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Groundnuts between rows of young eucalyptus trees. Photo: Phokele Maponya

Agri-silviculture community growers in Mpumalanga Province, South Africa

Phokele Maponya

"Agroforestry can help bridge the gap between agriculture and forestry by creating integrated systems that fulfil environmental and socioeconomic goals and generate income."

Introduction

The important contributions of agriculture and forestry to the South African economy have the potential to support poverty alleviation and economic growth. According to Kotze and Rose (2015), about 32,000 commercial farmers account for 95% of the country's locally produced food, while the remaining 5% of food is produced by 220,000 emerging farmers (a category of farmers between smallholders and commercial farmers) and 2 million subsistence farmers. According to Agriculture, Forestry & Fisheries (2017), the forestry sector is a major contributor to the South African economy through its well-developed and diversified forest products industry. It supports manufacturing subsectors such as sawmilling and pulp and paper production, as well as mining and construction. In addition to its upstream and downstream impacts, the sector has strong potential for creating jobs and small businesses; it includes about 157,500 jobs across its entire value chain.

Groundnuts planted between eucalyptus rows at the MTO plantation. Photo: Phokele Maponya

Agroforestry is a land-use system that combines the use of woody perennials and agricultural crops and/or livestock to achieve beneficial ecological and economical interactions for food, fibre and livestock production. Structurally, according to Nair (1985), the system can be defined as agri-silviculture (crops plus trees), silvopastoralism (pasture/animals plus trees), or agrosilvopastoralism (crops plus pasture/animals plus trees). Properly managed agroforestry systems provide multiple benefits and contribute to improved livelihoods and income generation. Agroforestry practices are also specific to location and climate; it is key to develop systems that are locally relevant, and to consider the biophysical and socioeconomic context on a case-by-case basis. South Africa is a semi-arid country and is vulnerable to water stress, particularly drought.

Agri-silviculture combines and integrates crops and trees managed on the same farm. According to Bentrup et al. (2019) and Maponya et al. (2022) the main contributions of agri-silviculture are as follows:

- produce multiple products such as food/vegetables/fruits, fodder and forage for livestock, firewood, timber, and leaf litter for organic manure production;
- sustain and improve crop productivity, which increases income for the farmers;
- improve the nutritional value of animal feed by supplying green fodder;
- recycle soil nutrients, which also reduces the need to buy chemical fertilizers;
- improve farm-site ecology by reducing surface runoff, soil erosion, nutrient loss, gully formation and landslides;
- improve the local microclimate and enhance the farm's productive capacity;
- reduce pressure on community forests and other natural forests for fodder, firewood and timber; and
- help beautify the surrounding areas.

Agroforestry in Mpumalanga Province

A study by Maponya et al. (2022) in Limpopo and Mpumalanga provinces showed that including crop production in forestry plantations (intercropping groundnuts with eucalyptus trees) contributed to increasing food security and improving community livelihoods. The objectives of the study, which is summarized here, was to monitor the establishment and expansion of this type of agri-silviculture and to determine the food security status and socioeconomic characteristics of the community growers.

There is great interest in agroforestry among the smallholder farmers and community growers in the Ehlanzeni and Gert Sibande districts of Mpumalanga Province (Maponya et al. 2022). A total of 143 agri-silviculture community growers participated in the study in an area where annual rainfall is about 600–700 mm (range 400–1,000 mm), with cool to hot temperatures. The research employed both qualitative and quantitative methods concurrently; the aim was to establish the

limitations, balance and strength of the data. The methods included participatory action research with closed and open-ended questionnaires and the option for participants to construct their own response about the subject matter. In October 2021, each of the 143 growers was allocated an area of 2,601 m^2 within a forestry plantation area to implement the agroforestry scheme; the total area was 37.2 hectares. The land was made available by Mountain to Ocean (MTO), a private forestry company. This agroforestry initiative is referred to here as the "intervention." The food security status of the growers was assessed before (October 2021) and after (June 2022) this intervention.

The socioeconomic characteristics of community growers in Ehlanzeni District are summarized in Table 1. It shows striking results about the gender of participants (68% women) and age distribution (60% were more than 60 years old, a worrisome indicator that the young generation needs to be attracted to agroforestry).

Weeding groundnuts between rows of young eucalyptus trees at the MTO plantation. Photo: Phokele Maponya

Table 1: Selected socioeconomic characteristics, agri-silviculture community growers, Ehlanzeni District, 2022

Variables	Details	Community growers	Percentage
Gender	Female	97	68
	Male	46	32
	Total	**143**	**100**
Age category	18 – 35	3	2
	36 – 45	3	2
	46 – 60	52	36
	> 60	85	60
	Total	**143**	**100**
Level of education	Less than Grade 7	113	79
	Matric	30	21
	Post-matric	0	0
	Other	0	0
	Total	**143**	**100**
Farming experience (years)	1 – 5	3	2
	6 – 10	3	2
	11 – 20	52	36
	21 – 49	85	60
	> 50	0	0
	Total	**143**	**100**
Training provided *	Yes	143	100
	Total	**143**	**100**

* The provider of training for all 143 participants was the Small Enterprise Development Agency, a division of the national government's Department of Small Business Development.

A glimpse of part of the 37.2 ha allocated to the nearby communities at the MTO plantation. Photo: Phokele Maponya

Food security

Before intervention

An evaluation of food accessibility before the intervention revealed that not all 143 community growers had land to grow or access food and that all were moderately food insecure. Problems such as monotonous diets and few or small meals or undesirable food were commonly mentioned.

Of the growers, 54% indicated problems in terms of food availability before the intervention, mentioning that food runs out before they get money to buy more, while 71% said that they cannot afford to eat enough food every day. 72% mentioned that they often feel hungry and that children cannot get enough to eat (28% sometimes and 72% always). According to Maponya et al. (2022), some of the coping strategies that community growers used to support food availability include buying food on credit from local shops, remittances, social grants, food parcels, food support from neighbours, etc.

In terms of food diversity, all the 143 community growers said they have access to the following foods: cereals, white tubers and roots, vitamin A-rich vegetables, fruits, dark green leafy vegetables, other vegetables, legumes, meat and fish, eggs and dairy products, as well as oil, fat and sugar, and spices, condiments and beverages.

After intervention

Food accessibility after intervention had strongly increased, with a whopping 88% of the community growers indicating that they could now access food on the land allocated to them. Only 12% indicated that they were still food insecure, in some instances because of the lack of transport money to monitor their land allocation and in some instances, because of damage by animals to their groundnut fields.

In terms of food availability after intervention, 59% of the participants indicated that their food never runs out before they get money to buy more; 40% said it sometimes runs out. 38% said that they can always (50% often) afford to eat enough every day. Most said that they can now buy or have enough food and 62% that they are never hungry anymore, including children.

Agri-silviculture community growers have access to both formal and informal markets. On the formal market, prices range from ZAR 200 to ZAR 650 per kg of groundnuts; 19 rand (ZAR) = USD 1. The harvest was transported from Mpumalanga to Pretoria by the processing facility at no cost. On the informal (local) market, prices range from ZAR 50 to ZAR 100 per five-litre bucket of groundnuts. This local market price resulted in a 42% increase in income, although exact figures are difficult to compare because of different marketing metrics (kg versus five-litre buckets). So, people obviously

An agri-silviculture community grower checking the progress of her upcoming harvest and the condition of her harvested groundnuts. Photos: Phokele Maponya

indicated that they prefer the informal market, since they got a good price for their harvest. In addition, it must be emphasized that community growers were reluctant to disclose the exact quantities sold to the formal and informal markets as they feared that future support could be compromised.

Conclusions

The findings of the study show that agroforestry can help bridge the gap between agriculture and forestry by creating integrated systems that fulfil environmental and socioeconomic goals and generate income. Furthermore, public-private partnerships — which involve collaboration between a government agency and a private-sector company — can be used to finance, develop and operate projects such as agroforestry/agriculture initiatives. In this case, the collaboration was between Mountain to Ocean (MTO), a private company, and the Agricultural Research Council (ARC), a government research agency.

The study showed that the agri-silviculture community growers were able to sell their products at both formal and informal markets. The study also indicated the various challenges faced by the growers, including high transport costs and lack of transport. This transport challenge should be prioritized as similar studies indicate that the influence of collaborations, and of increasing access to markets, road and transport, helped farmers shift from subsistence to market-based farming. Furthermore, a gradual increase in the production of crops and the raising of animals contributed to an increase in agroforestry for cash generation.

The current collaboration is growing from strength to strength. The agri-silviculture community growers were allocated a further 150 ha by MTO, given groundnuts seeds by the Department of Forestry, Fisheries and Environment, and the ARC continued with its socioeconomic study and market linkage. During land allocation to the communities, Kalinda Trading, a private company, also served the communities with peanut butter made from the previous growing season's groundnuts sold to the formal market. The agri-silviculture community growers emphasized that they moved away from their villages to the MTO plantation in search of its good climate, including rainfall, and because it would improve their livelihoods through income generation, job creation and food security. It is thus recommended that agroforestry should be intensified across South Africa, especially since it also contributes to Sustainable Development Goals 2 (Zero hunger) and 17 (Partnership to achieve the goal) of the United Nations.

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