The Application of Ethnobotanical Research to Working Forests in the Tropics

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Editorial

In this special issue of Ethnobotany Research and Applications, members and affiliates of the National Science Foundation funded Working Forest in the Tropics Integrative Graduate Education and Research Traineeship (hereafter WFT-IGERT) present case studies from research in Mesoamerica, lowland and montane Amazonia, the Andean Sierra, and Sub-Saharan Africa. In the spirit of actively engaging graduate students in publications and professional activities, the guest editorship was led by a recent PhD graduate of the Working Forests in the Tropics IGERT (Luzar) with the assistance of a University of Florida associate professor and one of the co-principal investigators on the grant (Stepp).

The WFT-IGERT is a collaborative effort started in 2002, between faculty from the disciplines of anthropology, botany, wildlife ecology and conservation, forestry and Latin American studies. In addition, there are participating faculty from another dozen or so related disciplines. We have developed what we hope is an innovative graduate education program that focuses on interdisciplinary skills and knowledge of human-environment interactions related to the use and conservation of tropical forests that generally do not enjoy protected-area status and are subject to human use for economic purposes, known as "working forests." The training program includes cross-disciplinary requirements, consisting of courses in ecology and social science, history/culture of the research regions, and appropriate language proficiency; integrative coursework; and complementary learning/teaching opportunities. The research goals are to analyze tradeoffs and complementarities among working forest options; clarify how biophysical, social, economic and political constraints and their interactions influence the effectiveness of different kinds of working forests for conservation and development; and measure the impacts of capacity-building interventions designed to improve forest management and promote conservation (Zarin *et al*. 2003). The methods are integrative across a wide range of disciplines and, in part, explicitly comparative across four tropical forest regions: Lowland Bolivia; Acre, Brazil; Eastern Amazonia, Brazil; and the tri-national Maya Forest, although over time we have had affiliates work in other tropical regions as well.

Of course, the work presented in this special issue represents only a fraction of research interests in the WFT-IGERT. These papers specifically focus on the utility and application of ethnobotany (*sensu lato*) to conduct research on the appropriate conservation and management of tropical forests that takes into account that these forests are occupied and have, in some cases, been utilized for millennia. What follow is a brief summary of the papers divided by their geographical regions.

Mesoamerica

The Maya Forest is a well known area of lowland tropical forest that spans across Belize, Guatemala and Southern Mexico and presents numerous opportunities for working forests research. Wyman *et al*. (2007) use socio-demo-

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graphic data and remote sensing to explain differences in land cover change in two municipalities in Mexico's Yucatan Peninsula between 1988 and 2001. Land cover in the region is dominated by dry tropical forest. As the region is experiencing accelerating deforestation, research has been needed to assess the significance of various drivers of land use change in the region. The majority of the fieldwork was composed of two parts. The authors first analyzed previous satellite imagery to predict land cover for 2004. The team then visited the site to assess the accuracy of their predictions and to gather socio-demographic data. Based on their study, the authors found that the major drivers of land cover change in the region have been infrastructural and political in nature. Specifically, they point to the importance of proximity to a major highway and to the capital city of Yucatan state, Mérida, as well as governmental programs encouraging land privatization and agricultural intensification as principal drivers of deforestation in this region during this period.

Moving from Mexico into Guatemala, we find Wilsey and Radachowsky (2007) considering means of promoting sustainable non-timber forest product (NTFP) management in the Maya Biosphere Reserve of Guatemala's Petén region. The authors discuss problems with boom and bust tendency in the production of palm leaves (*Chamaedorea* spp.) as this product is gradually forced to compete with palm leaves grown intensively in plantations. The tendency of this, like other NTFPs, to be replaced by plantation crops has implications for the viability of this product as a component of integrated conservation and development in community forest concessions in the reserve. In light of this dilemma, the authors assess the capacity of certification as a strategy to promote the socially and ecologically sustainable extraction of palm leaves.

Amazonia

Baraloto *et al*. (2007) assess the accuracy of the parataxonomy of 310 woody harvested species in the Brazilian state of Acre. The authors found that majority of commercial species had multiple common names. While less common, the authors also found many cases in which a single common name was applied to multiple taxonomic species. The lack of conformity between common and scientific identification presents challenges to the sustainable harvest of timber species in the region. The authors conclude by discussing several programs aimed to rectify the disjunctures between scientific and parataxonomic identification of trees in Acre.

Keefe (2007) considers the ethnoecology and economics of forest use in a community in the state of Amapá in the Brazilian Amazon. The author focuses upon two timber species and one non timber forest product (*Euterpe oleracea* or **açai**). Drawing upon interviews with rural households conducted over three years, the study found that household residents had a well-developed understanding of the implications of biophysical phenomena such as tides and topography for these products.

Del Campo and Wali (2007) evaluate the effectiveness of asset mapping that has been adopted by the Field Museum of Chicago as a technique for promoting local participation in protected area management in the Cordillera Azul Park in the Peruvian Amazon. Asset mapping represents an effort to include local understandings of the surrounding ecosystem and priorities for its management into resource management strategies for the region. The authors highlight an example of asset mapping in 53 communities in and around the Cordillera Azul Park in which community members designed community shields representing the communities. The shields were analyzed by members of the research team and community to better understand the ways in which communities envisioned their place in the wider physical and political world. The authors see the exercise as an example of asset mapping through which local needs and perceptions can better be incorporated into management plans.

Given the large amount of lands they possess, indigenous people are key stakeholders in the conservation of Amazonian ecosystems. Duchelle (2007) examines the use of natural resources among the Shuar, an indigenous group in Ecuador's Cordillera del Cóndor. She focuses specifically on the use of woody plants, agricultural systems and attitudes toward conservation in a Shuar community of Warints. In the study, forest transects were used to collect plant specimens from mature forest and abandoned cropland. These specimens were then used to gather information from community members about the plant's Shuar name and traditional uses. Additionally, semi-structured interviews were conducted to gain broad insights into Shuar attitudes toward conservation and threats to their forests and livelihood systems. The author concludes by pointing to mining and hunting as the most pressing threats facing Shuar livelihood systems.

Andean Sierra

Luzar (2007) offers an assessment of the social and economic impacts of an introduced species-*Eucalyptus globulus*-in a peasant community in the Peruvian Andes. Using a political ecological perspective, the author shows the ways in which this tree species has been intimately connected with political and economic transformations in the region. The widespread propagation of the species in the mid-20th century was a reflection of contemporaneous political and economic processes, including agrarian reform. Subsequently, *E. globulus* has had various political and economic implications for this campesino community including the facilitation of the community's interactions with the regional cash economy and the creation of a space in which the community and outside actors such

as the state, NGOs and regional businesses, negotiate for power. The study shows the ways in which the introduction of commercial timber species can transform not only the physical landscape, but also the economic and political landscapes in regions such as the Southern Peruvian Andes.

Sub-Saharan Africa

Moving out of the neotropics into Africa, Thangata *et al*. (2007) find that an important component of both forest conservation and food security in many parts of Sub-Saharan Africa is the use of improved fallows, both as a means of restoring soil fertility and for household income from the various plant species present in these areas of managed secondary succession. Using linear programming, they assessed the likely factors affecting the future adoption of agroforestry as a means of improved fallow management in three case studies in Sub-Saharan Africa. Interviews with rural households were used to collect data on local livelihood systems, which were then used to create representative linear program model for each case study. Based on the results of the linear programming models, the authors see the potential for successful widespread adoption of improved fallows. However, the success of efforts will largely depend, they argue, on careful case-by-case attention to household composition and availability of household land, labor and cash.

Morton (2007) addresses the commonly held notion linking household fuel wood harvesting with savannization in Sub-Saharan Africa. The author focuses specifically upon the use of woody plants among seven households in a small community in Western Mali. The author conducted a preliminary study measuring fuelwood consumption among the households. By using inventory plots, fuelwood supply was also measured in fallow areas owned by each family. With linear regression analysis, the author failed to find a significant relationship between the number of individuals in a household and the amount of woody biomass used. Based on these findings, Morton did not find evidence that fuelwood consumption leads to deforestation in this particular community.

The Future of the WFT-IGERT Program

As a five-year NSF funded initiative, we are taking stock of our efforts to date and plot a course for the future. While many components of the program existed prior to the grant, we have been able to significantly strengthen course offerings, attract new faculty and make progress towards ensuring that the program persists beyond the sponsorship of the National Science Foundation. Our first graduates are starting to emerge and will leave the University of Florida to work in a range of settings: academic, government, NGO and the private sector. It is our hope that they will continue to engage in collaborative and meaningful research on forests and the people who reside in them worldwide.

Acknowledgements

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