

Sustainable agriculture for the future

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# SilvoPasture System (Trees, Pasture and Live- stock) Implementation:

A Collaboration Initiative between Agricultural Research Council (ARC) and South African Forestry Company Limited (SAFCOL).

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**A**groforestry is a sustainable land management system that deliberately includes woody plants with crops and / or animals within the same land management unit resulting in a positive socio-economic and / or ecological interactions between the woody and non-woody components; and is applied in a manner and scale that is compatible with the local cultural, socio-economic, and agro-ecological context. Agroforestry can be categorised in to three broad categories: Agri-silvicultural systems (Integrates crops and trees) Silvo-pastoral systems (integrates trees and pastures and/ or animals) and Agro-silvopastoral systems (Integrates trees, crops, and pastures/ animals).

Agroforestry systems should comply with the 3 I's (Intention, Interconnected, and Intensive) and 4 F's (Firewood, Fertilizer, Food & Fodder). Maponya et al. (2018) explained that one needs to satisfy the following three I's to confirm an agroforestry system: (1) intentional, intensive, and interconnected. Maponya et al. (2018) gave examples of silvipasture systems visited in the Limpopo Province that satisfy the three I's: For example,

(1) Intentional: The individuals within the community lease plantations for livestock grazing throughout the year and mostly sell them in Easter and festive seasons. The owner of the plantations also allows leasing to receive income (2) Intensive: Maponya et al. (2018) explained that this practice is very intensive as a large size of land is used for the silvopasture practice, and (3) Interconnected: Maponya et al. (2018) further explained that the practice is interconnected with the community and there is also mutual benefit among all parties involved. The researchers further indicated evidence of the importance of agroforestry systems especially silvopasture and agrosilvopasture for supporting food production and income generation in Limpopo Province (Table 1). Some farmers in Limpopo Province highlighted that they are generating income through renting of farms for grazing, selling trees to the communities to build shelter, kraals, medicinal purposes, fuelwood, etc.

The areas of land used for trees, crops, livestock, and apiculture were also summarised per farming systems in the Limpopo Province (Maponya et al. 2018).

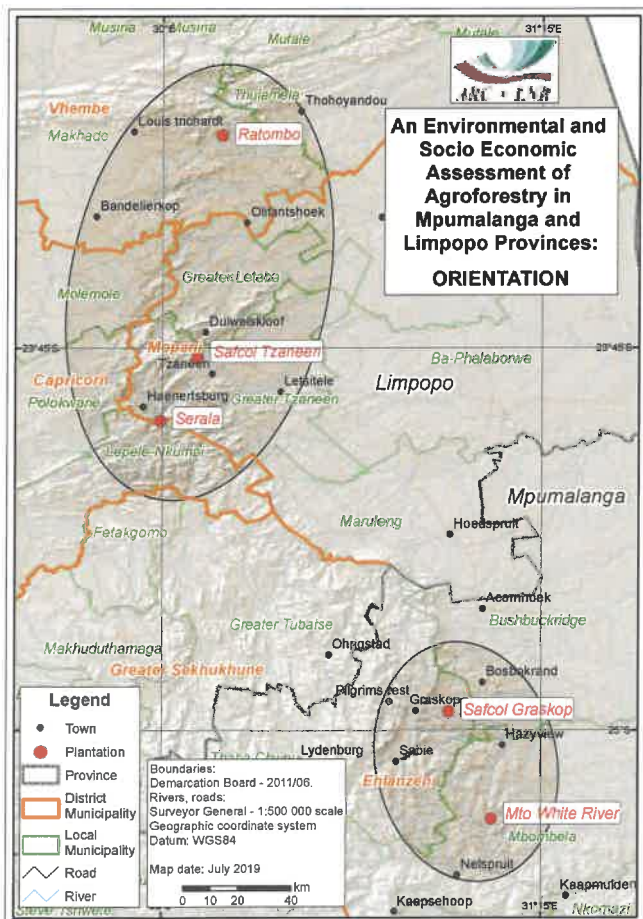
**Table 1:** Land usage per enterprise for the different agroforestry systems in Limpopo Province

Farming system	Trees (ha)	Crops (ha)	Livestock (ha)	Bees (ha)
Agrosilvopasture	5552	225	5703	0
Agrosilvopasture + Apiculture	128	45	165	165
Agrisilviculture	230	212	0	0
Apiculture	80	210	0	100
Silvopasture	3518,9	0	3534,9	0
Total	9508,9	692	9402,9	265

As indicated in Table 2, some small timber growers (86% of the respondents that answered this question) were generating income from rentals paid by people for grazing cattle within their plantations. These monthly rentals ranged from R1000 to R9000. This is likely to be one of the reasons why silvopasture and agrosilvopasture remain the most popular systems in the Limpopo Province (Table 1). It must also be emphasised that some small timber growers were reluctant to disclose their farm income fearing that it

will jeopardise their future financial assistance from government.

In addition, the demonstration training trials were conducted and identified challenges for agroforestry integration and food security, i.e., lack of commitment from other farmers, choosing of the right compartment for integration, water challenges, fencing, and the uncontrolled roaming of game animals, to name just a few. The demonstration trials also served as a tool to educate farmers in different agroforestry systems in order to improve sustainability and ensure job creation,



**Figure 1:** Identified Agroforestry sites in Limpopo and Mpumalanga Provinces



**Table 2:** Monthly grazing rentals obtained by 56 small timber growers

Monthly income (Rands)	No. small timber growers
0	8
1000	3
1500	8
1700	1
2000	18
3000	13
4000	3
4500	1
9000	1

Furthermore, the Agricultural Research Council have successfully implemented Agri-silviculture system research with collaborators (South African Forestry Company Limited, MTO Forestry, Department of Forestry, Fisheries and Environment, Water Research Commission, Universities of Pretoria and KwaZulu Natal) across various provinces (Figure 1) for the past 5 years. The following Agri-silviculture research outputs were achieved: Papers Published (3); Book Chapters Published (3); Book Chapters IN Press (6); Conference Full Papers Published (3); Oral Presentations (18); Poster Presentations (10); Popular Articles (2), 3 PhD Students In Progress and International Paper Awards (3).

It is against some of above background that ARC and SAFCOL signed a service level agreement (2022 – 2025) to implement the silvopasture system (Figure 2) within their plantations in South Africa. The scope of the work will cover 4 distinct components (1) Situation analysis: review and provide a literature review document of the profile and current research themes that are being carried out by public institutions, research organizations and industries (2) Understand the socio-economic status in the context of: status of land claims within SAFCOL; cattle owner socio-economic survey, farmer focus group interviews, stakeholder survey-interviews with plantation management, tribal authorities and municipal officials and challenges with developing a silvopasture systems (3) Biophysical assessment: a focus

on cattle farming, understand the needs for successfully promoting the use of cattle farming within plantations as a new revenue stream for entrepreneurial development and for community upliftment, maps and site indices-from planning department, site carrying capacity - case studies from at least 4 plantations, assessment of production systems-cattle breeds, forage quality and impact on tree growth and yield, environmental benefits and resources for a sustainable production system (4) Develop a silvopasture business case for SAFCOL by assessing the following: the availability of the forage and sites in terms of location and quality; R&D and state capabilities that currently exist and those required to drive competitiveness of the sector; high value and low value cattle breeds that should be targeted to support diversification; market, environmental and regulatory constraints to be addressed; human capacity requirement to support the development of a sustainable silvopasture production system; provision of a detailed plan integrating tree farming with cattle farming; proposal of a business model linking small scale cattle farming with forestry and timber processing; provision of job creation estimates and the multiplier effect of adopting silvopasture across the forestry value chain; assess the potential of silvopasture production system's contribution to the environment and the carbon economy , case studies from other forestry companies with silvopasture projects and assess the potential of the silvopasture project's contribution to

new revenue generation.

The current project progress includes: The completion of the stakeholder mobilisation and situational analysis - In order to obtain buy-in for the intended project, numerous meetings and discussions were held with SAFCOL plantations. During these discussions, a detailed presentation of the project concept, as well as proposed procedures for a thorough situation analysis and selection of the sites were illustrated and discussed. Belfast Plantation identified more for commercialization purposes with few communities' members staying within the proximity of the plantation. Jessievale and Roburna plantations were also identified as potential. Hence, pilot study conducted and completed, questionnaire pretested and revised, and data collection has commenced with plantation managers in the Highveld, SAFCOL land claims status completed and categorised (As Further research and claimant verification; Research, Settled, Verifications, Gazetted, Finalised etc.) and general challenges identified. This approach was critical in order to choose the right plantations with the right compartments

which are not under claim or with less wild animals' disturbance e.g., Baboons; to assist in being specific on the cattle carrying capacity; to understand the timing on when to introduce browsers and grazers within the compartments. This participatory action research included the livestock owners and for example, tags will put on animals and animals will be weighed before they are introduced to the compartment and weighed during and after when the owner decide to sell. This can be easily compared to the animal that are free ranging outside the allocated compartment.

### Reference

Maponya P, Venter SL, Du Plooy CP, Backeberg GR, Mpandeli SN and Nesamvuni E, (2018). Oral Presentation & Full Paper Publication, Perceptions on the Constraints to Agroforestry Competitiveness: A Case of Smallholder Farmers in Limpopo Province, 9th International Scientific Agriculture Symposium, 04<sup>th</sup> - 07<sup>th</sup> October 2018, Bosnia - Herzegovonia

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**Figure 2: SilvoPasure System (Trees, Pasture and Livestock).** Trees can be planted in single, double, or triple row sets. Cluster plantings may also be used. When multiple row woody planting sets are used, stagger within woody plantings. In general understanding of management and taking care of interaction of tree, livestock and pasture is critical.