Opportunities and Limitations for Agroforestry Systems in the Highlands of North Thailand

Abstract

This paper begins with a brief review of forces and processes underlying current transitions in the highlands, organized under six themes: 1) geo-politics and geo-economics; 2) population growth and migration; 3) agricultural commercialization, capitalization and opium crop substitution; 4) forest resource management, watershed protection and environmentalism; 5) urbanization, industrialization and tourism; and, 6) adaptations in land use, society and culture.

Projected major roles of the highlands in the future are discussed within two broad categories: 1) *protective functions*, including maintenance of watershed services, biodiversity, carbon stocks and esthetics; and 2) *productive functions*, including agricultural production, forest products and tourism. The tension between protective environmental functions and productive developmental functions can be expected to continue as society continues to search for ways to balance and integrate the two.

Although many agroforestry systems potentially relevant to the highlands have been catalogued, there are two basic categories: 1) *sequential systems*, which include both traditional and modified types of swidden agriculture, as well as relay and transitional intercropping; and 2) *simultaneous systems*, which include both strip plantings (*e.g.*, alley cropping, boundary plantings) or mixed plantings (*e.g.*, home gardens, "jungle rubber"). Management approaches can be *field-based* or *landscape-based*. The paper proposes a new type of simultaneous system that appears to fit with recent trends in the highlands: a landscape-based system that employs a community watershed mosaic pattern of land use management.

Contributions that agroforestry systems may be able to make toward improved sustainability, productivity, stability and equity in the highlands are discussed in terms of: 1) watershed regulation; 2) nutrient capture and retention; 3) biodiversity; 4) carbon sequestration; 5) household incomes; and, 6) equity. Although agroforestry cannot be expected to be a panacea for solving the range of complex problems related to land use in the highlands, it appears to offer some promising options for efforts to seek a "middle way" between extremes of environmental preservation and economic development.

Six general factors that may facilitate or limit the use of agroforestry systems in the highlands are briefly reviewed: 1) Increased *land pressure* is already inducing transitions in land use patterns and adoption of agroforestry-related practices. 2) Variation in *resource base characteristics*, including both their capacity and current condition, can facilitate or limit adoption of agroforestry systems. 3) *Access* to roads, markets, inputs, capital, information and education can strongly influence adoption and development of agroforestry, as well as its opportunity costs; 4) The level of *commercialization* helps determine opportunity costs for agroforestry, selection of components and the direction of system development; 5) The strength of *local organization and institutions* can affect the viability of agroforestry, and is especially important in landscape-based systems; and, 6) The content, enforcement and perceptions of *government policy* can facilitate or limit adoption and development of agroforestry in the highlands, especially in terms of tenure, land use constraints, infrastructure and services.

Actual acceptance, adoption and development of agroforestry systems by households and communities in the highlands is likely to be based on a rational decision-making process. Incremental acceptance and adaptation can be expected, and is a process that can help strengthen their skills and ability to adapt to further changes expected in this rapidly changing region.

Finally, the paper very briefly introduces efforts that the International Centre for Research in Agroforestry (ICRAF) and the global Alternatives to Slash-and-Burn Agriculture (ASB) Programme have very recently begun to facilitate development of a regional-level analytical mechanism in North Thailand, aimed at accelerating the learning process associated with development and implementation of appropriate agroforestry systems, and understanding of their effects on national and global issues.