

TAKE URGENT ACTION TO COMBAT CLIMATE CHANGE AND ITS IMPACTS



13 CLIMATE
ACTION



CASE STUDY:

Activities by members of the Association of Latin American Sugar Producers (UNALA) supporting the implementation of the Sustainable Development Goal 13 (SDG 13) of the United Nations 2030 Agenda for Sustainable Development

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End Poverty in all its forms everywhere / UNALA

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SDG 13: TAKE URGENT ACTION TO COMBAT CLIMATE CHANGE AND ITS IMPACTS

Target 13.1: Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries.

Target 13.2: Integrate climate change measures into national policies, strategies and planning.

Target 13.3: Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.

Target 13.a: Implement the commitment undertaken by developed-country parties to the United Nations Framework Convention on Climate Change to a goal of mobilizing jointly \$100 billion annually by 2020 from all sources to address the needs of developing countries in the context of meaningful mitigation actions and transparency on implementation and fully operationalize the Green Climate Fund through its capitalization as soon as possible.

Target 13.b: Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.

Source: United Nations, 2015.



1



CAMARA NACIONAL DE LAS INDUSTRIAS
AZUCARERA Y ALCOHOLERA

2



ASAZGUA
Asociación de Azucareros de Guatemala

3



4



ESASA
Empresa de Servicios Azucareros S.A.

5



6



7



SECTOR
AGROINDUSTRIAL
DE LA CAÑA

asocaña

8



9



CENTRO
AZUCARERO
ARGENTINO

10



11



PERUCAÑA

12



AZUCALPA
Asociación de Azucareros y Productores del Perú

13



FENAZÚCAR

14



ALUR

THE ASSOCIATION OF LATIN AMERICAN SUGAR PRODUCERS

The Association of Latin American Sugar Producers (UNALA) is a private non-profit organization that brings together the agro-industrial sector of sugarcane and sugar beet of Latin America. The idea of creating UNALA surged in 2017 and it was formally constituted in 2020. It includes representatives from this agroindustry from 14 countries in the region. Its members are strongly committed to the sustainable production of sugar, electricity, and ethanol, among other byproducts. Together, the members of UNALA represent the largest sugar producing and exporting region in the world. UNALA is more than sugar, it is sustainability, energy, and economic development.

UNALA works with all its members to promote:

- Balanced lifestyles and diets
- The efficient and responsible use of natural resources, including water and land
- The production and use of renewable energy
- The use of ethanol as part of diversified energy matrices

According to data published in the Sugar Yearbook 2024 and the Ethanol Yearbook 2024, the countries represented in UNALA produce approximately 30 % of sugar and 30 % of ethanol in the world. Besides generating more than 6.5 million jobs, some of UNALA members also cogenerate renewable electricity and heat from sugarcane biomass, which is key to promote the sustainable development of Latin America.

The members are:

1. National Chamber of the Sugar and Alcohol Industries (CNIAA) - Mexico
2. Association of Sugar Producers of Guatemala (Asazgua/Guatecaña) - Guatemala
3. Distribuidora de Azúcar y Derivados S.A. (DIZUCAR) - El Salvador
4. Empresa de Servicios Azucareros, S.A (ESASA) - Nicaragua
5. Sugarcane Industrial Agricultural League (LAICA) - Costa Rica
6. Sugar Consortium of Industrial Companies (CAEI) – Dominican Republic
7. Association of Colombian Sugar Cane Growers (ASOCAÑA) - Colombia
8. Brazilian Sugarcane Industry and Bioenergy Association (UNICA) – Brazil
9. Centro Azucarero Argentino (CAA) - Argentina
10. Empresas Iansa - Chile
11. Peruvian Association of Agro-Industrial Sugar and Derivatives (PERUCAÑA) - Peru
12. Cane Sugar Industrial Association of Panama (AZUCALPA) - Panama
13. Federación Nacional de Azucareros del Ecuador (FENAZÚCAR) – Ecuador
14. Alcoholes del Uruguay (ALUR) - Uruguay

Vision

UNALA's vision is to be a sugar agroindustry that works together as a region and that operates sustainably in a global context in which its interests are represented.

Mission

UNALA's mission is to be the platform that allows the Latin American sugar agroindustry to operate under fair international conditions, in a competitive market while remaining committed to sustainability.

UNALA works to stimulate the continuous improvement of sustainable practices and thus promote low-carbon energy solutions, as well as actions to improve the efficient use of land and water resources. Therefore, its members have renewed different processes of the production chain allowing an increase in efficiency, an improvement in environmental sustainability, a reduction in the use of water in irrigation and an increase in investment for the preservation of biodiversity.

Objectives

- Facilitate a space for dialogue to promote communication and the development of joint activities that support the sustainable development of member countries in Latin America.
- Represent the Latin American sugarcane and sugar beet sector in regional and multilateral organizations.
- Promote actions, programs and strategies aimed at the sustainable development of the Latin American sugarcane and sugar beet agroindustry.
- Promote the exchange of information and the development of research and technology for the benefit of the sector.

UNALA is committed to advance the objectives and targets of all the Sustainable Development Goals of the United Nations 2030 Agenda for Sustainable Development as well as other global agendas including the Climate Change, Biodiversity and Human Rights agendas. Therefore, UNALA's sustainable development strategy focuses on integrated actions directed to address three key dimensions: people (social), prosperity (economic) and planet (environmental), as the basis for achieving sustainable development.

People

The sugarcane and sugar beet agroindustry of Latin America is committed to ensure the well-being of its collaborators and the communities that surround their operations. UNALA members generate decent employment,

which translates into better quality of life and more opportunities for development. UNALA members generate a total of more than 6.5 million jobs.

Prosperity

The sugarcane and sugar beet agroindustry in Latin America, in total, represents the major producer and exporter of sugar in the world. Along its entire value chain, the sugar agroindustry represents economic development for countries. Sugar means opportunities for investments, innovation, and businesses.

The sugarcane agroindustry is also key for national economies due to its contribution to energy matrices including ethanol production for transport and electricity generation from sugarcane biomass.

Planet

In addition to working on all the issues related to the sustainable production and consumption of sugar, UNALA members work directly addressing many issues related to the efficient use of water and the reduction of contaminating wastewater discharges. Another major priority work area is the production of renewable energy that supports climate change objectives including the production of ethanol as an alternative fuel to fossil-fuels for use in the transportation sector and the cogeneration of electricity and heat using sugarcane residues, including bagasse, for self-consumption and to support national energy grids.

UNALA members also conduct programs and projects specifically designed to address other Sustainable Development Goals including: sustainable consumption and production, poverty eradication, decent jobs, ending hunger through improvements in agriculture productivity, sustainable production systems, inequality reduction, protection of biodiversity and aquatic and terrestrial ecosystems, quality education, improvements in health services and industrial processes and promotion of advanced technologies and innovation.

UNALA promotes sustainable development and cooperation of the sugar agroindustry of the region through work in three priority areas:

Sugar. Promoting balanced diets that recognize the importance of sugar with four objectives: (1) participate in regulatory processes related to sugar; (2) inform and educate about sugar and substitutes in the diet; (3) show the positive impact of the value chain of the sugar agroindustry; and (4) share knowledge and experiences about the consumption, education and regulation of sugar consumption.

Sustainability. Promoting the sustainability of the sugar agroindustry including: (1) sharing and promoting knowledge and experiences about sustainability practices in the social, economic and environmental dimensions; (2) closing the knowledge gaps in issues related to sustainability; (3) participating and creating partnerships with international organizations related to sustainable development; and (4) communicating information about the sustainability practices being implemented by the sugar agroindustry.

Renewable energy. Recognizing the importance of increasing the use of renewable energy through activities that: (1) promote the generation of renewable electricity using sugarcane residues; (2) promote the use of ethanol in Latin America; (3) exchange knowledge and experiences in the generation of renewable electricity and the production of ethanol; (4) develop new innovative opportunities for the use of sugarcane and beets; and (5) inform the public about the importance of the sugar agroindustry in the generation of renewable electricity for self-consumption and its contribution to the energy matrices of Latin American countries.

► UNALA and the SDG 13

The members of UNALA have multiple initiatives in place that support the objectives of SDG 13 on Taking Urgent Action to Combat Climate Change and its Impacts. Some examples of these important activities include: Renovabio: Towards the Decarbonization of the Brazilian Transport Matrix, Brazilian Sugarcane Industry and Bioenergy Association (UNICA), Brazil; Water Security and Adaptation to Climate Change in Six Rural Communities in

the Sugarcane Landscape of El Salvador, Grupo CASSA, El Salvador; Strengthening Community Resilience Capacity to Promote Climate Change Adaptation in Priority Watersheds of Sugarcane Producing Regions in El Salvador, Grupo CASSA, El Salvador; Installation of 9 Meteorological Stations, Central Izalco and Chaparrastique Mills / the Private Institute for Climate Change Research, El Salvador; and GHG Emissions and Carbon Footprint, Asazgua/Guatecaña, Guatemala.



► **RENOVABIO: TOWARDS THE DECARBONIZATION OF THE BRAZILIAN TRANSPORT MATRIX**

UNICA

Brazil

Objectives and Description

RenovaBio is the National Biofuels Policy regulated by Law 13,576/2017. Its objective is to provide the legal framework to fulfill the undertakings agreed upon by Brazil under the Paris Agreement relative to the reduction of emissions, the increasing of the biofuels share in the energy matrix to the detriment of fossil fuels, with focus on regular supply and provision of predictability to the market, promoting efficiency in production and the reduction of greenhouse gas emissions.

Based on the strategic role of all biofuels in the Brazilian energy matrix (ethanol, biodiesel, biomethane, biokerosene, second generation, among others), the policy has three strategic axes:

- **Decarbonization Goals.** The government establishes ten-year national objectives. These are distributed among fuel distributors. Distributors are responsible for policy compliance;
- **Biofuel Production Certification.** Allows producers to voluntarily certify their production and receive energy-environmental efficiency scores; and
- **Decarbonization Credit (CBIO).** The CBIO is calculated by multiplying the efficiency scores by the volume of biofuel sold. This results in the number of CBIOs that a given producer will be able to issue and sell on the market. The CBIO is equivalent to one ton of CO₂eq avoided and must be used to offset the emissions of the liable entity, the fuel distributors, in accordance with their specific annual targets.

In 2020, the first year of this policy, despite the challenges of the pandemic, almost 98 % of the decarbonization target was achieved, avoiding 14.5 million tons of CO₂eq. This same year, the ethanol sector alone was responsible for 85 % of the Decarbonization Credits (CBIO) awarded. Since then, more than 100 million tons of CO₂eq have been avoided under the RenovaBio program. By 2032, the program aims to prevent a total of 737 million tons of CO₂eq from entering the atmosphere.

Overall, the program consolidated biofuels as one of the solutions to decarbonize the Brazilian transportation matrix and established a separate different institutional framework, with ten-year targets, a carbon pricing mechanism, zero deforestation, measures to promote energy and environmental efficiency gains in production and greater predictability for the agents operating in the market, all in line with the Brazilian goal of a 50 % emissions reduction by 2030.

Regarding the sugar-energy sector specifically, 80 % of the entire CBIOs market issued to meet decarbonization objectives are emitted from sugarcane ethanol.

The Brazilian Sugarcane Industry and Bioenergy Association (UNICA) / State of São Paulo, Brazil represents the sugar-energy sector of Brazil's Center-South region in fulfilling the environmental goals of the Green Ethanol and Greener Ethanol Protocol. It is also the entity that signed the Agro-environmental Protocol with the Government of the State of São Paulo in 2007 and 2017. Currently, it is responsible for representing the sugar mills within the Executive Group of Greener Ethanol, the body in charge of implementing the Protocol. Additionally, it is responsible for coordinating with each of the sugar-energy mills the fulfillment of their individual objectives.

Related Targets

This RenovaBio legal framework contributes to Target 13.2 on integrating climate change measures into national policies, strategies and planning by substantially increasing the share of renewable energy; and Target 13.3 on improving education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction.

Challenges

RenovaBio is a complex and challenging process that guarantees and supports the emissions avoided with legal certainty, ambitious goals, and the issuance of CBIOs. Production companies have used the results achieved and certifications received under the program to apply for credit lines to increase efficiency and production capacity.

Another major challenge has been to achieve the important involvement and participation of different partners nationwide, namely: the government, research institutes, the private sector, academia, experts, civil society, financial organizations, certifiers, among others.

UNICA's sugar-energy producing members initially faced the challenge of making important investments in adequate machinery, sugarcane areas adaptation, forest recovery and labor recycling. Later on, the industry began to face more specific challenges throughout its production chain, such as the demand for new agricultural management techniques and equipment, the disposal of the sugarcane straw left on the ground, and the hiring of skilled labor, among others.

The elimination of pre-harvest burning also brought about new challenges. These include the need to improve control erosive processes resulting from mechanical harvesting, vinasse application methodology, and the use of sugarcane straw, no longer burned.

Lessons Learned

A nationwide strategic approach is required to include all crucial sectors of the economy, the proper legal framework, and adequate incentives to production companies in exchange for their implementation of effective actions to reduce greenhouse gas emissions and increase biofuels use. The extensive discussion and commitment of all parties were fundamental in overcoming all challenges since RenovaBio's outset in 2020.

Another relevant lesson learned is that ongoing support policies and long-term outreach are necessary to keep production

companies engaged and attract new ones to adopt and implement all of its policies.

It has also been necessary for UNICA to maintain continuous, active, and long-term communication with the Protocol's signatories to ensure compliance with its directives. This action has been very productive as the sugar-energy sector has turned out to be highly responsive and has even surpassed set objectives.

In addition, sustained coordination and interaction with the protocol's implementing body, the Executive Group of Greener Ethanol, has been found of the utmost importance.

Results

RenovaBio sets mandatory decarbonization targets and compensates fuel distributors with CBIOS. In 2023, the program issued more than 100 million CBIOS, according to the National Agency for Petroleum, Natural Gas and Biofuels. This is equivalent to avoiding 100 million tons of CO₂ emissions since the start of the program in January 2020. RenovaBio projects to avoid the emission of 737 million tons of CO₂ by 2032, and the creation of 1.4 million jobs. The program is voluntary for biofuel producers, and there are currently 288 certified ethanol producing companies providing 94 % of the country's ethanol.

Other important results include: improving health and air quality, through the increase in proportion of ethanol in the fuel matrix, which results from the reduction of CO₂eq emissions and pollutants such as particulate matter 2.5; the commitment to zero deforestation and compliance with current environmental legislation; and the generation of employment and income in the municipalities and neighboring



areas where the industrial plants are located.

RenovaBio is a key element to promote new investments in renewable energies, such as biogas, biomethane and second-generation ethanol. Assigning a price to the positive externalities of these products allows rationality into the market logic as regards to the decision of producing and consuming more environmentally friendly alternatives.

All UNICA members are certified by the program and, therefore, committed to it.

UNICA indicates that results obtained through the protocol's implementation, and interaction between the government and sugar producing members have yielded a major transformation of the sugar-energy sector in the State of São Paulo. Among these results are:

- Elimination of pre-harvest burning as an agricultural method. This results in

avoiding the emission of more than 11.8 million tons of CO₂eq and more than 72 million tons of air pollutants, such as carbon monoxide, particulate matter and hydrocarbons.

- Sugar producing members, are responsible for 47 % of Brazil's ethanol production.
- The generation of bioelectricity avoided the emission of approximately 7 million tons of CO₂.
- In 2021, sugarcane bagasse and straw generated 20.2 TWh of electricity provided to the grid, accounting for 4 % of national electricity consumption. This is equivalent to the electricity consumption of over 10.2 million homes.
- The sugar-energy sector is responsible for supplying 79.5 % of the bioelectricity to the grid, but the industry only uses 15 % of its technical potential. This means that, by 2021, the industry's potential for bioelectricity generation could have been seven times higher than the 20.2 TWh effective generation.

- Under UNICA, the sugar sector in the State of São Paulo has almost 4,000 harvesters (its own and outsourced harvesters), while in the 2007/08 harvest the total was only 750.
- Water consumption was reduced from 5 m³ per ton of sugarcane processed in the 1990s to 0.78 m³ per ton of sugarcane processed in the 2021/2022 harvest. Since 2010, the mills have reduced water consumption for industrial processing by 49 %, due to the reuse system, improvement of industrial processes and the advancement of mechanized harvesting.
- The recovery of forests in water springs and preservation areas of other watercourses. Through the planting of 54 million seedlings of native vegetation in over 200 thousand hectares of riparian forest and the protection of more than 8 thousand water sources.
- 60 % of the signatory mills have forest restoration programs from their sugarcane suppliers.
- The sugar-energy sector's official and firm commitment to the adoption of best sustainability practices throughout its production chain and to the well-being of local communities.
- Today, the sugar-energy sector in the State of São Paulo has taken on two significant roles:
 - i. it has become the main partner in the prevention and combat of forest fires occurring in the territory, and

- ii. it has become a major partner in the largest project for the protection and restoration of riparian forests and springs in the area.

Interlinkages with other Sustainable Development Goals

RenovaBio's objective for the reduction of emissions by increasing the biofuels share in the energy matrix to the detriment of fossil fuels, enclosed within SDG 13, has very important interlinkages with: SDG 6 on Clean Water and Sanitation, by RenovaBio's comprehensive approach combining specific actions in water efficiency, waste treatment, reduction of water contaminants and promotion of sustainable water practices; SDG 7 on Affordable and Clean Energy, through developing and implementing reliable and renewable energies, such as biogas, biomethane and ethanol generation; SDG 8 as achieved by ethanol producers stimulating and fostering economic growth in the bioenergy sector, and through the creation of sustained, inclusive, full and productive employment and decent work; SDG 9, by promoting resilient infrastructure, sustainable industrialization and fostering innovation through cleaner biofuel technologies and relevant infrastructure; and SDG 17 by the number of partnerships achieved with certified ethanol producing companies in locations throughout the country.

References

RenovaBio-<https://antigo.mme.gov.br/web/guest/secretarias/petroleo-gas-natural-e-biocombustiveis/acoes-e-programas/programas/renovabio>
 UnicaData -- <https://unicadata.com.br/listagem.php?idMn=110>



► **WATER SECURITY AND ADAPTATION TO CLIMATE CHANGE IN SIX RURAL COMMUNITIES IN THE SUGARCANE LANDSCAPE OF EL SALVADOR**

Grupo CASSA
El Salvador 

Objectives and Description

This project is a component of the Community Allies Program of Grupo CASSA. CASSA, with more than 11 years of experience, serves rural sugarcane communities in El Salvador. The Private Institute for Climate Change Research (ICC) collaborates with CASSA on biodiversity conservation and responses to climate change, including mitigation and adaptation measures based on watershed and landscape-scale integration.

The Community Allies Program implements local climate change adaptation measures involving the community. This includes: (i) capacity building processes to strengthen knowledge, criteria and attitudes in communities; (ii) identification of climate risks, their manifestations, effects and impacts in prioritized sectors, specifically water resources; and (iii) formulation and adoption of measures to reduce vulnerability and exposure, improve resilience and adaptive capacity, and sustain transformation and governance.

The project, a collaboration between CASSA and ICC, focuses on reducing vulnerability and improving resilience and adaptive capacity in the sugar sector communities of El Salvador. To achieve this, water resources adaptation strategies and measures are implemented in the communities of: Vista Hermosa, Palo Combo, El Paraíso, El Carrizal, El Cedral and La Pelota. The actions are conducted in the hydrological regions of: Mandinga-Comalapa, Jiquilisco Bay and Grande de San Miguel.

These adaptation activities target the effects and impacts of climate change related to lack of water, such as droughts, heat waves, water unfit for human consumption, and excess water, caused by high rainfall. These activities include:

- a. Installation of rainwater harvesting systems (tank or geomembrane) for domestic and agricultural use, at family and community levels.
- b. Improvement of water quality for human consumption. Actions include community wells improvement and restoration, increasing the shield and improving hermeticity of domestic artisanal wells, capacity training on improving water quality for human consumption and delivery of artisanal filters.
- c. Disaster risk mitigation. Activities include: improving drainage and runoff management through pilot civil works; establishing an early warning system (EWS) for water increases and overflows of the Manachera River; designing civil works to protect against floods caused by the Grande de San Miguel River overflows.
- d. Improvements of savings and efficiency in water use and training in water security systems.

Related Targets

The project's actions are framed within the SDG 13. These are related to: Target 13.1 on strengthening resilience and adaptive capacity to climate-related hazards and natural disasters, by focusing on reducing vulnerability and improving resilience and adaptive capacity in the sugar sector communities. Actions include capacity building, identification and impacts of climate change, resilience improvement and adaptive capacity, and governance; Target 13.3 on improving education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning, as evidenced by the various capacity building processes to strengthen knowledge, criteria and attitudes in communities. Local communities are empowered with knowledge, skills, climate-resilient practices such as infrastructure improvement, water use savings and efficiency, water quality for human consumption, rainwater harvesting systems, solid waste management, training on early warning systems (EWS) for water and overflows, among others; and, Target 13.b on promoting raising capacity mechanisms for effective climate change-related planning and management, as shown by developing adaptation strategies through effective methodologies to address climate change impacts based on community participation, capacities and priorities. Mechanisms target vulnerability, exposure reduction, resilience and adaptive capacity, and their sustainability management.



Challenges

Important challenges encountered during the implementation of the project include:

- The community's limited technical knowledge of the terrain posed a significant challenge. Shallow water tables undermined the walls of community-built ditches essential for water harvesting and vegetable irrigation.
- Effectively conveying technical information on rainwater harvesting systems to families, for domestic use or for vegetable irrigation, represented a major challenge.
- As a result of deforestation and other land use changes, high levels of runoff and evapotranspiration, only 57 % of El Salvador's precipitation (1,784 mm/year - Integrated Water Resources National Management Plan) is the annual water supply (20,755 m³).
- Due to pollution, soil erosion and climate change impacts only 9.7 %

(2,018.9 m³) of the annual water supply is available to meet water uses (domestic, commercial, agricultural and industrial).

Lessons learned

The process of securing water supply and creating climate change adaptation strategies through community participation has resulted in several lessons learned. Among them:

- A major lesson learned is that individuals from the communities could be trained and, through consensus, criteria can be established for selecting the beneficiary families. These criteria considered factors such as the proper utilization of projects and the economic and social conditions of the most vulnerable. The process ensured objectivity and transparency, ensuring that not only group members but also other families and communities in need received support.



- The criteria observed, however, made it possible to detect that it was not feasible to implement a community water harvesting system for vegetable irrigation.
- Another important lesson learned resulted from the house-to-house interviews. These revealed a willingness on the part of the people for the project to be implemented.
- Lastly, a more creative and user-friendly approach is necessary to convey technical aspects to the final beneficiaries and stakeholders that will use each system.

Results

The project's activities have resulted in significant achievements including:

- One of the most important results achieved with this project lies in its sustainability value, ensured by its

broad participation and social approach. It involves the private industry, CASSA value chain, ED&F MAN Liquid Products' MAS project, molasses buyers, the ICC and neighboring communities. All stakeholders united, addressing social problems in the sugarcane producing regions.

- The climate change adaptation process has integrated and strengthened the community. This is evidenced by the adoption of the efficient water use strategy developed by CASSA. This strategy is based on the fact that 70% of the water used in sugar production comes from rainfall. It also establishes indicators to ensure the effectiveness and preservation of water resources at basin level, guaranteeing productive sustainability and implementing other land uses.

Other more specific results, June to October 2023 period, include:

- 31 Family rainwater harvesting systems installed.
- 4 out of 6 Community rainwater collection systems installed.
- Drilled community wells improvements: 50% completed.
- Buckler rise and hermeticity of artisanal wells improvement: 100% completed.
- Restoration of walls in community wells: 100% completed.
- Contribution to quality of water for human consumption. Goal: 30 – Total: 125 completed.

Interlinkages with other SDGs

This program's actions under SDG 13 have interlinkages with:

SDG 6 Clean Water and Sanitation, on ensuring availability and sustainable management of water and sanitation for all, by implementing water resources adaptation strategies and measures targeting the effects and impacts of climate change related to lack of water, such as droughts, heat waves, water unfit for human consumption, and excess water.

SDG 11 on Sustainable Cities and Communities, by implementing sustainable adaptation and mitigation measures involving the community.

SDG 12 on Responsible Consumption and Production by sugarcane producers formulating and adopting measures to reduce vulnerability and exposure, improve resilience and adaptive capacity, and sustain transformation and governance.

SDG 17 on Partnerships for the Goals by involving the private industry, CASSA value chain, ED&F MAN Liquid Products' MAS project, molasses buyers, the ICC and neighboring communities.

References

Seguridad hídrica comunitaria 1
 Seguridad hídrica comunitaria 2
 Seguridad hídrica comunitaria 3

► STRENGTHENING COMMUNITY RESILIENCE CAPACITY TO PROMOTE CLIMATE CHANGE ADAPTATION IN PRIORITY WATERSHEDS OF SUGARCANE PRODUCING REGIONS IN EL SALVADOR

Grupo CASSA

El Salvador

Objectives and Description

This project is part of the Community Allies Program of Grupo CASSA. For over a decade, this program has benefited more than 39 sugarcane communities and 43,000 Salvadorans residing near sugarcane producing areas.

One of its main objectives is to enhance the resilience and adaptive capacity of sugarcane-growing communities. It promotes their socioeconomic development and environmental sustainability in priority watersheds through learning, planning and implementation of biodiversity conservation strategies.

In a collaboration between the Private Institute for Climate Change Research (ICC) and CASSA, types and effects of climate change were identified in sugarcane cultivation areas coinciding with watersheds, groundwater, natural areas and land use. As a result, three priority hydrological regions were selected for environmental sustainability actions: Sonsonate Bandera in the western part of the country, and Jiquilisco Bay and Grande de San Miguel in the eastern part of the country, which will be key locations to implement this project.

The project involves activities related to adaptation planning and ecological restoration actions. These include the following:

- a. Environmental education and awareness-raising campaigns for communities on watershed management, biodiversity and climate change adaptation.
- b. Development of an Adaptation Strategy through a rapid and effective methodology to assess climate change impacts, vulnerability and adaptation options at community level.

- c. Restoration and ecological rehabilitation of watersheds, through actions based on community participation, capacities and priorities. These include reforestation initiatives, field excursions for the recognition of sustainable agriculture and establishment of nurseries.

- d. Strengthening of Community Environmental Committees, assisting in issues related to their structure, operation and compliance with legal aspects. The objective is to promote sustainability and institutional relations with other stakeholders, government and private sector.

Related Targets

The project's actions support SDG 13 on taking urgent action to combat climate change and its impacts and are related to: Target 13.1 on strengthening resilience and adaptive capacity to climate-related hazards and natural disasters, by the project's actions on enhancing climate change resilience and adaptive capacity of sugarcane-growing communities in priority watersheds focusing on adaptation planning and ecological restoration actions; Target 13.3 on



improving education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning, by the implementation of environmental education and awareness-raising campaigns for communities on watershed management, biodiversity and climate change adaptation; and Target 13.b on promoting raising capacity mechanisms for effective climate change-related planning and management, as shown by developing adaptation strategies through rapid and effective methodologies to assess climate change impacts, vulnerability and adaptation options for communities, including restoration and ecological rehabilitation of watersheds, through actions based on community participation, capacities and priorities.

Challenges

Several significant challenges were faced during project implementation:

- Community will and organization. Gaining the will and commitment of the communities to become actively involved in the project's initiatives, and achieving their proper organization were major challenges encountered.
- Making communities understand the importance of obtaining medium- and long-term useful tools was another important challenge.

- In some cases, selecting suitable locations for environmental restoration represented a significant challenge due to the imposition of the will of the neighbors.

Lessons learned

Some important lessons learned during the project implementation include:

- To ensure the project's medium and long-term sustainability and to address community disinterest and non-participation in the project's initiatives, it was necessary to apply motivational and organizational criteria.
- The project aims to empower communities with knowledge to identify climate change manifestations, effects, and impacts so that they can independently determine adaptation or mitigation actions for each locality. Consequently, a voting system had to be developed for community decision-making about the actions that should be conducted.
- Afterwards, it was also necessary to reinforce this knowledge. Participants were then empowered by means of a knowledge test and a graduation event that factored the final grade and attendance to workshops.
- Another significant lesson learned has to do with the selection of suitable locations for environmental restoration, it was necessary to balance the will of the neighbors with the project's objectives.



Results

Important results achieved during the project's implementation include:

1. Environmental education and awareness-raising actions in 6 communities:

- » Planned: 36 workshops on Environment and biodiversity; Reforestation and restorations
- » Implemented: 36 workshops (6 per community)
- » 138 participants from 7 community sectors
- » Knowledge exchange tour (Guatemala)
- » Workshops: Water reuse management, Vertical food technology, Nursery management. River overflow mitigation, Local agriculture management.
- » 16 participants from 6 communities

2. Adaptation strategy development:

- » Planned: 12 workshops / Implemented: 12 workshops.
- » Workshops: Agriculture. Increase in pests and weed, high cost of agrochemicals / Food safety. Perishable food loss, loss of stored staple grains due to pests / Hydric resource. Contamination of artisan wells, dependency on bottled water, lack of water for orchards / Health. Vector diseases, disaster risk due to river overflow

/ Biodiversity. Loss of fauna and flora. Infrastructure / Deterioration of access due to erosion, risk of falling trees.

3. Ecological restoration:

- » 3,770 trees planted – 6.16 Ha (663,057 sqf) – 1.20 miles of fence.
- » 74 participants – 43 % women – 1,000 trees in community nurseries

4. Environmental committees

- » Planned: 6 committees / Formed: 6 committees (1 per community)
- » Project implementation through the adaptation strategy used by community with the ICC/CASSA collaboration.

Interlinkages with other SDGs

This project, framed within SDG 13 bears important interlinkages with:

SDG 4- Quality Education, by providing environmental education and awareness-raising actions in 6 communities. 36 workshops on Environment & Biodiversity, Reforestation & Restorations short, medium and long-term sustainability tools.

SDG 11- Make cities and human settlements inclusive, safe, resilient, and sustainable, by implementing Adaptation Strategies at community levels through a rapid and effective methodology to assess climate change impacts, vulnerability and adaptation options, and promoting socioeconomic

development and environmental sustainability in sugarcane growing regions.

SDG 15- Life On Land, on protecting, restoring, and promoting sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, halt land degradation, and halt biodiversity loss, as shown by implementing watershed restoration and ecological rehabilitation, including reforestation, sustainable agriculture and establishment of nurseries, based on community participation, capacities

and priorities.

SDG 17- Partnerships for the Goals, on strengthening the means of implementation and revitalize the global partnership for sustainable development, by strengthening Community Environmental Committees, assisting in issues related to their structure, operation and compliance with legal aspects and promoting sustainability and institutional relations with other stakeholders, government and private sector, as led by the collaboration between CASSA and ICC.

References

Fortalecimiento de la capacidad 1 Adaptación Cambio Climático, GRUPO CASSA, EL Salvador.

Fortalecimiento de la capacidad Adaptación Cambio Climático 2, GRUPO CASSA, EL Salvador.pdf

Fortalecimiento de la capacidad Adaptación Cambio Climático 3, GRUPO CASSA, EL Salvador.pdf

► INSTALLATION OF 9 METEOROLOGICAL STATIONS

Central Izalco and Chaparrastique mills

Grupo Cassa and ICC

El Salvador

Objectives and Description

The Private Institute for Climate Change Research (ICC) specializes in the generation, analysis and dissemination of hydrometeorological information through the monitoring and management of meteorological stations.

From 2019 to 2023, the (ICC) – Grupo CASSA alliance has developed 9 meteorological stations throughout the CASSA Group's sugarcane fields. These stations monitor, collect and measure weather data, such as temperature, rainfall and wind speed. These data are essential to determine factors affecting crops and for taking preventive measures.

Currently, these 9 meteorological stations serve the purpose of monitoring the flow of 11 rivers during the dry season across 4 hydrographic regions of the CASSA sugar cane production territory in the western zone. Additionally, they oversee the monitoring of 33 artisanal wells spread across 5 communities throughout the sugarcane area.

The project started in 2019 with the establishment of 3 meteorological stations. The second phase in 2020 included 3 new stations, and phase 3 completed the project with 3 additional stations in 2023. In total, 9 weather stations provide 90 % coverage of the Grupo CASSA's sugarcane fields. The stations are located in the Central Izalco mill in the municipality of Izalco, and Chaparrastique mill in the municipality of San Miguel.

These meteorological stations significantly contribute to crop planning and development, pest and disease control management, and disaster risk reduction strategies. These efforts help mitigate climate change's potential impact on communities, infrastructure and environment.

Through specialized educational training on correct technical operation and care of equipment to generate a skilled local staff, and the awareness campaigns and institutional capacity training programs, the project provides further benefits to the communities. These actions play a crucial role in ensuring the project's own sustainability.

Related Targets

The project's actions are framed within the SDG 13 on taking urgent action to combat climate change and its impacts, and they support the objectives of: Target 13.1 on strengthening resilience and adaptive capacity to climate-related hazards and natural disasters, by the 9 stations collecting and measuring weather data essential to determine factors affecting crops and for taking preventive measures, monitoring the flow of 11 rivers across 4 hydrographic regions and overseeing 33 artisanal wells spread across 5 communities, others; and Target 13.3 on improving education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning, as shown by the project's programs on crop planning and development, pest and

disease control, disaster risk reduction strategies, and developing well-trained local technical staff as well as the various raising-awareness and institutional capacity training programs, and other efforts to mitigate climate change impact on communities.

Challenges

Significant challenges encountered during the implementation of the project include:

- Determination of suitable locations to establish the stations was one of the major challenges faced. This was because the sites chosen were in areas that had previously been used for sugarcane cultivation. This required specialized adaptations to ensure suitable conditions for the meteorological instruments.
- The lack of trained personnel for proper technical use, care and maintenance of the equipment.
- Engaging the local community in the project represented another significant challenge.

Lessons learned

Some of the most important lessons learned with this project include:

- To ensure long-term sustainability and community engagement in the project, it is essential to train local staff and conduct institutional capacity training.
- Engaging local communities and stakeholders has been essential. It has been necessary to include raising-awareness initiatives about the stations' purpose and the importance of monitoring, recording and use of climate data, and, especially on the benefits this information represents for the communities.

- Maintaining fluid communication between all stakeholders has also been an important lesson learned. Keeping everyone informed through regular meetings, progress reports and updates has been essential to keep all stakeholders engaged.

Results

The meteorological stations have been providing significant results. Some include:

- The stations are taking measurements and generating real-time information necessary for the execution of field activities. This information is key for making decisions related to agricultural sustainability, integrated disaster risk management, the development of the company's work plan and for sugarcane producers.
- Farmers and agricultural producers benefit from accurate weather forecasts and historical climate data.
- Crop planning, irrigation scheduling and pest and disease management are being optimized based on the insights provided by the stations.
- The stations are playing a significant role in disaster risk reduction strategies. Early warnings for extreme weather events (such as storms, heavy rainfall, or heatwaves) are helping to mitigate potential impacts on communities, infrastructure and environment.
- Data on the flow of 11 rivers (during the dry season) are being monitored and recorded across 4 hydrographic regions of CASSA's sugar cane production territory in the western zone.
- The stations oversee, monitor and collect data on 33 artisanal wells spread across 5 communities.

Interlinkages with other SDGs

The actions related to these meteorological stations are in line with SDG 13. They bear important interlinkages with:

SDG 4 on ensuring inclusive and equitable quality education and promoting lifelong learning opportunities for all, and, SDG 9 on building resilient infrastructure, promoting inclusive and sustainable industrialization, and foster innovation; as shown by the project's raising-awareness programs across 5 communities, and, the various actions on capacity training, both at developing local technical staff and at institutional levels, bringing inclusive educational training to the communities in support of the project's objectives.

SDG 11 Sustainable Cities and Communities, and SDG 15 on protecting, restoring, and promoting sustainable

use of terrestrial ecosystems; shown by the significant results generated, based on data being collected and registered on weather. These measurements are essential for determining factors impacting the environment, crop planning and development, disaster risk prevention and reduction strategies, and other efforts to mitigate climate change impact on the environment, the sugar industry and the communities of influence.

SDG 17 on partnerships for the Goals, by addressing the project's objectives through establishing the efficient ICC and Grupo CASSA collaboration. And, by ensuring sustainability and expansion of the meteorological network through continued cooperation and development of public-private partnerships to address climate change challenges.

References

<https://www.grupocassa.com/wp-content/uploads/2023/04/Informe-de-Sostenibilidad-y-Gestioin-Grupo-CASSA-2022.pdf>

► GHG EMISSIONS AND CARBON FOOTPRINT ASAZGUA/GUATECAÑA Guatemala



Objectives and Description

Reducing GHG emissions is a legal and international commitment of Guatemala. The decarbonization of the productive systems is an important goal for Guatemala and the Guatemalan Sugarcane Agroindustry (Guatecaña). The first step in this important process is the estimation of the direct and indirect GHG emissions associated with the production and transport of products to be able to develop an inventory of GHG emissions resulting from the activities of Guatecaña. A methodology being used worldwide to measure GHG emissions is the Carbon Footprint. The Carbon Footprint is the total GHG emissions caused by an individual, organization, service or product, expressed as CO₂ equivalent (CO₂eq).

ICC has estimated the GHG emissions of the sugarcane harvests beginning with the 2010-2011 harvest and is conducted annually. The inventory is based on the Life Cycle Analysis methodology taking into consideration the following categories: pre-harvest and post-harvest burning in

the sugarcane fields, direct and indirect emissions from nitrogen fertilization, use of fuels for the different operations related to crop management and the energy produced from the fuels for the internal consumption of the factories (mills).

The direct GHG emissions reported in this inventory include CO₂, methane and nitrous oxide according to international standards set by the Intergovernmental Panel on Climate Change (IPCC). The inventory includes data from the agricultural and production phases of the sugarcane as well as the industrial phase and the generation of electricity for internal consumption.

The inventory of emissions for the 2018-2019 harvest shows that the production of 2.97 million metric tons of sugar generated 770,088 tons of CO₂eq. The activity that generates the most emissions is the use of fossil fuels for agricultural and transport activities (43 %). This is followed by the use of nitrogen fertilizers that generates 25 % of the total emissions and by the generation of electricity for internal consumption at 14 % and the burning of biomass in the field, also at 14 % (ICC, 2020a).

For the inventory of emissions, it is also necessary to take into consideration the factors that contribute to reduce or avoid emissions and to fixing and storing carbon. Carbon contained in the natural forests of the Sugarcane Agroindustry are estimated at 1.4 million tons of CO₂eq. The carbon temporarily stored in the sugar is about 2.8 million CO₂eq.

The avoided emissions from the generation of electricity from biomass from sugarcane are about 4 million tons of CO₂eq if coal is used for the generation of electricity for internal consumption and for sale to the Interconnected National System. Therefore, the use of the sugarcane biomass, as a byproduct of sugar production, allows the considerable reduction of the GHG emissions and the carbon footprint of the Guatemalan Sugarcane Agroindustry and the whole country.

Based on the GHG estimates and the production of sugar, the carbon footprint of sugar from Guatemala for the harvest 2018-2019 is estimated at 0.26 kg CO₂eq/kg produced sugar. The activities of the Guatemala Sugarcane Agroindustry generate less than 3 % of the total GHG emissions of Guatemala although sugar provides the second largest profit from exports for the country.

The carbon footprint of sugar from Guatemala is one of the lowest in relation to others at the international level. Although this can be attributed to different methodologies used, type of inventories and other factors, they are mainly the result of improvements in the activities of the productive process such as the efficient use of fertilizers (reduction of nitrogen fertilizer use), the high yield rate of sugarcane per hectare, the use of sugarcane biomass for the generation of electricity and the reduction of fossil fuels for agricultural and transport activities by the Sugarcane Agroindustry.

Related Targets

The work related to measuring GHG emissions, developing inventories of emissions, and defining the carbon footprint supports climate change policies, strategies, and plans. These are the objectives of Target 13.2. These activities are also related to human and institutional capacity building and awareness-raising on climate change mitigation which are part of the objectives of Target 13.3.

Challenges

The challenges of this activity are mainly related to the availability of data to be able to perform the estimates of GHG emissions as well as the importance of using the right, latest and internationally approved methodology. Comparing estimates and



footprints for different harvests could be challenging due to these issues.

Lessons learned

It is important to allow for revisions of previous estimates if more accurate data and better methodologies are being developed for this purpose.

The estimates of the emissions inventories and carbon footprint are a powerful educational tool for managers and directors of companies. Also, it has contributed substantially to inform the public, especially those whose opinion and perception was that the agroindustry was responsible for a high percentage of emissions in the country. The findings of the studies have helped illustrate the positive effects of the sugar sector, especially through avoided emissions from the use of sugarcane biomass for electricity generation.

Results

Guatemala plays an important role in limiting the GHG emissions in Guatemala. About 4 million tons of CO₂eq are avoided

annually through generating electricity from sugarcane bagasse. The Sugarcane Agroindustry contributes to the reduction in the use of fossil fuels by generating electricity from sugarcane bagasse, replacing 316 million gallons of oil or about 1.54 million tons of coal during the 2018-2019 harvest. Furthermore, the carbon footprint of electricity generated by the sugar industry in Guatemala has been reduced from 2.3 kgCO₂eq/kwh in 1998-1999 to 0.26 kgCO₂eq/kwh in 2018-2019. Around 1,550 hectares of the sugarcane mills' natural forests store an additional 879,000 tons of CO₂, and about 6,900 hectares of forests plantations absorb over 118,400 tons of CO₂ during the year (ICC, 2020a).

At the general level, including increases and reductions of different sources of emissions, the GHG emissions of the Guatemalan Sugarcane Agroindustry for the 2018-2019 harvest are estimated at 770,088 tons of CO₂eq. This represents a reduction of 2.94 % with respect to the 2017-2018 harvest.

Interlinkages with other SDGs

The interlinkages between climate change activities (SDG 13) of the Guatecaña on GHG emissions and carbon footprint and other SDGs are substantial. The strongest interlinkages are in relation to terrestrial ecosystems/forests (SDG 15) and energy (SDG 7). The interlinkage with SDG 15 is evident by the effective and continuous effort to protect, restore and promote sustainable terrestrial ecosystems and by enhancing and supporting biodiversity. There is also

a strong interlinkage related to energy (SDG 7), given the fact that the Sugarcane Agroindustry is generating renewable energy in the form of electricity and ethanol with positive consequences in relation to climate change mitigation. Another strong interlinkage is with respect to partnerships (SDG17), given that Guatecaña and Asazgua have many partnerships with national, local and regional organizations committed to the pursuit of sustainable development in Guatemala and Central America.

References

- ICC (Instituto Privado de investigación sobre Cambio climático) (2020a): Inventario de Emisiones de Gases de Efecto de Invernadero y Huella de Carbono del Azúcar de Guatemala, zafra 2018-2019, Marzo 2020.
- ICC (2020b): Informe de Labores 2010-2020, Guatemala, 2020.
- ICC (2020c): El impacto de la conservación de bosques y la restauración del paisaje forestal en la captura y almacenamiento de carbono. Guatemala.
- Sistema Guatemalteco de Ciencias del Cambio Climático (SGCCC): (2019). Primer reporte de evaluación del conocimiento sobre cambio climático en Guatemala. (E. J. Castellanos, A. Paiz- Estévez, J. Escribá, M. Rosales-Alconero, & A. Santizo, Eds.). Guatemala: Editorial Universitaria UVG.



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