Different Types of Agroforestry System in Nintavur Area

M.L. Fowzul Ameer[1] & K.Kuraisiya[2]

[1]Senior Lecturer, Department of Geography,
South Eastern University of Sri Lanka.
[2] Development Officer

Corresponding author's e-mail: fowzulameer1@gmail.com

Abstract: Agroforestry combines agricultural and forestry technologies to create more diverse, productive, profitable, healthy and sustainable land-use systems. The Agroforestry Program has generated much information about tree integration on farms. Knowledge, careful selection of species and good management of trees and crops are needed to optimize the production and positive effects within the system and to minimize negative competitive effects. In research area Alley Cropping and Home garden systems are practicing. When farmers practicing this method they are facing many problems because research area is very remote area therefore poverty is a main obstacle for improving their farming system and no adequate technologies. Government helps this area people to improve their home garden system through Thivi Neguma project. Agroforestry has an important role to play in the research area both for food and wood security and the conservation of the environment. The programme can't do it alone due to limited financial, human and other resources. There are no adequate techniques in gardening system they want to improve sustainable farming system. Thirty families' information have been taken for research and thirty farmers have been selected randomly for interview and field observation method also used for this research. Through the research brought out what are the problems they are facing, and in future what type of techniques they have to use to improve the agroforestry gardening system.

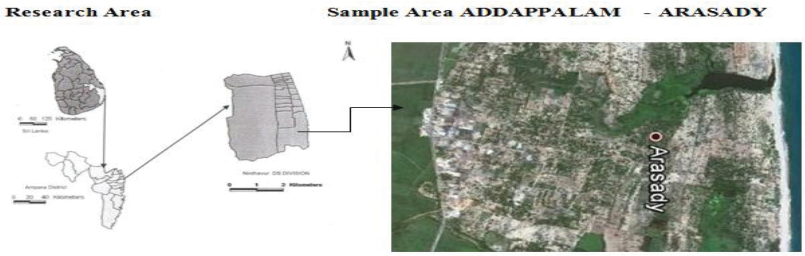
Keywords: Agroforestry, Alley Cropping, Home Garden

Introduction

Agro forestry is an integrated approach of using the interactive benefits from combining trees and shrubs with crops and/or livestock. It combines agricultural and forestry technologies to create more diverse, productive, profitable, healthy and sustainable land-use systems.

According to the World Agroforestry Centre, Agroforestry is a collective name for land use systems and practices in which woody perennials are deliberately integrated with crops and/or animals on the same land management unit. The integration can be either in a spatial mixture or in a temporal sequence. There are normally both ecological and economic interactions between woody and non-woody components in agroforestry.

- Agroforestry has an important role to play in the research area both for food and wood security and the conservation of the environment.
- By integrating tree growing with crop production, the problems of poor agricultural production, worsening wood shortages and environmental degradation can be addressed.
- Furthermore, Agroforestry technologies/practices are seen as an opportunity to take pressure off the remaining natural forests and to increase the diversity of vegetation on existing farms.



Source: Divisional secretariat, Nintavur

Research Objectives

- The main objective of this study is to identify the different types of Agro forestry systems in research area.
- Identify the problems which farmers facing, when they are practicing agroforestry system.
- Providing management strategies to make their agroforestry system sustainable.

Research Methodology

This paper deals with several data by using qualitative and quantitative methodologies. Data have gathered from primary as well as secondary data collection schemes. Primarydata were collected mainly through random sampling. In this method 30 families selected in Addapalam Arasady area for field visit. And also 15 farmers randomly selected for the interview.Information on 30 families and their home gardens was compiled between January &May 2014. And data have also been analysed as well as by using computer software.

Results and Discussion

This research basically focuses on different types of agroforestry in Addaplam Arasady area. Based on the primary data mainly two systems are practicing in research area. They are,

1. Alley Cropping
2. Home garden
    - Vegetable cultivation
    - Fruit cultivation
    - Flower gardening

1. Alley Cropping

Alley cropping, also known as intercropping is an agroforestry system where rows of crops are cultivated alongside rows of trees. Trees are planted in row and the alleyways in between the rows of trees serves as a bed for the agricultural crop. Any type of horticultural and agricultural crops can be grown in this manner. Crops that are sown in the fall make full use of the available full light that is provided because the deciduous trees have gone dormant. Alley cropping is both a visually appealing and economical method of farming that utilizes farmland for short-term income as well as long-term. Alley cropping is also a way to protect from soil erosion as the trees produce a network of roots that hold the soil. Fallen leaves provide ground cover and nutrients to the crop as well.

It is necessary to be knowledgeable in the technical and managerial skills of growing more than one crop at a time in the same area. Choosing the right types of crops and trees is likewise important, as the wrong type of trees can become an obstacle to harvesting the crops if they grow too large. Trees can also compete with the crops for nutrients, sun, and water, and if you utilize herbicides on your crops, it can potentially damage your trees.

Adequate spacing of tree rows will ensure many years of crop growth in the alleys in between. Deciding how to orient your rows of trees is another critical factor. East to west orientations are best, as that will allow the most sunlight to shine upon the alley crop, but thought must be given to the topography of the land, soil erosion potential, and prevailing winds.in research area,

Alley Cropping method

Source: Fied visit

Alley Cropping Benefits in research area

- Diversify farm enterprise
- Reduce erosion
- Improve water quality
- Protect crops
- Improve utilization of nutrients
- Improve aesthetics
- Store carbon

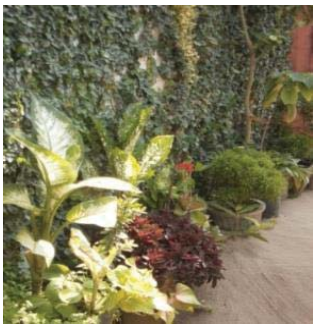
1. Home Garden

Main agroforestry system in this research area is Home garden. Itmeans **FOOD ALWAYS IN THE HOME.** Its objectives are,

1. To address food security
2. To address nutrition
3. To have additional income

Home garden practicing in many ways such as,

Flower gardening



Fruits


Vegetables






Source: Field visit

Advantages of home garden

- Area people getting Quality vegetables
- Vegetables and fruits are Always available
- Mostly girls are practicing this gardens so they are saving Time
- Address nutrition
- Low/No cost, labour intensive, rather than capital intensive
- Ecologically sound
- Sustainable to household level food security

In research area some problems facing by farmers.

1. Most of the farmers do not have own land and they are practicing other's land. And some of them practicing their own land but they do not use proper materials.
2. Animal destructions: cows and goats are destructing their crops
3. Water supply
4. Availability of vegetable seeds
5. Finance: research area is very remote one therefore they do not have enough financial support at the same time they are using expensive chemicals and water pumps.
6. Technology
7. Time

8. Epidemic attracts on their crops.

Farmers using Strategies in home garden system

- Using Water Pumps to watering crops
- Using ground water through tube well
- Using natural organic compost

Watering Method

Source: Field visit

Agroforestry systems can be advantageous over conventional agricultural and forest production methods through increased productivity, biodiversity, economic benefits, social outcomes and the ecological goods and services provided.

Final overview of research area's agroforestry system

Scale	**Household**
Location	Nintavur - 10 , AddapalamArasady
Elevation	0 ' meters
Climate	Dry Zone Climate
Population Density	100persons / square kilometre
Principle Crops	**Fruits:** Bananas, Passion Fruit , Mango, Wood apple, custard apple, grapes, jackfruit, watermelon **Vegetables:** Ladies' finger, Brinjal, Long beans, Cucumber, Sweet potatoes, Tomatoes, Pumpkin, Snake beans, Bitter melon, Bottle Gourd, Drumstick, Snake Gourd, Onion, green chilies **Trees:** Mango tree, Arica nut, Jack tree, Coconut **Flower:**

	jasmine, Sunflower, Anthooriam, x- sora,
Domestic Animals	Chickens, Cow, Goat
Soils	Clay, Sand, Mud

Conclusions

In the research area major agroforestry types are Alley cropping and Home garden. Under the home garden they are practicing flower gardening, fruit cultivation and vegetable. Farmers are facing many problems. Major problems are finance, area and water supply.

Research has also confirmed that agroforestry systems can include the following benefits in research area:

- Controlling runoff and soil erosion, thereby reducing losses of water, soil material, organic matter and nutrients.
- Maintaining soil organic matter and biological activity at levels satisfactory for soil fertility. This depends on an adequate proportion of trees in the system - normally at least 20% crown cover of trees to maintain organic matter over systems as a whole.
- Maintaining more favourable soil physical properties than agriculture, through organic matter maintenance and the effects of tree roots.
- Leading to more closed nutrient cycling than agriculture and hence to more efficient use of nutrients. This is true to an impressive degree for garden/farming systems.
- Checking the development of soil toxicities, or reduce existing toxicities - both soil acidification and salinization can be checked, and trees can be employed in the reclamation of polluted soils.
- Utilising solar energy more efficiently than monoculture systems - different height plants, leaf shapes and alignments all contribute.
- Leading to reduced insect pests and associated diseases.
- Moderating microclimates. Shelter given by trees improves yields of nearby crops and livestock. Shade in summer can be beneficial for livestock, reducing stress.
- Agroforestry can provide a more diverse farm economy and stimulate the whole rural economy, leading to more stable farms and communities. Economic risks are reduced when systems produce multiple products.
- Reducing poverty through increased production of agroforestry products for home consumption and sale
- Contributing to food security by restoring farm soil fertility for food crops and production of fruits, nuts

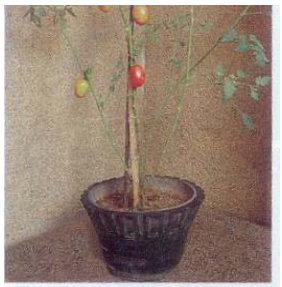
Recommendation for Home Garden Establishment in research area

1. Materials (Indigenous materials) they can use,

* Sacks, Pots, Baskets, Rubber booths, Tires, Plastic bags, Cans, Plastics, Bamboo/ pipe

Examples

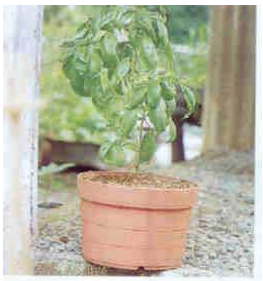
Pineapple in basket



Tomato plant in rubber pot

Bell peppers in bayong

Ginger plant in catsup plastic container



Sweet basil in plastic pot

Eggplant in oil tin can

2. Fertilizers
    * Using Organic Fertilizers
        - Animal manures
        - Compost
    * In-organic
3. financial aid rendering by government
4. giving technical support and training for farmers

References:

Amarasinghe, M.K.T.K. and Senaratne, R., 2000, Relevance of agrobiodiversity in developing sustainable agroecosystems. International Conference on Managing natural Resources for Sustainable Agriculture Production in the 21st Century. - 14 to 18 February 2000 at Vigyan Bhawan, New Delhi.

Anoja Wickramasinghe, 1992, Village Agroforestry Systems and Tree-use Practices: A Case Study in Sri Lanka, Forestry/Fuelwood Research and Development (F/FRED) Project

http://en.wikipedia.org/wiki/Agroforestry

http://www.agroforestry.co.uk/afbens.html.

http://www.worldagroforestry.org/

http://www.worldagroforestry.org/newsroom/highlights/turning-tide-farm-productivity-africa-agroforestry-solution

http://www.worldagroforestrycentre.org/evergreen_agriculture

Nair. P.K. 1989, Agroforestry Systems in the Tropics, Volume 31 of Forestry Sciences, 9024737907, 9789024737901

Senaratne, R. and Amarasinghe, M.K.T.K.,1996, Relevance of Agroforestry species in ensuring food security in Sri Lanka with special reference to the Southern province. Proceedings of Seventh regional work shop on multipurpose trees, Kandy, Sri Lanka. 24- 26 October 1996, pp 52-68

Thamiem.S, Weerahewa.J, Pushpakumara. D.K.N.G., and SinghV.P., 2011, Trade Competitiveness of Agroforestry Crop Sector in Sri Lanka, Tropical Agricultural Research Vol. 22 (4): 338 – 347

The Springer Journal, "Agroforestry Systems"2001, The Centre for Agroforestry, University of Missouri (ISSN 1572-9680)