Vision for Homegarden Research in Sri Lanka

by

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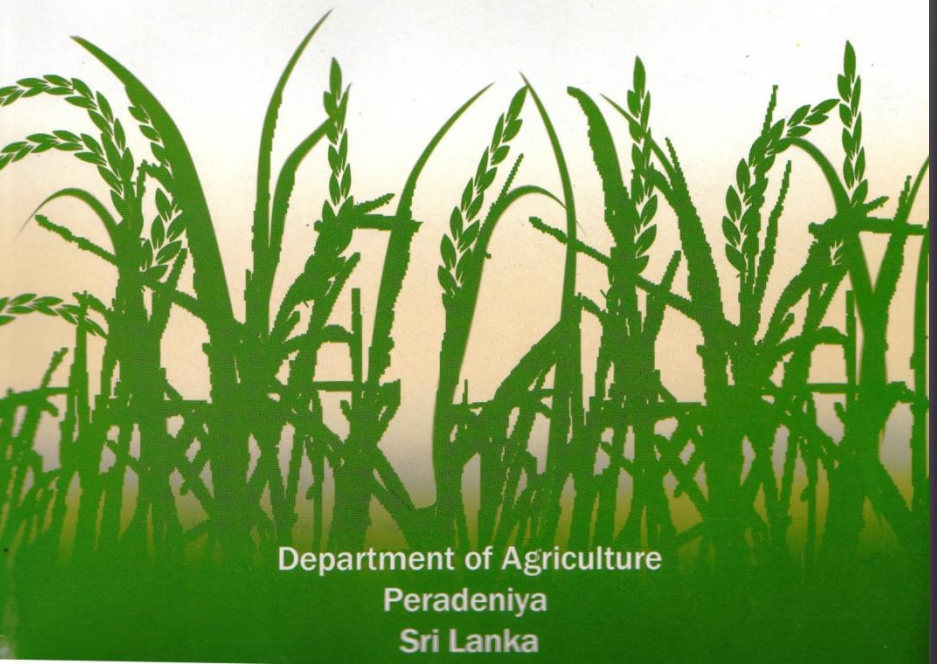

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Peradeniya
Sri Lanka

A REVIEW OF RESEARCH ON HOMEGARDENS IN SRI LANKA: THE STATUS, IMPORTANCE AND FUTURE PERSPECTIVE

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ABSTRACT

Homegardens in Sri Lanka are dynamic sustainable food production systems, and presumably the oldest land use activity, next to shifting cultivation. It is still one of the major forms of land use in the island that has continued to evolve through generations within the Sri Lankan landscape to suit the socio-economic, cultural and ecological needs. In most cases, transferred from one generation to the next, the gardens are maintained as a family property. This land use system has existed in Sri Lanka for centuries, and in 1995 accounted for 13.1% of the total land area of the country. However, it started receiving the national recognition only recently. This review summarizes the current status of knowledge on homegardens, their importance to the society and environment, and potential for improving them. In this endeavor, about 90 published documentary evidences were reviewed. As revealed the homegarden research in Sri Lanka dates back to 1973 and during the past four decades, the research focus was mainly on providing system description on localized homegarden systems. It was further attempted in this review to highlight the significance of the homegarden land use system and its dominant contribution in maintaining agricultural and environmental sustainability of the country. In this context, the importance of classification of homegardens, present status of homegarden agroforestry in terms of area under homegardens and their distribution, contributions of homegardens to timber and fuelwood production, food and nutritional security of householders, biodiversity conservation, and in managing landscape sustainably through environmental services, are discussed in detail. Further, the critical gaps in available information and way forward in homegarden research are identified.

KEYWORDS: Homegardens, Species diversity, Food, nutritional security, Timber, fuelwood, Environmental conservation, Research gaps.

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Sri Lanka is Characterized

1. High density of population (319 per sq km)
2. Inappropriate land management
3. Soil erosion and land degradation
4. Expansion of settlement
5. Fragmentation of agricultural land
6. Issue of food security in the dry zone
7. Deforestation and urbanization
8. Climate change challenges
9. Landscape mosaics

Issues

1. Poverty, low and unstable income
2. Food, nutritional and health security
3. Environmental degradation, including loss of biodiversity
4. Climate change effects and adaptation

We (the Team) believe that

homegarden agroforestry

is one of the essential components that can address the above challenges on a sustainable basis

“Two trends seem almost universal in the tropics:

1. the number of trees in forests is declining,

2. the number trees in farms is increasing”

(FAO, 2008).

Land Use Types of Sri Lanka

Source: Department of Census & Statistics (2010)

Land use type	Extent (ha)	Extent (%)
Built up lands	29,190	0.5
Agriculture lands	3,710,880	59.5
Homegardens	900,000	
Coconut	394,386	
Tea & Rubber	300,000	
Forest lands	1,759,840	28.2
Range lands	593,520	9.5
Wet bodies	61,810	1.0
Barren lands	77,480	1.2
Total	6,523,240	


Poor inter and multi-disciplinary thinking.....
Soil erosion and sedimentation are serious problems in the up and mid country wet zone areas. Siltation of Randenigala tank. Compare the colour of water in Victoria (upper tank) and Randenigal tank (below). Siltation is mainly due to potato and vegetable cultivation in the up country area.
Photo: Pushpakumara
2005 3 13

Values are Subjective: Perspectives and Scales

Local communities

Land developer

Tourist company

Government agency

Aquaculture company

Environmental group

Value of Water

We trying to be a change agent…..


BE AN AGENT OF CHANGE
through research and dissemination

“The hardest thing to see is what is in front of your eyes”

Goethe

Statistics on land area, population density, forest cover and homegarden area of selected districts of Sri Lanka.

District	Area (sq km)	Population density (per sq km)	Forest cover (%)	Homegarden cover (%)*	Tree canopy cover (%)
Ampara	4,318	143	37.5	4.1	41.6
Colombo	**656**	**3,631**	**2.8**	**13.1**	**15.9**
Gampaha	1,386	1,523	0.3	25.2	25.5
Hambantota	2,579	210	20.5	15.1	35.6
Kandy	**1,906**	**704**	**17.0**	**30.4**	**47.4**
Kegalle	1,693	468	9.5	23.2	32.7
Nuwara Eliya	1,720	423	24.5	5.3	29.8
Rathnapura	3,255	325	20.0	15.8	35.8
Vavunia	1,967	74	51.0	10.1	61.1
Sri Lanka	**65,610**	**314**	**23.5**	**14.3**	**37.8**

Homegarden as a Science

Competition

Complexity

Profitability

Sustainability

Figure 60.3 Architectural profile (20 x 50 m) of an agroforest producing fruit, wood and spice in the region of Lake Maninjau, West Sumatra province. The fruit trees are mainly "durian" (*Durio zibethinus*, 3,7, 11, 12, 15, 26, 32, 34, 40) which form the canopy. The median stratum is densely occupied by "bayur" (*Pterospermum javanicum*, 2, 8, 14, 22, 23, 25, 27, 31, 36, 38) cultivated for their wood for which there is a considerable regional market, while the understorey is reserved for the typically commercial species, coffee (*Coffea canephora* var. *robusta*, K), cinnamon (*Cinnamomum burmanii*, C) and nutmeg (*Myristica fragrans*, 13, 16, 20, 21).

Why trees?

Trees are the backbone and skeleton of the system

More tree species

Resilience

Treesilience


Homegardens also Evolving…..

APPROACHES

1. Identify and maintain existing good systems, and characterize them to generate new knowledge based on ecology.

2. Enhance traditional system through management to generate new knowledge.

Woody Interventions for Homegardening

A. Replacement

harvest Jackfruit, replant with Jackfruit (improved or not)

B. Substitution

harvest Hawarinuga or Michelia, replant with Jackfruit

C. Expansion

increase number of trees from 155, and increase number of species from 16 of both planted and naturally regenerated trees

D. Management

better manage existing and new trees (spacing, thinning, pruning, harvesting)

3. Diversify existing good systems through high value trees and crops to generate new knowledge.

Homegardens are good nutritional gardens. Thus, helping food and nutritional security.

4. Identify policy barriers to up scale / imrpve of acceptable systems

Spice Gardens in Sri Lanka, another agroforestry with commercial potential.

5. Identify system contribution to environmental security – impact assessment (ecosystem services)

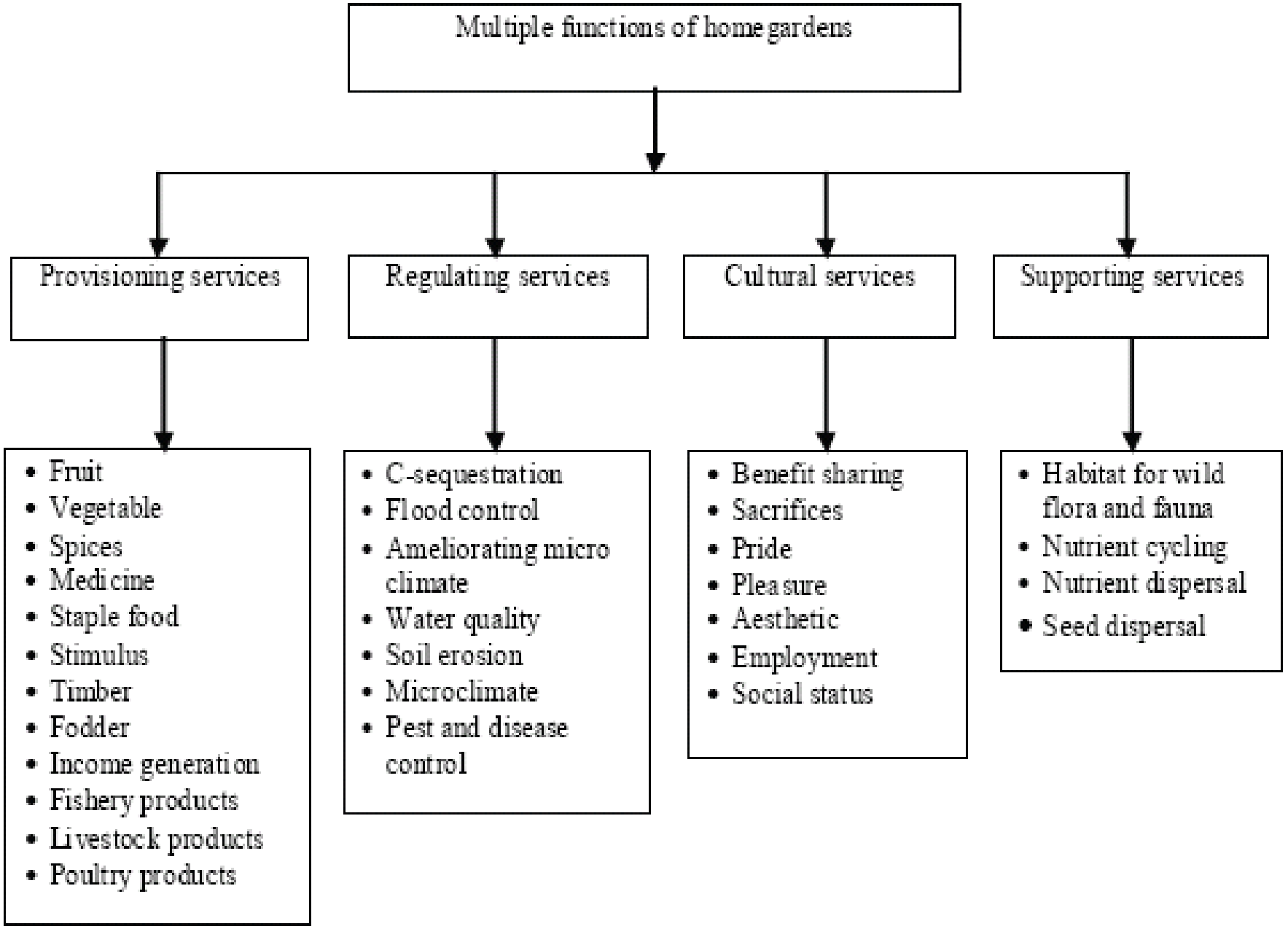
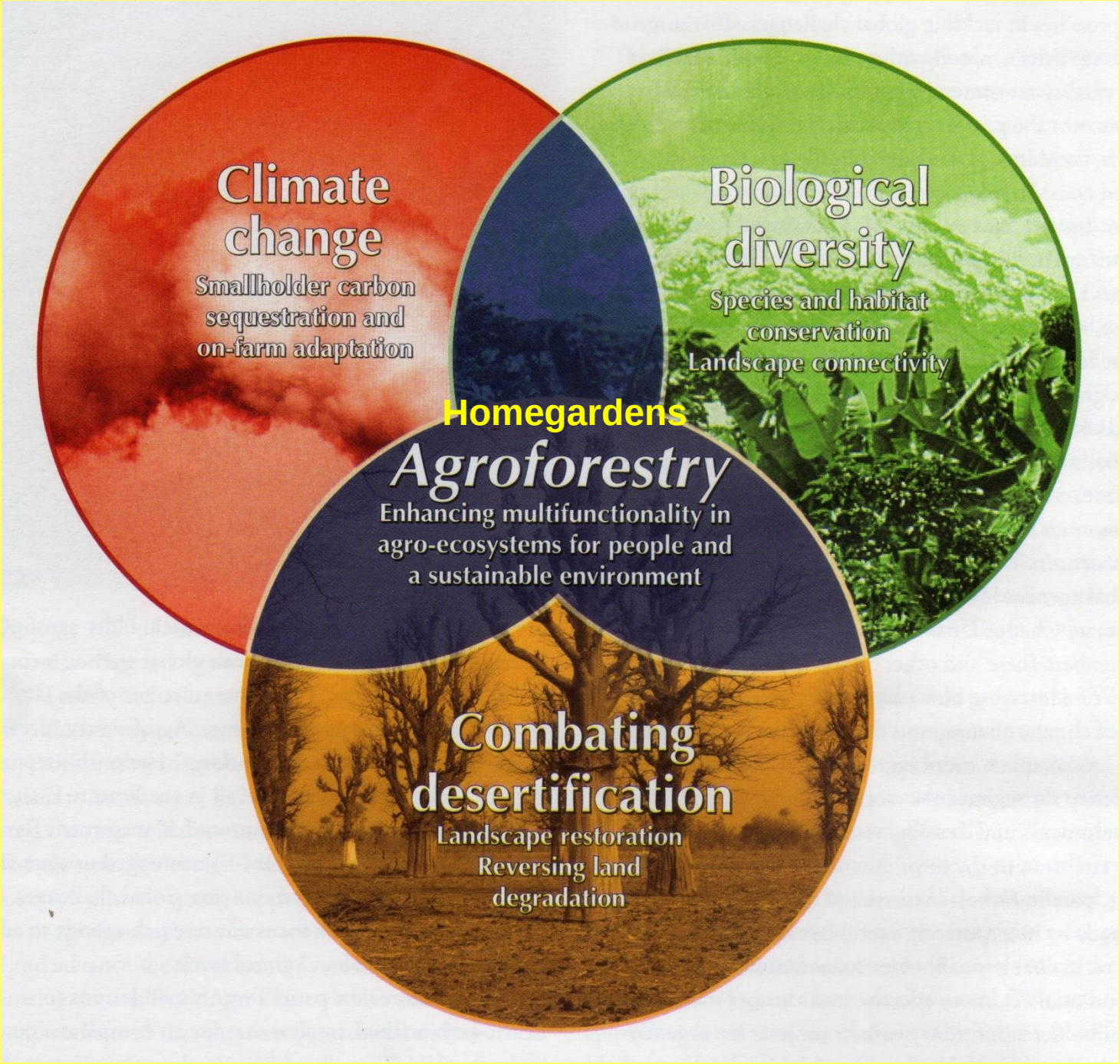


Figure 2. Ecosystem services provided by the agroforestry homegardens


Climate change
Smallholder carbon sequestration and on-farm adaptation
Biological diversity
Species and habitat conservation
Landscape connectivity
Homegardens
Agroforestry
Enhancing multifunctionality in agro-ecosystems for people and a sustainable environment
Combating desertification
Landscape restoration
Reversing land degradation

These enable to achieve

-- food security
-- nutritional security
-- health security
-- adequate water
-- fodder security
-- shelter and energy security
-- income security, and
-- environmental security

Hence sustainable Development in Sri Lanka

Agroforestry make tr
forest cover is less th

Photo: Pushpakumar

Thank you very much for your attention…….

Richness Abundance: Summary

Butterflies	Primary forest	Logged forest	Home gardens	Pinus plantations
Species detected (% of total)	43 (35.83)	66 (55.00)	95 (79.17)	57 (47.50)
Number of individuals	463	783	1413	762
Mean no. spp./transect ± SE	6.28 ± 0.66	8.71 ± 1.08	19.44 ± 1.52	12.34 ± 0.84
Mean abundance/transect ± SE	14.5 ± 2.26	24.47 ± 3.78	44.11 ± 3.69	23.81 ± 1.54
Amphibians				
Species detected (% of total)	17 (53.13)	23 (71.88)	18 (56.25)	1(3.13)
Number of individuals	1317	1247	1276	30
Mean no. spp./transect ± SE	6.6 ± 0.55	7.84 ± 0.57	8.2 ± 0.48	0.64 ± 0.09
Mean no. individuals/transect ± SE	52.68 ± 3.4	49.92 ± 3.39	51.04 ± 5.44	1.20 ± 0.21

species of amphibians; 22 endemics amphibians (14 forest – 8 Home gardens)

120 species of butterflies; 12 endemics (16 forest – 30 modified)

Significant community changes in amphibians – direct developers!!

Source: Enoka P. Kudavidanage

C Content in Different TROF systems

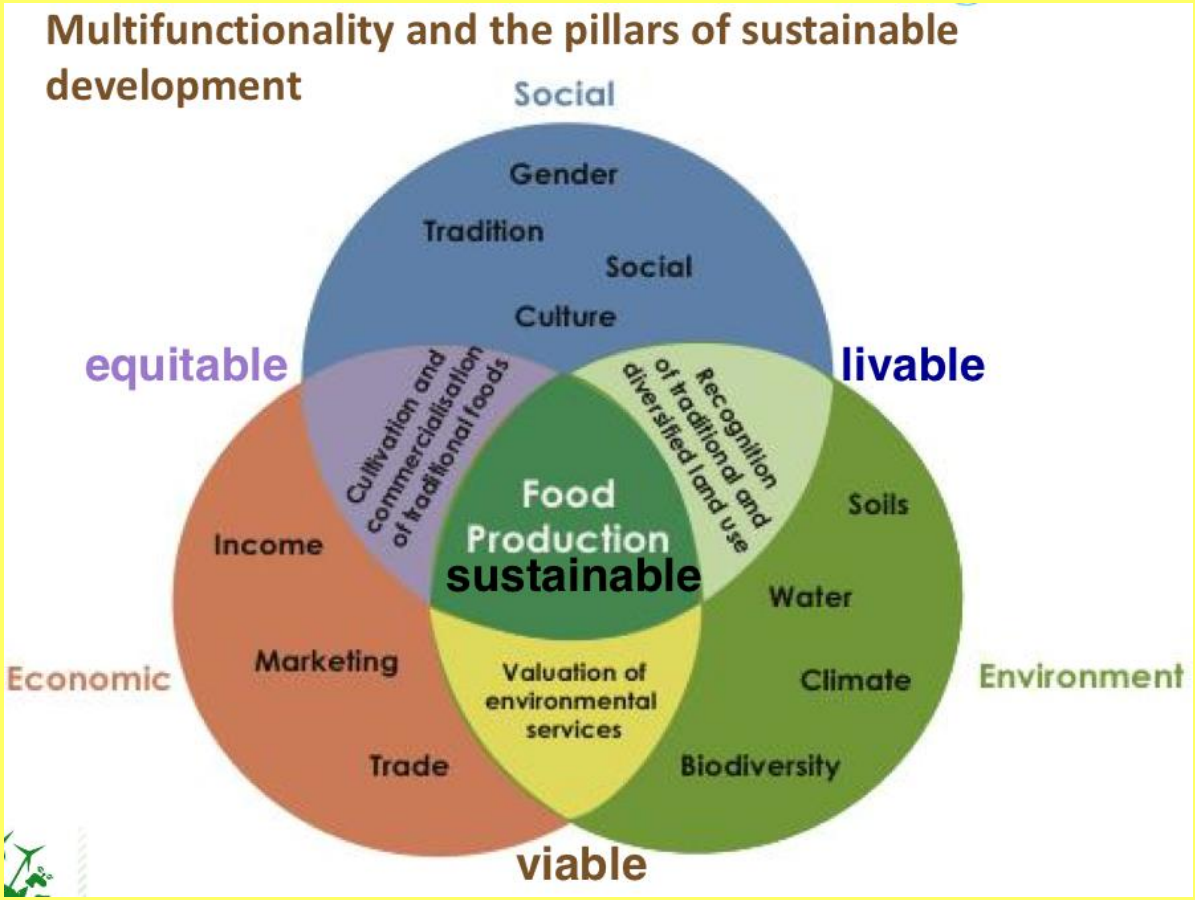
TROF system	Extent	Weight at 20% M.C	Carbon content (kg)
Homegarden	27,440	1,655,528,757	711,875,713.2
Tea based TROF system	79,182	989,007,345	441,097,275.7
Urban agricultural based TROF system	3,885	77,924,882	34,754,497.42
Grassland	4,289	41,101,104	18,331,092.44
Annual crop based TROF system	13,154	4,383,012	1,954,823.516
Total	127950	2,767,945,100	1,208,013,402

Jackfruit


Well developed
homegarden

Maize farming in an agroforest of *Faidherbia albida*, Tanzania

Sustainable agricultural intensification



TROF systems maps