

# CUBA

*"Tarea Vida":*

An ambitious plan  
to address climate change





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► “Tarea Vida”:

## An ambitious plan to address climate change

Cuba presented its Nationally Determined Contribution (CND per its Spanish acronym) in November 2015. Cuba’s CND outlines adaptation as its main priority, due to the negative impact of climate change on its natural and human ecosystems and considering the low level of Greenhouse Gases (GHG) emissions in the country.

This proposal –that became Cuba’s contribution as of the entry into force of the Paris Agreement– acknowledges that in the area of mitigation *“Cuba has undertaken significant efforts to implement programs to reduce greenhouse gas emissions and shall continue to show its commitment thereto, in accordance with its national circumstances and available financial and technological resources, in the pursuit of technological modernization, development and capacity building on the basis of sustainability”*.

The Cuban government has continued to strengthen its national endeavors and has created an ambitious framework of adaptation and mitigation actions, accompanied by training and communication pro-

grams. In April 2017, its State Plan to Address Climate Change was approved, an overview of which was presented to the Secretary General of the United Nations in July 2019.

**On September 23, 2019, the Climate Action Summit will be held, in response to the call of the UN Secretary General to raise ambition in the face of climate change and produce progress in the implementation of the Paris Agreement. Cuba is pleased to present some of the most significant advances and projections of its State Plan, as part of the initiatives that contribute to the global efforts that are taking place today, offering a broad and ambitious platform of action.**

**This material illustrates examples of the work carried out by the country, beyond the Nationally Determined Contribution (2015) that confirms the priority given to adaptation while emphasizing some mitigation actions that are currently being planned and implemented.**

# 1 State Plan to Address Climate Change in the Republic of Cuba

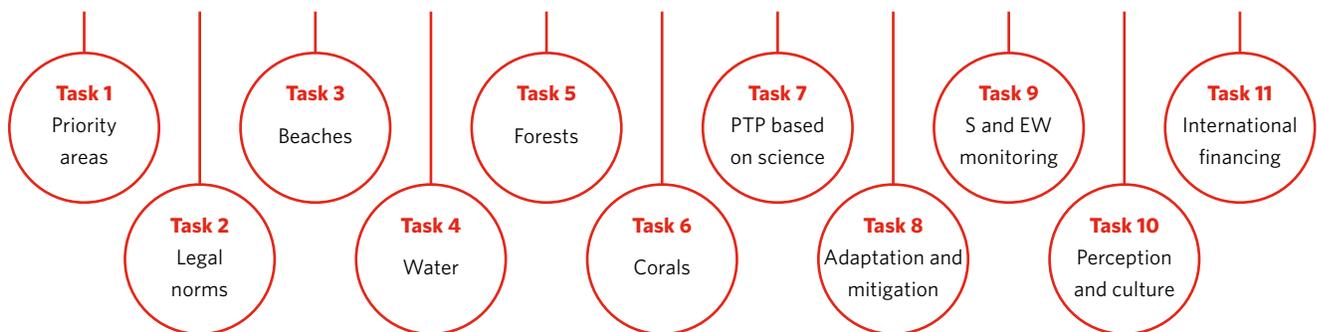
The State Plan to Address Climate Change in the Republic of Cuba, known by the Cuban society as **“Tarea Vida”** (Task: Life), was adopted by the Government in April 2017, to respond to its national

goals and international commitments. It is a comprehensive and ambitious program to address climate change in the Cuban national territory through adaptation and mitigation measures.

## State Plan for Address Climate Change Task Life



### 11 task



**Acronyms used:** SA: Strategic Actions / PTP: Physical Territorial Planning (POT per its Spanish acronym) / S: Surveillance / EW: Early Warning

## Climate Impacts and trends in Cuba

### Some Impacts



A 0.9°C increase in the annual average air temperature; a 1.9°C in the annual average lowest temperature; and a significant reduction in the diurnal range of this variable.



Cloud cover decrease and solar radiation increase.



Increased frequency of severe and prolonged droughts, particularly during the summer, with an average recurrence of one every five years.



Increase in rainfall levels during the dry season and slight decrease in the rainy period of the year, mainly in Central and Eastern Cuba.



Increase of the sea surface and lower troposphere temperatures.



Permanent loss of the country's emerged surface that could reach up to 2.3% by 2050 and up to 5.5% by 2100; those figures are likely to increase once the ongoing studies of the archipelago's isles, islets and cays are completed.



Vulnerabilities caused by sea intrusion; today 574 human settlements and 263 water supply sources have been identified.

### Cuba's future climate

Cuban researchers, using the Climate Modeling System (PRECIS, 2019), in collaboration with the CARICOM Climate Change Center (CCCCC) and the University of the West Indies, have estimated the future climate scenarios for the country and the Greater Caribbean region up to the year 2100 (with high spatial resolution); as well as the temperature scenarios in the Caribbean, when the world reaches the 1.5 and 2°C. Those estimates have made it possible to characterize Cuba's future climate, focusing calculations on years 2030, 2050 and 2070.

Since the 90s, the evaluation of investment security requirements begins in Cuba, under the coordination of the Civil Defense. The organization, systematization and integrated vision of these studies is perfected as of 2005, with the development of the Danger, Vulnerability and Risk (PVR per its Spanish acronym) studies. The investigations related to the impact of the rise of the average sea level, have a first antecedent in 1992, and are reflected in the First National Communication (2000), deepening from 2007, with the execution of a project on the impact of the rise of the average sea level in the years 2050 and 2100 (Macroproject). Annually, maps are generated with an update of the results, as early warning for decision making.

In general, it can safely be said that the Cuban climate is shifting from humid tropical to dry tropical, with average temperatures above 30°C, approximately 1,000 mm of annual average rainfall and 70 rainy days, conditions that will bring about the displacement of dry landscapes typical of the eastern region to other areas of the country. It can be said that:



The air temperature will continue to increase consistently with estimates made in previous models developed in Cuba, and could be as high as 4.5°C. The greatest warming will occur during the warmest period of the year, which will become more evident with the passing of time.



Rainfall will maintain its estimated downward trend. The number of rainy days will decrease; high and heavy rainfall will increase; while droughts will become longer and more severe.



Solar radiation will increase as the cloud cover decreases.

## Description of GHG emissions in Cuba

The country has done the national GHG inventories for the years 1990, 1992, 1994, 1996, 1998, 2000, 2002, 2004, 2006, 2008, 2010, 2012 and 2014. It is currently preparing the 2016 inventory that shall be reported in the Third National Communication and the First Biennial Update Report in 2020.

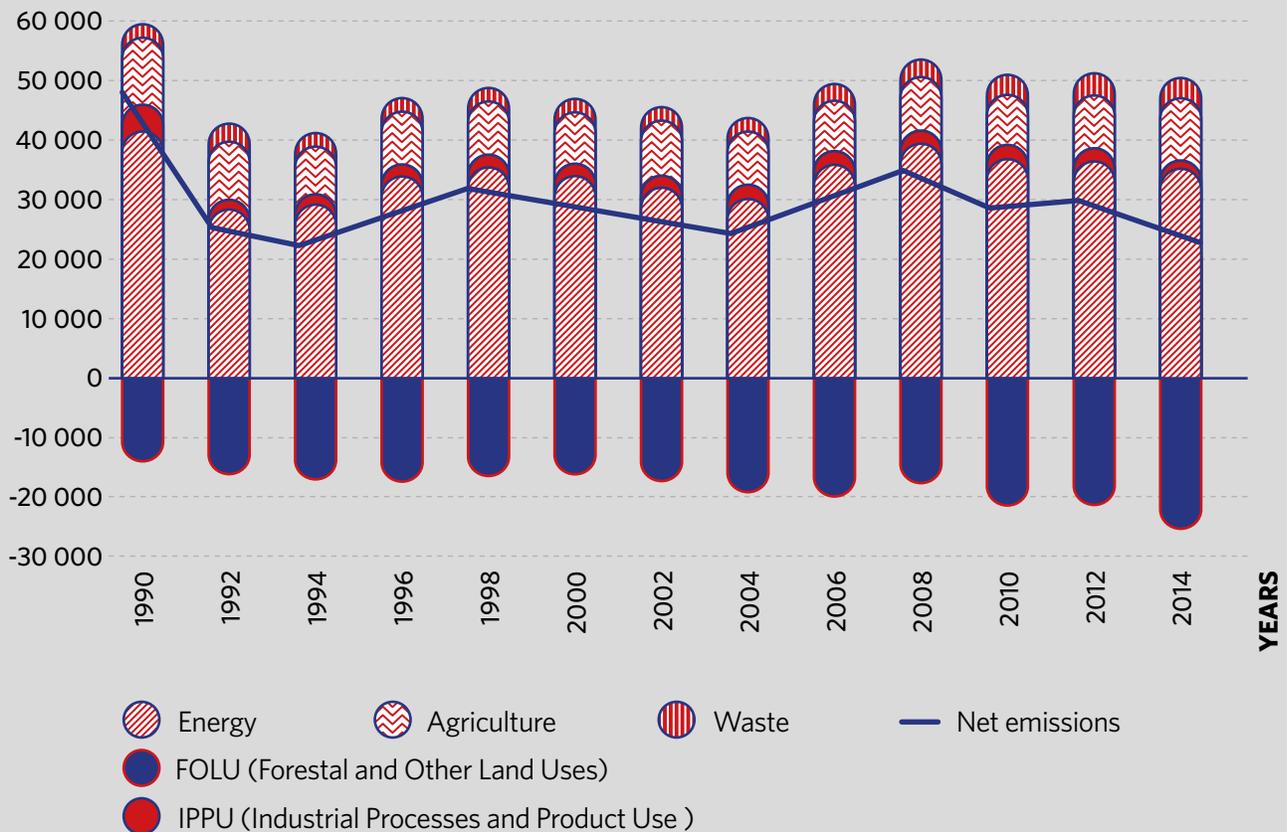
According to the last GHG inventory (2014), gross emissions amounted to approximately 42 million tons of CO<sub>2</sub> eq, accounting for 84 % of emissions in comparison with the base year, i.e. 1990. In 2014, around 70% of the total GHG emissions originated in the energy sector, which accounts for all fuel combustion emissions (power generation, transportation, industries).

Ranked second are agriculture and forestry with 22% of the total emissions, the remainder is divided between wastes and industry (8%).

Forests greatly influence Cuba's GHG inventory net emissions as they remove around 20 million tons of CO<sub>2</sub> according to data from the last inventory. This is the result of the sustained growth of the forest cover in Cuba, from 13.9% of the territory as of the triumph of the revolution in 1959 to 31.23% in 2018. The forest cover of the country increased to 3,184,057.86 million hectares, out of which 2,656,004.10 correspond to natural forests and 528,053.76 to plantations.

### Decrease in gross emissions and increase in CO<sub>2</sub> removals, due to forest area growth. 1990-2014

#### EMISSIONS (Gg CO<sub>2</sub> eq)



**Source:** Planos, E; T. Gutiérrez, R. Capote, G. Barranco, D. Salabarría y M. Vales (Eds.) 2018. *Aportes 2013-2018 del Programa Nacional de Ciencia Cambio Climático en Cuba: Impactos, Adaptación y Mitigación*. Agencia de Medio Ambiente. Editorial AMA.

The main objective of **“Tarea Vida”** is to protect human life and its quality, in a changing climate. To that end, it involves all the sectors of the economy and the society and is implemented at national and local levels. The two years devoted to the beginning of its implementation confirm the Plan is on the right track to achieve a resilient development with lower emissions.

Its implementation is supported by the Guidelines of the National Economic and Social Development Plan up to 2030, which provide that the State “... shall promote the implementation of a series of programs and actions to ensure the effective management of the country’s disaster risk and climate change adaptation; energy efficiency; and the development of renewable energy sources”. Likewise, they include **climate change mitigation and the promotion of a less carbon-intensive economic development** within its objectives. These national policy instruments support Cuba’s contribution to the 2030 Agenda.

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**The new Constitution of the Republic of Cuba, adopted in 2019 by popular referendum, expressly refers to climate change in the context of international relations**

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Article 16 / f



*“promotes the protection and conservation of the environment and the need to address climate change as it threatens the survival of the human species, on the basis of the principle of shared but differentiated responsibilities; the establishment of a fair and equitable international economic order and the elimination of irrational production and consumption patterns”*

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**Documents of the 7th Party Congress approved by the III Plenary Session of the CPC Central Committee on May 18, 2017 and endorsed by the National Assembly of Popular Power on June 1, 2017**

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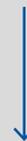
Strategic Axis

Natural Resources and Environment



**Specific Objective 11**

*Increase energy efficiency and the development of renewable energy sources, which contributes, among other benefits, to reducing the generation of greenhouse gases, mitigating climate change and promoting less intense carbon development.*



**Specific Objective 12**

*Effectively and efficiently implement programs and actions to address climate change, with emphasis on adaptation, vulnerability reduction and the introduction of systemic and intersectoral strategies.*

# ▶ Advances made in adaptation and mitigation actions

This section of the document presents the most important climate change adaptation and mitigation advances and projections achieved by the Republic of Cuba. Similarly, reference is made to existing synergies between both issues and resulting co-benefits.

## **RESILIENCE, ADAPTATION AND NATURE-BASED SOLUTIONS.**

Initiatives including national and local planning, Ecosystem-Based Adaptation and the sustainable management of agricultural landscapes are outlined below.

### **1. Mainstreaming climate change policies into planning.**

Physical territorial planning is conceived as a system that goes from the national to the municipal level. The main territorial planning tool is the National Physical Territorial Planning Scheme (ENOT, per its Spanish acronym), adopted by the Council of Ministers in 2018. ENOT supplements the 2030 National Economic and Social Development Plan. Reducing vulnerabilities to climate change impacts

is one of the guiding principles of this important planning tool.

In December 2018, a specific accounting standard was adopted, *“Environmental Accounting”*, which provides the procedure to recognize and record environmental expenses, in order to assess climate change impacts and the results of the Tarea Vida.

Cuba is taking steps to design Climate Change Adaptation Plans at provincial and municipal level, as basic tools to identify, prioritize and plan adaptation measures. Initially, this process has focused on the country’s capital, Havana, as it is the most complex area where all climate change impacts identified for the country’s overall coastal area converge. Lessons learned in the preparation of this Adaptation Plan shall serve as basis for future improvements and scaling up to the rest of the country.

At municipal level there are some experiences in the development of Adaptation Plans in the agricultural sector and Adaptation Plans for prioritized coastal areas under the Tarea Vida are forthcoming. The success of these processes requires local government leadership and strong stakeholder engagement.



**Coastal flooding by sea penetration**  
Image taken from CUBAHORA

## 2. Nature-Based Solutions.

Cuba has fostered the sustainable use and conservation of its biodiversity and the environmental services that its marine and terrestrial ecosystems provide, actions that contribute to climate change adaptation. In that regard, the National System of Protected Areas (SNAP, per its Spanish acronym) comprises around 22% of the national territory and the forest cover index was 31.23%, by the end of 2017.

Cuba has privileged the implementation of Nature-Based Solutions as a cost-effective climate change adaptation strategy, particularly in its coastal areas, as reflected in one of the State Plan Strategic Actions. Said actions seek to maximize the protective services that marine and coastal ecosystems provide to reduce the vulnerabilities of human settlements and built infrastructure and improve the preservation of soils and aquifers.

Today, the implementation of the Ecosystem-Based Adaptation approach is extended to prioritized areas under the State Plan to enhance the functional

rehabilitation of coastal wetlands (i.e. mangrove forests, marshland forests and grasslands) and marine ecosystems like seagrass and coral reefs. These processes are carried out with broad local community, government and stakeholder participation; and the establishment of knowledge and information management platforms to support decision-making.

A permanent beach recovery investment program has been designed, experience that has already been shared with other countries of the region. Experiments on coral reef rehabilitation and protection are ongoing, prioritizing coral reef crests around the island shelf, and its results are being assessed for possible scaling up to other regions of the country. Reforestation programs of vegetative buffer strips of the country's rivers and reservoirs, and mountain areas have been implemented, bringing about benefits at watershed/basin level.

The 2016-2020 National Biodiversity Program widely reflects Cuba's commitment to nature-based solutions. Its implementation generates considerable mitigation co-benefits since rehabilitating forest ecosystems increases carbon removal services.



**Mangrove sowing**

Image taken from the project MANGLAR VIVO

### 3. Climate change adaptation in the agricultural sector.

Two of the five strategic actions included in the State Plan deal specifically with the priority of climate change adaptation in the agricultural sector in response to the rise of mean sea level and drought. On the basis of accumulated scientific knowledge and available agrometeorological data, interaction between productive entities is fostered to identify and implement mitigation measures. The implementation of the Sustainable Land Use approach with an integrated vision that includes other resources such as Water, Soils and Forests is promoted to strengthen ecosystem services contributing to food security.

Soil use planning and preservation; diversification of crops and growing crop varieties adapted to the changing climate conditions; and the use of technologies to increase irrigation and water supply efficiency are among the priority actions. These measures, in turn, will generate mitigation co-benefits by removing soil carbon, using renewable energy sources and promoting energy efficiency.



**Sustainable Land Management Actions**  
Image taken from the Program CPP-OP 15



**Adapted varieties of rice**  
Image taken from the project BASAL

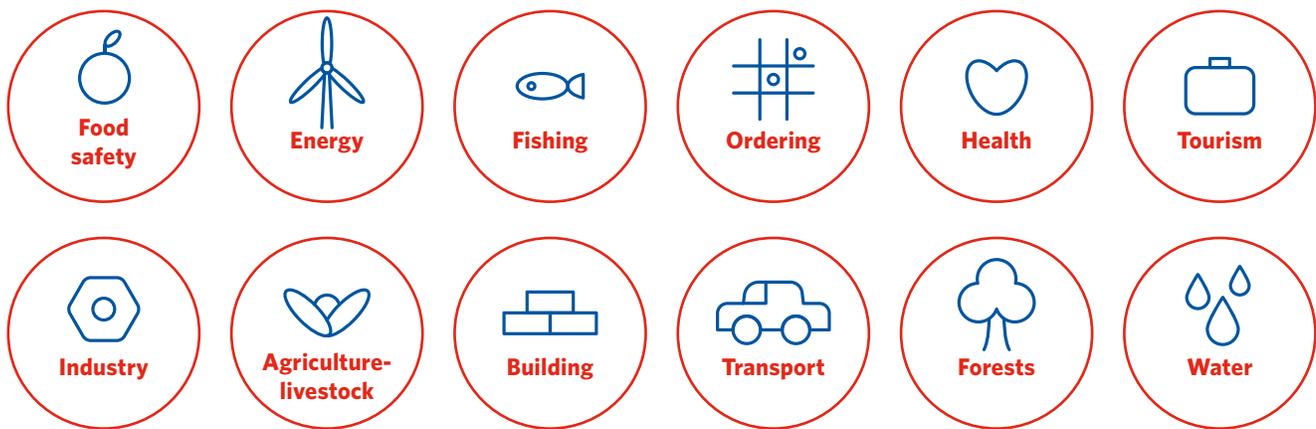
## MITIGATION AND LOW-CARBON EMISSION DEVELOPMENT.

Whereas the current Nationally Determined Contribution (NDC) of Cuba (2015) focuses on the energy sector with particular emphasis on renewable energy sources, the State Plan to Address Climate Change widens the scope of mitigation to other sectors as evidenced in the call for “*promoting a less carbon-in-*

*tensive development*” stated in the Basis for the Economic and Social Development Plan up to 2030.

While reaffirming the instrumentation of what has been agreed upon in the NDC, initiatives related to the use of bioenergy, the promotion of sustainable mobility, the role of forests in carbon removal and the promotion of low-carbon development strategies are presented here.

### Sectors where the main adaptation and mitigation actions are being implemented. Task 8 of the State Plan.



#### 1. Implementation of Cuba's Nationally Determined Contribution (CDN).

The “Policy for prospective use of renewable energy sources and energy efficiency” is being implemented, under which progress has been made in reducing GHG emissions in power generation. The construction of facilities to generate a total of 2,144 MW, which includes 700 MW generated by photovoltaic solar energy; 755 MW generated by bioelectric energy; 633 MW generated by wind farms and 56 MW generated by hydroelectric plants is foreseen. The implementation of these programs will generate over 7,000 GW annually and will prevent the emission of over 6 million tons of CO<sub>2</sub>.

Most outstanding in the 2014-2018 period was the significant growth of photovoltaic solar energy, the

installed capacity of which went from 14 MW in 2014 to 135 MW in 2018, increasing in more than 8 folds the power generation based on this technology. Wind energy will be incorporated in 2020 with 100 MW to be incorporated to the National Electroenergetic System (SEN per its Spanish acronym) with large-size wind turbines. In the case of bioelectric plants, 60 MW will also be incorporated to the grid on that same year.

Progress is being made in the installation of LED technology with plans to distribute 13 million lamps in the residential sector and 250,000 street lamps, and to replace 2 million electric stoves with induction cookers.

This policy is implemented in coordination with the industrial sector that is developing production lines

for manufacturing industrial and residential solar heaters, LED lamps and induction cookers.

In order to promote clean energies, Cuba is also evaluating the potential of sea currents to generate electricity.



**Wind farm**

Image taken from CANAL CARIBE



**Photovoltaic farm**

Image taken from CUBAHORA

## **2. Transfer of Bioenergy Technologies related to food production.**

In order to reduce the environmental pollution caused by agricultural wastes, transfer of technologies to harness these bioenergy resources is being promoted.

The first National Bioenergy Atlas with geo-referenced data at the provincial level has been published. This provides information on the availability and potential of biogas, biodiesel, forest biomass and agro-industrial wastes to increase their use. As part of the National Statistics and Information System, data collection is being expanded to include the level of use of such resources thus contributing to monitor the progress being made in the implementation of the country's policy on renewable energy sources.

The assimilation of biodigestors by producers and the cooperative sector is being consolidated, including the introduction of adequate technologies for medium-scale facilities. Small-scale domestic production of tubular biodigestors has started. In the pigmeat sector, a reduction of accumulated emissions of over 8 million tons of CO<sub>2</sub> for the 2019-2030 period is foreseen with the installation of more than 18,000 biodigestors of different kind. Once the program is completed, more than 200,000 m<sup>3</sup> of biogas will be generated daily, which will allow the generation of electricity equal to that generated by a 40 MW wind farm.

Pilot projects for the production of biodiesel and its use in agriculture machines are being developed under the integrated production of food and energy approach. Introduction of the rice husk gasification technology, connected to the national grid, is being promoted in order to reduce the consumption of fossil fuel in the process of drying rice and increase the economic profitability of this productive activity. The capacities of the domestic industry are being built to manufacture the required material and components to increase the use of biogas and biodiesel nationwide.



**Biodigesters in rural communities**

Image taken from the Program PPD

### 3. Alternatives to promote sustainable mobility.

The country has approved a comprehensive policy and a program to develop urban transportation in the capital. Within this framework, several initiatives are being implemented for an effective transition towards a low-carbon urban transportation system in Havana that will generate many benefits for the population and reduce emissions. Taking into consideration climate change impacts, urban mobility is foreseen to be included in physical territorial planning. Pilot transportation development measures are being promoted, namely, walkways and intelligent traffic lights, public bicycle sharing system, intermodal stations, and mass bus rapid transit system. Hybrid and electric transportation means are being introduced on experimental bases, which will also enhance the quality of the public transportation service.

Pilot actions are being implemented to improve mobility in urban and rural areas. In highly popu-

lated areas, electric tricycles powered by a photovoltaic park connected to the national grid are being used. In some agricultural cooperatives, this means of transportation is being used to facilitate economic activity.



**Electric bus**

Image taken from the project NEOMOVILIDAD

### 4. Mitigation potential of the forestry sector for carbon removal.

In the year 2000, Cuba began implementing research and development projects to evaluate the potential of the forestry sector for atmospheric carbon removal. Today we know that forests in Cuba help to remove 20 million tons of CO<sub>2</sub> from the atmosphere every year. The forestry sector is considered the only net carbon sink in the country, reason for which there is an annual increase in the area under forest cover.

For some years now, the country has assimilated and implemented a methodology to calculate the quantity of atmospheric carbon removed in the main forest ecosystems. A pilot project is being implemented to establish payment for this envi-

ronmental service through sustainable forest management with potential to scale it up to the forest estate of the nation. This initiative would generate additional financial resources for the preservation and sustainable use of biodiversity.

The 2016-2020 National Biodiversity Program widely reflects Cuba's commitment to the implementation of payment for environmental services, since Goal 3, action b) and Goal 14, action f) expressly refer to carbon capture and storage; and Goal 13, action f) states the need to conclude the technical basis to establish payment for environmental services in the protected areas and the forestry sector.



**Forest heritage**

Image taken from RADIO GUANTÁNAMO

### **5. Integrated solutions to promote sectorial and local low-carbon development strategies**

Sectorial and local (municipal) low-carbon development strategies are being designed in line with the country's priorities and a less carbon-intensive development.

At the local level, this concept is based in harnessing the energy resources of the territory and building capacities for carbon removal through the sustainable management of natural resources while promoting the development and implementation of technological solutions combining the use of renewable energy sources and energy efficiency to improve access to energy services in rural communities. This will enhance the community's economic development, social welfare and resilience to extreme natural events. Local initiatives are being implemented for the installation of photovoltaic parks connected to the grid in order to supply power to mini-industries producing food and building materials.

At the sectorial level, more cost-effective measures are being explored, including the reduction of emissions through sustainable management of soils and better agricultural practices; taking energy efficiency into consideration in different types of constructions; and the evaluation of low-carbon development projects in key sectors such as the tourist sector.

#### **Measurement, Reporting and Verification (MRV) actions implemented in the country:**

- Development of the General Basis for the establishment of a National MRV System in Cuba.
- Design and implementation of a MRV system for the agricultural and forestry sectors.
- Design and implementation of a MRV system for the energy sector.
- Design and implementation of a MRV system for the public transportation system in Havana.

# ▶ Distinctive features of *Tarea Vida*



## **Solid scientific basis**

All actions are based on scientific and technical findings and on the accumulated experience in managing the human, social and natural resources of the country.



## **Transformative impact**

Strengthens adaptation as well as mitigation climate-related national actions, far exceeding the scope of prior policies.



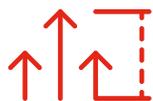
## **Inclusion and co-benefits for sustainable development**

Involves the Cuban society and its economic and social actors. It is implemented within the framework of the country's legislation and the policies for prosperous and sustainable development, with a short, medium, long and very long-term vision up to the year 2100.



## **Replicability and scalability**

It is national in scope and adapts to sectorial and territorial needs. Studies supporting the mitigation and adaptation measures, as well as ongoing monitoring of the experiences, ensure the replicability, scalability and improvement of the results.



## **Measurable and implementable**

There is an inventory and control mechanism established at all government levels from top to bottom. There is a National Greenhouse Gas Inventory System by emission sources in place and a System of Indicators and Measurement, Reporting and Verification (MRV) Mechanism is currently being developed.



## **Innovative and visible**

A communication policy supervised at the highest government level guarantees process transparency and wide dissemination by different means. Its innovative nature is based on its advanced scientific and technical content and technology transfer.



## **Room for improvement**

Permanent implementation monitoring, supervision and analysis, the existence of scientific programs that cover knowledge gaps and synergies in implementation with changes in economic and local management models being implemented in Cuba makes *Tarea Vida* a dynamic program in line with each development phase of the country.



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