

Realizing the potential of Trees on Farms for biodiversity and livelihoods



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Agricultural productivity and biodiversity conservation are inseparable

For the success of the post-2020 global biodiversity framework, it will no longer be sufficient to seek to limit biodiversity loss through agriculture. Instead, agriculture must become an integral element of sustainable landscapes a force for conserving biodiversity and providing vital ecosystem services to local populations and securing livelihoods.

Trees on Farms (TonF) play a critical role in contributing to biodiversity conservation in agricultural landscapes through in-situ conservation, by connecting fragmented wild habitats and providing stepping-stones between protected area networks and conserving soil biodiversity and agrobiodiversity. TonF are one of the key nature-based solutions to the conservation and food production challenges we face as they also play a critical role in achieving sustainable, biodiversity friendly agricultural landscapes.

To date, TonF are still invisible in most National Biodiversity Strategies and Action Plans (NBSAPs).



The 'Trees on Farms for Biodiversity' project

Funded by the International Climate Initiative (IKI), the **IKI-TonF project** was a joint programme implemented between 2018 and 2021 at the global level and in five countries: **Honduras, Peru, Uganda, Rwanda, and Indonesia**. It aimed to influence decision making and action on the ground to scale up the use of Trees on Farms (TonF). The project demonstrated how ecological, financial, and societal benefits of TonF can contribute to improving human wellbeing hand in hand with biodiversity outcomes, as well as countries' abilities to meet the Aichi Biodiversity Target 7 (Sustainably Managed Agricultural Areas).

Led by **ICRAF**, the project was implemented in Honduras by the Centro Agronómico Tropical de Investigación y Enseñanza (**CATIE**) in partnership with the CGIAR's research consortium on Forests, Trees, and Agroforestry (**FTA**), the General Directorate for Biodiversity (**DIBio**) of the Ministry of Natural Resources and Environment (**MiAmbiente**), the Instituto Nacional de Conservación y Desarrollo Forestal, Áreas Protegidas y Vida Silvestre (**ICF**), the Oficina de Cambio Climático de la Presidencia de la República, Secretaría de Agricultura y Ganadería (**SAG**), the Universidad Nacional de Agricultura (**UNAG**), the Honduran livestock sector, represented by the Federación Nacional de Agricultura y Ganadería de Honduras (**FENAGH**) and the National Platform on Sustainable Livestock Farming (**PNGS**), as well as eight NGOs, notably the Asociación de Productores de Cacao de Honduras (**APROSACAO**) and the American Bird Conservancy (**ABC**).



Key achievements

- **Strong partnerships paved the way to improved farming:** The IKI-TonF project in alliance with several ministries and agencies (SAG, DIBio-MiAmbiente, ICF), Academia (UNAG, CATIE), and stakeholders from livestock farming (PNGS) gathered science-based knowledge at the pilot cattle ranches in Catacamas and demonstrated the benefits of "trees in live fences" for improving farming, family livelihoods, and biodiversity conservation.
- **Sustainability through enhanced knowledge sharing and inclusion in education and research:** Concepts, methods, and results of the IKI-TonF project have permeated the curricula at both CATIE's graduate school in Costa Rica and undergraduate programs at the Universidad Nacional de Agricultura in Honduras (UNAG).
- **Increased visibility of TonF at national level and improved reporting to the CBD:** The project motivated ICF to include TonF in the Honduras' information System for Forest Management and Monitoring (SIGMOF). The information will guide policy development and serve as a basis for Honduras' reporting to the Convention on Biodiversity (CBD).
- **TonF are ready to scale:** The momentum and the knowledge created by the IKI-TonF project in Honduras has motivated other stakeholders to apply the TonF approach in their practice, including both actors from the agricultural sector (e.g., the Honduras livestock sector and the cocoa grower association APROSACAO) as well as nature conservation organizations (e.g., the American Bird Conservancy).



INITIAL SITUATION

In Honduras, 48% of the country is covered by forests (5.4 million hectares) that are home to more than 8900 species of plants and 1700 species of animals (ICF 2019). Yet, between 7,000 and 41,000 hectares are lost every year. At least 80% of this deforestation is caused by agricultural expansion.

The key agricultural sectors in Honduras have varying impacts on biodiversity. Cattle ranching has the most extensive land use and is pegged as the main driver of deforestation with approximately 100 thousand farms covering more than 2.5 million hectares. Subsistence agriculture (primarily maize and beans) covers between 400 to 600 thousand hectares, including fallow lands used to restore soil fertility in the slash-and-burn system used to produce these grains. Coffee cultivation is the best-organized sector, with more than 130 thousand producers and a total area of approximately 350 thousand hectares. More

than 95% of coffee farms are managed under shade but there is massive potential to increase the range of benefits to biodiversity.

A significant number of trees are retained in the agricultural landscape; some are remnants from the original forest, others are recruited from the natural regeneration or are planted by farmers. However, the diversity, quantity, and spatial-temporal arrangements of these trees in the agricultural landscape requires far better planning and management to optimally achieve the urgently needed benefits for nature and rural livelihoods. An explicit TonF approach would be an effective method of choice, but it was completely absent from national laws and institutions, public policies, agricultural extension curricula, and universities when the IKI- TonF project started. TonF were invisible in any of the relevant forums or bodies in Honduras.



WHAT DIFFERENCE DID THE IKI-TonF PROJECT MAKE?

Strong partnerships paved the way to improved farming

As a model area for biodiversity conservation in tropical agricultural landscapes, the IKI-TonF project selected Catacamas, Olancho, Honduras, as its action landscape because it is representative of the tensions between extensive livestock production systems and primary forests of high importance for biodiversity conservation. The IKI-TonF team worked with local experts in promoting learning about the local context and building knowledge about the importance of TonF from an ecological, social, and economic perspective. Crucial information was gathered and shared on farmer needs and interests, suitable tree species and characteristics, and pathways to collaborate to improve both biodiversity conservation and farmers' livelihoods in this landscape. The improvement of live fences was identified as the most promising strategy to better integrate trees into extensive cattle ranching. Live fences are essential for rotational grazing to increase pasture growth and animal productivity and retain ecologically important native tree species in the agricultural matrix, increase biological connectivity between forests, control soil erosion, and provide important goods and services such as shade for animal comfort, fodder, timber, fruits and fuel.

Promoting learning and knowledge sharing among local experts was crucial for defining an entry point for TonF in Honduras. A second success factor was to include decision-makers early-on and link key stakeholders such as cattle ranchers and farmers' associations, land use planners, academia, NGOs, financial and private sector institutions, and policy makers both from local and national levels. The TonF

research was presented at several workshops and technical discussions where both representatives from the National Federation of Farmers and Ranchers of Honduras (FENAGH) and the Ministry of Forestry and Conservation (ICF) were present. Inspired by the innovative approach, the President of FENAGH and the Minister of ICF signed an agreement in 2019 to supply cattle ranchers nationwide with tree seedlings, technical advice, and official registry and certification of timber tree planting in cattle ranches. FENAGH members also committed themselves to provide land and cover the costs for tree planting and care for at least five years to secure tree establishment.

The project staff succeeded in promoting the use of TonF as an inclusive, territorial approach for sustainable development in the "*Programa de desarrollo económico inclusivo territorial de la región del Golfo de Fonseca (sur de Honduras)*". The Gulf of Fonseca is a priority region for rural development in Honduras. The program adopted the use of diversified live fences in cattle ranches and supported the establishment of two further pilot farms in southern Honduras which now effectively use cashew nut – pasture silvopastoral systems and rotational grazing. This was the first example of project outcomes being scaled up outside the project area in Catacamas, Olancho.

Sustainability through enhanced knowledge sharing and inclusion in education and research

Early in the project cycle, various departments at CATIE engaged in the IKI-TonF project researching the nexus of agroecological approaches with

behavioral economic methods and concepts (e.g., using COMMOD, a behavioral analysis tool used in Honduras). The IKI-TonF project provided two fellowships to CATIE students and the IKI-TonF pilot sites offered an ideal research laboratory to produce the scientific evidence on how behavioral analyses can enhance effective silvopastoral and agroforestry systems. The combination of agroecology with behavioral economics offered a new way to look at the participatory development of innovations at the farm level not only for CATIE but also for the agroforestry scientific-technical community.

The IKI-TonF project further established close linkages with the academic sector including two departments of the Universidad Nacional de Agricultura (UNAG) in Catacamas: Natural Resources (Recursos Naturales) and Agronomic Sciences (Ciencias Agronómicas). Linking both perspectives in joint student research on TonF themes not only resulted in increased collaboration between faculties and departments, but also introduced new themes and subjects in the education curricula and research agendas (e.g., research on the optimization of TonF in shaded cocoa plantations). Graduates from both UNAG and CATIE acquired the necessary skills and knowledge to scale out the concepts and methods of the IKI-TonF project, creating awareness of the TonF approach in the next generation of farmers and other stakeholders, and can continue to provide technical assistance to local actors once the project ends; As such, they play an important role in sustaining the TonF approach in Honduras.

Increased visibility of TonF at national level and improved reporting to the CBD

The national mandate to implement the CBD is held by two agencies in Honduras: ICF oversees project-related implementation of policies and guidelines, and DIBio generates the National Biodiversity Strategies and Action Plans (NBSAPs) and other strategic guidelines.

The Aichi Biodiversity Target 7 was not achieved by 2020, yet TonF remain an important approach to biodiversity conservation in agricultural landscapes contributing to the post-2020 global biodiversity framework. The groundwork for this was laid in 2020, when ICF and DIBIO agreed to include the knowledge base of the IKI-TonF Honduras project in their national information system on forest resources in Honduras (Sistema de Información para la Gestión y Monitoreo Forestal, SIGMOF). The biodiversity monitoring protocol developed by the IKI-TonF project can be applied to various biogeographical regions and agricultural landscapes in Honduras, e.g., broadleaf dry and humid tropical forests, pine-oak forest regions, coffee production zones, smallholder hill farming subsistence grain crops, commercial tree crop plantations. Hence, it offers to DIBIO-MiAmbiente the possibility to regularly monitor tree cover and landscape connectivity in key

sentinel territories and, based on these data, report to the national government and the CBD. This is an important contribution to the overarching goal of the project which was to harness the potential of TonF for meeting national and global biodiversity targets, explicitly Aichi Target 7.

TonF reporting through SIGMOF also contributed to Honduras's Nationally Determined Contribution (NDC) to greenhouse gas mitigation and inform climate change adaptation strategies. The project closely worked with the Presidential Office on Climate Change to integrate TonF into their Climate Financial Inclusion Policy.

TonF are ready to scale

Project outcomes were scaled out further when the Honduras livestock Nationally Appropriate Mitigation Actions (NAMA) included the improved live fences in their set of options recommended for implementation from 2022. The NAMA-livestock program in Honduras will pilot live fences in cattle ranches in the five most important livestock-producing departments of the country, providing both financial and technical support to cattle ranchers interested in planting and tending valuable trees on their farms.

The achievements facilitated by the multi-actor, inter-disciplinary partnership approach in Honduras encouraged further organizations in Honduras to support the TonF research or adopt its learnings for their own purposes. For instance, the IKI-TonF researchers trained extension staff of APROSACAO, the cocoa grower association of Honduras' department Olancho, in the use of methods to assess shading provided by shade trees in cocoa-based agroforestry systems. Subsequently, APROSACAO recommended their members the planting and management of timber trees as shade for their cacao. This would not only increase income but also store atmospheric carbon and hence the cocoa farmers would benefit from the certified carbon neutrality of their produce.

In addition, the Chocolate4All project implemented by Heifer and CATIE supported the TonF approach by targeting 400 cocoa farmers in Olancho. The IKI-TonF staff provided training to the agronomists and community advisors in the optimal design of cocoa shade canopies using timber, fruit, and nitrogen-fixing tree legumes. This knowledge contributed to the success of the farmers field school program implemented by Chocolate4All between 2019-2021.

One of the key accomplishments of the IKI-TonF project is that it has not only attracted the attention of stakeholders from the agriculture sector but also from both the sustainable development and nature conservation arenas. For example, after the presentation of project results at UNAG in 2019, the American Bird Conservancy adopted the idea that TonF can help conserve migratory birds and allocated 33 thousand USD to implement the innovations proposed by the project in six cattle or cocoa demonstration farms in Catacamas.

CONCLUSIONS

The IKI-TonF project in the Honduras has demonstrated that it is possible to significantly improve field level practices to the benefit of both people and biodiversity when the recommendations are backed by evidence and simultaneously upscaled into both policy and sectoral, development initiatives. It showcased that the TonF approach can help producers conserve biodiversity in their farms while improving their livelihoods and reducing their financial and environmental vulnerability.

CATIE's longstanding reputation and trusted partnerships with both local and national stakeholders

facilitated a dialogue that helped to integrate the project into ongoing academic, developmental, and political processes. The scientific approach to farm diagnosis and participatory development of innovation was attractive to local and national government, private sector and NGO initiatives who were willing to adopt IKI-TonF project's ideas and tools into their own programs.

Through science-based evidence and the multi-stakeholder approach, TonF finally became a visible resource in Honduras with enormous potential for both improving livelihoods and biodiversity conservation.

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