



# Newsletter

**DFG Research Unit 816:**  
Biodiversity and Sustainable Management of a Megadiverse Mountain Ecosystem in Southern Ecuador

**Issue 6 - July 2009**

## Speakers' Corner

### Second Phase of the RU

During the past months the research groups and the local managers were occupied with the preparation of the application for funding of our Research Unit (RU) for another 3 years, the second phase of the 6-year period of any RU funded by the German Research Foundation (Deutsche Forschungsgemeinschaft, DFG). On 18<sup>th</sup> of June the compilation of the applica-

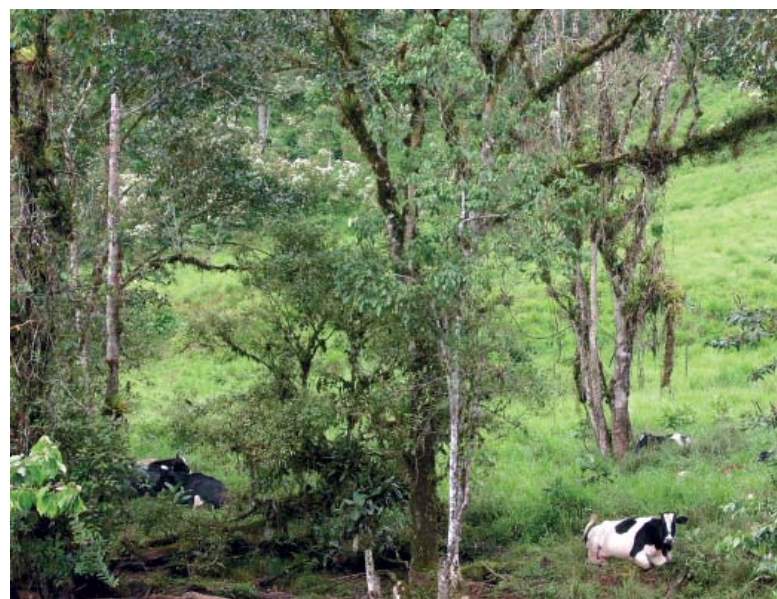
tion booklet (with more than 1000 pages it is rather a weighty tome than a booklet) was completed and the digital file was delivered to the printer on 19<sup>th</sup> June. The speaker's office is still occupied with compiling the application DVD and the quotation booklet which is expected to be completed in the last week of June. We are confident to deliver the whole application to DFG in time (deadline 1<sup>st</sup> of July). At this point, we would like to thank all applicants for their excellent collaboration and particularly, for their endeavours to meet all the deadlines.

### Contributing Data and Talks

At the same time, we are polishing our web performance for review which encompasses the data warehouse. It will be unlocked for the reviewers over the next months. Needless to say, that the reviewers

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Sustainable land-use in Ecuador seems feasible since farming and conservation issues can be reconciled as RU scientists found out recently. Details are in the section Science News. Photo: RU 816.

expect data sets from all contributing projects. With regard to data upload, we definitely need a significant improvement of the collaboration of the PIs in the next weeks, which unfortunately appears really poor at the moment. Currently, the speaker's office is asking for contributions to our Status Symposium in Loja because the application for additional travel funds has to be compiled soon. We also thank for your collaboration and meeting the deadlines in advance.

### DFG President Will Visit the ECSF

The application for the prolongation phase comprises also the organization of the evaluation event, bringing the review panel to Loja and to the ECSF, arranging the meetings with local counterparts and authorities, and combining the evaluation with the annual Status Symposium in Loja. Shortly before the evaluation, the President of the DFG, Prof. Matthias Kleiner, accompanied by high-ranked DFG-officials, will visit Loja and the ECSF on the occasion of a journey to several South American countries. We appreciate your understanding that not all PIs and students can stay at the station during this time, because the rooms are needed for our guests. Details will be discussed at our member assembly at Marburg. This visit will hopefully also bring the top management of NCI to Loja. Previewing all the events, October and November will become a hot fall for our RU.

### Speakers Met NCI Founder

In the run-up of the preparations for the new application the Speaker and Deputy Speaker visited Nature



Ivan Gayler has transferred the NCI presidency to Byron Swift. Together with Erwin Beck and Jörg Bendix (from left to right), they exchanged current and future plans. The image was taken while they were hiking through a wilderness on the Southern California coast close to Del Mar which harbours the rare Torrey pine trees. Photo: Erwin Beck.

and Culture International (NCI) in Del Mar, California, in April 2009. The Presidency of NCI has now been conveyed from Ivan Gayler to Byron Swift, an experienced environmental lawyer. It was a fruitful exchange of ideas and information. Apart from financial considerations especially with respect to the rent of ECSF by the RU and local salaries for drivers and guards which have to be reflected in the context of the economic and financial situation of Ecuador, the major intentions of the extension phase and the perspectives beyond 2013 were discussed.

### Future Research and the RBSF

NCI has purchased more areas not only in the San Francisco valley and around the Podocarpus National Park but in particular also in the dry forest areas of southern Ecuador and northern Peru, as well as in the Amazon lowland and foothill region of this country. A few of these areas are already equipped with facilities for researchers, but upon request NCI would also consider improvement. Of course those additional research facilities will not be offered for free, but at negotiable favourable rates. NCI as well as the RU are interested in a continuation of the mutually beneficial cooperation after the termination of the current RU (DFG no. 816) and extending the research area to the dry forest would be an obvious aspect.

### Involving Ecuadorian Students

This does not mean that the highly equipped research platform "RBSF" would be given up. On the contrary by intensifying our fruitful cooperation with our Ecuadorian counterparts we hope that at least part of the ongoing monitoring research could be continued by them and that further individual projects in the San Francisco valley will still be funded by the DFG. A first move in that direction has been mentioned in our last Newsletter by the stepping in of Ecuadorian PhD-students paid by their universities whose work is jointly supervised by Ecuadorian and German PIs. We hope that it will be possible to make use of the Transfer-Program of the DFG for that purpose. This however will need intense discussions with the DFG.

### Upcoming GTOE-ABTC Conference

In the next weeks, the speaker and his staff are operating at full stretch for the preparation of the joint meetings of the Association for Tropical Biology and Conservation (ABTC) and the Society for Tropical Ecology (*gtö*) entitled "Impacts of Global Change on Tropical Ecosystems - cross-cutting the Abiotic, Biotic and Human Spheres" which will take place in Marburg, Germany, from 26<sup>th</sup> to 31<sup>st</sup> July this year ([www.gtoe-atbc2009.com](http://www.gtoe-atbc2009.com)). The meeting will encompass our general Member Assembly which is scheduled for 14:00

LST on Wednesday 29<sup>th</sup> July in the central lecture hall building of the University of Marburg.

### RU Members Chair Focal Sessions

It is striking that our RU is exceptionally well-represented giving numerous talks and presenting many posters at the conference. Particularly, RU members are organizing eight focal sessions of the conference, evenly distributed over the four central days:



- “Tropical dendroecology” is organized by Achim Bräuning (Monday 27<sup>th</sup>; session 3)
- “Biodiversity theories” is chaired by Erwin Beck and Manfred Nikisch (Monday 27<sup>th</sup>; session 20)
- “Learning from the past: environmental history and biodiversity development” is organized by Herrmann Behling and Simone Haberle (Tuesday 28<sup>th</sup>; session 15)
- „Tropical forests“ is headed by Robert Gradstein and Patrick Jansen (Tuesday 28<sup>th</sup>; session 37)
- „Tropical Fungi & Mycorrhiza“ was initiated by Ingrid Kottke and Gerhard Kost (Tuesday 28<sup>th</sup>; session 7)
- “Nutrient manipulation experiments in tropical forests” is organized by Jürgen Homeier & Christoph Leuschner and addresses one of the focal experimental issues of the RU (Wednesday 29<sup>th</sup>; session 9, see also section Science News in this newsletter)
- “Applying ecological knowledge for sustainable management of tropical forests” organized by Sven Günter and Marielos Peña Claros (Thursday 30<sup>th</sup>; session 8)
- “Human ecological dimensions in sustainable utilization and conservation of tropical rainforests” initiated by Perdita Pohle and Heiko Faust (Thursday 30<sup>th</sup>; session 14).

The last two of them will highlight aspects of sustainable development and socio-economic issues which are a central theme of our RU. We are confident that all of these focal sessions will attract major attention of the audience.

*Jörg Bendix and Erwin Beck,  
Speaker and Deputy Speaker of the RU*

## News from the ECSF

### Studying in Germany

Simon Kreye, Cultural Attaché of the German Embassy, and Paul Vörkel, representative of the German Academic Exchange Service (DAAD) visited Loja and the Research Station (ECSF) on April 27<sup>th</sup> and 28<sup>th</sup>. About 40 students attended the presentations in the *Casa de la Cultura* in Loja, where Kreye and Voerkel introduced characteristics and peculiarities of German culture. The speakers also informed about the distinctive features, possibilities and preconditions for applications to study at a German university financed by the DAAD. This included undergraduate, graduate as well as postgraduate studies. The presentations were followed by an open discussion and later on by individual dialogues.

After Kreye and Vörkel spent a night at the ECSF they explored the ECSF reserve on a walking-tour before they returned to Loja.

*Felix Matt*



Paul Vörkel (left) addressed the services and benefits the DAAD offers to foreign students studying in German in his talk entitled *Estudiar e Investigar en Alemania*. He is flanked by Simon Kreye from the German Embassy. Photo: Felix Matt.



An audience of students and interested parties listened to the talks about living and studying in Germany as well as the requirements to apply for financial support provided by the German Academic Exchange Service (DAAD). Both talks were given at the *Casa de la Cultura* in Loja. Photo: Felix Matt.

## News from NCI

### Conserving Dry Forests

Recently Nature and Culture International (NCI) purchased about 1,900 hectares of the Tumbesian dry forest in Zapotillo county. The forest is situated close to the Peruvian border opposite the Peruvian Biosphere Reserve *Tumbes*. Bolivar Tello explains how NCI helps to conserve these threatened forests on the next page.

### Zoning proposal for the forests of Hacienda Romerillos

NCI has sent a detailed proposal to the Municipality of Loja to assume management of 30,000 hectares of the Hacienda Romerillos tract. This area is owned by the municipality and borders Podocarpus National Park, but is not actively managed. Through a thorough survey of the land NCI has already recommended that nearly 7,500 hectares of exceptionally preserved cloud forest be established as three municipal reserves adjacent to the Podocarpus Park.

The Romerillos property was purchased by the city of Loja in 1937 and consists of over 75,000 hectares, 60% of which is located in the Podocarpus Park. Land use regulation here has been difficult or nonexistent in the past, making NCI's zoning proposal of utmost

importance for the conservation of this threatened cloud forest. The region protects an incredible amount of biodiversity and is home to such attractive mammals as the spectacled bear, mountain tapir, ocelot and puma.

### Watershed Project FORAGUA

The Ecuadorian cities of Pindal, Celica, Puyango, and Macará as well as the NCI board of directors in the United States recently approved the Regional Water Trust Fund (FORAGUA, Spanish acronym). As explained in a previous issue of the TMF newsletter ([issue 3, page 4](#)) NCI has been working on the protection of these watersheds by buying areas and providing the necessary technical and legal support to local administrations.

An endowment will be established with the funds collected from taxes for water consumption. These funds will be complemented by funds received through international cooperation, hydroelectric plants, banks, enterprises, NGO's and the central government. In this way NCI is helping to further the implementation and conservation of watersheds and reserves within Ecuador.

*Helmut Sonnert*

## Sharing Management Duties

**To conserve the highly threatened Tumbesian dry forests, NCI helped to employ a new model of management to meet conservation needs as well as the requirements of local people.**

The dry tropical forests of southern Ecuador and northern Peru, known as the Tumbesian Dry Forests, have been declared highest priority of conservation in the world, harboring a huge number of endemic plants and animals. However, since people inhabit the area, classical models of conservation will not succeed here.

Originally this land was owned by large private estates of up to 17,000 hectares and managed under a feudal system. The area was used for various agricultural and livestock ventures by local people, who were completely dependant on this source of income. Changes in annual rainfall have caused local economic instability.

Local people still depend on forested regions for water conservation in this mainly arid climate where only around 10% of the land has access to manmade or natural irrigation. The people also depend on the forests as a source of livestock feed for cattle and goats. Native hardwoods provide the majority of local construction materials and kindling.

Forested areas make up between 50 and 60% of the land (state-owned, communal, or private), a percentage that is ever-decreasing due to land clearing for agricultural use as the price of corn remains high. Unfortunately, the government has not paid much attention to the conservation of these natural resources and each day these forests are more and more threatened by illegal deforestation and rapid growth of agricultural areas.

Since 2000 Nature and Culture International (NCI) has been working to create a system of protected areas to guarantee the conservation of these forests: It developed a new model of conservation in which the people both benefit from the forest and work to conserve it. First NCI acquired a reserve in Zapotillo County known as *The Ceiba* (about 10,000 ha) which originally belonged to two estates: *Romeros Huasimal* (mainly Peruvian) and *Ceiba Grande* (mainly Ecuadorian). Peace agreements between Ecuador and Peru in 1998 obligated the two countries to remove any military presence within 50 km of the border, causing social chaos in these regions and an increase in livestock theft and massive deforestation of local hardwoods. Unfortunately, the life of the local poor was affected the most.

Due to the urgent nature of the problems, NCI then developed the idea to create a Shared Management



In the *La Ceiba* Reserve members of the Shared Management Committee established rules for grazing livestock. They also decided upon the use of lumber and regular monitoring of the reserve. Photo: NCI Ecuador.

Committee among the local people and NCI to stop indiscriminate deforestation and livestock theft as well as to permit sustainable use of the forest. 16 members formed the association of livestock herders *2 de Febrero* in 2005. This organization, along with NCI, formed the Shared Management Committee of *The Ceiba* reserve.

Their first actions were to build fences around the reserve areas and to establish new rules for the management of livestock within the reserve. The Shared Management Committee continues to meet on the 2<sup>nd</sup> of every month to evaluate current conservation and development efforts and to plan future projects.

In 2007, the association was officially recognized by the government of Ecuador. It is currently made up of 72 official members with another 20 applications pending. The group continues to work towards its original goals through monthly hikes to monitor and control the state of the reserve as well as local research to improve local production systems and quality of life. Among the groups most important achievements are the establishment of areas set aside for livestock to graze and areas for communal use of resources like lumber, group planning of long-term conservation efforts, as well as biological and social monitoring.

*Bolivar Tello Cano*  
([botelloci@hotmail.com](mailto:botelloci@hotmail.com))

In this section NCI ([www.natureandculture.org](http://www.natureandculture.org)) introduces its activities. NCI is a non-governmental organization whose mission is to assist in the conservation of biological and cultural diversity.

## Science News

### Reconciling Conservation and Needs of People

**A new model of land-use preserves natural forests, generates “new” natural resources, and gives rise to farmers’ income. As soon as ten years after the start deforestation could be stopped.**

Our work aims at investigating the deforestation and reforestation/rehabilitation processes for a tropical landscape. Both a financial perspective and aspects of sustainability were incorporated into the analysis: Using computer simulations we developed a concept of Ecological-Economic Farm Diversification (EFFD) that is capable of convincing farmers of the benefits of sustainable practices and of halting deforestation.

The EFFD showed that stopping deforestation after ten years is possible without violating subsistence demands. The key activity in halting deforestation at the farm level is the accumulation of “new” natural resources, through reforestation with the native tree species Andean alder (*Alnus acuminata*); a species that can be used for a wide variety of purposes, which are scientifically well documented. By reforestation, formerly unproductive “wastelands” like abandoned pastures can be returned to productive land use.

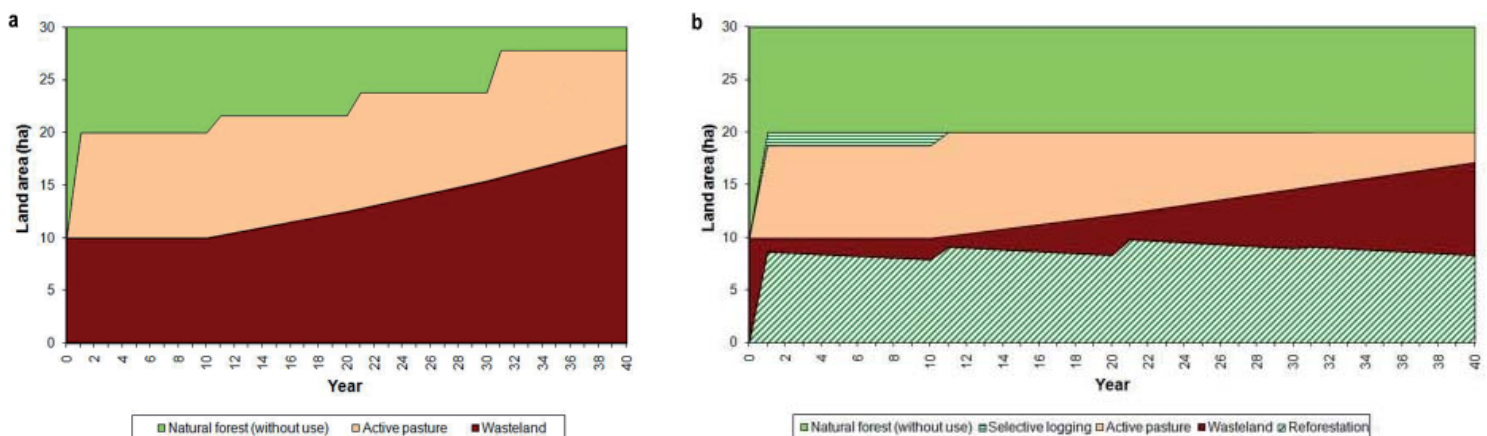
### Classical Strategies Lead to Deforestation

For a small farm (30 ha), including 10 ha of previously degraded wastelands, a traditional land-development strategy would lead to deforestation of 18,3 ha over the course of one generation of farmers (40 years; Figure 2a). This type of land management provides relatively constant net revenues (Figure 2a) when a specific probability of pasture abandonment is given.

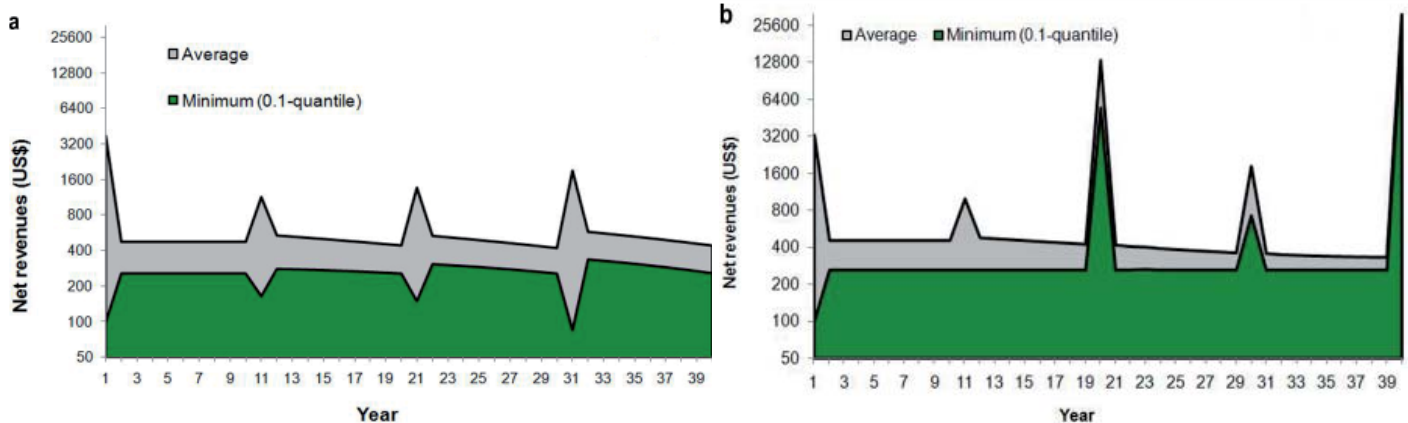


The new model results in the conservation of natural forest and yields continuous profits for farmers, since they are able to re-use pastures after reforestation with Andean alders. Photo: Baltazar Calvas.

The risk of future yield losses due to pasture degradation promotes further deforestation. Moreover, after the establishment of new pastures, the conversion of tropical forests continues (after 10, 20, and 30 years), to compensate for yield losses as a result of pasture abandonment.



**Figure 1** Allocation of land-use activities to the available farm area **a)** under a classical single-use pasture system and **b)** under the EFFD system.



**Figure 2** Average expected and minimum net revenues under **a)** a classical single-use pasture system and **b)** under the EFFD system.

Our EFFD model suggests an immediate land-use diversification that provides multiple activities and products (Figure 1b), as the diversification stabilizes the uncertain net revenues and reduces the demand for land which is necessary to provide subsistence net revenues.

The combination of pasture and selective logging (Figure 2b) produces higher minimum net revenues per year than the single pasture system (Figure 2a), although the conversion of tropical forests is only 8.7 ha instead of 10 ha under the single pasture system (Figure 1a).

The model considered market price fluctuations, correlations and pasture degradation, changes in dairy productivity, as well as uncertainties associated with the sustainable harvest under selective logging and fire damage.

Results show a feasible win-win scenario: it is possible to reconcile conservation objectives and the subsistence needs of local people. Ecological-economic farm modelling, focused on subsistence revenues and long-term effects, shows the economic benefits of diversification and reforestation of abandoned wastelands. We assume that the absence of quantitative experience of the available land-use options and of land-use combinations is an important factor in the currently accelerating deforestation.

After 40 years, 8,3 ha of tropical forest per farm will have been conserved under the EFFD concept, as compared with the classical system. As a result of the Andean alder plantations valuable natural resources will be also available. During the 40-year time frame, land devoted to the plantations can be used to reestablish agriculture, while the areas degraded by pasturing can be reforested.

### 65% Increase in Profits

Following the optimized management path under EFFD, farmers can achieve a 65% increase in profit from their land (US\$20,680 ± 2,260, discounted at a risk-free 5%, versus US\$12,560 ± 2,560 with the classical system), with deforestation being limited to a maximum of 10 ha per farm. The farm profit at risk (profit that is achieved with a probability of 0.9), which we maximized, is 109% greater for the EFFD approach (US\$16,970 versus US\$8,100 for single-use pasture). Our model shows considerable peaks in revenue in years 20, 30, and 40 (Figure 2b), when final crops of Andean alder plantations can be harvested. These financial results should be attractive to farmers who are not necessarily interested in conservation, because – from their point of view – fulfilling subsistence needs and increasing profits are of primary importance.

We consider it important to estimate biophysical and financial coefficients for different regions. Also, the land-use forms discussed here do not represent all possible options like bee keeping, nurseries of native tree seedlings and saplings, non-timber forest products, home gardens, etc. This example therefore represents a first step in analyzing and modelling options to reconcile subsistence and conservation demands.

The challenge is now to link the results to local farmers in Ecuador.

*Baltazar Calvas*

**More Information**

Thomas Knoke, Baltazar Calvas, Nikolay Aguirre, Rosa María Román-Cuesta, Sven Günter, Bernd Stimm, Michael Weber, and Reinhard Mosandl (2009):

Can tropical farmers reconcile subsistence demands with forest conservation? *Frontiers in Ecology and the Environment* 2009 Doi: 10.1890/080131

## NUMEX: Fast Responding Forests

**After a single year Andean forests already react to experimentally increased N and P concentrations. This unexpected fast response at this early stage of nutrient manipulation indicates that the studied forests are very sensitive. The results illustrate how important experiments about expected alterations of key element cycles in these forest ecosystems are.**

Human activities globally affect N and P cycles which influence the productivity of plant communities. How tropical mountain ecosystems will respond to human influences, particularly to the expected increase of atmospheric N is not yet clear. The RU therefore established a replicated nutrient manipulation experiment (NUMEX) in old-growth forest stands at three elevations (1000, 2000 and 3000 m a.s.l., see TMF newsletter issue 1, 2008). Four replicated blocks at each elevation contain four treatment plots (400 m<sup>2</sup> each: control, +N, +P, +NP) and five treatment plots at 2000 m (additional +Ca-treatment), respectively. Nutrient addition (50 kg N yr<sup>-1</sup>, 10 kg P yr<sup>-1</sup>, and 10 kg Ca yr<sup>-1</sup>) started in January 2008.

### Influences on Litter and Trees

First results of group A 2.2 (J. Homeier, D. Hertel, V. Horna & C. Leuschner) showed a rapid response of the studied forests. In general, the total amount of fine litter decreased after the first year of P addition, whereas N and N+P addition had positive effects on litter production at all elevations (Figure 3A). At 2000 m the amount leaf litter was significantly increased by N+P addition.

Mean stem diameter growth and plot basal area growth both were highest at 1000 m, where N addition as well as N+P addition resulted in a 20-30% increase of plot basal area growth eleven month after the start

of NUMEX (Figure 3B). The effect of N+P addition was similar at 2000 and 3000 m, whereas N or P addition showed slightly positive or even negative effects on stem growth.

Concentrations of N and P in the fine litter both were significantly elevated after addition of the respective nutrient (Figure 4, so far only analyzed for 2000 m). Litter nutrient contents (N, P and Ca) at 2000 m were in the lower range compared to values from other tropical forests and stayed low after addition of the respective nutrient.

At the species level, N addition generally caused a higher specific leaf area (SLA) in the four most common tree species at 2000 m, whereas Ca addition always resulted in smaller leaves.

### Influences on Litter and Decomposers

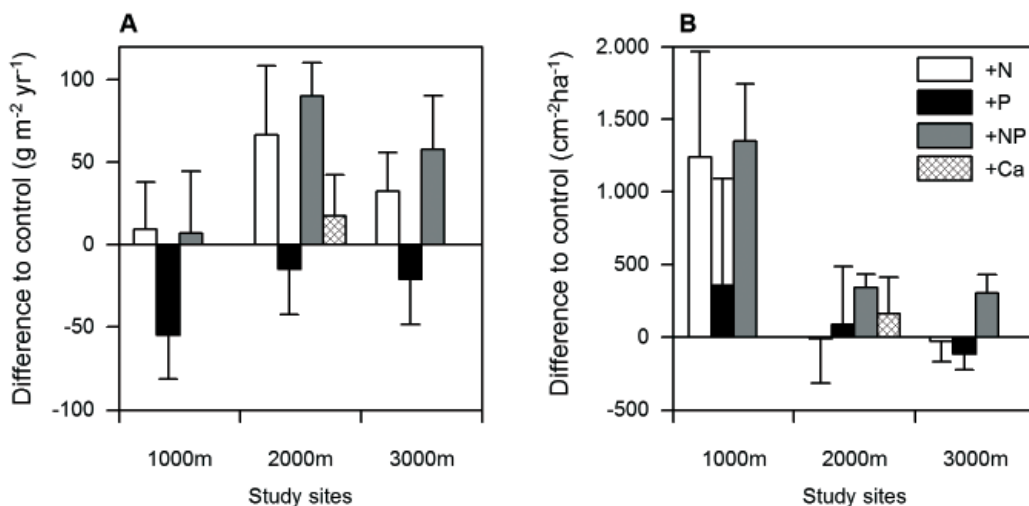
The group A2.3 (D. Sandmann, M. Maraun & S. Scheu) uses the litterbag technique to study decomposition of leaf litter of *Cecropia sciadophylla* and *Graffenrieda emarginata*. Six months after the addition of N and P there was no general effect on the decomposition rate of leaf litter. However, at 1000 m the addition of N increased decomposition of both litter species. Moreover, at 1000 m microbial biomass in *Cecropia* leaf litter was significantly increased by P addition.

### Influences on Trace Gas Exchange

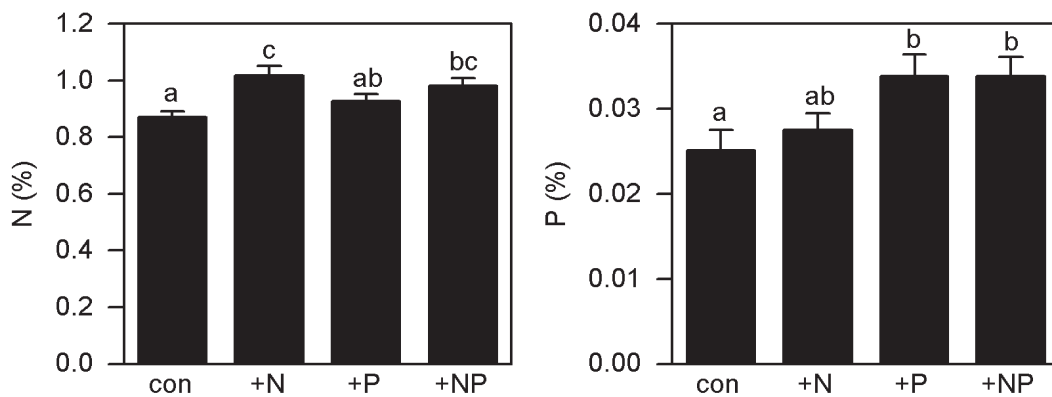
At all three elevations the group A2.4 (G. Martinson, E. Veldkamp & H. Flessa) measured increased nitrogen oxide (NO and N<sub>2</sub>O) emissions shortly after N addition by a factor of ten ('direct effect'). One month after N addition, nitrogen oxide emissions had returned to their 'background' values before N addition. At 2000 m, only the N+P treatment was higher than the control during the first year. We found evidence that already

**Figure 3**

Effects of the first year of nutrient addition on **A.** the total litterfall (February 2008 – February 2009) in the NUMEX plots (N = 24 litter traps per treatment; means ± SE) and **B.** the plot basal area growth eleven months (February 2008 – January 2009) after nutrient addition (N = 4 plots per treatment; means ± SE).







**Figure 4**  
Litter nutrient concentrations after the first year of NUMEX at 2000 m (samples from January 2009, N = 24 litter traps per treatment; means ± SE). Different letters indicate significant differences between treatments (ANOVA, Fisher LSD test).

during the first year, N addition increased soil N cycling rates which may lead to elevated nitrogen oxide emissions as the nutrient addition experiment will continue. P additions did not result in any short-term or long-term effects on N<sub>2</sub>O emissions.

### Influences on Ecosystem Fluxes

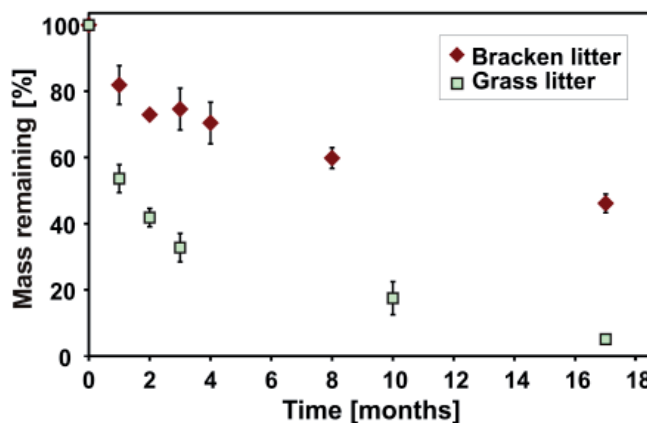
The first results of group B2.3 (H. Wullaert & W. Wilcke) indicate that all applied nutrients are largely retained in the soil with only small leaching losses to below the organic layer. This suggests that the added nutrients are immobilized by soil microorganisms or taken up by plants.

First results of all participating groups in NUMEX will be presented at the ATBC conference in Marburg in July 2009 on a symposium on nutrient manipulation experiments in tropical forest ecosystems.

Jürgen Homeier

### FERPAST: Bracken Litter Decomposes Slowly

To elucidate pasture productivity we measure microbial decomposition rates in subproject B2.1. Within the FERPAST (fertilisation of pastures) experiment the decay of different litters are compared. We therefore placed litter bags into pastures: 60 litterbags (20 cm x 20 cm, 1 mm mesh each) were filled with *Setaria*-grass, originating from a 17 year old managed pasture site, and with bracken fern litter, originating from a 10 year old abandoned pasture site. In May 2007 the litterbags were placed into the sites of origin and allowed to decompose under field conditions for several months. Eight replicates at each time point (see Figure 5) were collected and the remaining mass was determined, respectively.



**Figure 5**  
Remaining bio mass of grass and bracken litter after several time intervals of desomposition. Shown are mean values with standard errors (n=10).

As expected, the in situ decomposition rates differed significantly among the two litter types: A faster decomposition of grass litter with a remaining mass of 5% compared to a remaining mass of 46% for bracken litter was observed. This suggests that the determined higher C/N ratios and lignin contents of bracken litter affected microbial mineralization rates.

Karin Potthast & Ute Hamer



Litterbags containing grass litter were placed into the control plots (X) of the FERPAST experimental site in May 2007. Photo: Ute Hamer.

## Cooperations

### Memorandum of Understanding between DAAD and UTPL

Paul Vörkel, the Ecuadorian representative of the German Academic Exchange Service (DAAD, <http://www.daad.de/en/index.html>), and Simon Kreye, the Cultural Attaché of the German Embassy in Ecuador, jointly visited the Universidad Técnica Particular de Loja (UTPL) on April 28<sup>th</sup>. Now the DAAD and UTPL are preparing a memorandum of understanding to support master and doctoral students as well as research stays for UTPL staff members at German universities. This agreement with DAAD will provide new opportunities and increase the number of UTPL members involved with the RU.

*Juan Pablo Suárez, UTPL*

### UNL and RU Research on Sustainable Fertility

On May 11<sup>th</sup> an agreement between the National University of Loja (UNL) and the Jungle Battalion No. 62 of the Ecuadorian Army quartered in Zamora was registered at the First Notary of the Canton Zamora. This will allow the installation of one of the experiments of the research project "Management of soil fertility with Charcoal amendments in timber plantations in the south of the Ecuadorian Amazon" which is co-funded by the National Science and Technology Secretariat (SENACYT).

The project, as part of the research program of the Center for *Studies and Development of the Amazonia* of the UNL, is conducted by Prof. Carlos Valarezo, Ecuador, and his scientific counterpart Prof. Wolfgang Wilcke from the Johannes Gutenberg University

Mainz, Germany (group B2.3). It is also supported by PD Dr. Bruno Glaser of the University of Bayreuth, Germany (group A3.3) who is also leader of the Group of BIOCHAR Europe.

The main purpose of the project is to generate alternatives for sustainable fertility management of the acidic and poor soils in the south of the Ecuadorian Amazon region through amendments of charcoal, lime and nutrients. It will be used as a strategy for the production of commercially valuable timber tree species, in order to boost the economy, restore degraded areas, improve the capture of CO<sub>2</sub>, and mitigate the degradation of primary forest.

The goal is to determine the effects of soil amendment with charcoal, lime and mineral nutrients on:

1. the growth and economic performance of pachaco (*Schizolobium parahybum*) and melina (*Gmelina arborea*) as timber tree species indicators.
2. the physical and chemical soil conditions, nutrient availability and storage of C, N, P, K, Ca, Mg, S, Fe, Cu, Mn and Zn, and
3. the capture of CO<sub>2</sub> by tree timber species and C input into the soil.

The project results will form the basis for reforestation with native trees of commercial value - some of them of slower growth. It also will provide guidelines for the payment of environmental services under the action of the Clean Development Mechanism.

*Carlos Valarezo, UNL*



City of Loja viewed from El Tiro Pass. Since its start the RU and the preceding RU collaborate with scientists from both universities at Loja, the UTPL and the UNL. Photo: Ingrid Kottke.

## Data and Publications

### Website Invites with a New Face

Minor changes have been done on the webpage [www.tropicalmountainforest.org](http://www.tropicalmountainforest.org) since publishing the last newsletter. There is a new picture on the starting screen with a collage of photos representing the various disciplines our RU is dealing with. The "Document & Services" section was used to coordinate and supply all PIs with the new proposals from all subprograms.



The new face of the home page of the RU integrates some of the many scientific disciplines working together in the study area. The speakers and the data managers are asking the PI's and their coworkers to complete their data sets for the upcoming review process. Image: RU.

### Data Warehouse: New Attributes

In the last month there was a massive upload of datasets from various working groups. Over 50 new attributes were created from the central project to fit new datasets. If you wish to upload new data, please check in the new list of "attributes" which are appropriate for you. A new feature is the selection of "qualified datasets" especially in the climate data section. Different flags describe the quality of the data and the user is able to select "all" or "checked and verified data" for download.

### Publications

The publication section was also filled with numerous new articles and thesis deriving from the subprograms. All the new datasets and publications make a look at them worthwhile. We wish to thank all contributing members of the RU.

Dietrich Göttlicher

## People and Staff

**Jens Boy** (Subproject B2.3, working group of Prof. Dr. Wolfgang Wilcke) completed his doctoral thesis entitled „External drivers of biogeochemical cycles in a tropical montane forest in Ecuador“ in February 2009. He was promoted to Dr. rer. nat. by the Faculty of Chemistry, Pharmacy and Geosciences of the Johannes Gutenberg University Mainz, Germany. Jens started a new position as an Assistant Professor at the Institute of Soil Science of the Leibniz University Hannover, Germany, in the Soil Chemistry group of Prof. Dr. Georg Guggenberger (<http://www.soil.uni-hannover.de/>) this June.

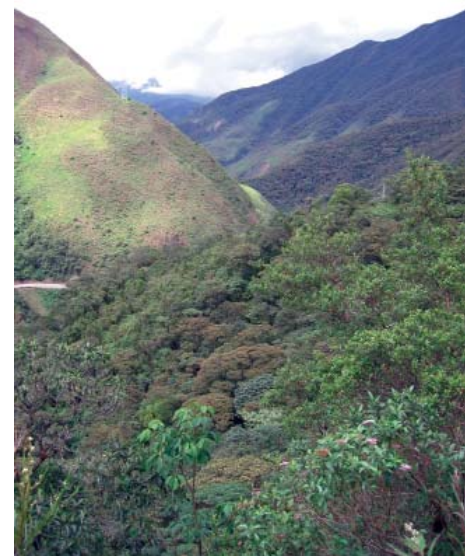


Jens Boy shows the former information sign from his major target site, Microcatchment (MC2). In this area Jens monitored the nutrient cycling of the forest and published the results in well recognized papers (see also Newsletter No 3, page 9). Photo: private.

Wolfgang Wilcke

## Media Coverage

Several media reported about the new model of sustainable land-use developed by groups C2.1 (Weber, Mosandl et al.) and C3.3 (Knoke et al.) which is introduced in detail by Baltazar Calvas on page 4 of the issue. The model brings together conservation objectives and subsistence needs of local people. The *Bayerisches Landwirtschaftliches Wochenblatt*, *Proplanta*, *Epoch Times* (<http://tinyurl.com/lyhs5z>), *Innovations Report*, several portals, and the *Süddeutsche Zeitung* picked up the press release from the scientists from the Technische Universität München.



The scientists developed a land-use model that conserves natural forest (foreground) to stop deforestation which results from the need to acquire further pasture land (background). Photo: Michael Weber.

## Miscellaneous

### Mycorrhiza and Fly Scientists from Hungary visit ECSF and UTPL

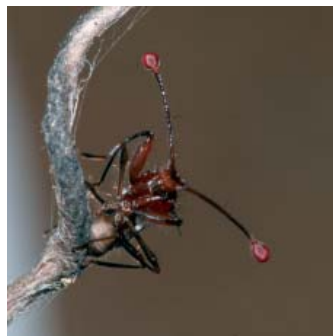
Two Hungarian researchers spent ten days experiencing the tropical mountain rain forest, the dry forests and bush land. Dr. Gábor M. Kovács studies mycorrhizal and root-endophytic fungi of (semi)arid areas. He holds an assistant professorship at Department of



Sampling roots for research proved to be a challenge in the bush land of San Pedro but finally the scientists succeeded. Photo: Ingrid Kottke.



Welcome at UTPL rector's office: Juan Pablo Suarez, Ingrid Kottke, Gábor Kovács, Mihály Földvári (from left to right). A seminar was given and probable future joined research projects were discussed at the University. Photo: Ingrid Kottke.



Male stalk-eyed flies are bearing characteristic eye projections at their heads. This traits have evolved because of mating advantages that they bestow on these males, since they are both better able to compete with rival males and females prefer to choose males with long eyestalks for mating. Photo: Mihály Földvári

Plant Anatomy at Eötvös Loránd University Budapest (<http://ludens.elte.hu/~gmkovacs/>) and is currently working as a Humboldt Fellow at the Helmholtz-Centre for Environmental Research (UFZ Halle) with professor François Buscot.

Dr. Mihály Földvári is an expert on tropical stalk-eyed flies and currently works as a research fellow funded by the European Union's Marie Curie grant at the University College London (<http://www.ucl.ac.uk/stalkie/>). He sampled flies from the mountain rain forest close to the ECSF which will provide us with some ideas to study the rich fauna of the wet areas.

With kind help of and organization by Franziska Volland-Voigt, Oswaldo Ganzhi from professor Bräuning's group (project A 1.1) and José, the ranger of NCI, we visited two plots in the dry forest reserve Laipuna from NCI which is situated close to Macara. We found the dry forest in a beautiful green state but sampling of roots was extremely difficult.

Root sampling in the dry bush land of San Pedro, Catamayo, was more successful. We were assisted by Carlos Espinoza and Omar Cabrera from the Universidad Técnica Particular de Loja (UTPL) who currently is carrying out botanical studies on these interesting plots.  
*Ingrid Kottke*

### Deadline

The editorial deadline for the next issue of the TMF-Newsletter is:

**September 24<sup>th</sup> 2009**

Please send your information to Dr. Esther Schwarz-Weig at the editorial office:  
e-mail: [esw@sci-stories.com](mailto:esw@sci-stories.com)

## Imprint

### DFG Research Unit 816 (RU)

More information about research, the scientific and the local advisory board, and all principal investigators is available at:  
[www.tropicalmountainforest.org](http://www.tropicalmountainforest.org)

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One of the many life forms from the RBSF research area: a bromeliad from the genus *Pitcairnia* spec. Photo: RU 816.