

The History and Future of Agroforestry Research and Development: Policy Impacts and Needs

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Forests in the Global Balance – Changing Paradigms
IUFRO World Series Vol. 17

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What is agroforestry?



Agroforestry (AF) is:

- practices where trees are integrated into farming
- interdisciplinary subject area
 - embracing land use systems
 - involving interactions among trees, people and agriculture.

There is a long tradition of AF practice in many parts of the world, but only during the last three decades, AF has developed as a formal scientific discipline.

AF unites the subject areas of forestry and agriculture

Agroforestry:

- contributes to sustainable natural resource management
- introduces a more human perspective from agricultural tradition into forestry
- includes the understanding of social processes and behaviour of people
- emphasizes a more ecological perspective in agriculture
- includes longer time horizons and larger spatial scales than agriculture.



Evolution of AF research since the 1970s (1)

Description: farmer knowledge of agroforestry systems (AFS);
tropical and temperate agroforestry



Quantification phase: scientific quantification of biomass and
productivity; above-ground nutrient cycling



Interactions: adaptations from other disciplines for tree-crop
interactions; below-ground studies



Socio-economics: economic analyses; farmer decision making;
labour and gender; market studies of products



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Evolution of AF research since the 1970s (2)

Integration: integration of bio-physical with socio-economic variables; indirect interactions



Environmental services: biodiversity in AFS versus other land uses; AFS and water/carbon; soil and nutrient conservation



Markets: quality of products; certification; value chains; national and international markets



Policy: intellectual property/germ-plasm rights; reforestation incentives; land use and policy interventions; competitiveness

The major general shifts in AF research and development

In broad lines the emphasis has shifted:

- from description of systems, to understanding how they function
- from simple systems at field and farm levels, to complex, diverse systems at landscape and regional levels
- from researcher designed practices, to farmer designed practices based on local knowledge
- from quantification of productivity, to economic valuation of environmental services.



From a narrow focus on biophysical variables to an interdisciplinary approach

Today focus is on:

- diversified land uses (e.g. timber-coffee AFS) or particular functions (e.g. climate change) rather than on one commodity (coffee) or discipline (e.g. soil fertility)
- integrating information from both the socio-economic and biophysical fields.



Growing emphasis on an interdisciplinary approach to sustainability



Today AFS research and development emphasize:

- improving farm profitability (productivity, sustainability and quality of products)

as well as

- quantifying and valuing the environmental services provided in managed rural landscapes.

➔ AFS are now considered important for achieving the Millennium Development Goals.

Major changes in funding and collaboration mechanisms

- Many public sector institutions contributing to AFS research and development are privatized, with decreased budgets and personnel.
- Medium and long-term sustainability of specific research areas and independence of researchers is diminishing.
- New public-private partnerships and new management models for research and development institutes need to be built.



Challenges in developing AFS (1)

Climate change:

- **adaptation** to cope with droughts and/or intensive rainfall
- **mitigation** by AFS enhancing productivity and carbon sequestration

Genetics and plant improvement:

- diversification of AFS species of high market value and quality

Ecosystem sustainability:

- quantifying and valuing environmental services of AFS

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Challenges in developing AFS (2)



Soil micro-flora and macro/micro-fauna:

- identification of soil components for the management of AFS interventions

Biological and cultural control:

- biological disease and pest control to reduce costs

Value chain analyses:

- supporting value chains, certification and chain of custody

Challenges in developing AFS (3)

Landscape planning and management:

- assessment of different land uses and management of environmental services at different scales

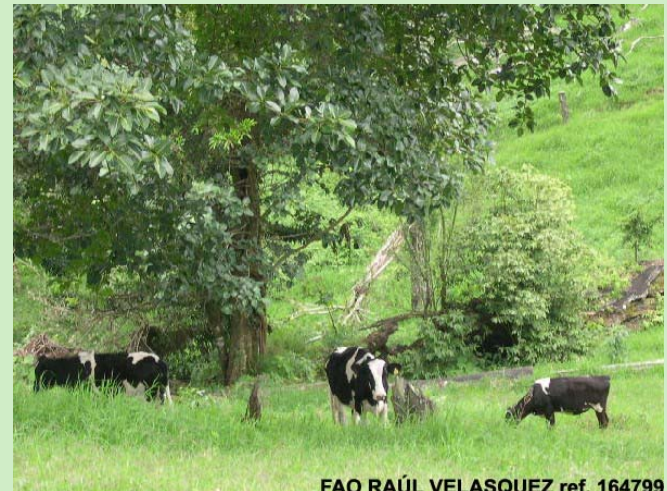


Policies:

- prevention of degradation and rural poverty

Socio-economics:

- understanding of the rapid changes in the social structures at all levels



Towards a new AFS research and development framework

A more interdisciplinary research framework is needed with:

- decentralized flexible, interdisciplinary thematic groups
- innovative collaborative arrangements with new partners
- improved integration of higher education and research programmes and joint degree programmes.



Agroforestry for development and sustainability



More integrated and synthesized information is needed for efficient, cost effective and socially equal policy making and for setting local, national and international priorities.

For example there is need for:

- models and predictions of the effects of macroeconomic changes on the viability of AFS, both traditional and novel
- methods to integrate and predict the effects of different policy interventions.