Agroforestry Third stage

Forestry Department

**2- Silvopasture**

Silvopastural system of agroforestry integrates woody species with grass or grass legume mixtures simultaneously on the same piece of land. This system includes mixing of trees and pasture or forage production (wood-pasture). Forage production and livestock component are the main goal of this system.

Cattle, sheep and goats are the most common livestock incorporated into silvopasture systems.

**Forage system:** Usually permanent pasture, grazed rotationally. Other options are pasture cut for hay or silage. White clover (especially wild types) is more shade-tolerant than other pasture legumes and should be included in mixtures. Browsing animals are more likely to damage trees than large grazing animals or poultry. Deciduous trees are more readily browsed than conifers.

**Tree component:** May be timber or fuel wood trees, or fruit or nut crop. Nitrogen-fixing trees can also be used to supply nitrogen for the forage crop.

**Fruit crops:** As the tree component are usually grown as standards to allow for grazing beneath. Apples, cider apples and plums are some of the possibilities.

**Nut crops:** Can include chestnuts and hazelnuts. Walnuts are slow growing and are only suitable if animals are excluded or if cheap form of tree protection is available.

There are three recognized types of silvopasture systems and they are:

**a- Trees and shrubs on pastures**

These are also called parkland systems. Trees grow on rangeland, in an open, mixed spatial system. The trees are usually natural and randomly distributed. The trees provide shelter for grazing animals and often influence the soil and growth of grass beneath them.

**b- Hedgesand live fence of fodder tree**

Growing fodder trees or hedges along the field boundaries as live fence on pasture lands they are pollarded heavily to obtain substantial fodder.

Boundary hedges, sometimes with trees as standards, are grown as elements in livestock management, including around homesteads.

**c- Protein banks**

Trees are planted as blocks and managed for fodder production. This can make good productive use of areas of poorer soil on the farm. Monocropping of fodder trees that produce abundant fodder is done under the system and fodder legumes are grown among the trees.

**Design & establishment**

Trees can be planted evenly at wide spacing (e.g. 10 x 10 m), in rows with forage alleys between, or in clusters. All methods necessitate some form of weed control-black plastic mulches produce the best tree growth.

- **Even wide spacing:** Means those trees have to be individually protected from stock unless the forage is cut for hay/silage for the first few years until trees are large enough. Trees also have to have individual weed control measures. Research suggests that deciduous trees planted this way into pasture have no detrimental effect on pasture and livestock production for at least 10 years.

**- Row planting:** Allows trees to be planted more closely, if desired, for later thinning. Also allows for block weed control measures, e.g. black polythene strip. Tree protection against stock can be significantly cheaper by using straight fences or electric wire/netting.

Both single and double rows of crop trees can be used; a further alternative is a triple row, with high-value crop trees sandwiched between rows of nurse trees (usually coniferous) which help train straight crop trees and are themselves thinned at a later stage. Rows are best aligned North-South.

**Benefits:**

1- Trees provide shade and wind protection, which reduce heat stress and wind chill of livestock; performance is improved and mortality reduced.

2- Economic returns from forage/livestock production continue while creating a sustainable system with environmental benefits.

3- Can be designed for little or no long-term reduction of forage production whilst growing other crop(s) on the same site.

4- The combined tree plus forage productivity of silvopasture can substantially exceed that of pastures or forests grown alone.

**Drawbacks:**

1- Main one is the cost of protecting trees from livestock, which in wide planting can be more than the trees themselves. This will remove the time and cost involved in restocking the tree component, if trees are subsequently pollarded.

2- Many high-value deciduous timber trees grow with poor (crooked) form without the sideways light pressure of a forest. Correction pruning and/or the use of nurse trees can overcome some of this problem.