



Mini-Symposium / Thematic Session 8

Natural capital benefits of agroforestry

This session presents three research papers from the CSIRO's Perennial Prosperity (PP) Project. The Project aims to improve the adoption of trees on farms by quantifying the costs and benefits of trees integrated into agricultural enterprises, and the attitudes of farmers and farm influencers towards agroforestry systems. The Project aims to derive financial and natural capital balance sheets for agroforestry systems that will demonstrate and quantify the benefits of trees on farms and will show that the right trees in the right places will add substantial value to the farm enterprise, both in terms of cashflow and capital.

Paper 1: A review of the literature on cultural ecosystem services benefits of trees and forests

Tim Capon

Cultural ecosystem services are the most difficult type of ecosystem service to quantify and monetize. The Millennium Ecosystem Assessment (2005) doesn't provide detailed guidance on how to ask landholders and residents to value cultural ecosystem services. Our literature review focuses on three main types of cultural ecosystem services: educational values, sense of place, and heritage values. The objective of the review is to 1) evaluate the various methods used to assess, define, or measure cultural ecosystem services related to trees and forests, and 2) collate any monetary values that have been estimated for cultural ecosystem services of trees and forests. Additionally, from our literature review, we have identified a range of themes about the characteristics of places and how people interact with these places, that could affect people's values for cultural ecosystem services.

Paper 2: Using the Imagine model to account for the full value of agroforestry systems

Daniel Mendham

Farmers understand that the value of trees extends beyond the value of just their wood products, as they convey many other natural capital benefits, including shade and shelter for crops. But to date the decision to plant commercial trees tends to be focussed on the relatively low value wood products, and the fact that returns occur decades into the future. By quantifying and bringing a range of these other natural capital benefits into the Imagine model, we are demonstrating that planting the right trees in the right place can add substantial value to farm enterprises starting from early in the tree rotation. At 4 case study sites in Tasmania we have demonstrated that accounting for five of these natural capital benefits (carbon, amenity, livestock benefits and timber products),

from a strategically located *Pinus radiata* shelter belt increased the gross margins from a 25 ha grazing paddock on average by \$2000-3000 per year (depending on shelter belt configuration).

Paper 3: Quantifying farmer preferences for agroforestry design attributes and ecosystem services

Mark Tocock

This study explores farmer preferences for agroforestry design using data from a discrete choice experiment undertaken in temperate agricultural regions of Australia. Marginal willingness to pay estimates were obtained for: species composition, configuration, and extent of tree cover. To test the hypothesis that agroforestry design preferences will align with demand for ecosystem services, participants were also asked to rank the relative importance of a range of ecosystem services.

Results revealed strong preferences for lower-cost agroforestry alternatives, mixed native species compositions over single species pine, and shelterbelt/woodlot configurations over paddock trees. Design preferences were found to align with demand for ecosystem services, with biodiversity and shelter-related services ranked most highly. These results can inform development and application of extension and policy efforts aimed at increasing agroforestry adoption within the study area and beyond.

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