

## **Symposium 1: Multi-functionality and Ecosystem Services, August 26, 2009**

Reported by Grace Villamor and Meine van Noordwijk

### ***Segregate or integrate for multifunctionality and sustainability***

The symposium was opened by raising questions for multi-functionality:

1. Where is the space for synergy in integrated multifunctionality?
2. Where are 'hard tradeoffs' unavoidable and is segregated multifunctionality more efficient?
3. How can sustainability of people, flora and fauna be secured?

Introduction by chair: Meine van Noordwijk, World Agroforestry Centre  
Agroforestry as the interface of the agricultural and forestry spheres has strong roots in an 'integrate' approach to multifunctionality. It achieves short, medium and long term goals in the provision of valued goods and services. The 'segregate' approach achieves multiple goals by intensive agriculture (or tree production) in one part of the landscape and areas dedicated to conservation elsewhere. It minimizes the interface of agriculture and natural forests. By contrast, the integrate approach combines functions within unified management. The segregate-or-integrate choice plays out at multiple spatial scales, from farm to landscape, but also across time. The 'segregate' pathway has been associated with the 'intensification' hypothesis, expecting that more productive forms of agriculture will leave more space for conservation. In reality, however, this forms a necessary but not sufficient condition for achieving conservation goals. The shape of tradeoff curves between the multiple functions provides a guide to rational choices in the segregate-or-integrate dilemma. Locking up land for single functions may seem efficient for now, but reduces future options. The sustainability questions focuses on the maintenance of resources for future change and includes the reversibility of choices and opportunities for cross-scale access to biological resources for future goods and services. The symposium started with current concepts and criteria, and then provide perspectives from three continents and bridging the science-policy continuum. There are unavoidable tradeoffs (ecological services vs. goods and tradables) in the landscapes, but many systems operate substantially below the potential to reduce diversity as well as livelihood deficits, and thus allow for local win-win solutions.

Presenter 2. Hesti Tata (Forestry Research and Development Agency, Indonesia): A case study of change in the integrated rubber agroforest landscape of Jambi

The case study of the tradeoff between profitability and biodiversity focused on the current role and dynamics of Rubber Agroforest (RAF). Various biodiversity indicators (including the vegetation and fauna diversity at family, genus or species level and IUCN red list species) suggest that the biodiversity deficits in these systems are small, while the profitability (returns

to labour) is compatible with local wage rates. Beyond the marketable products, RAF provides considerable benefits for the farmers' livelihoods by retaining the useful trees for fruit, food, fodder, medicine, dye and timber. The high proportion of fruit trees attracts bats, birds and other fauna as pollinator and dispersal agent. Yet, the current trend in the landscape is the replacement of complex RAF by monoculture tree plantations (rubber or oil palm). Increased profitability of the RAF systems is needed to keep it in the landscape and fulfill its ecological functions. Eco-certification as a payments for ecosystem services (PES) scheme is currently explored as an option of secure sustainability in the RAF dominated landscape.

Presenter 2: Jianchu Xu (ICRAF) - Maintaining ecological connectivity in the Greater Mekong Subregion through agroforestry

This presentation highlighted a different story of the rubber in the landscapes of the Mekong Subregion. The diverse landscapes in the greater Mekong (diversified swidden agriculture e.g. Hani Taungya swidden-fallow) are currently challenged by rubber monocultures.

The traditional Swidden farming e.g. Hani Taungya swidden-fallow is a tedious (time consuming) activity that farmers readily give up for rubber monocultures, as supported by the country's policy and existing institutions. Because of this, there is an imbalance between biodiversity conservation and consumption. To address these aspects of the rubber monoculture in the landscape, a project to develop the carbon and biodiversity assets for multifunctional landscapes in upper Mekong was presented.

Presenter 3: Celia Harvey (Conservation International): Biodiversity conservation in landscape mosaics of Central America: Segregate or integrate?

The presentation showed how biodiversity can be compared across forest, pasture and silvopastoral systems in four highly fragmented landscapes in Central America. Factors such as 1) floristic composition and structural complexity; 2) management; 3) tree density; and 4) location of the silvopastoral plot within the broader landscape were presented and showed how it influenced patterns of biodiversity within silvopastoral systems. It providing significant information on the segregate and integrate issue. With regards to the comparison of the biodiversity within the silvopastoral landscapes to that of forest landscape, the presentation showed that the rate of species accumulation within agroforestry landscapes may be similar to that of intact forest landscape but the species composition may be quite distinct.

The general discussion focused on the various types of livelihood and diversity deficits. Issues of scale, optimal spatial structure, invasive exotics and incentive structures require further attention.