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Exploring the potential for silvopasture adoption in south-central Florida: an application of SWOT–AHP method

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Abstract

We analyzed the prospects and challenges for silvopasture adoption in south-central Florida using the strengths, weaknesses, opportunities, and threats approach in combination with analytic hierarchy process. We used preference data from opinion leaders who have had extensive knowledge about silvopasture practices in south-central Florida. Results reveal that strengths and opportunities for silvopasture adoption outweigh its weaknesses and threats. The participants perceive that land stewardship and diversification of income as major strengths of silvopasture and environmental benefits and government support for silvopasture practices as important opportunities. While long-term investment requirement and poor-quality soils are identified as weaknesses for the adoption of silvopasture, government regulation relating to land-use practices is considered as a critical threat. These results provide important insights for policy developments relating to silvopasture practices.
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1. Introduction

Silvopasture is an agroforestry technology that combines trees and pasture with cattle operations (Gold et al., 2000; Clason and Sharrow, 2000). It provides various environmental benefits including soil conservation, carbon sequestration, water quality improvement, biodiversity conservation, and aesthetics (Alavalapati and Nair, 2001; Clason and Sharrow, 2000). This system is thought to have a potential of diversifying the risk and enhancing household income (Kurtz et al., 1996). Lundgren et al. (1983) found that pine silvopasture systems in the southeast could have as much as a 4.5% positive rate of return. Clason (1995) reported that silvopasture utilizing loblolly pine (*Pinus taeda*) in Louisiana could produce greater net returns than either pure pasture systems or pure timber systems. Grado et al. (2001) found that raising beef cattle with pine plantations can be profitable in southern Mississippi. Stainback and Alavalapati (2004) found that combining longleaf pine production with cattle ranching is more profitable than conventional forestry or cattle ranching in Florida. However, silvopasture adoption among North American farmers is still very limited (Garrett et al., 2000).

The prospects for silvopasture adoption are often analyzed using financial cash-flow or benefit-cost techniques (Current et al., 1995; Kurtz, 2000). These analyses, however, incorporate only tangible and commensurable inputs and outputs information to derive decision criteria. A host of environmental, social, and institutional factors, which cannot be quantified easily, may influence landowner's adoption decisions. It is important to know how landowner's preferences to environmental services, uncertainty associated with future taxes, and future land use regulations, for example, influence their silvopasture adoption decisions.

In this study, we attempt to assess the effect of environmental, economic, and social factors relating to silvopasture adoption decisions. We use the strengths, weaknesses, opportunities, and threats (SWOT) approach in combination with analytic hierarchy process (AHP) to achieve this task. The SWOT–AHP allows us to define silvopasture adoption decision process in a hierarchical structure of factors, evaluate factors in pairs, and quantify the relative importance of each factor to the adoption decision. We utilize preference data from selected opinion leaders involved in silvopasture practices in south-central Florida. Although SWOT–AHP is an established method in strategic planning literature, to our knowledge, this is the first study to apply it to agroforestry.

2. SWOT–AHP methodology

The SWOT approach involves systematic thinking and comprehensive diagnosis of factors relating to a new product, technology, management, or planning (Weihrich, 1982). It is used extensively in strategic planning, where all factors influencing the operational environment are diagnosed with greater detail (Weihrich, 1982; Kotler, 1994; Smith, 1999; Hill and Westbrook, 1997). Specifically, it allows analysts to categorize factors into internal (strengths, weaknesses) and external (opportunities,