

COURSE REPORT

Monitoring of Areas Undergoing Ecological Restoration

Pereira, Risaralda – Colombia
May 26-30, 2014

A field course jointly organized by:
Environmental Leadership & Training Initiative (ELTI)
Humboldt Institute for Research on Biological Resources (IAvH)



Background: In Colombia, ecological restoration is a practice that is becoming increasingly essential since more than 26% of the country is undergoing some level of transformation, degradation or destruction (IDEAM et al. 2007)¹. This deterioration is attributed to inadequate socio-economic planning and to the fact that economic development historically has been based on the exploitation of natural resources, without considering that economic growth depends on the ability of the natural environment to support these processes.

As a result, about 84% of the municipalities, in which 67% of the nation's population resides, have an average to high probability of experiencing water shortages during dry years and are highly vulnerable to flooding

¹ IDEAM, IGAC, IAvH, INVEMAR, I. SINCHI y IIAP. 2007. Ecosistemas continentales, costeros y marinos de Colombia. Bogotá, D. C, 276 p. + 37 hojas cartográficas.

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or landslides during rainy years (Etter & van Wyngaarden 2000)². Additionally, in most regions of the country there is a loss of biodiversity and both soils and maritime bodies of water have been polluted and degraded. Ecological restoration is – to date – the only concrete strategy that can help to understand and address these degradation processes, as well as to conserve and enhance biodiversity, maintain ecosystem services, improve human livelihoods and adapt to global climate change.

Over the past 20 years, various governmental institutions, NGOs and researchers have been interested in ecological restoration and have developed and implemented various research and applied ecological restoration projects, each with different levels of success regarding their results. Several academic events (e.g., courses, symposia and conferences) have also been organized on the theme, which have led to a substantial generation of knowledge on restoration and to the creation of the Colombian Network of Ecological Restoration. Despite these efforts, many of the basic concepts about restoration remain unclear. Moreover, more clarity is needed about the basic stages involved with the implementation of an ecological restoration project and how to define and measure success.

Generally speaking, the success of an ecological restoration process can be evaluated by establishing a monitoring program (that includes evaluation and follow up), through which the changes that occur in the ecosystem are assessed and analyzed after implementing the restoration measures that were designed to solve the problem in a degraded area.

This course is the result of an international and inter-institutional effort. The main objective was to help participants understand the importance of monitoring the project's objectives and –

² Etter, A. and W. van Wyngaarden 2000. Patterns of landscape transformation in Colombia, with emphasis in the Andean Region. *Ambio* 29(7): 443-450.



based on that information – determine if the objectives are being met or if there is a need to adapt their management strategy. The course also introduced the participants to strategies to effectively and efficiently measure the advances of their restoration projects, as well as to guide their decision making for adapting their current projects and for better designing and implementing future restoration projects.

Objectives:

- Communicate theoretical and practical monitoring approaches for ecological restoration plans, programs, and projects;
- Provide the participants with the principles, criteria and indicators used to monitor ecological restoration projects;
- Analyze, in situ, the follow up and evaluation processes that can be implemented in ecological restoration;
- Define indicators and data collection approaches, using the most efficient methods to measure the success of ecological restoration processes;
- Present case studies and advances about the monitoring of ecological restoration processes.

Course Format: This course was divided into four modules that took place over five days. One full day of the course was dedicated to fieldwork and data analysis, while a half-day was set-aside for participants to present their work and receive feedback from instructors and peers.

Day 1:

- The first day began with the welcoming remarks of Dr. Brigitte L.G. Baptiste, Director of the IAvH, and a keynote presentation by Dr. José Ignacio Barrera, President of SIACRE (Iberoamerican and Caribbean Society on Restoration Ecology). These talks provided the context about Ecological Restoration in Colombia and in the region more broadly.
- Several additional presentations introduced participants to the fundamentals of forest ecology, degradation, forest restoration and ecological restoration models.



Day 2:

- The second day included an introduction to monitoring and the importance of this process for ecological restoration projects, followed by an introduction to biological and socioeconomic indicators and a cost analysis for including a monitoring protocol in restoration projects.



Day 3:

- The third day of the course began with an introduction to a scientific approach for generating useful data, followed by a walk through four restoration areas within the Otún Quimbaya Fauna and Flora Sanctuary that represented diverse restoration strategies that had been carried out within the Sanctuary. After the site visit, the participants were divided into four groups to develop a monitoring strategy for one of the four restoration scenarios that they visited in the morning.



Day 4:

- During the morning of the fourth day, the instructors guided the participants through the establishment of a monitoring plot or transect and the data collection process.

- In the afternoon, the participants divided into working groups and analyzed the data that they collected during the field exercise and prepared their presentations for the final day.

Day 5:

- The fifth day consisted of group presentations, during which the participants presented their monitoring question and design, the indicators that they measured and the analysis of the data that they collected during the field exercise. They also gave their opinion about whether or not the restoration strategy was working, or if it needed to be adapted in order to achieve its objective(s). The instructors and participants provided feedback during the exercise.

Participants: This training course was offered to 23 professionals. The majority of the participants (19) were from Colombia, while four came from other countries, including Honduras, the Dominican Republic, Venezuela and Ecuador. The participants represented a variety of disciplines, including biology, ecology, geology, engineering (environmental, civil and forestry) and also a range of professions, including from the public and private sectors and NGOs.

Instructors and Coordinators: Dr. Severino Ribeiro Pinto, Director of the Northeast Center for Environmental Research (CEPAN), facilitated the delivery of the course, in collaboration with Dr. Wilson Ramirez, Senior Researcher at IAvH, and Cecilia Del Cid-Liccardi, ELTI's Neotropics Training Program Coordinator. Mauricio Aguilar (IAvH) and Saskia Santamaría (ELTI) organized the course. Instructors covered different topics according to their expertise, including:





- **Dr. José Ignacio Barrera** presented the national and regional context of ecological restoration and explained the ecological importance of disturbance regimes (natural and anthropogenic) on forests and their effects on forest degradation;
- **Dr. Severino Ribeiro** discussed the fundamentals of forest ecology, ecological restoration, monitoring and data analysis;
- **Zoraida Calle** of the Center for Research on Sustainable Agriculture Production Systems (CIPAV) presented about community participation in ecological restoration exercises, participatory research, participatory monitoring of biophysical variables and training community members to participate in the monitoring process. She also shared case studies on monitoring protocols for different projects that were implemented with the support of community members.
- **Roy González** (IAvH) lead the plot and transect establishment exercise and facilitated the data collection process in the field;
- **Dairo Escobar** (IAvH) explained the Colombia Biodiversity Information System (SIB in Spanish) and how uploading information to the system helps to facilitate scientific collaborations and makes data – both published and unpublished – accessible to many audiences.

Course Follow-Up: Participants were actively engaged throughout the course and benefited from the practical exercises and also from the feedback they received from instructors and their peers. ELTI's Leadership Program (LP) was presented during the event and generated interest among participants. Participants also made a commitment during the course to share their experiences with their organizations and report back to ELTI about the process. ELTI will work with IAvH in order to follow-up with the participants through an online questionnaire in order to determine if and how the course has influenced their professional development and implementation of projects, as well as whether or not they are interested in applying to the LP program.

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