Urban restoration area in Los Cipreses, San José. Photo: Adam Kabir Dickinson
Small-scale tea producers learn about analog forestry in Ndu, Cameroon

Adam Kabir Dickinson
IAFN Secretariat

Ndu, in the North-West Region of Cameroon, is a town with a great potential for restoration and analog forestry. With some of the highest elevations in the country, its rolling hills were singled out for tea plantations in the 1950s, and it has become one of the centres of tea production in the country.

Many smallholders who have been farming tea are looking for alternative approaches that involve diversified crops and the incorporation of forest products for food security and increased production. They have also joined forces in order to share information and adopt better techniques.

IAFN partner CENDEP has been working with both smallholder tea producers and larger plantations in the area since 2013, and recently had the opportunity to learn from Sri Lankan tea farmers who produce in a forest garden system that uses analog forestry techniques.

Wirsiy Eric Fondzenyuy and Perry Ndzeffemegho from CENDEP recently had the opportunity to share these experiences with 34 smallholder farmers in the Ndu region. Their involvement comes at an opportune time, as the Ndu local council has been engaged in organizing tea farmers under their poverty reduction strategy.

The European Union is supporting the tea farmers with a processing unit but these farmers will need to adopt sustainable production techniques to avoid problems of land degradation. These problems, arising from conventional tea production techniques, are well-known in other parts of the world where tea production have been going on for a long time.

That’s where CENDEP’s involvement is crucial: it is part of an initiative through the Rich Forests concept, which creates links between local farmers’ groups and business groups in Cameroon. This event was the beginning of a months-long process of trainings and technical advice, which would eventually lead to linking local sustainable tea production to value-added markets in Cameroon and abroad.
Perry and Eric, members of the IAFN trainers’ network, led the training explaining key elements of analog forestry and relating the experience of tea gardens in Sri Lanka. With the farmers’ group, they also mapped out potential complementary forest products that could be useful to include in small-scale tea plantations.

These exchanges of good practices, be they between Cameroon and Sri Lanka, or between farmers in neighbouring villages, are the basis of the adoption of practices such as analog forestry, and important steps toward the restoration of degraded ecosystems around the world!

**Los Cipreses: An analog forest takes root**

*Eduardo Aguilar*

*IAFN Secretariat*

At the beginning of this year, we were interested in establishing an analog forestry site in Costa Rica’s capital of San José, the new location of the IAFN’s secretariat office since August of 2013. This site would allow us to show the functioning of the analog forestry methodology and the development of an analog forest to colleagues, organizations, and institutions. What we didn't realize at the time was the rich tapestry of relationships that such a project would weave together!

Thanks to the Watersheds and Biological Corridors Program of the San José Municipality, we had the opportunity to meet the community of Los Cipreses in Barrio México, a few minutes away from the city centre. The site borders on the Río Torres, one of the main tributaries of the Tárcoles River, which drains much of the solid and liquid waste of Costa Rica’s central valley.

![Recent erosion in Los Cipreses, San Jose, Costa Rica. Photo: Kitty Garden](image-url)
In this context, the Los Cipreses site, cared for by a community that stands out for its organization, unity, and the strong will to improve their quality of life through their efforts, presented itself as an invaluable opportunity. With the endorsement of the committee of the local development association, and the unconditional support of Gerardo Aguilar, we initiated an ambitious project: to restore three hectares of forest in the middle of the city, and next to a highly contaminated river.

This urban river contains an abundance of disheartening elements: trash that is tossed away by some individuals, used grey and black waters, rainwater runoff, and areas of erosion and landslides. The site has also served as an occasional hiding place and stomping ground for unsavoury characters. But the site's beauty is undeniable. That's why the community decided from day one that what they wanted from reforestation in the area was a return of the old colours, smells, and sounds. The analog forestry design focused on trees with colourful flowers and sweet smells, as well as species that would attract birds.

The first year of the reforestation project covered 1.5 hectares of the site, covering areas with some existing trees, and others that had become overgrown with elephant grass (*Penicetum purpureum*). Controlling this invasive grass has been a major task, especially since the control methods have been manual, without the use of agrotoxins. The idea is that as the tree canopy provides more and more shade, this invasive species will be crowded out and eventually eliminated. The following is a list of the species planted in July of 2014, the first planting:

<table>
<thead>
<tr>
<th>Common name</th>
<th>Scientific name</th>
<th>Use in analog forestry design</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uruca</td>
<td><em>Trichilia havanensis</em></td>
<td>Locally native species</td>
</tr>
<tr>
<td>Moringa</td>
<td><em>Moringa oleifera</em></td>
<td>Many medicinal and food uses</td>
</tr>
<tr>
<td>Corteza amarilla</td>
<td><em>Tabebuia ochracea</em></td>
<td>Native species, flower</td>
</tr>
<tr>
<td>Cortéz Negro</td>
<td><em>Tabebuia impetiginosa</em></td>
<td>Native species, flower</td>
</tr>
<tr>
<td>Cirrí</td>
<td><em>Mauria heterophylla</em></td>
<td>Nectar, flower</td>
</tr>
<tr>
<td>Sacuanjoche</td>
<td><em>Plumeria rubra</em></td>
<td>Nectar, flower</td>
</tr>
<tr>
<td>Jacaranda</td>
<td><em>Jacaranda sp</em></td>
<td>Flower</td>
</tr>
<tr>
<td>Guanacaste</td>
<td><em>Enterolobium cyclocarpum</em></td>
<td>Structure, arts and crafts (seeds)</td>
</tr>
<tr>
<td>Dama</td>
<td><em>Citharexylum donnell-smithii</em></td>
<td>Flower</td>
</tr>
<tr>
<td>Lluvia China</td>
<td><em>Koelreuteria sp.</em></td>
<td>Flower</td>
</tr>
<tr>
<td>Nogal</td>
<td><em>Juglans sp</em></td>
<td>Fruit for birds</td>
</tr>
<tr>
<td>Sotacaballo</td>
<td><em>Zygia longifolia</em></td>
<td>Soil retention</td>
</tr>
<tr>
<td>Malinche</td>
<td><em>Delonix regia</em></td>
<td>Flower, structure</td>
</tr>
<tr>
<td>Lemongrass</td>
<td><em>Cymbopogon citratus</em></td>
<td>Medicinal, soil retention</td>
</tr>
</tbody>
</table>

As a complementary initiative, with the cooperation of the Programa Bandera Azul Ecológica Los Cipreses (a local environmental initiative) IAFN has also actively participated in efforts to encourage food security with local families. Training modules for urban agroecological
production have been developed, with Eduardo López; and as a part of this effort, we have constructed a simple but functional nursery which can store plants for distribution to home gardens, as well as serving as a germinator and storage area for new species to introduce into the analog forest area.

Inter-institutional collaboration has been key, as well as the involvement of the community and the drive to see a small piece of the Río Torres watershed in a better state; connecting wildlife and strengthening ties to the land. Thanks to all those who have formed part of this common effort, we'll see you in 2015!

What is photosynthetic biomass?

*Ranil Senanayake*
*Founding member, IAFN*

Currently, when discussions of climate change mitigation discuss carbon capture by plants, the primary focus is on woody biomass. There is a newfound appreciation of the ecosystem service provided by plants, in which they convert atmospheric carbon into a solid form. This process has been hailed as a tool by which the problem of increasing atmospheric carbon can be addressed. ‘Plant trees which soak up the carbon dioxide’ the reasoning goes ‘and you can contribute to reducing the atmospheric burden of that gas’.

While the science of carbon sequestration is well understood, there is an urgent need to address the fundamental differences between the components of living biomass, photosynthetic biomass and respiring biomass.
Photosynthetic biomass performs the act of primary production, the initial step in the manifestation of life. The biomass so termed has the ability to increase in mass through the absorption of solar or other electromagnetic radiation while releasing oxygen and water vapour into the atmosphere. Respiring biomass is that component of living biomass that uses the output of photosynthesis to make the complicated biological patterns of life.

It is only this photosynthetic biomass that powers carbon sequestration and the generation of oxygen, as well as the generation of woody biomass and its myriad functions: actions essential for the sustainability of the life support system of the planet. However, only one product of this photosynthetic biomass, sequestered carbon, usually represented by wood or timber, is currently recognized as having commercial value in the carbon market for mitigating climate change.

The ephemeral part, the leaves, are generally ignored, yet the photosynthetic biomass in terrestrial ecosystems are largely composed of leaves, this component needs a value placed on it for its ‘environmental services’.

It is not difficult to place value on photosynthetic biomass today. Initial computations are based on the current values of the carbon market are currently in excess of 125 billion dollars, assuming that the global market would pay at least a similar amount to maintain our life support system, the 93.1 billion tons of photosynthetic carbon currently in stock would be roughly worth about 1.35 dollars per kilogram.

It is this biomass that has to grow in order to sequester the lost biotic carbon. With such growth we will see more oxygen generation, carbon sequestering, and water cleansing. Much of the biomass to be gained is in degraded ecosystems around the planet, many of which are also home to the world’s rural poor. What these degraded ecosystems do have, however, is great growth potential for generating photosynthetic biomass.

If the restoration of these degraded ecosystems to achieve optimal photosynthetic biomass loads becomes a global goal, the amazing magic of photosynthesis could indeed help change our current dire course, create a new paradigm of growth and make the planet more benign for our children.

IAFN launches plant database!
Adam Kabir Dickinson
IAFN Secretariat

In the practice of analog forestry, it is important to have a repository of information of useful species to include in forest designs. For example, a design may require trees of a certain height or ecological function – how do designers decide which species to use?

Often, the answer lies in the local knowledge of an area – people know which trees grow well and which poorly. However, when dealing with an unfamiliar area or species that do not have
a long history in an area, it is useful to have a systematized resource of information of plant species and their use in analog forestry species.

This is the niche that the IAFN plant database seeks to fill. It is a project that has been in the works since 2010, when an analog forestry initiative in Central America and the Caribbean collected detailed information on the species used in analog forestry sites in the area. Over the last year, this information was systematized and built into a searchable database that is now available to the public.

To use the IAFN plant database, follow this link and use the following instructions:

The search dialogue on the landing page allows you to enter a species name. Both common and scientific names are accepted. Also, by selecting the ‘advanced search’ option, you can filter your search by further characteristics.
The most pertinent categories here are the ‘physiognomic formula growth type’ and ‘physiognomic formula height class’. These are especially useful when working with the physiognomic formula, a tool in analog forestry.

The search results are organized by relevance, and all the species shown have a ‘show’ button which you can press to see more of the details. Notice here that a search for ‘acacia’ turned up species with ‘acac’ia in either their common or scientific names.

When you click on the ‘show’ link, you will be taken to a page where you can peruse the details of the plant, including ecological conditions, uses, and taxonomic information.
It is important to note that the database is a work in progress. If you encounter inaccurate or incomplete information, or you would like to contribute your knowledge, please write to the IAFN secretariat at info@analogforestry.org.

**End of year greetings from the Centro de Capacitación Bosques Análogos**

*Milo Bekins  
President, CCBA*

The training of agronomists, forest engineers, community leaders, and farmers in the methodology of analog forestry is of major importance to farming communities around the world for obvious reasons. Since 2007, as one of the three training centres accredited by IAFN on three continents, the Centro de Capacitación Bosques Análogos (CCBA), a non-profit organization in Costa Rica, has been involved in training these organisations, technicians, and farmers’ groups.

Year after year we have trained hundreds in the intricate yet simple-to-understand concepts of analog forestry. Who trains these willing souls? The answer has been addressed by IAFN with its network of trainers, who have been accredited to train farmers’ groups and technicians. Trainers have now been accredited in Mexico, Cuba, the Dominican Republic, and Costa Rica.

Over the past year, CCBA has been involved in four analog forestry workshops with groups such as *Red Permanezca*, the permaculture network of Costa Rica, and *UNAFOR*, a farmers’ group. We also held a *Training of Trainers* for accreditation purposes with experts from Mexico, Puerto Rico, and Costa Rica. In addition, we have facilitated other workshops, such as a training on beekeeping and its relationship with analog forestry.

Not only do we provide the tools to facilitate the restoration of biodiversity and the improvement of economic benefits, we can demonstrate them by showing what a mature AF farm looks like and how many diverse products can come out of these designs.

Our designs of different parcels, all connected within the same ecosystem, all provide living proof of how a diversity of crops mixed with keystone native species and exotic species are analogous to our original primary rainforest.

Primary forests, whether tropical or temperate, are living organisms of beauty, spirituality, ecological functions, and diversity. If we consider that trees make up only 1 to 2% of the totality of this biodiversity, yet up to 70% of the total biomass of a forest, we can understand our designs utilize all the components of a forest to create an anthropogenic forest, not only trees.

Equally important, the photosynthetic biomass of the analog forestry system is of value for the mitigation of climate change. The final objective of a farmer, namely the marketing of products, must also be taken into account. Visitors to CCBA can see our commitment to added
value in analog forestry in our family business, La Botanica, where we sell essential oils and spices from our forest farm.

In 2015, CCBA plans to offer a wide array of subjects in future workshops such as biodynamic farming, nutrition, and basic organic techniques, all of which relate to our core work of analog forestry.

It is my hope that our workshops will advance analog forestry and a host of related concepts in the coming year. I look forward to collaborating with IAFN and the network of newly accredited trainers in order to offer trainings that inspire people to restore our planet's life support systems.

End of year greetings from Belipola Training Center

Sion Zivetz

Belipola

As the earth has travelled around the sun in this year that we call 2014, the forest garden at Belipola has been slowly re-entering the consciousness of the world. It had been quietly fermenting for some years, in a sense it has been composting the challenges of the past. In the creation of new soil it has captured the energy and spirit of new custodians, eager students, and the interest of people who have been seeking, but who have previously been unable to find inspiration.

In 2014 Belipola has hosted local and international trainings, student groups, visitors and of course the permanent and transient biodiversity that makes up the forest. This year we have spread the ideas and tools of analog forestry through the people who have come here. Through them, the idea of what a forest is capable of becoming has spread to 17 countries across all of the continents of the world.

We have watched people react to the forest and the possibility of the forest as the answer to how we might restore abundance in the face of scarcity. We have listened to people express their motivation and willingness to share this process and carry the work forward. We have answered questions, been challenged by new perspectives and we have tried our best to represent the original vision of analog forestry in its myriad of colors, structures and functions.

In living and learning the processes of the forest, in listening to her breathe, we have found comfort and safety under the canopy, and we have meditated on the opportunities and challenges before us. Belipola has always sought to be a model for restoration and sustainability and we intend to share this with as many people as possible at the local, regional, and global scales.

We have been building up the training center so that we can teach this system to more people who are drawn here from around the world. We have recruited and up-skilled an amazing
team of people who have become the caretakers of this forest ecosystem. We have built a business model that is based on our own forest garden products and created a producer group that empowers forest gardeners in our village through training and direct access to organic outlets. We continue to explore, create and innovate towards meeting our goals of sufficiency from the forest.

Looking forward, we have been challenged to make the centre financially self-sufficient. We have taken this challenge and we are determined to demonstrate that with a creative vision and mindful work, analog forests can realize the ambition of creating sustainable livelihoods for people. It is important to us that we continue down this path, despite the challenges that we face, because we have seen first-hand that generating income motivates, empowers and helps people meet their needs for sufficiency. We want Belipola to inspire people to meet their basic needs for survival and restore, protect and enhance ecosystems.

We invite you to join us, to share in our abundance and to learn alongside us as we continue down this path. Please get in touch via our website and Facebook page.

We offer respect and gratitude to our teachers and mentors, collaborators, supporters and friends who have been by us and with us this past year.

IAFN thanks all authors for their contributions. Photos are by the author of the respective articles, except where noted. To contribute to a future IAFN bulletin, please contact Adam Kabir Dickinson, Knowledge Management Officer at kabir@analogforestry.org