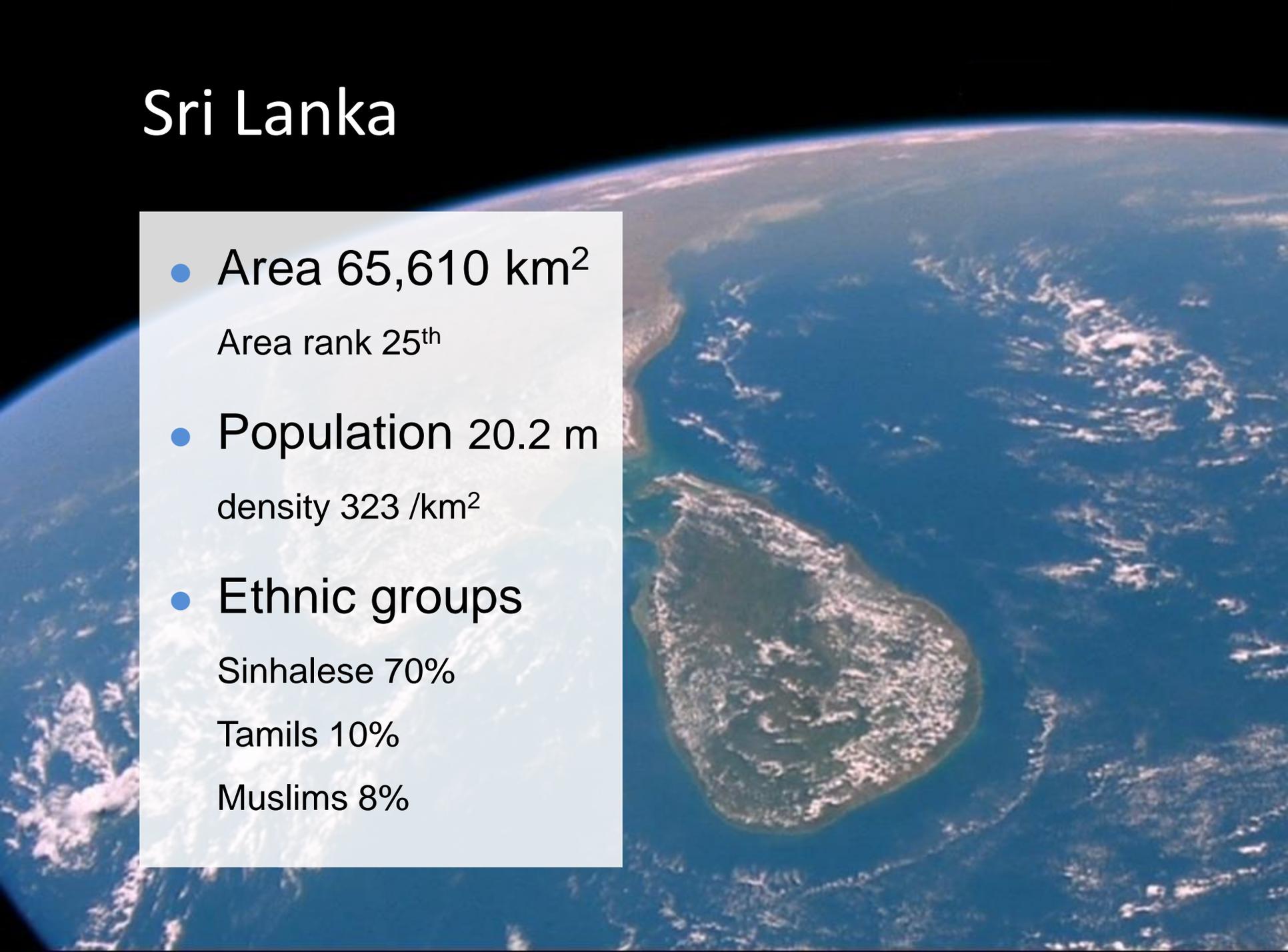


GIAHS in Sri Lanka

... proposals for further action

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Sri Lanka

A satellite view of the Earth showing the island of Sri Lanka in the Indian Ocean. The island is a small, teardrop-shaped landmass with a mix of green and brown terrain, surrounded by deep blue water. The curvature of the Earth is visible at the top of the frame.

- Area 65,610 km²

Area rank 25th

- Population 20.2 m

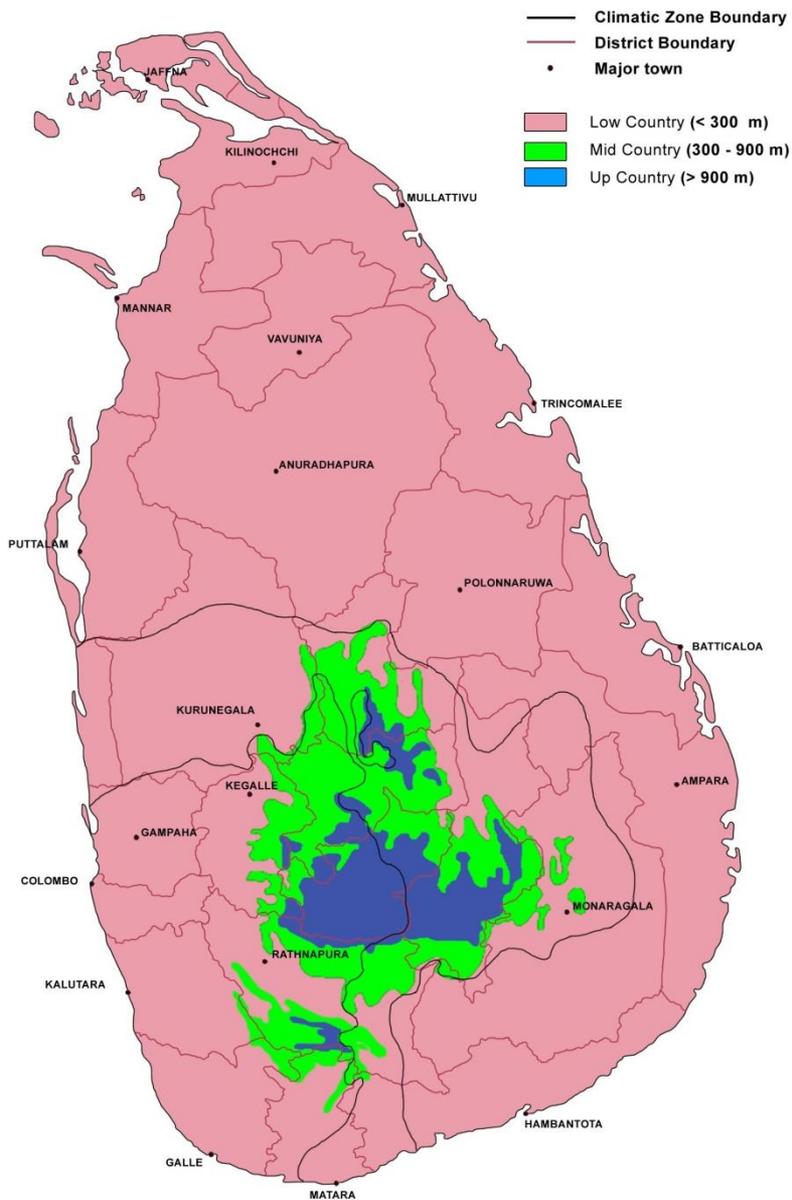
density 323 /km²

- Ethnic groups

Sinhalese 70%

Tamils 10%

Muslims 8%



Geography

- Mostly flat plains
- Mountains rising in the south-central part
- The highest elevation 2,524m
- Warm tropical climate
- 103 rivers
- 1,585 km coastline

Climatic zones of Sri Lanka

Average temperature

Dry zone 28 °C

Intermediate zone 24 - 26 °C

Wet zone 24 °C

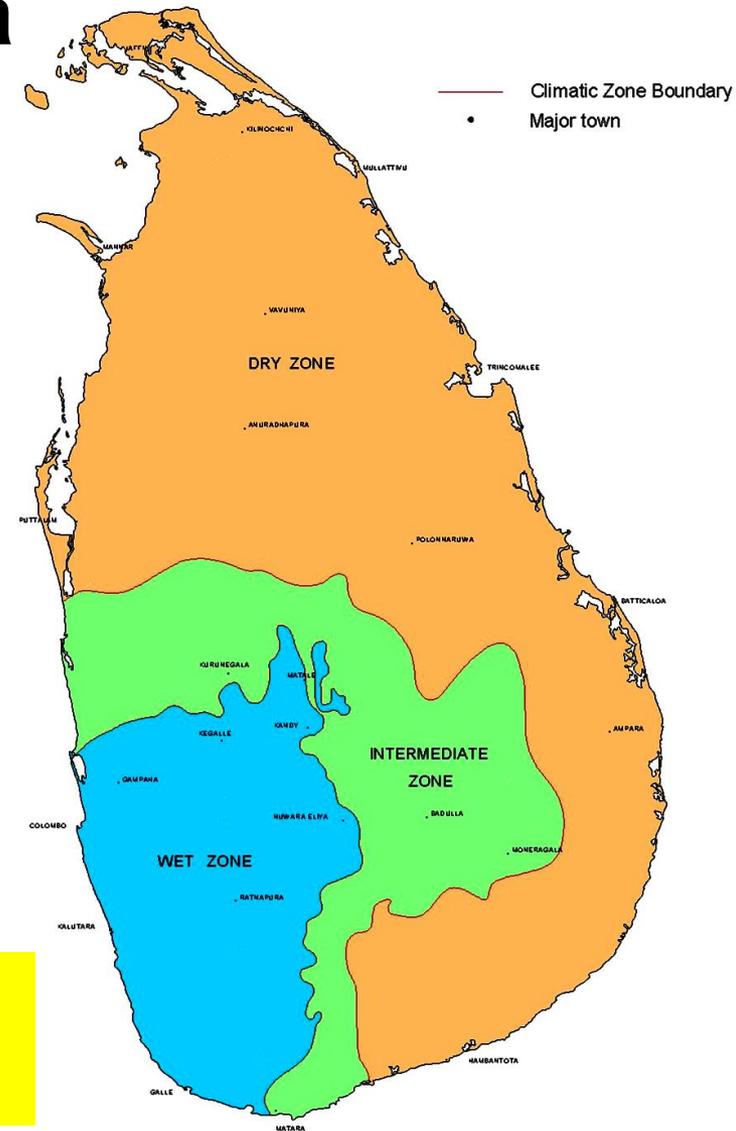
Average Rainfall

Dry zone < 1,750 mm

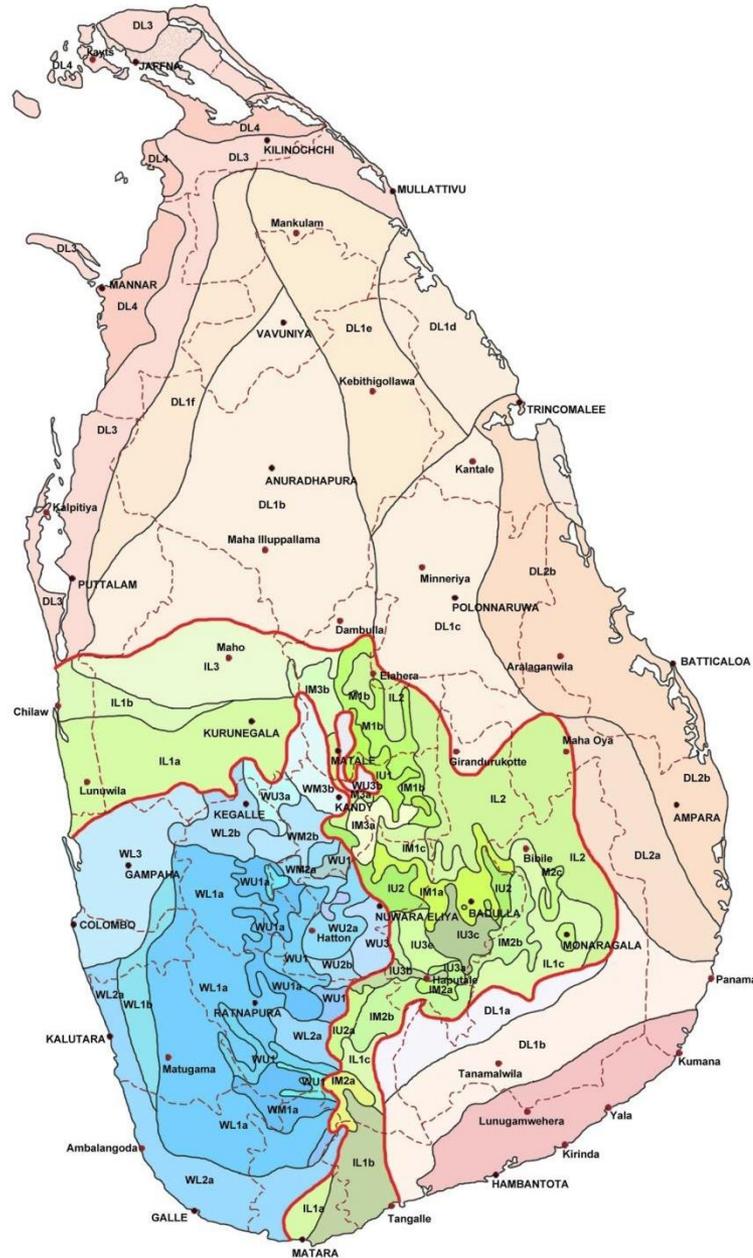
Intermediate zone 1,750 - 2,500 mm

Wet zone > 2,500 mm

**Average annual rainfall
900 – 5,700 mm**



Agro Ecological Zones - 46



CLIMATIC ZONE	AGRO-ECOLOGICAL REGION	75% EXPECTANCY VALUE OF ANNUAL RAINFALL (MM)		
WET ZONE	UP COUNTRY	WU 1	> 3,100	
		WU2a	> 2,400	
		WU2b	> 2,200	
	MID COUNTRY	WU3	> 1,800	
		WM1a	> 3,300	
		WM1b	> 2,900	
		WM2a	> 2,200	
		WM2b	> 1,800	
	LOW COUNTRY	WM3a	> 1,600	
WM3b		> 1,400		
WL1a		> 3,200		
LOW COUNTRY	WL1b	> 2,800		
	WL2a	> 2,400		
	WL2b	> 2,200		
	WL3	> 1,700		
	INTERMEDIATE ZONE	UP COUNTRY	IU1	> 2,400
			IU2	> 2,100
IU3a			> 1,900	
IU3b			> 1,700	
IU3c			> 1,600	
IU3d			> 1,300	
MID COUNTRY		IU3e	> 1,400	
		IM1a	> 2,000	
		IM1b	> 2,000	
LOW COUNTRY	IM1c	> 1,300		
	IM2a	> 1,800		
	IM2b	> 1,600		
	IM3a	> 1,400		
	IM3b	> 1,200		
	IM3c	> 1,100		
LOW COUNTRY	IL1a	> 1,400		
	IL1b	> 1,100		
	IL1c	> 1,300		
	IL2	> 1,600		
	IL3	> 1,100		
	IL3	> 1,100		
DRY ZONE	LOW COUNTRY	DL1a	> 1,100	
		DL1b	> 900	
		DL1c	> 900	
		DL1d	> 900	
		DL1e	> 900	
		DL1f	> 800	
		DL2a	> 1,300	
		DL2b	> 1,100	
		DL3	> 800	
		DL4	> 750	
DL5	> 650			

Natural Heritage



Flora and fauna

- One of 25 biodiversity hotspots in the world
- The highest biodiversity density in Asia (27% of the 3,210 flowering plants and 22% of the mammals are endemic)
- Untapped genetic potential of *Sinharaja* world heritage forest (vegetation density 240,000/ha)
- Home to over 250 types of resident birds

Forest cover (high dense natural forest) around 49% in 1920, had fallen to approximately 24% by 2009



Cultural Heritage



Pre-historic Period

- Back over 125,000 BP and possibly even as early as 500,000 BP
- Human settlements in *Pahiyangala* (37,000 BP), *Batadombalena* (28,500 BP) and *Belilena* (12,000 BP)
- In those caves, remains of anatomically modern humans (*Balangoda Man*) and other evidence suggesting that **they may have engaged in agriculture and kept domestic dogs**



Ancient history

483 BC -1815 AD: King *Vijaya* to
Sri Wickrama Rajasingha

Anuradhapura Kingdom

(380 BC – 1055 AD)



- Ancient constructions such as irrigation tanks, dagobas and palaces
- Transformed the society with the arrival of Buddhism in 250 BC from India

... history

- 1506- 1948 AD: Colonial Period

1506- 1658 : Portuguese ruled marine area

1658- 1796 : Dutch ruled marine area

1796- 1815 : British ruled marine area

1815- 1948 : British ruled the whole country

- 1948- 1980's:

democratic governments

economy not opened

- 1980's- to date:

liberal economy



Our Agricultural Heritage.....

GIAHS in Sri Lanka

- Kandyan homegardens in MC WZ
- Village small tank cascade system in LC DZ
 - Irrigated rice cultivation
 - Rainfed upland rice cultivation
 - *Chena* cultivation (shifting cultivation)
 - Traditional cattle management system
- Traditional paddy cultivations under small anicuts in WZ and terraces in IZ

Kandyan Homegarden System in the MCWZ of SL

KANDY



Location

- Elevation: 300 - 600m
- Rainfall: 1250 - 2500mm
- Dry period: January to March
- Geographical distribution: Kandy, Matale, Kegalle, Nuwara Eliya, Kurunegala

Special features KHGs

- High species diversity and high complexity
- Largely perennial base
- Small units (0.5 - 2 acres), 80,000 Ha< in Kandy, Matale, Kurunegla districts
- Jak fruit, Durian, Rambutan, Papaya, Avocado, Banana, Pineapple, Passion fruit, Mango
- Breadfruit, Coffee, Cocoa, Tea, Pepper, Kithul, Spices, Yams, Fodder



Composition of different land types and likely economic benefits

Land type	Functions / Dominant species
Forestgarden	Complex tree crop gardens used mainly for cash crops; sometimes retain natural regeneration especially on places where ecosystem roles are most crucial
Kitchengarden	Area that have a close interaction with the kitchen itself; Residual materials from the kitchen are deposited here; Vegetables leafy vegetables, papaya, banana, plantain and medicinal are planted
Fruitbelt	A narrow band of fruit trees (e.g. Avacado, guava are rambutan) between the <i>midula</i> and the forestgarden area especially to the front and sides of the houses.
Livefence	Demarcation of boundaries rather than the protection. Fences were only built in the absence of other land marks such as roads, ravines or leader drains.
Flowergarden	Established in front of the houses for amenity with ornamental plants such as flowers and foliage
Midula	Open area around the house provide space for drying the harvests, for children to play and relaxation during leisure times
Kamatha	The area where the rice harvest is threshed; land from garden is allocated for ' <i>kamatha</i> ' where the homegarden is bordering the paddy field
Vegetable plot	these were distinguishable from kitchengardens because they had much less interaction with the kitchen and were not located close to the house.

*Wells (bore holes), unplanted areas, rocky outcrops and houses of farmers were also found in the gardens.

Hitinayaka and Sinclair, 1996

Classification of dominant species in the forestgarden areas of KHGs using ecological and economic criteria:

Vertical layer	Dominant species
Upperstorey trees that primarily produce fruit	Coconut (<i>Cocos nucifera</i>), arecanut (<i>Areca catechu</i>), jak (<i>Artocarpus heterophyllus</i>)
Upperstorey trees that primarily produce timber	Jak, <i>gini-sapu</i> (<i>Michelia champaca</i>), mahogany (<i>Swietenia macrophylla</i>) and <i>halmilla</i> (<i>Berrya cordifolia</i>)
Shade tolerant beverage shrubs that are in Understorey	Coffee, cocoa, tea
Mid-layer, high value, spice crops-not necessarily shade tolerant and may cast heavy shade themselves	Clove (<i>Syzygium aromaticum</i>) and nutmeg (<i>Myristica fragrans</i>)
A miscellany of mid-layer plants that are difficult to classify	Pepper (<i>Piper nigrum</i>), banana, <i>Gliricidia sepium</i>

Hitinayaka and Sinclair, 1996



Species	Relative Importance Value
Coffee	14.7
Coconut	13.1
Arecanut	9.7
Banana	8.7
Gliricidia	6.8
Cocoa	5.4
Clove	5.3
Jak	5.1
Pepper	3.7
Nutmeg	2.0
Other species	25.5
Total	100

Importance value of dominant species in the forest garden areas of 40 KHGs from Galagedara area

Hitinayaka and Sinclair, 1996

Number of species found in the KHGs of Nillambe, Kandy

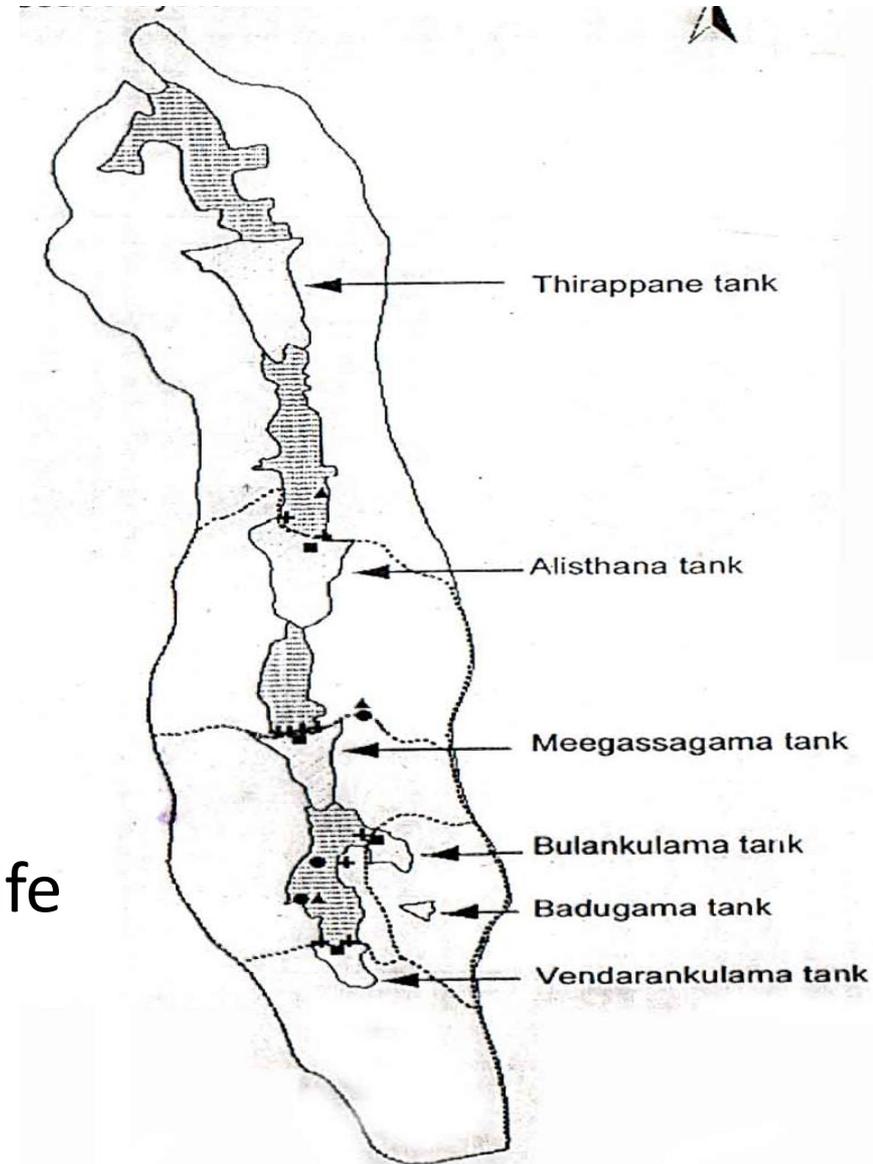
Use	Number of species
Cash crops	12
Timber trees	32
Medicinal plants	55
Annual food crops	47
Ornamental plants	43
Fruit trees	42
Miscellaneous	32
Total	263

Hitinayake and Sinclair

Village small tank cascade system

Village small tank cascade system

- 3rd century BC
- Cluster/ series of tanks
- More than 11,000 live tanks
- Rainwater harvesting
- Increasing the water table
- Rice cultivation
- Fish culture
- Water to livestock and wildlife



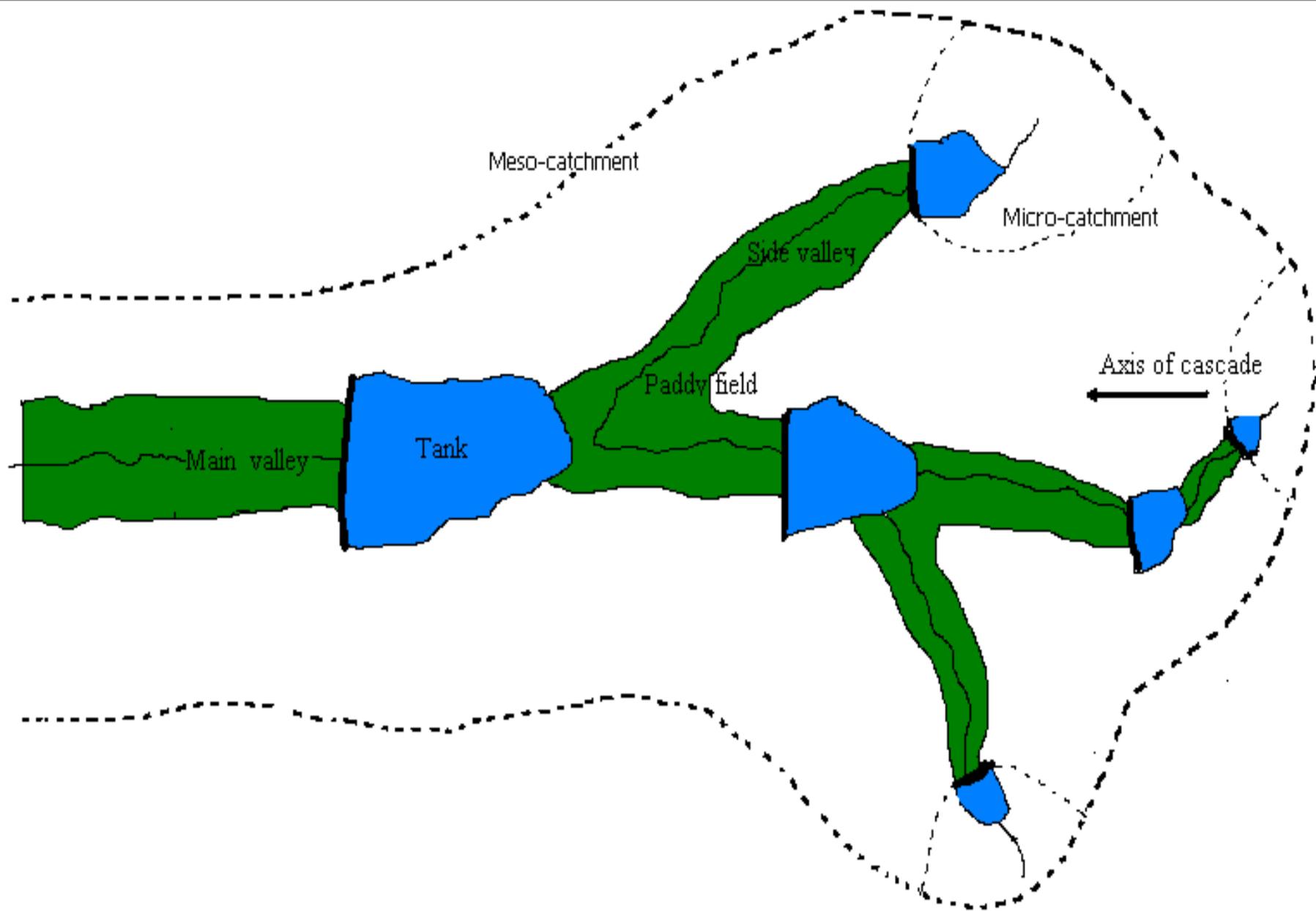
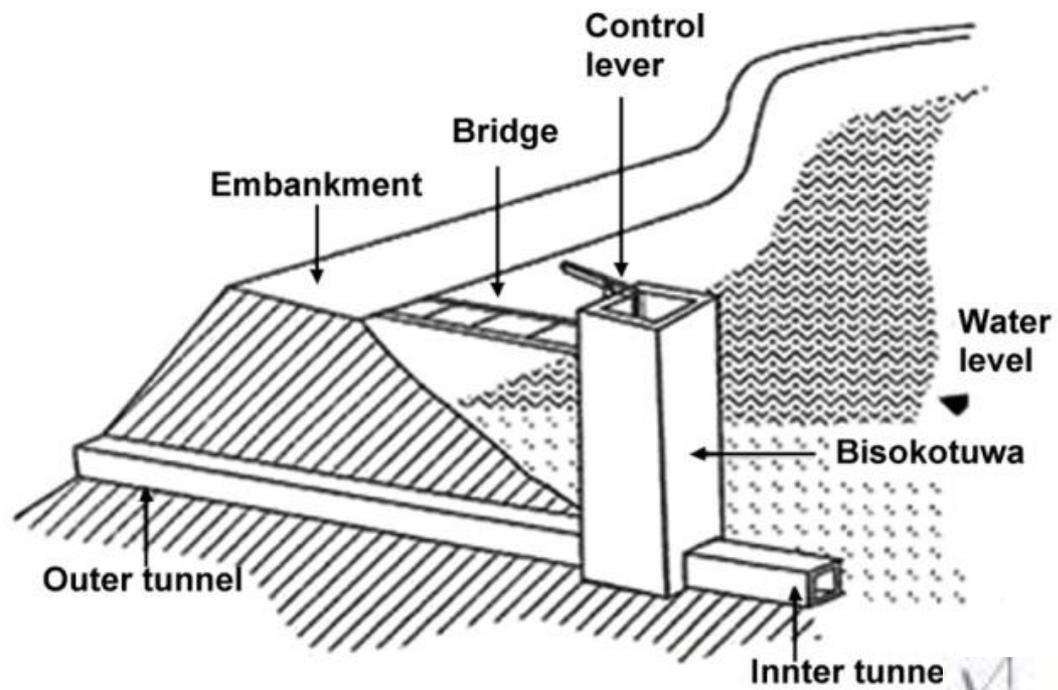
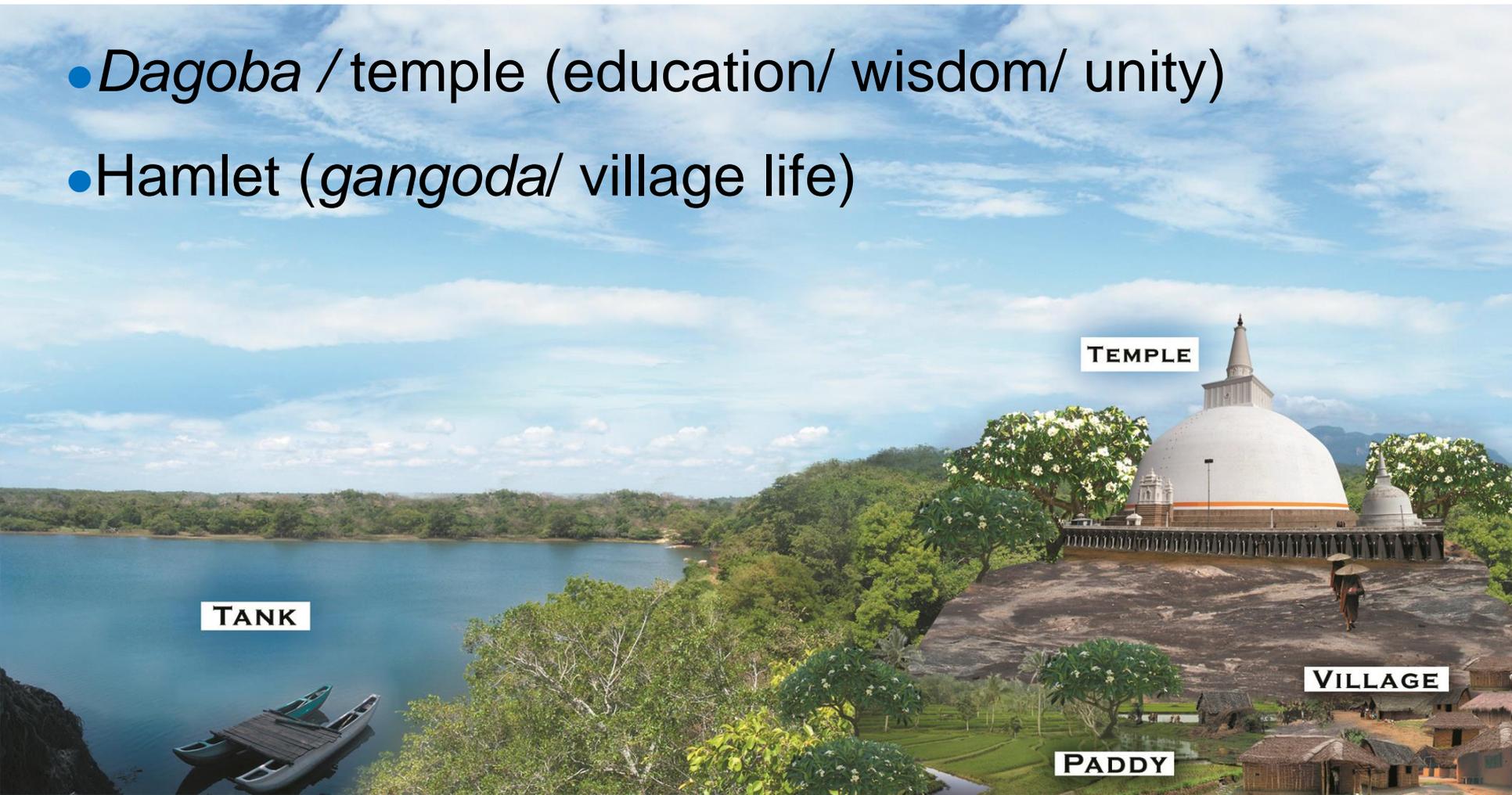


Fig.3. Schematic representation of a tank cascade

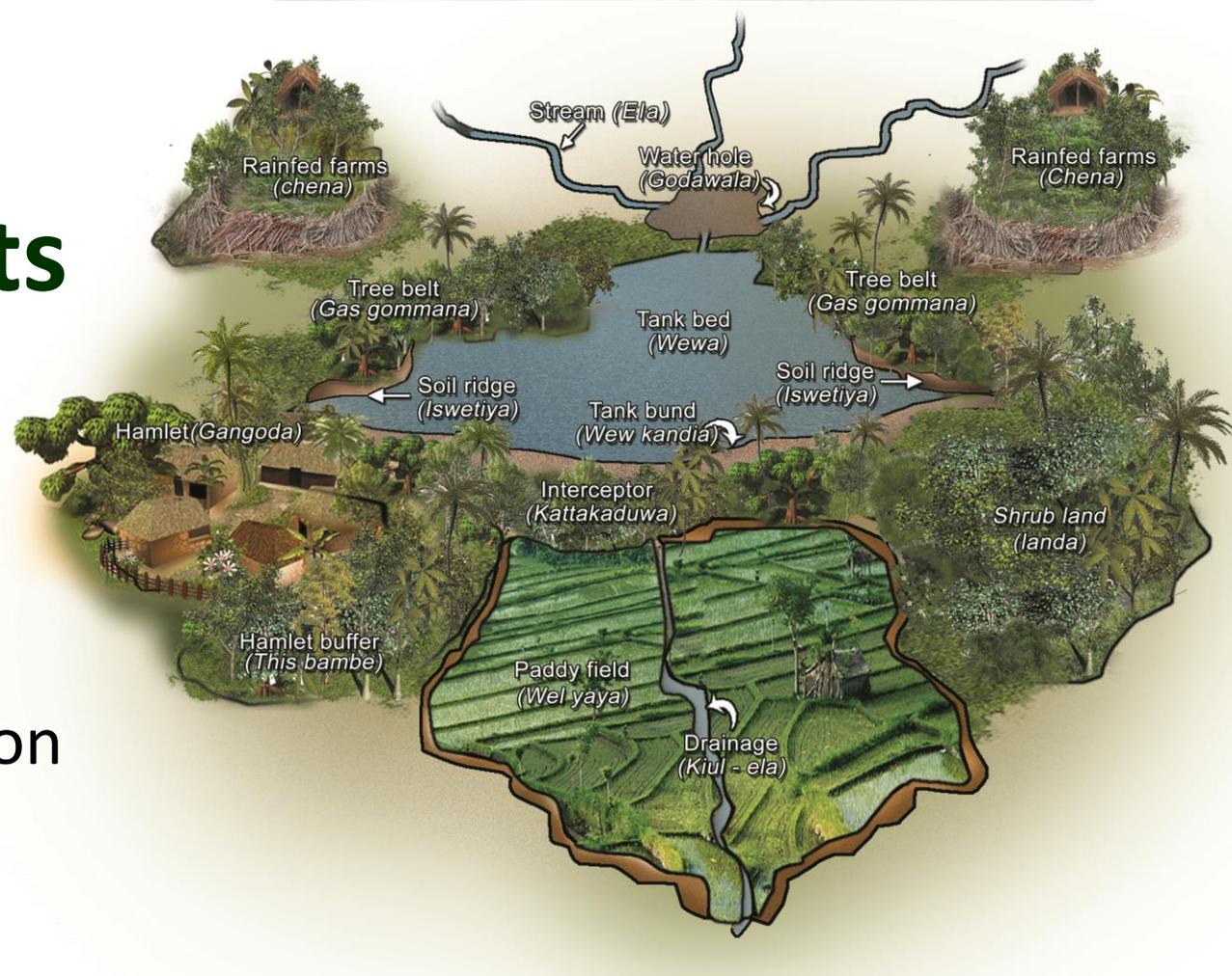


Three Pillars of the village culture

- *Wewa* / tank (water and field for food security)
- *Dagoba* / temple (education/ wisdom/ unity)
- Hamlet (*gangoda*/ village life)



Components



- Chena cultivation
- Homegardens
- Lowland rice
- Free ranging cattle, buffaloes, goats and village hens

(1) Chena cultivation

- Mixed cropping and traditional crop varieties: finger millet, upland rice varieties
- Simple technologies and no chemical inputs – depends on inherent fertility
- Family & shared labour and low production cost
- Totally under rainfed



Bush-fallow (Chena) farming - Kekirawa



Kekirawa



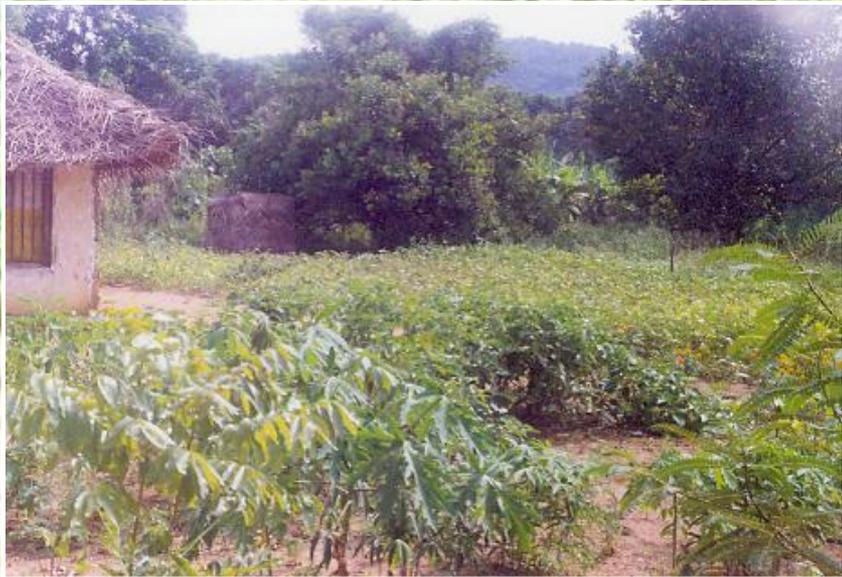
(2) Homegardens

- Rainfed system
- Vegetation depends on the access to ground water
- Gardens have easy access to ground water for Perennial crops
- Only depends on rain for seasonal food crops

Udawalawe



Polpitigama



(3) Lowland Rice

- Major season – Rainfed + tank water
- Depends on tank water for minor season
- Family / shared labour
- Planted at the same time
- Seeds are often – own seeds / shared among fellow farmers



Deeyawa, Kurunegala

Ritigala





(4) Free Ranging Cattle

- Animals are kept in the paddocks
- Released in the morning for free grazing
- Young / pregnant animals are kept in the paddock even in the day time
- Cattle - Kept for meat / milk
- Buffaloes – Milk / ploughing & threshing
- Feeding:
 - Wet season: Forest and other vegetation
 - Dry season: Tank bed, rice fallow

Udawalawe



Udawalawe

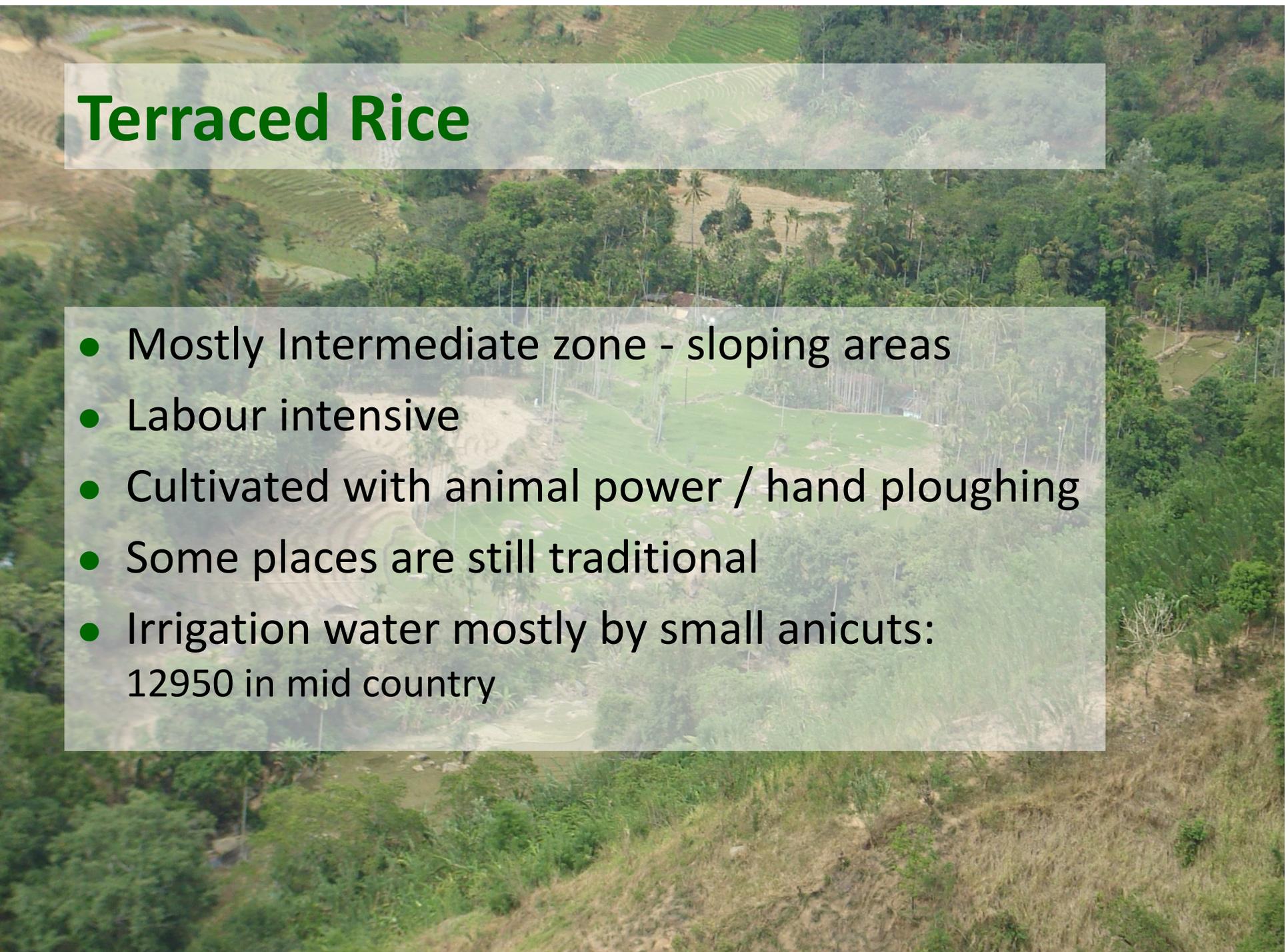






Terraced Rice Cultivation System in the IM & WZ

Terraced Rice

An aerial photograph showing a series of terraced rice fields carved into a steep, green hillside. The terraces are filled with vibrant green rice plants. The surrounding area is densely forested with various types of trees, including palm trees. The overall scene is a lush, rural landscape.

- Mostly Intermediate zone - sloping areas
- Labour intensive
- Cultivated with animal power / hand ploughing
- Some places are still traditional
- Irrigation water mostly by small anicuts:
12950 in mid country



Passara – Mechanization is not possible

Meda Mahanuwara

























Rainfed Upland Rice in the LCDZ

Rainfed Upland Rice

- Rice grown with rainfed uplands
- Bunds made only for soil conservation (not for keeping water)
- Planted with traditional upland rice varieties









THANKS