

Oil (Groundnut) : 06

Fruits : 04

Family	Species
Grasses (Poaceae)	: 45
Legumes (Fabaceae, Mimosaceae, Caesalpinaceae)	: 61
Asteraceae	: 15
Euphorbiaceae	: 15
Sedges (Cyperaceae)	: 09

Non Chordate Fauna: 46*

Chordate Fauna : 77*

Avifauna (Birds) : 61

Mammals : 11

Herpetofauna : 05

Lepidoptera : 20

Anisoptera : 04

Araneae : 04

Orthoptera : 04

Coleoptera : 03

Hymenoptera : 03

Domestic fauna: 10 species

Cow : 06 breeds

Bullock : 06 breeds

Domestic fowl : 11 breeds

Buffalo : 02 breeds

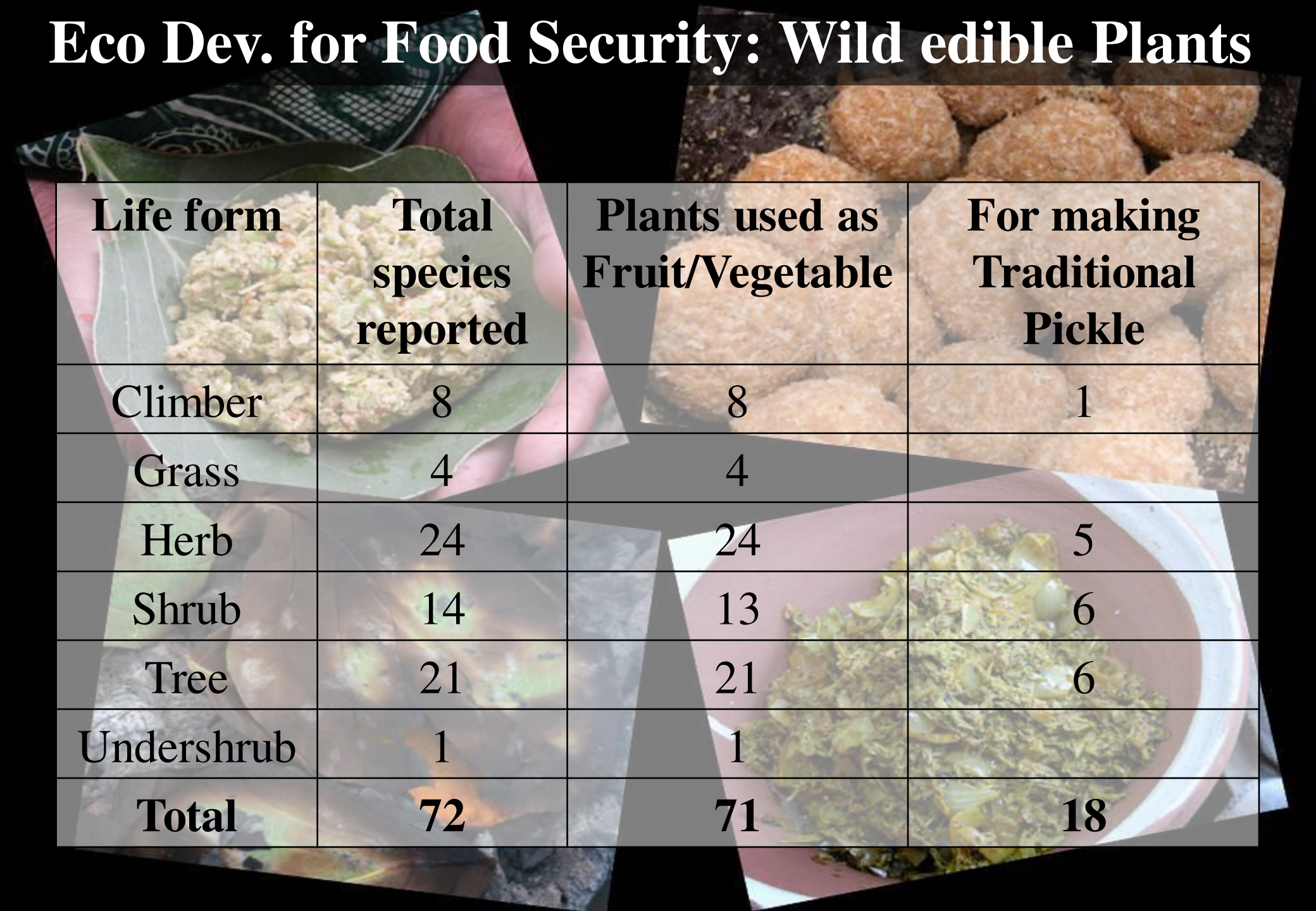
Goat & Sheep : 04 breeds

**Interlinkages with Guttur
Reserve Forest**

**Mushtikovila Tank area is
the Corridor between GRF
and Kalpavalli**

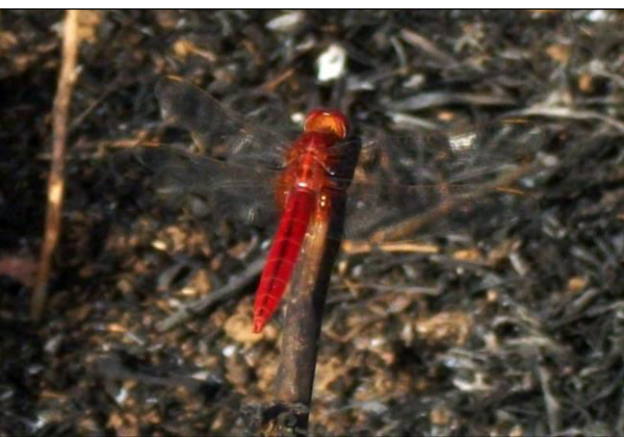
*** Checklist update going on...**

Eco Dev. for Food Security: Wild edible Plants

The background of the slide is a collage of images related to wild edible plants. It includes a close-up of a green leafy plant, a bowl of a green salad, a bowl of a yellowish-green salad, a bowl of a brownish-green salad, and a bowl of a brownish-green salad. The table is overlaid on this collage.

Life form	Total species reported	Plants used as Fruit/Vegetable	For making Traditional Pickle
Climber	8	8	1
Grass	4	4	
Herb	24	24	5
Shrub	14	13	6
Tree	21	21	6
Undershrub	1	1	
Total	72	71	18





NON TIMBER FOREST PRODUCE



Kalpavalli eco restoration & Livelihood benefits

- **Kalpavalli generates Rs 27.50 lakh of produce & over 34,000 work-days of employment annually.**
- **The availability of fodder supports a great Genetic Diversity of cattle and small ruminants.**
- **Kalpavalli provides fuelwood, NTFPs & many more ecoservices to the local community.**

Cont...

Kalpavalli provides about 4000 cart loads of thatch / fodder grass per year. This is roughly Rs. 6000/- per family per year.



About 160 poor families benefit from selling bodha gaddi, making & selling brooms, baskets etc. They earn upto Rs.8,000/- during the four months season.



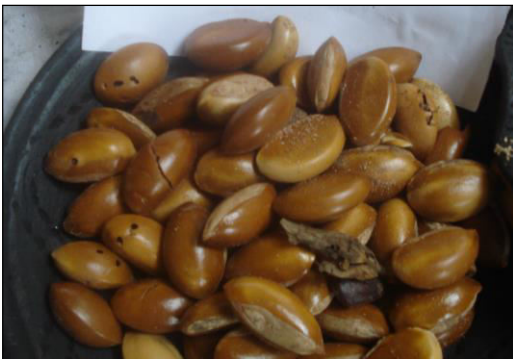
The Date palm trees (Eethakai) give up to 20,000 kgs or more of fruits per year. 240 families earn up to Rs. 8,000/- each every season.



Toddy tapping is done in 6 villages from 6000 trees every year



Kalpavalli: a living seed bank





**Restored Ecosystems are Rich Resources,
they can strongly contribute in
Sustainable Development;
If we Respect & Manage them Properly**