

A successful pilot in the frame of the Initiative “Biodiversity in Standards and Labels for the Food Sector”

Improving Biodiversity protection in coffee cultivation in South America



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Climate change and loss of biodiversity – main challenges of our times

We are losing ecosystems, species and genetic varieties at a dramatic speed. In this year's IPBES-Report scientists from all over the world warn that the situation is even worse than expected. A few examples:

- 65% of the land surface is significantly degraded, and over 85% of wetlands (area) have been lost.
- Across the highly biodiverse tropics, 32 million hectares of primary or recovering forests were lost between 2010 and 2015.
- An average of around 25% of species in assessed animal and plant groups are threatened, suggesting that around 1 million species already face extinction, many within decades, unless action is taken to reduce the intensity of drivers of biodiversity loss.

Climate change increases the pressure on ecosystems and species, on the other side loss and degradation of ecosystems accelerate the negative impacts on our climate, and reduces the possibilities to adapt to climate change impacts.

Biodiversity in the food sector

Loss of biodiversity directly impacts our economic activities – and especially food production. Currently, land degradation has reduced productivity in 23 per cent of the global terrestrial area, and between \$235 billion and \$577 billion in annual global crop output is at risk as a result of pollinator loss. Globally, local varieties and breeds of domesticated plants and animals are disappearing. This loss of diversity, including genetic diversity, poses a serious risk to global food security by undermining the resilience of many agricultural systems to threats such as pests, pathogens and climate change.

At the same time, land use changes for agriculture are the main driver of loss of biodiversity – and one of the sources of climate change. More than one third of the terrestrial land surface is being used for agriculture and in many countries, agriculture is highly intensified with little benefits for biodiversity. Therefore, the food sector with agriculture as a main supplier, needs to improve biodiversity performance significantly and contribute to stop the loss of biodiversity. As the scientists underline: The activities during the next few years determine the future of our planet.

Food standards and sourcing requirements of food companies are instruments to mainstreaming sound biodiversity protection. Effective criteria are necessary as well as training for farmers, assessors and auditors and practical tools to facilitate sound biodiversity management.

The LIFE-Initiative “Food and Biodiversity” is working on these aspects. The two NGOs Global Nature Fund and Lake Constance Foundation are part of a consortium of European organizations, which developed, among others, the Biodiversity Performance Tool. The BPT facilitates the elaboration and implementation of good Biodiversity Action Plans.



UTZ – now merged with Rainforest Alliance – was one of the first standards to join the initiative and to contribute to the elaboration of recommendations for effective biodiversity criteria. These recommendations are intensely discussed in the current development of the new standard. Rainforest Alliance agreed with GNF and LCF to go further and to test the implementation of Biodiversity Action Plans in coffee farms in Colombia and to adapt the BPT to support farmers in this important task. Rainforest Alliance will consider lessons learned for future RA-certified coffee plantations in South America and beyond.

Biodiversity challenges in the coffee regions in Colombia

Colombia is a mega-diverse country with shores in two oceans and the Northern Cordillera de Los Andes breaking in three massive branches making a natural division of the Colombian territory. Those geographical and geological particularities, among other factors, result in a wide variety of ecosystems that range from coral reefs and mangroves at the seaside, tropical rain forest, mountain forest, páramos and tropical glaciers at the top of the cordilleras. The abundant biodiversity found in those ecosystems places Colombia among the world's most biodiverse countries.

The ecosystems supply the population with water, food and raw materials - just to mention some of the essential services they provide. The coffee crops found in the cordilleras an ideal place to grow, between 1.000 and 1.800 meters above sea level, a region originally dominated by Andean forest characterized by its high biodiversity in different taxonomic groups.

Since the expansion of the coffee crops, the natural ecosystem of the coffee's altitudinal range has been transformed in more than 60% of its original area into coffee agro-ecosystem. These agro-ecosystems have today the challenge to conserve the related biodiversity and ecosystem services in order to maintain the water availability and quality, prevent erosion, maintain the land suitable for agriculture and provide good conditions for biodiversity conservation.

To deal with those challenges and take effective measures will lead to a more resilient agro-ecosystem, better prepared to face current problems such as loss of biodiversity and the impacts of climate change. Some measures do not have related costs, others yes. Farmers should be motivated and rewarded via incentives and specific trade opportunities to preserve and increase biodiversity which not only benefits the Colombian coffee sector, but also our society as a whole.



Left: Coffee agroecosystem landscape, from top to bottom: shaded coffee, bamboo (guadua) forest protecting a watercourse and high exposition coffee. Right: Plot of coffee with degraded soil.

BAP and BPT: Improve and monitor biodiversity performance on the farm

The BPT is a practical instrument to realize a baseline evaluation of the situation of biodiversity on the farms, taking inputs from questions and making visible strengths and weaknesses of biodiversity performance using a classification system of thresholds. The Biodiversity Action Plan (BAP) is a document where farmers, assessors and auditors can find all the aspects analyzed in the baseline evaluation and the results based on the thresholds. Measures of the BAP address two big lines of action: the creation of potential for biodiversity (creation and improvement of habitats, protection of species, biotope corridors etc.) and the reduction of negative impacts on biodiversity (pesticide and fertilizer management, protection of water sources and soil etc.). According to the weaknesses identified, farmers decide which measures they want to implement during the next 1 – 3 years.

During the pilot project, the environmental NGO Fundación Humedales accompanied the farmers in Colombia during the assessment of the baseline, the selection of measures and monitoring of the implementation. The objective of the periodic visits was to observe advances, talk with the farmers about their experience and document their efforts in terms of time and money to realize the actions.

With the implemented measures, the farmers improved the biodiversity performance on the farm, making them a more suitable place for conservation and increase of ecosystems and species. The pilot farmers recognize the positive effects on a medium and long term such as protection of soil fertility and hydrological balance as well as adaptation to climate change.

One of the main objectives of the pilot project was to adapt the Biodiversity Performance Tool to the coffee growing particularities of Colombia. The whole process including monitoring visits and the intense exchange with the farmers were a valuable input to adapt the BPT and make it a useful tool for improving biodiversity performance in coffee growing in Colombia.

Rainforest Alliance certification and the Biodiversity Performance Tool

Conservation of biodiversity is one of the priority topics in the certification systems RA. This includes the prevention of deforestation driven through agriculture, but also the management of biodiversity on and around the farms, such as shade trees and other semi-natural habitats, as well as reducing the negative impacts of farming on the surrounding environment.

The RA certification programs focus on coffee, cocoa, tea and bananas, all of which coincide with biodiversity hotspots, therefore posing a risk but also the potential to enhance biodiversity through a good management of the agricultural production. Coffee is an important export crop for Colombia and therefore potentially a driver of deforestation and biodiversity loss. It is therefore important to raise awareness about the value of biodiversity and the opportunities to grow coffee in biodiversity-friendly manner.

Why we are a supporting partner of the LIFE initiative “Food & Biodiversity”?

We think multi-stakeholder discussions are important to translate scientific knowledge into actionable advice to farmers and private sector. And we recognize the importance of taking a continuous improvement approach with a baseline assessment, setting targets and management actions, which is one thing we appreciate about the Biodiversity Performance Tool.

We are in the process of revising our certification system and continuous improvement is one of the aspects that we are strengthening in the standard. Another important aspect of our revision as well as the BPT is the demonstration of improvements. With the monitoring and the visualization of improvements, producers can show they have improved, and thereby position themselves as frontrunners in this topic, hopefully leveraging the supply chain for support.

We are grateful to the producers and the partners for all the efforts, and hope to continue the work together to switch agriculture’s impact from being one of the biggest drivers of biodiversity loss to one of positive impact.

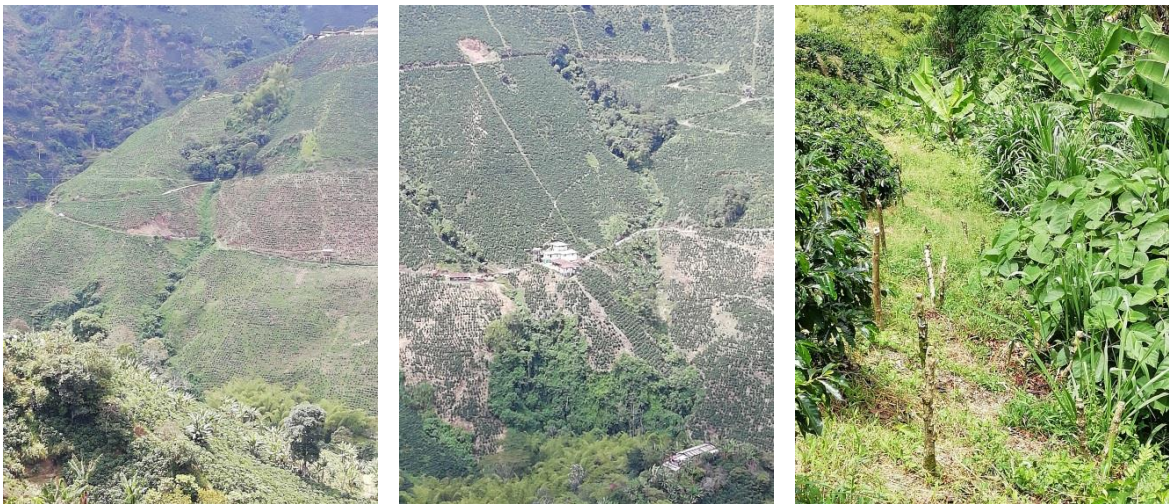
Practical experience of biodiversity pioneers: Measures and first results

Finca Santa Clara. Santuario, Risaralda

Santa Clara is located in Santuario, Risaralda, close to Tatamá Natural National Park. The farm has coffee plots between 1450 and 1600 m.a.s.l. and an average annual precipitation of 1847ml. The 339,85 ha are managed as a familiar enterprise by Johana and Alejandro Ochoa, brother and sister and a great team with sound executive and management capacities. Santa Clara is totally dedicated to coffee growing with an integrated production system, currently using three varieties in their coffee plots: Colombia, Castillo and Cenicafe 1.

After applying the Biodiversity Performance Tool and based on the baseline results, Fundación Humedales and LCF proposed measures to the owners. Some of the measures they selected:

- Update the map of the farm with all components: coffee areas, plantain plots, forest and bamboo (guadua) forest among others
- Increase the natural and semi-natural habitats in the farm to reach 15% of the total area for conservation (initially 8,12%)
- Create buffer zones along the water ecosystems that were unprotected and amplify the buffer zones where needed to achieve 12 to 20m wide depending of the water bodies
- Improve the connection between natural and semi-natural habitats by biological corridors
- Protect individuals of Cedro Rosado (*Cedrela odorata*), a threatened timber tree species growing in some of the coffee plots
- Amplify the treatment of residual domestic waters to all farm houses.



First and second images show forest fragments at the upper part of the mountains being connected by biological corridors with bigger forest at the bottom. Third image shows stakes that mark the beginning of a recently created buffer zone (at the right side of the photo).

First results obtained by Johana and Alejandro are great. The owners dedicated new areas to native vegetation; most of them are enlargements of buffer zones and areas in specific points where native vegetation will help to control erosion. At some locations coffee rows were eliminated to obtain the required wide for the buffer zones. With this, vegetation corridors between forest fragments were created or improved.

Some measures for the development of native vegetation support also the protection of water sources. Stakes are used to indicate the limit for farming practices such as pesticide use and protect the newly growing vegetation. They also work as propagation material for local tree species.

After having the new areas for natural and semi-natural habitats and old ones well delimited, the owners updated the map of the farm - demanding work that required fieldwork for the geo-positioning as well as software desk work. Today, the farm has 59.96ha of natural and semi-natural habitats that correspond to 17,65% of its total area. The map and the BPT are sound management instruments and will enable improvements in farming practices based on the exact description of the situation on the farm.



*Alejandro inspects the recently installed domestic waste water treatment.
Johana in one of the new buffer area followed by coffee rows.*

The process in Santa Clara was characterized by challenging measures and hard work. But because of the conviction and determination of Johana and Alejandro, sound results have been achieved. Santa Clara has a more sustainable future, providing an improved place for biodiversity with positive impacts for the farm as well as for the whole area.

Further information:

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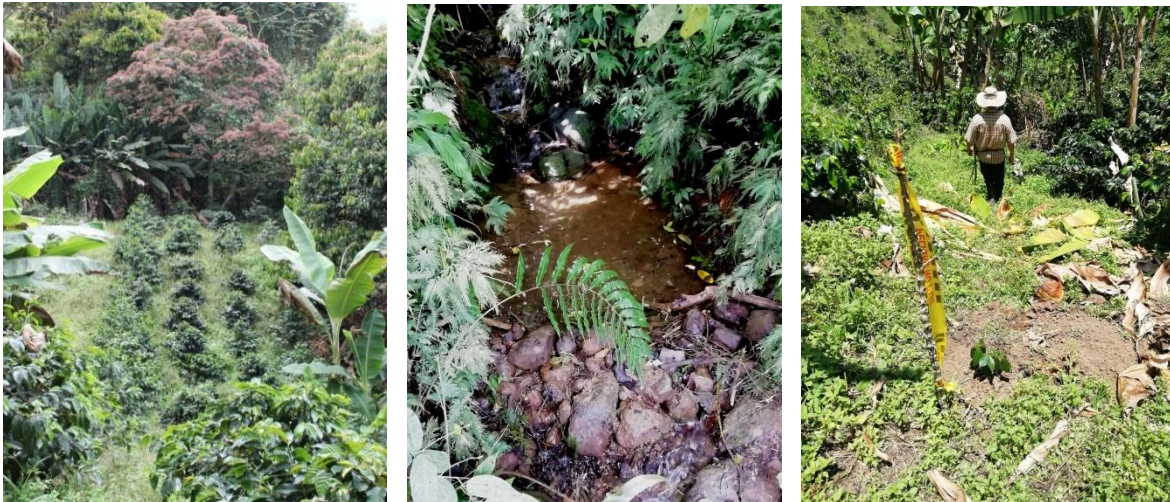
Finca Santa Elena, Caicedonia, Valle del Cauca

Santa Elena is managed by a dedicated couple, Esperanza Fajardo and Pablo Lozano. Since 2006, they are working hard to restore the farm and make the coffee and the nature flourish in this 29 ha of land.

The farm is at 1840masl and has an average annual precipitation of 1800ml. Currently six varieties are cultivated in the shadowed coffee plots: Caturro, Colombia, Castillo, Tabi, Cenicafe 1 and Borbón. The 29 ha are divided in 10 ha of coffee, 4 ha of avocado, 2 ha of plantain and 3 ha for other uses and the buildings. Forest and fallows covered 5 ha in 2006 and increased now to 10 ha - more than one third of the farm. They are part of the protected areas of a rural aqueduct. Esperanza is part of the women association of coffee producers "Café Sello Mujer" working on coffee quality, gender equality and environmental issues.

After applying the Biodiversity Performance Tool, the measures proposed to Santa Elena were:

- Connect all the natural and semi-natural habitats
- Increase the shadow tree density inside the coffee plots with poor soil condition
- Increase the number of water elements: create shallow ponds
- Improve the windbreaker edges
- Reduce the amount of herbicides applied
- A complete register of the amount of fertilizers applied
- Improve the treatment system for domestic residual waters



Coffee rows besides a forest and with shadow trees (endangered species such as Retrophyllum rospigliosii are used as shadow trees in Santa Elena). 2. Shallow pond created to promote biodiversity. 3. Inga tree planted and marked to create a connective edge between two forests.

First results of Santa Elena are promising. The farm perimeter was almost totally surrounded by different types of tree coverage as forest, tree edges and fallows. The only part missing is now planted with *Inga* trees that will serve as a connection between the forest and complete the tree cover around the farm. *Inga* trees have also been planted in plots with poor soil condition in order to contribute to restore the soil.

The owners constructed two shallow ponds in the streams of the farm to attract biodiversity. In the upper limit of the farm they have grown trees as a windbreak barrier. In order to create more structure, natural vegetation is growing under the trees. This will improve the function as wind braking barrier and promote biodiversity.

One of the best results in Santa Elena is a reduction in herbicides application. Those are used principally to control grasses. Carrying out an integrated weed control plan, finding the correct timing between mechanical control and the application of the herbicides was leading to a reduction of 50% of the volume applied. Another measure to reduce negative impacts on biodiversity is the complete registration of the fertilizers applied. This register will be used for a more exact planning and probably lead to a reduction. The improvement of treatment system avoids contamination by domestic residual waters.



Esperanza and Pablo beneath the shadow of a tree in Santa Elena. A deer offspring (Mazama sp.) found resting inside the coffee crop.

Esperanza and Pablo were always improving the potential for biodiversity on their farm Santa Elena, because they are sensitized and committed. Now they are realizing measures in a more structured way and based on a complete assessment. With the Biodiversity Performance Tool they will monitor the biodiversity performance and can proof a continuous improvement.

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Finca Berlín, Caicedonia, Valle del Cauca

Berlín is a 356 ha farm with 150 ha dedicated to silvopastures, 30 ha of coffee, 116 ha of fallow land and 60 ha of mature Andean forest. The Andean forest (16,85% of the farm area) is well preserved due to its location and the determination of Aneth Chocontá to conserve it without interference. The forest of the farm is part of the protected area of Caicedonia municipality. Aneth is member of the women association of coffee producers “Café Sello Mujer” working on coffee quality issues, gender equality and environmental protection.

The farm ranges between 1700 and 2000masl, the coffee plots are all shaded with a diversity of tree species such as *Inga*, a nitrogen fixing legume, and a natural population of Cedro Negro (*Juglans neotropica*), a threaten timber specie. Aneth is specially interested in coffee varieties and cultivates eight varieties on her farm: Caturro, Tabi, Colombia, Java, Geisha, Catimore (Costa Rica), Castillo and Típica.

After applying the Biodiversity Performance Tool, the measures proposed for Berlín were:

- Conserve the Cedro Negro population inside the coffee plots
- Reduce the applied amount of herbicides
- Carry out a soil analysis with organic matter contents
- Analyze the nitrogen contend in the organic fertilizer applied
- Improve the records of mineral nitrogen fertilizer used
- Obtain an annual net nutrient balance



One of farm houses and part of the forest in the mountains of the farm. Trees of Cedro Negro (*Juglans neotropica*) with different leaf stages giving shadow to Berlín coffee.

Aneth always considers the farm forest and the Cedro Negro in the productive area in her management decisions. She informed the local environmental authority about the existence of Cedro Negro in her farm and she made the commitment to conserve these trees in the coffee plots.

Berlín is using a simple technology called “trapero” - a tool that reduce the amounts of herbicide by doing selective applications without spraying. Combined with the big effort to realize manual uprooting of the aggressive grasses it is leading to a reduction of herbicides. For the near future, Aneth plans to increase the density of coffee per plot so the coffee will provide more shadow and grasses will be controlled more easily.

Aneth is always trying alternative ways to manage her coffee cultivation, searching effectiveness and less environmental impacts. In her experimental path she uses mineral fertilization and also different sources of organic fertilizers such as coffee pulp compost sometimes mixing it with ingredients coming from the animals of the farm.

By implementing the measures proposed, she has now all necessary data to calculate the amount of nitrogen and other nutrients applied to the crop. Adequate nutrition is complemented by nitrogen fixing species inside the crop. But, what was the actual nutrient situation of the soil? What is the annual net nutrient balance? In order to answer these questions, Aneth carried out soil nutrient analyses and participated in a fertilizing course to improve her knowledge about coffee nutrition. With this input, she will improve the fertilizer program for the farm.



Aneth and her team, Edelberto Castañeda Gonzales y Alberto Castañeda; Aneth with her recently obtained soil analysis and fertilization course diploma.

With the measures realized and Aneth's commitment to conservation, Berlín will start a new momentum with an improved management leading to very good agricultural practices and more biodiversity.

Further information:

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Conclusions

The first results obtained show the improvements in different aspects of the biodiversity performance on each farm: Increased areas for native vegetation, protection of water bodies, creation of biological corridors to connect habitats, adaptation of farming practices toward less impacts on biodiversity and the compilation of baseline information to enhance biodiversity through good management practices.

The different kind of measures proposed to the farmers required different efforts. Some measures required more work and time than others and therefore more resources. Monetary resources can be a limiting factor for the producers. That means producers should not cover additional costs alone and there should be a fair share of costs by all actors of the supply chain.

Monitoring visits through the year allowed the recording of the progress regarding implementation and the difficulties and challenges found. For example, invasive species are an additional challenge for the restoration of ecosystems and are as well a difficult task to deal within the crop and the objective to reduce the amount of applied herbicides.

For the farmers is important to understand the biological and ecological processes and relations behind the measures. Dedicating time to talk with the farmers will increase understanding regarding the importance of the measures and will commit them more to follow the positive way initiated.

In general, the results indicate a significant improvement of the biodiversity performance of the farms. The Biodiversity Action Plan elaborated and monitored with the help of the Biodiversity Performance Tool proofed to be useful instruments to increase the potential for biodiversity in coffee cultivation in Colombia. The experience demonstrates that these instruments are flexible and can be adapted to all regions and agricultural productions.

The partners

Rainforest Alliance (RA) is a global NGO working on the interface of business, agriculture and conservation, currently governing two certification schemes for sustainable farming of, among others, coffee.



One of RA's principles is the protection of biodiversity. The standards that certified producers have to comply with include criteria around the protection of natural vegetation on and around the farm through prevention of deforestation, among others, as well as through many requirements around good agricultural practices, such as organic soil management, biological pest control etc.

Lake Constance Foundation (LCF) is an environmental organization created in 1994 and based in Germany. Together with the NGO **Global Nature Fund**, LCF is working on the improvement of biodiversity protection in the food sector since 2012.



In collaboration with Solagro and AGoodforGood in France, Fundación Global Nature in Spain and Instituto Técnico Lisboa in Portugal, they carry out the European Initiative "Biodiversity in Standards and Labels for the Food Sector". See: www.food-biodiversity.eu



With the input of all partners, Solagro designed the Biodiversity Performance Tool, which is now ready for roll out in Europa and beyond.

Fundación Humedales is an environmental NGO based in Colombia, established in the year 2000 and specialized in the stimulation of social processes that aim for the sustainable management of natural resources and services provided by aquatic and other crucial ecosystems in the Northern Andes region.



Fundación Humedales provides assessment for the tree pilot farms in the preparation and implementation of the BAP. Based on the practical experience, the organization contributed highly to the adaptation of the BPT to the regional context.

Expocafé® is the leading exporter of coffee grower's cooperatives, has a high and strict commitment to quality coffees that manages and delivers to its customers. Established over 25 years ago, it has positioned itself as a reference in the sector for innovation, excellence and reliability.



Amongst the value added services it provides to its members, Expocafé helps linking the producer with its customer, develop communication materials, support its member in project developments that will allow them to extend their sustainability policy, and offer detailed traceability down to the producer field.

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