

## NAMA Café Costa Rica – A Tool for Low-Carbon Development



Nearly all of Costa Rica's coffee plantations are situated at high altitudes, guaranteeing exquisite quality.

### Introduction

The production of coffee is an integral part of the history and identity of Costa Rica. It also contributes 9 % of the national greenhouse gas (GHG) emissions. To reach the Costa Rican goal of carbon neutrality in 2021, and contribute to international climate protection efforts, the country has established a number of Nationally Appropriate Mitigation Actions (NAMAs), tools that support countries in tackling climate change and finding their own path toward low-carbon development.

The NAMA Café Costa Rica is the first agricultural NAMA in the world that is ready for implementation and is an innovative collaboration effort between the public, private, financial and academic sectors. It aims to reduce GHG emissions and improve resource use efficiency at the level of both coffee plantations and coffee mills. These actions will create the first low-emission coffee worldwide and give Costa Rican coffee producers access to new markets. In 10 years, the nation-wide project aims to reach the entire coffee production area with a total investment of US\$ 30 million. It also seeks to lay the groundwork for extending the initiative nationally and internationally to different agricultural systems and other sectors.

The implementation of the Costa Rican NAMA Café will receive technical and financial assistance from the NAMA Support Project “Low-Emission Coffee Costa Rica”, financed by the NAMA Facility. In this aim, it joins a number of other international actors and initiatives such as the project “Development of a NAMA for the Coffee Sector” financed by the Multilateral Investment Fund of the Inter-American Development Bank.

### The coffee sector and its carbon footprint

Costa Rica's coffee plantations stretch along the country's mountain range, covering an area of more than 90,000 hectares between 600 and 1,600 meters above sea level. The coffee sector comprises 50,000 producers, 172 coffee mills, 57 exporters and 37 coffee toasters, representing 8 % of the Costa Rican workforce.

The relevance of the coffee sector at the national level is also reflected in the fact that it contributes 9 % (GHG Inventory 2010) to the total greenhouse gases of Costa Rica, generating 25 % of the emissions originated by the agriculture sector which, in turn, is responsible for 37 % of the country's total emissions.

On behalf of



Federal Ministry for the  
Environment, Nature Conservation,  
Building and Nuclear Safety



Department for  
Business, Energy  
& Industrial Strategy

**The NAMA Support Project (NSP):**  
An integral part of NAMA Café

On behalf of	German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB); British Department of Energy and Climate Change (DECC)
Delivery organisation	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
Expected impacts	<ul style="list-style-type: none"> <li>• Farmers implement sustainable practices such as more efficient fertilizer use and agroforestry.</li> <li>• Coffee mills adopt low-emission, eco-efficient technologies.</li> <li>• Financial mechanisms offer attractive opportunities for sustainable investments.</li> <li>• Baselines are established and progress measured transparently within a MRV system.</li> </ul>
NSP project region	Zona los Santos, Valle Central and Valle Occidental, Costa Rica
NSP target group	Up to 6,000 producers and 50 mills, 25,000 ha
NAMA target area	93,000 hectares of coffee
NSP duration	5 years (2015–2019)
NAMA duration	10 years
NAMA Facility funding	€ 7 million
NAMA investment	US\$ 30 million
Responsible ministries	Ministry of Environment and Energy (MINAE) Ministry of Agriculture and Livestock (MAG)
Implementing partners	ICAFE, BCIE, Fundecooperación para el Desarrollo Sostenible
Technical support	CATIE, UNA, IICA

## Institutional Framework

Costa Rica took on the challenge to achieve carbon neutrality in 2021. Setting this goal required the establishment of an institutional framework to connect the different sectors in which mitigation measures would be implemented on a national level. The Ministry of Environment and Energy (MINAE) is the steering entity of the National Climate Change Strategy, coordinating its implementation and cooperating with the other Ministries included in the Strategy. The Ministry of Agriculture and Livestock (MAG) has defined a “State Policy for the agricultural sector and the rural development of Costa Rica 2010–2021”, which integrates climate change and agri-environmental management.

A key institution in the coffee sector is the Coffee Institute of Costa Rica (ICAFE), established in 1933. It is a non-state, public entity that promotes national coffee production and has an agreement with MAG to support the development and implementation of the NAMA Café.

Fundecooperación is a non-profit organization working for sustainable development in Costa Rica. It provides technical assistance to projects regarding sustainable agriculture, gender equality and energy efficiency, among others. Fundecooperación also has a lending program called “tailor-made credit” that finances green initiatives, including in the coffee sector.

This group of institutions forms the basis for the NAMA Café. Its structure consists of a political committee, a technical committee, an executing “Mesa NAMA Café” (NAMA Coffee Round Table) and a project managing unit as a technical secretariat. These will be supported by national and international consultants like the Tropical Agricultural Research and Higher Education Center (CATIE) and the National University of Costa Rica (UNA). International cooperation projects, such as the project “Development of a NAMA for the Coffee Sector” financed by the IADB-MIF, and the NAMA Support Project “Low-Emission Coffee Costa Rica”, financed by the NAMA Facility and implemented by the GIZ, support the implementation of the NAMA Café Costa Rica.

## Overall goal and concept of the NAMA Café

The overarching goal of the NAMA Café is to produce and process coffee in Costa Rica in a low-emission, sustainable fashion. This objective will be reached by strengthening the technical and institutional capacities at the country level, and at the same time facilitating the inclusion and coordination of the public and private sectors in national emission reduction initiatives.

At conclusion of the initiative, coffee growers and mill operators will possess the agronomic and technological knowledge to initiate change toward low-carbon coffee production. Furthermore, they will have access to attractive financing options for long-term eco-efficient investments, and will be connected to international buyers interested in sustainable, high-quality products. The concept is based on the implementation of technologies in the coffee sector that will increase competitiveness, mitigate the emission of greenhouse gases, and simultaneously generate social, economic and environmental co-benefits, including with regard to climate change adaptation.

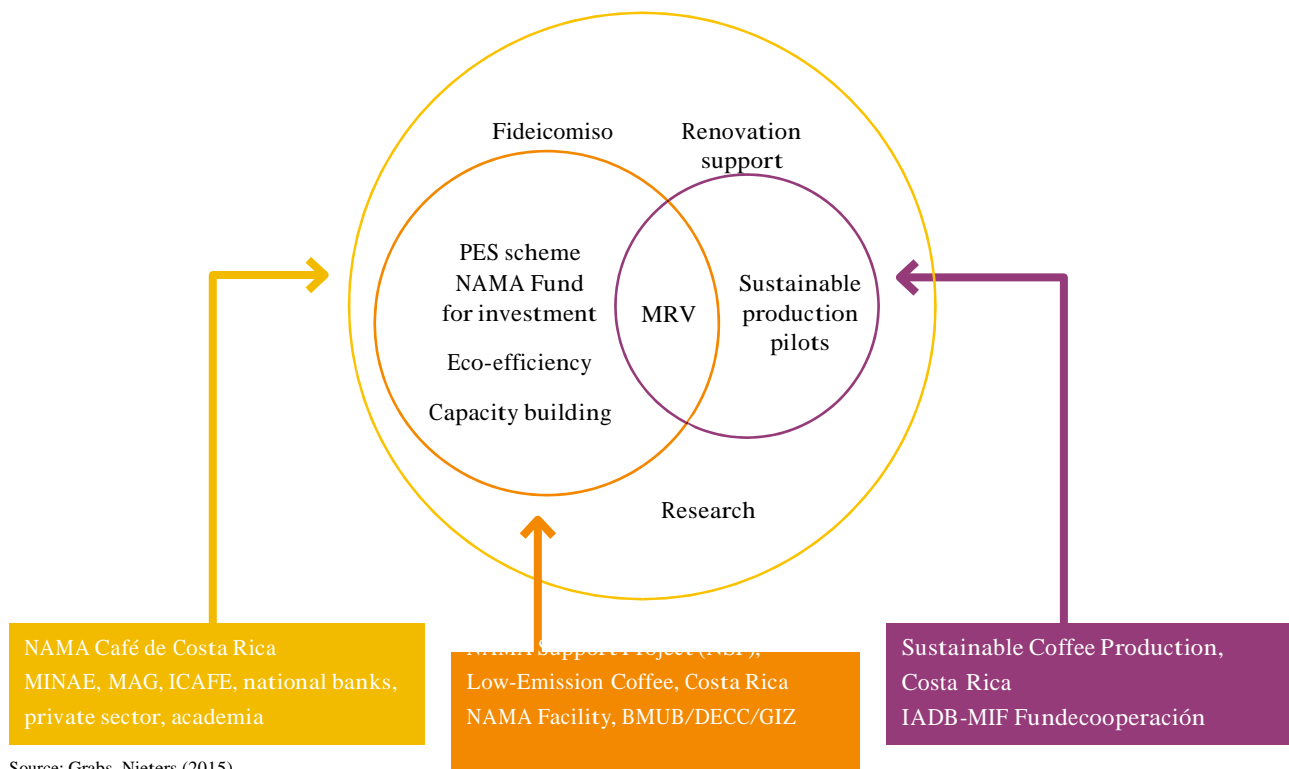
To ensure success, the NAMA Café will include the entire value chain, from farmers to exporters, in a range of activities. It will also integrate ongoing governmental

initiatives that strengthen the coffee sector, such as the *Fideicomiso cafetalero*, a trust that supports producers affected by coffee rust in renewing their plantations.

Another important government-driven program included in the NAMA Café is the renovation of the coffee plants. A coffee plant produces coffee for more than 40 years, but after 20 years its productivity declines. Increasing the productivity of the farm simultaneously lowers the emissions per kg of coffee produced. Therefore, coffee plant renovation helps to increase productivity, lower the emission intensity, and at the same time helps adapting to climate change through the introduction of new varieties.

Finally, trees in coffee cultivations have various positive effects: increasing biodiversity, diversifying the producers' income, capturing carbon and protecting and conserving soil and the water resources. Agroforestry is already included in the country's "payments for environmental services" (PES) system. Each producer who cultivates coffee with at least 70 trees per hectare receives 70 \$/ha/year.

The following image shows the interplay between national and cooperation projects that all contribute to NAMA Café:



Source: Grabs, Nieters (2015)

## NAMA Facility and NAMA Support Project “Low-Emission Coffee Costa Rica”

The NAMA Facility was established by the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) and the Department of Energy and Climate Change (DECC) of the United Kingdom (UK). It provides tailor-made support for the implementation of highly ambitious and transformational NAMAs in developing countries. The Facility conducts competitive calls and selects the most ambitious and promising NAMA Support Projects for funding. The NAMA Support Project “Low-Emission Coffee Costa Rica” (NSP) was developed by the BMUB/ICI Project “Support Implementing National Climate Strategy – Programa ACCION Clima”, implemented by GIZ Costa Rica in collaboration with the members of the Mesa NAMA Café, which includes the MAG, the MINAE, ICAFE, and Fundecooperación.

The NAMA Facility approved the NSP in February 2015 and its implementation phase will prospectively run from May 2015 to April 2019.

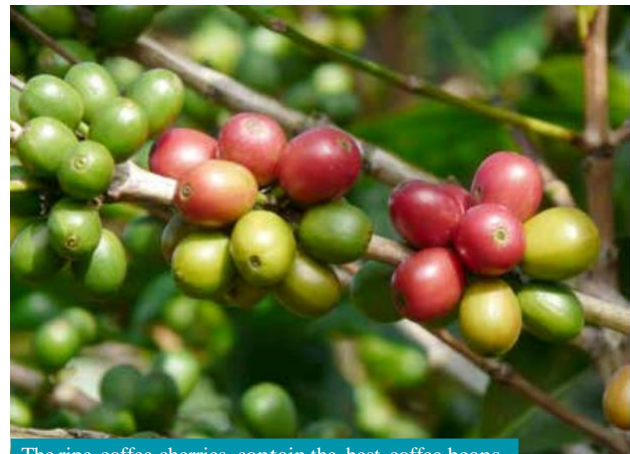
The total funding commitment of the NAMA Facility amounts to € 7 million. The greater share of these funds will enable technical and feasibility studies, capacity-building measures, carbon audits and other awareness raising activities to take place. Part of the financial assistance component will be managed by the GIZ, offering direct investment subsidies to facilitate the adoption of small-scale innovative technologies in coffee mills. The NAMA Fund will offer partial guarantees for low-interest credits for the implementation of larger-scale low-emission technologies that will be disbursed in collaboration with national financial institutions.

The NSP’s implementation strategy includes the selection of projects which are highly profitable and result in high emission reductions. Its main scope will be in the Zona los Santos, Valle Central and Valle Occidental regions because these areas have a high influence on the coffee sector and will likely mobilize the other areas. These areas include around 12,000 coffee growers, thus the mills have a high number of suppliers. Coopetarrazú for example has over 3,000 producers and Coopedota groups almost 1,000 producers.

In five years, the NSP “Low-Emission Coffee Costa Rica” aims to reach up to 6,000 producers on up to 25,000 ha, who apply at least 2 of the promoted technologies and

practices, and up to 50 coffee mills, which apply at least 2 emission-reducing technologies.

It thus creates valuable best practice experiences, supports the creation of indispensable framework conditions, and kick-starts innovative collaboration projects at the country level that will continue to yield results beyond the NSP’s conclusion.



The ripe coffee cherries contain the best coffee beans.

### Low-emission, sustainable coffee production

In Costa Rica, the fertilization of coffee plantations is responsible for the majority of N<sub>2</sub>O emissions coming from the agricultural sector. It is important to understand that N<sub>2</sub>O has a 20 times higher greenhouse effect than CO<sub>2</sub>. Therefore, the optimization of fertilizer use is crucial to reduce emissions. There are still producers that manage fertilizers inefficiently by using incorrect doses and disregarding adequate time tables, which results in environmental contamination and an increase in production costs. Merely changing the type of fertilizer used could already result in a significant reduction of GHG emitted.

Furthermore, as mentioned, agroforestry practices have important environmental and economic co-benefits. The NSP will contribute to Costa Rica’s Payment for Ecosystem Services system and financially support the producers which change their systems to agroforestry, particularly those who introduce new tree species on their farms.

These are some of the best practices that will be verified and validated in order to establish low-emission procedures that maintain or even increase the productivity of the farm. Cost-benefit analyses will yield additional evidence on the economic profitability of such measures. Training of trainers (for example of extension officers)



and capacity building measures for farmers in collaboration with the extension services will promote these practices.

### Low-emission coffee processing

The next step in the production chain of coffee is the processing of the coffee in the mills. The different layers of the coffee cherries are removed to obtain the coffee beans; hereafter they are classified and dried. A small part will also be roasted. There are coffee mills that use water for the separation, the transport in the mill and the sorting of the beans. This water frequently gets contaminated by the by-products. Reusing and recycling the water would save valuable resources and lower emissions.

Besides the water, high amounts of biomass are produced. In the production of one ton of coffee beans, 2.25 t of pulp, 0.9 t of mucilage and 0.25 t of husk are generated. Normally, the pulp is thrown away, producing methane and bad odour. Together with the husk, the pulp could be composted, producing a very fertile soil. This procedure reduces emissions and at the same time diminishes the use of fertilizers. Another option is to use this biomass as a source for bioenergy. This could make processing more sustainable and at the same time lower the costs for the mills.



Using coffee husks as fuel can save much firewood.

The water of the pulp and the mucilage, together with the waste water, could for example be transformed to biogas through anaerobic digestion. Husks could be used as fuel in an oven to generate heat for the drying and roasting process. Another option to produce bioenergy and gain self-sufficiency is the use of solar panels. The NSP will help the mills to invest in those technologies and measures to process high-quality coffee in a low-emission manner.

During the “Readiness” phase of Costa Rica’s NAMA Café, the BMUB/ICI/GIZ project “Support Implementing National Climate Strategy – Programa ACCION Clima” worked with 10 coffee mills to evaluate their carbon footprint and three of them started working towards carbon neutrality. This data will be helpful in prioritizing and analysing the different technologies. Furthermore, the exchange of information and the promotion of technologies at a national and international level will be facilitated.

### Access to differentiated markets

Coffee producers will have access to a market for differentiated coffee at favorable prices due to their product’s low-carbon footprint, high quality and sustainable production. To achieve this goal, market opportunities will be studied, marketing strategies developed and cooperation between Costa Rican and international actors strengthened.

### NAMA Café Fund and financial incentives

A share of the funds allocated to the implementation of the NSP “Low-Emission Coffee Costa Rica” will be administered by the Central American Bank for Economic Integration (BCIE) and national banks that will offer credits with lower interest rates supported by a credit guarantee fund to mills and producers for investments in low-emission technologies and practices. Another financial incentive system of the NAMA Café will be a co-financing mechanism (i.e. subsidies for capital investments) which will facilitate the dissemination of low-emission technologies not yet regarded as bankable and cover a certain amount of the investment on a non-reimbursable basis. Furthermore, the NSP’s aim is to mobilize additional public and private financing for low-carbon technologies and practices.

### Measurement, Reporting and Verification system

One of the most important elements for the successful implementation of the NAMA Café is a cost-efficient Measurement, Reporting and Verification (MRV) system: the actual emissions in farms and mills have to be measured, reported and verified to define the baseline.

Current scientific data suggest that emissions in a farm amount to an average of 1.02 kg CO<sub>2</sub>e/kg green coffee and in the mill to an average of 0.48 kg CO<sub>2</sub>e/kg green coffee (Kilian, B., Rivera, L., et al. 2013). The NSP will assist in constructing a sound and straightforward MRV framework. After implementing the new practices and technologies, emissions will be measured again to record the GHG reductions. The MRV system will also help monitoring the financial performance and the impact of the Fund's operation.

### Indicators of success

The NSP's goals will be monitored using a range of indicators detailed below:

- Emission intensity of coffee production at national level and absolute emissions per year
- Volume of public finance mobilized
- Potential for transformational change

- Increase in number of trees and number of species per ha of coffee produced
- Further-reaching and better access to markets for coffee produced by those farmers applying low-carbon technologies than for conventional coffee

The NSP aims to effectively support the Costa Rican coffee sector's goal to not only reduce GHG emissions, but also to produce and process high quality coffee in an environmentally and socially sustainable manner, taking into account the fact that coffee production has to be highly competitive to maintain access to international markets; and has to provide adequate income to farmers and preserve natural resources such as soil and water in order to be sustainable. In addition, the experiences with low-carbon technologies and practices in Costa Rica can inform mitigation activities in other coffee growing countries in Central America and globally.



Low-emission production supports both economic and environmental sustainability of Costa Rican coffee farms.

### Cooperation Partners



### Imprint

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