UNALA
Unión de Azucareros Latinoamericanos
União do Açúcar Latino-americano –UNALA–

SUSTAINABLE WATER & ENERGY SOLUTIONS NETWORK

ENSURE AVAILABILITY AND SUSTAINABLE MANAGEMENT OF WATER AND SANITATION FOR ALL

6 CLEAN WATER AND SANITATION

CASE STUDY:

Activities by members of the Association of Latin American Sugar Producers (UNALA) supporting the implementation of the Sustainable Development Goal 6 (SDG 6) of the United Nations 2030 Agenda for Sustainable Development

UNALA: Association of Latin American Sugar Producers 2025

End Poverty in all its forms everywhere / UNALA

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SDG 6: ENSURE AVALABILITY AND SUSTAINABLE MANAGEMENT OF WATER AND SANITATION FOR ALL

T.6.1: By 2030, achieve universal and equitable access to safe and affordable drinking water for all.

T.6.2: By 2030, achieve access to adequate and equitable sanitation and hygiene for all, and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations.

T.6.3: By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally.

T.6.4: By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity.

T.6.5: By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate.

T.6.6: By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes.

T.6.a By 2030, expand international cooperation and capacity-building support to developing countries in water- and sanitation-related activities and programs, including water harvesting, desalination, water efficiency, waste-water treatment, recycling and reuse technologies.

T.6.b Support and strengthen the participation of local communities to improve water and sanitation management.

Source: United Nations, 2015.

1 CAMARA NACIONAL DE LAS INDUSTRIAS AZUCARERA Y ALCOHOLERA

2 ASAZGUA Asociación de Azucareros de Guatemala

3 izucar

4 ESASA Empresa de Servicios Azucareros S. A.

5 LAICA

6 cael

7 SECTOR AGROINDUSTRIAL DE LA CAÑA asocaña

8 UNICA

9 CENTRO AZUCARERO ARGENTINO

10 empresas iansa

11 PERUCAÑA

12 AZUCALPA Asociación de Azúcares y Alcoholes de Panamá

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 waste-water 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 6

The members of UNALA have multiple initiatives in place that support the objectives of SDG 6 on ensuring Availability and Sustainable Management of Water and Sanitation for All. Some examples of these important activities include: Responsible Use of Water in the Industrial Sugar-Alcohol Process, Centro Azucarero Argentino (CAA) Leales Mill, Argentina; The Technical Irrigation Program, Empresas Iansa, Chile; the Water Table Committee Program, “Colombian Sugar Cane Research Center (Cenicaña)”, Asocaña, Colombia; Water for Life and Sustainability Fund Program - FFAVS, Asocaña, Colombia; Bebedero I Protect You (Bebedero Yo Te Protejo), Sugarcane Industrial Agricultural League (LAICA), Taboga, Costa Rica; Agua 10 (WATER 10) Program, Grupo CASSA, El Salvador; Water Security and Adaptation to Climate Change in Six Rural Communities in the Sugarcane Landscape of El Salvador, Grupo CASSA, El Salvador; Water Use in Agricultural and Industrial Processes, Asazgua/Guatecaña, Guatemala; Water for All Program. Pantaleon Group, Monte Rosa Sugar mill, Nicaragua; and Integrated Water Resource Management Project. Construction of rainfall reservoirs for water harvesting, Santa Rosa Sugar Mill, Azucarea Nacional, S.A, Panama.

RESPONSIBLE USE OF WATER IN THE INDUSTRIAL SUGAR-ALCOHOL PROCESS

RESPONSIBLE USE OF WATER IN THE INDUSTRIAL SUGAR-ALCOHOL PROCESS
Centro Azucarero Argentino (CAA)
Leales Mill
Argentina

Objectives and Description

Founded in 1936 in Villa Fiad - Province of Tucumán, Leales Mill has deep wells as its only available source of water. The objective of the program is to reduce the consumption of water from natural resources. To achieve this, an investment plan was implemented to incorporate low water consumption equipment with capacity to reuse the water generated in the process.

Sugarcane has a 70 % water content, and the process reuses the vegetable condensation water generated from the evaporation of sugarcane juice. The company is currently implementing a significant investment program aimed at increasing milling capacity, sugar, alcohol, and energy production, improving efficiency and reducing environmental impact.

The multi-effect juice evaporation system is one of the processes that contributes the largest amount of water. In the first effect, all condensates with the right quality are recovered to feed the boilers. In the following effects, lower quality condensates are recovered and used to prepare chemical products, dilute sugar crystals in the boiling process, the imbibition of bagasse in the sugar mill and re-melting of raw sugar in the refining process.

Related Targets

The program's actions, framed within SDG 6, support the objectives of Target 6.3 by reducing consumption of water from natural resources, reusing sugarcane juice evaporation water, reducing industrial effluent and untreated wastewater, and substantially increasing water recycling and reuse; Target 6.4 by substantially increasing water-use efficiency across the company's industrial processes; Target 6.5 on implementing effective water resources management at all levels of industrial production; Target 6.6 on protecting and restoring water-related ecosystems by significantly reducing consumption of water from natural sources; and Target 6.b on supporting and strengthening its local community by the implementation awareness and training programs for the company's personnel.

Challenges

The greatest challenge has been the limited availability of water. This resource can only be obtained through the extraction of groundwater, which is being depleted. To address this circumstance, the company incorporates technologies for water reuse through closed cooling circuits and the incorporation of equipment and/or process modifications to minimize industrial water consumption. At the same time, training and awareness-raising plans are developed for all plant personnel to promote water and environment care.

Lessons learned

Reducing the consumption of water from natural sources without affecting the efficiency of the process or the quality of the final products has been the main lesson learned. This reduction was achieved by integrating equipment,

technologies and industrial water quality control systems to adapt it to the requirements of the process and the facilities. This water reuse policy also led to a significant reduction in the flow of industrial effluent, which is used to irrigate neighboring productive farms.

Another lesson learned refers to the fact that the effective implementation of this investment program was possible thanks to the teamwork and awareness of all the organization's employees.

Results

The company's commitment to sustainability in sugar, alcohol, and energy production has generated a total 51% reduction in water consumption per ton of cane milled since Leales Mill was acquired by CIISA in January 2010. Currently, the water use is 1.32 m3 per ton of milled cane and the goal is to further reduce the water use to 0.90 m3 per ton of milled cane by 2025.

Currently, this agro-industrial complex has the capacity to mill 10,000 tons/day of cane, produce more than 800 tons of sugar and around 150,000 liters of alcohol per day.

Some current parameters to illustrate the program achievements are:

a. Milling: 8,800 Tons/day
b. Refining: 700 T/day
c. Continuous Fermentation - with tank cooling water recirculation.
d. Distillery 2+3 - alcohol production: 200 m3/day - with condenser circuit water recirculation.
e. Energy Cogeneration: 5MW/h

Interlinkages with other SDGs

Leales mill's water related activities have important interlinkages with: SDG 8 on creating decent jobs and economic growth; SDG 9 on industry, innovation, and infrastructure, by the implementation of new equipment, technology, and infrastructure to significantly reduce water consumption from natural sources; and SDG 12 on responsible consumption and production, by developing actions to reduce water consumption and promote water recycling and reuse throughout the mill's industrial processes.

TECHNICAL IRRIGATION PROGRAM
Empresas Iansa
Chile

Objectives and Description

For more than a decade Chile has faced a prolonged drought. More than 50% of the national territory faces water scarcity. Currently, 53% of the country's municipalities have been declared in water drought. These municipalities include 47 % of the population and are distributed in the regions of Atacama and Los Lagos. A population of 8.25 million live under water rationing conditions.

Empresas Iansa technical irrigation program addresses the challenges posed by climate change and water scarcity, ensuring sustainable agricultural practices and water management. The program has been implemented in the company's own cultivation fields and those of partner farmers. It aims to improve sustainable agricultural practices through efficient water management. Some specific activities of the Technical Irrigation Program include:

- Introduction and implementation of irrigation systems for farmers, especially small and medium-sized ones.
- Improving irrigation efficiency through providing support for small and medium-sized farmers, integrating environmental criteria.
- Investing in infrastructure to support efficient irrigation systems.

During the last decade, the extent of cultivation land equipped with technical irrigation has experienced a twofold increase, rising from 45 % under conventional irrigation methods in 2009- 2010 to 89 % utilizing technical irrigation in 2022-2023. This represents a significant reduction in the water footprint of the company's crops, and an important benefit to farmers and the environment.

The advantage of technical irrigation is that it is more efficient in the use of water, compared to conventional irrigation. The efficiency of sprinkler irrigation exceeds 75 %, while the efficiency of conventional irrigation reaches maximum values of 40 %.

The technical irrigation program consists of a platform to inform beet water consumption to farmers. It quantifies water demand and contributes to optimal irrigation programming. The platform provides manuals aimed at empowering farmers with practical knowledge and tools for effective irrigation. These include: **i)** comprehensive guidelines for irrigation development by small agriculture partners, covering rationale, irrigation types based on site conditions, facilities, and irrigated agriculture, **ii)** information on the construction of irrigation systems for farmers, including the provision of technical support from government officials, and **iii)** information and practices for low-input agriculture. It also targets government irrigation technical officers and agriculture extension practitioners.

Related Targets

The program supports the objectives of SDG 6 on sustainable water management. Its actions are related to: Target 6.4 on substantially increasing water-use efficiency across all sectors and ensuring sustainable withdrawals and supply of freshwater to address water scarcity, through the program addressing the

challenges posed by climate change and water scarcity, ensuring sustainable agricultural practices and water management; Target 6.5 on implementing integrated water resources management at all levels, by the program improving sustainable agricultural practices through efficient water management without compromising environmental sustainability; Target 6.6 on protecting and restoring water-related ecosystems, as shown by the program's actions on quantifying water demand and optimizing irrigation, leading to savings of up to 90 % of water compared with the conventional irrigation methods; and, Target 6.b on supporting and strengthening the participation of local communities to improve water and sanitation management. This is achieved through the knowledge platform, by providing farmers with practical knowledge and tools for effective irrigation, supporting the development and construction of irrigation systems, and promoting the adoption of technical irrigation equipment and practices.

Challenges

The program's actions have encountered significant challenges during its implementation. Some include:

- Introduction and implementation of irrigation systems for farmers have been major challenges throughout the development of the program.
- Improving irrigation efficiency. Reconciling this improvement with environmental standards and farmer support has been a complex task and an ongoing effort.
- Investment in infrastructure, both inside and outside the company, to support efficient irrigation systems.
- Financial sustainability for the program and the technical support needed by farmers remains a significant ongoing challenge.

Lessons learned

Some lessons learned during the implementation of the Technical Irrigation Program, include:

- Over the past 20 years one of the main lessons learned is the effective impact of the irrigation technification and the hydric balance achieved. These advancements have not only increased the company's yields in its main crop, sugar beet, but also provided advantages to farmers and the state.
- The combined work between the company, the state and farmers, and the rotation with other species necessary to maintain soil fertility, has benefited the cultivation of beets and other species, such as wheat.
- The irrigation equipment and techniques adopted and the knowledge in water management achieved remain with the field and the farmer, generating capabilities that benefit agriculture in general.

Results

Important results achieved during the implementation of the Technical Irrigation Program include:

- Significant reduction in the water footprint of the company's crops with important benefits to farmers and the environment.
- Increased Technical Irrigation. The program has increased technical irrigation in fields to 89 % (2022-2023), which allows saving up to 90% of water compared to traditional methods.
- The company's 2025 goal of equipping 87.5 % of its cultivation area with technical irrigation systems, has already been achieved in 2023.
- Farmers have successfully adopted technical irrigation techniques and

practices, generating capabilities that benefit agriculture in general.

- The engagement of local communities has been successfully achieved. The knowledge and benefits of the Technical Irrigation Programs are adopted, shared and supported by those directly involved and affected by its implementation.
- The company's commitment to sustainability has been embraced and upheld by the communities throughout the program's evolution. Consistent with the program's objectives, sustainable practices have been adopted yielding benefits for farmers, other stakeholders and the communities.

Interlinkages with other SDGs

The program's actions, framed within SDG 6, bear important interlinkages with: SDG 9 on building resilient infrastructure, promoting inclusive and sustainable industrialization, through promoting, implementing and supporting technical irrigation infrastructure, systems, and practices; SDG 11 on Sustainable Cities and Communities, by supporting the conservation of water resources, benefiting communities and the industry; SDG 12 on Responsible Consumption and Production, by the program reducing water waste and contributing to more sustainable production patterns; SDG 13 on taking urgent action to combat climate change and its impacts, as shown by the program substantially increasing water-use efficiency across all sectors, ensuring sustainable withdrawals and supply of freshwater, sustainable agricultural practices and reducing the company´s water footprint; SDG 15 on protecting, restoring, and promoting sustainable use of terrestrial ecosystems since the program ensures the efficient water use to reduce the pressure on natural water bodies and contributes to the health of terrestrial ecosystems; and SDG 17 on Partnerships for the Goals because the program has secured the involvement of local communities, government agencies, and private sector partners including the Chilean Economic Development Agency (CORFO) and the Institute of Agricultural Development (INDAP).

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THE WATER TABLE COMMITTEE PROGRAM ASOCAÑA

THE WATER TABLE COMMITTEE PROGRAM
ASOCAÑA
Cenicaña
Colombia

Objectives and Description

The Water Table Committee Program, created in 2009, focuses on comprehensive and sustainable water resource management to ensure responsible water use and conservation balance. It is integrated by sugar mills (both in the field and factories), sugarcane growers and Cenicaña's expert researchers. This technical body designs, coordinates, implements, and evaluates strategies to enhance efficient and rational water use in sugarcane production and manufacturing.

For field processes, the Water Table Program has implemented strategies that include:

- Improving water conduction infrastructure to reduce losses (20 to 40 %).
- Continuing with the training of irrigators and supervisors.
- Supporting sugarcane suppliers to achieve the sector's goals (60 % of the sector).

By using the Water Balance Estimation tool to measure and control water consumption in the fields, the sugar agroindustry has managed to reduce its water consumption in sugarcane production by 50 %. This has been achieved by implementing advanced irrigation technologies, improving the efficiency of current irrigation systems, training irrigators and managers, maximizing the efficient reuse of water in subprocesses to reduce liquid waste, and adopting alternative tools to evaluate water quality.

Related Targets

The Water Table Program embodied within goal SDG 6, supports Target 6.3 on improving water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, as shown by the program's actions to reduce pollution and improve water quality, and the use of water recirculation; Target 6.4, on substantially increasing water-use efficiency across all sectors and ensuring sustainable withdrawals and supply of freshwater, by focusing on comprehensive and sustainable water resource management; Target 6.5 on implementing integrated water resources management, by successfully promoting and leading an integrated approach to water management to facilitate sustainable use and conservation of water resources; Target 6.6, on protecting and restoring water-related ecosystems, as shown by the program's actions to maintain water quality and prevent contamination and pollution, such as, industrial discharges, agricultural runoff, and untreated sewage.

Challenges

Increasing participation and adoption of measures defined in The Water Table Program by sugarcane growers represent a major mission. Related challenges encountered include:

- Managing industrial discharges, agricultural runoff, and untreated sewage represents a major ongoing challenge.
- Changing weather patterns, including prolonged droughts and intense rainfall

events, impact water availability.

- Efficient water management is hindered by insufficient water infrastructure, such as storage reservoirs, pipelines, and treatment plants.
- Accurate data collection and monitoring of water availability, quality and usage have been major issues affecting decision-making.
- Conflicting water use among different sectors (agriculture, industry, domestic use), competing for water resources, and prioritizing sustainable use are ongoing complex challenges encountered.
- Community Engagement. Community awareness, involvement and participation represent significant ongoing challenges to manage.
- Financial limitations. Securing long-term funding for water projects remains a significant concern.
- Legal and Institutional Framework. Coordinating among various government agencies, legal frameworks, and stakeholders continues to be an issue encountered.

Lessons learned

The program has yielded valuable lessons required to achieve a model for inclusive sustainable water governance and environmental justice. Some include:

- Governance processes are essential to achieve voluntary agreements that enable the rational and efficient use of water for cultivation.
- Multi-stakeholder collaboration and involvement, including government representatives, NGOs, indigenous communities and academia, needs continuous attention to ensure sustainability.
- The recognition of indigenous, ethnic approaches, integrating traditional knowledge and practices, and bio-cultural perspectives in water management, has been necessary.
- Ensuring meaningful participation of indigenous peoples, afro-descendants and other marginalized communities in decision-making processes is essential in recognizing water as a fundamental human right.

Results

The Water Table Committee Program has made significant progress in promoting responsible water use, protecting ecosystems, and securing water availability. Some of the results include:

- The program has successfully promoted an integrated approach to water management to facilitate sustainable use and conservation of water resources.
- Between 2013 and 2022, the use of water recirculation and measuring at each stage of the transformation process in the sugarcane industry led to a 32.6 % reduction of the amount of water consumed by mills from external sources.
- 50 % reduction in the water requirement for sugarcane production.
- The Water Table Program has contributed to the formulation of national water policies. These policies guide decision-making, planning, and regulation related to water resources.
- Water quality has been improved. Public health and ecosystem health have been positively impacted.
- Significant stakeholder engagement has been achieved. The program has developed awareness, participation and collaboration with government agencies, local communities and organizations.
- The program has promoted capacity building. It has provided training and technical assistance to water management authorities and communities.

- A robust information system has been established. Data collection, analysis, and research related to water resources have been adopted and/or improved.
- Significant investments in water infrastructure, such as reservoirs, pipelines, and treatment plants, have been made. Water availability and distribution have been improved and increased.
- The program has incorporated water management strategies, ensuring resilience against changing weather patterns.
- Between 2013 and 2023, the amount of water collected from an external source in the factories has been reduced by 29 %.

Interlinkages with other SDGs

The program's actions supporting SDG 6 have also significant interlinkages with SDG 9 on building resilient infrastructure and promoting inclusive and sustainable industrialization, by focusing on a comprehensive and sustainable sugarcane production system that ensures responsible water use and conservation; Target 12 on ensuring sustainable consumption and production patterns, by designing and implementing strategies to enhance efficient and rational water use in sugarcane production and manufacturing; SDG 15 on protecting, restoring, and promoting sustainable use of terrestrial ecosystems, halt land degradation, and halt biodiversity loss, by the program's efforts at preventing industrial discharges, agricultural runoff, and untreated sewage and focus on sustainable water resource management; and, SDG 17 on partnerships for the goals, as shown by the significant stakeholder engagement achieved by the program.

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WATER FOR LIFE AND SUSTAINABILITY FUND PROGRAM - FFAVS ASOCAÑA Colombia

Objectives and Description

The Water for Life and Sustainability Fund is a social and environmental program undertaken by the Colombian sugar sector and implemented in the Upper Cauca River Valley.

Through alliances with public, private, and professional entities, the fund conducts programs for the transformation of strategic ecosystems and communities. Restoration and conservation actions are carried out to generate sustainable environmental services and for transforming agents that increase the productivity and sustainability of the region. Its objective is to maintain the water flows necessary for the supply of drinking water, agricultural and industrial use, and for the conservation of biodiversity.

The strategy includes investment in watershed restoration. Through co-financing environmental conservation and food security projects, with the direct participation of the communities living in the upper part of the valley, the program contributes to the improvement of the watershed's regulatory capacity and the quality of life of these populations, bringing the region closer to achieving its water security.

Since its founding in 2009, the Water for Life and Sustainability Fund intervenes in strategic ecosystems of moorland (paramo), sub-moorland (sub-paramo), high Andean, sub-Andean and dry forests. Its area of direct influence on the high slopes of the valley covers approximately 850,000 hectares, at an altitude between 1,400 and 4,200 meters above sea level.

Related Targets

The program's actions, framed within SDG 6, support the objectives of: Target 6.1 on achieving universal and equitable access to safe and affordable drinking water for all, as shown by the Fund´s actions on maintaining the water flows necessary for the supply of drinking water, agricultural and industrial use, and for the conservation of biodiversity; Target 6.4 on substantially increasing water-use efficiency across all sectors, ensuring sustainable withdrawals and supply of freshwater to address water scarcity, by the restoration and conservation actions carried out to generate sustainable environmental services and transforming agents that increase the productivity and sustainability of the region; Target 6.5 on implementing integrated water resources management at all levels, shown by the effective regular monitoring systems and evaluation of program outcomes and the improvement of the watershed's regulatory capacity; Target 6.6 on protecting and restoring water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes, as shown by the program's intervention in strategic ecosystems of moorland, sub-moorland, high Andean, sub-Andean and dry forests; and Target 6.b on supporting and strengthening the participation of local communities to improve water and sanitation management, by educating communities and raising awareness about the importance of watershed conservation and sustainable practices.

Challenges

The implementation of the program has entailed significant challenges, among them:

- Land use conflicts arising from land use practices in areas where agriculture and urban development collide with natural ecosystems. Also, Law and Order situations continue to occur in the upper areas of the intervened watersheds.
- Educating communities and raising awareness about the importance of watershed conservation and sustainable practices has represented an ongoing challenge.
- Long-term funding for financial sustainability.
- Increasing alliances with private companies.
- Increasing technological solutions for measuring and monitoring the impact generated by the program's actions in the watersheds.
- Policy alignment. Aligning and coordinating the Fund's goals with existing broader national and international environmental policies has also been an important challenge to overcome.

Lessons learned

Several significant lessons have been learned during the development of the program. These include:

- Community participation has required strategies focused on building trust and cooperation to secure the engagement of indigenous groups, farmers and local authorities. These strategies have been necessary to consolidate the program's strategic alliances in the region.
- Critical impacted areas can only be addressed through the allies who live in them. This has been an incredibly significant lesson learned.
- The program must find sustainable financial models to maintain its projects beyond initial grants or donations.
- Working alliances are necessary and generate greater impact. The joint collaboration of the community, relevant official entities, the participation of the private sector with permanent contributions and the coordination of actions by the Fund have allowed to maintain project activities without interruptions, despite obstacles encountered, such as public order conflicts.
- Effective regular monitoring systems and evaluation of program outcomes are necessary.
- Coordinating and aligning the program's policies and actions with existing local, regional and national regulations have been necessary.

Results

The program has had meaningful results, achievements and positive impacts on the sugarcane industry and communities of influence:

- An investment of more than 11.8 million dollars in the 15 years of operation.
- More than 13,700 hectares have been intervened under the program´s landscape management tools.
- More than one million trees of native species have been planted.
- 26 watersheds have been intervened.
- 241 rural aqueducts have benefited from water source protection measures.
- 506 kilometers of riparian forests, native forests, and stream banks have been isolated.
- 642 springs have been protected.
- 603 sustainable production modules have been implemented.

- 53 educational centers have been sensitized to environmental issues.
- 3,217 families have directly benefited from or received training in natural resource management and sustainable production.
- 2,068 individuals have been trained in natural resource management and sustainable practices.
- 36 community organizations have been strengthened in their organizational and operational aspects.

Interlinkages with other SDGs

The Fund´s water related actions (SDG 6) have important interlinkages with: SDG 9 on building resilient infrastructure, promoting inclusive and sustainable industrialization, and fostering innovation; SDG 12 on ensuring sustainable consumption and production patterns, as shown by the innovation technology and industrialization methods adopted by the sector and the sustainable production modules implemented; SDG 15 on the restoration and protection of terrestrial ecosystems; and SDG 17 on partnerships for the Goals, through the important alliances with public, private, professional entities and community organizations.

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BEBEDERO YO TE PROTEJO (BEBEDERO I PROTECT YOU) LAICA Taboga Costa Rica

Objectives and Description

Bebedero Yo Te Protejo (I Protect You) is an initiative that originated in 2019 following a consultation by the company Aventuras Arenal (Blue Pass) with Taboga, aimed at preventing pollution of the Bebedero River, currently being used for tourism purposes.

Achieving river cleanliness in "Bebedero de Bagaces" and "Bebedero de Cañas" required changing the actions of residents, with collaborative efforts from organizations, institutions, and companies for the common good. The Bebedero Yo Te Protejo program seeks to ensure improvements in various areas through collective participatory care, emphasizing that every individual matters (each person counts). It aims to enhance the safety of residents, environmental protection, river conservation, cultural and traditional preservation, and maintaining a beautiful and healthy environment for work and living. To target this objective, a collaborative partnership involving local government, civil society, institutions, organizations, and the private sector was created.

The program consists of developing actions aimed at positively impacting the communities of Bebedero de Cañas and Bebedero de Bagaces, in partnership with grassroots organizations, private sector companies (Taboga and Blue Pass), public sector institutions (Cañas Municipality, Bagaces Municipality, Ministry of Health, ACAT-SINAC, Police Force), and civil society sector (Bebedero Development Association, Bebedero Scouts, Bebederos School), Cañas Red Cross, among others. It is a joint effort where all involved parties contribute resources, expertise, and share risks to achieve common objectives that contribute to sustainable development in both communities. It combines the human and economic resources of its participants in pursuit of a positive transformation in the Bebedero de Bagaces and Bebedero de Cañas communities.

Currently in its fourth year, with the goal of achieving impact and visible results by 2050, the program is scheduled to undergo an evaluation in 2025 that will carry continuous validity. The type of alliance it constitutes is transformational, targeting systemic transformations in social norms and delivering comprehensive solutions for sustainable development in the Bebedero community.

Its general objective is the development of a comprehensive proposal for the protection of the Bebedero community and its surroundings with the involvement and participation of all community stakeholders.

The specific objectives by thematic axis include:

- Cultural Axis. Rescue the identity and history of the Bebedero district.
- Environmental Axis. Implement an environmental management program.
- Health Axis. Raise awareness among target groups about proper management of solid and liquid waste.
- Security Axis. Establish and strengthen relationships with local law enforcement agencies.
- Sustainable Development Axis. Exchange experiences in good environmental, social, and economic practices.

Related Targets

The Bebedero project is strongly related to the SDG 6 on ensuring availability and sustainable management of water, particularly with respect to the following targets: Target 6.3 on improving water quality by reducing pollution, eliminating dumping and minimizing the release of hazardous chemicals; as evidenced by the program's actions on improving environmental protection, river conservation and a healthy environment for work and living; Target 6.5 on implementing integrated water resources management at all levels as achieved through the program's comprehensive and transformational approach at all levels involving collaborative efforts from organizations, institutions, companies and the communities for the common good; and, Target 6.6 on protecting and restoring water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes since the program aims at reducing and preventing pollution of the Bebedero River, and the implementation of good environmental, social, and economic practices by all stakeholders within the communities.

Challenges

A major challenge has been the continuous search for the most comprehensive and participatory solutions that can prevent the pollution of the Bebedero River in the short- mid- and long- term. The quest for these optimal solutions requires a commitment to continuous evaluation, capacity building, consultation and meetings with all stakeholders involved and impacted by the project.

Lessons learned

An important lesson learned is the need to establish a monitoring and management mechanism for all activities required to achieve the general and specific objectives of such projects. In the case of this project, this mechanism involves a coordination committee comprising representatives of various stakeholders, including local government, civil society, institutions, organizations and the private sector.

Results

The Bebedero program's actions on sustainable management of water have achieved meaningful results during the past four years including:

- 15 partnerships supporting the implementation of activities and the development of the program at all levels including the private, public, institutional and social sectors.
- 1 Ecological Blue Flag award for Micro Watershed, for the program campaigns on the river`s clean-up and conservation actions.
- 2 beneficiary communities along the Bebedero river have been actively involved under the program, Bebedero de Cañas and Bebedero de Bagaces.
- 332 trees planted, as part of program`s effort involving community-driven participation.
- 50 participants in the Family Gardens project, involved in enhancing environmental sustainability and food security for the Bebedero community.

Interlinkages with other SDGs

The Bebedero Yo Te Protejo program, aligned under SDG 6, has important interlinkages with:

- **SDG 12** on Responsible Consumption and Production. Work on the proper management of waste, with the purpose of preventing it from reaching the forests or water sources such as the Cañas River, Bebedero River, and Tenorio River align the program with this SDG.

- **SDG 13** on Climate Action, by implementing environmentally friendly practices such as protecting the Bebedero River's ecosystem, raising awareness among employees and stakeholders about the importance of forest conservation for CO2 sequestration and providing ecosystem services for adapting to climate change.

- **SDG 15** on Terrestrial Ecosystems. Through the conservation activities that help preserve biodiversity, such as, conservation of endangered species including felines (puma, ocelot, jaguarundi), jabiru, among others, as well as forest species such as mahogany, cocobolo, cenízaro, mora, royal guayacan.

- **SDG 17** on Partnerships for the Goals. The strategic collaborations with the private, public, institutional and social sectors developed by LAICA are enabling the communities of Bebedero de Cañas and Bebedero de Bagaces to manage their impacts to have a healthier, safer, and more prosperous environment for all.

AGUA 10 (WATER 10) PROGRAM
Grupo CASSA
El Salvador

Objectives and Description

The AGUA 10 Program, implemented by Grupo CASSA, aims to provide and improve access to safe drinking water and promote hygienic practices in school communities in El Salvador. It also includes providing access to basic services for disease prevention and reducing school absenteeism or dropouts. The program is based on the WASH model developed by UNICEF that guarantees an adequate closed water cycle, from its extraction to its correct final disposal into the environment.

AGUA 10 focuses on a comprehensive development for community members, starting at the school level. It is based on 3 key components:

1. Drinking Water / Hydration Points. Includes the building and improvement of hydration facilities in schools, ensuring clean and accessible water sources for students and staff.
2. Hygienic Practices / Sanitation Improvements. It focuses on the promotion of hygienic practices and health, with emphasis on hand washing with soap and water. Also, proper sanitation infrastructure, including well-maintained bathrooms.
3. Sustainability Committees. These are comprised of parents, volunteers and teaching staff to ensure long-term maintenance of the facilities and promote hand washing habits among the educational population.

The program also targets existing cultural barriers to habits related to water use and hygiene behavior. It conducts raising-awareness and education campaigns

promoting healthy habits in water use and the importance of hygiene practices. From inception to 2023, the program benefited 46 educational centers, and over 9,960 people. The program further collaborates with neighboring communities. Grupo CASSA recognizes these communities as part of the same ecosystem that sustains its industry.

During the 2021-22 period, Grupo CASSA entered a strategic alliance with the Business Foundation for Educational Development (FEPADE) and the United States Agency for International Development (USAID). An investment of $346,740 was received that benefited 10 educational centers across the municipalities of Sonsonate and San Miguel. This investment was used to improve access to safe drinking water in schools through hydration points and improvements in restroom facilities, and to strengthen community cohesion by providing technical assistance to teachers and administrators. It also included training community members to create a healthier and more connected environment. In 2023, this alliance benefited 10 educational centers and 1,080 individuals.

Related Targets

The actions of the AGUA 10 Program embodied within SDG 6 support the objectives of: Target 6.1 on achieving universal and equitable access to safe and affordable drinking water for all, by providing and improving access to safe drinking water and promoting hygienic practices in school communities; Target 6.2 on achieving access to adequate and equitable sanitation and hygiene for all, as shown by the program's comprehensive approach and implementation, which includes sanitation infrastructure construction/improvement, hygienic practices and education promotion at schools and communities, parents, teachers and community involvement through the Sustainability Committees, others; Target 6.3 on improving water quality by reducing pollution; Target 6.5 on implementing integrated water resources management at all levels, as evidenced by structuring the program under the WASH model (UNICEF) guaranteeing an adequate closed water cycle, Sustainability Committees to oversee sustained hygienic practices, others; Target 6.a on expanding international cooperation and capacity-building support to developing countries in water- and sanitation-related activities and programs, as achieved by Grupo CASSA contributions through alliances with international institutions such as USAID; and Target 6.b on supporting and strengthening the participation of local communities to improve water and sanitation management, through the Sustainability Committees to oversee and ensure enforcement and long-term application of proper water use and handwashing practices.

Challenges

The implementation of the AGUA 10 program has encountered several challenges:

- Some educational centers lacked drinking water and adequate sanitation. In other schools, existing water and sanitation facilities were found to be very deficient. Effective construction and upgrading of facilities have proven difficult, costly and time-consuming.
- One of the most critical challenges has been creating and maintaining awareness on the importance of safe drinking water and proper hygiene practices among students and community members. In addition, ensuring that communities continue to adopt healthy habits over the long term is an ongoing challenge.

- Although Sustainability Committees were formed to address sustained functionality of water and sanitation infrastructure, maintaining functionality and infrastructure is an important ongoing challenge.

Lessons learned

Valuable lessons have been learned during the development of the AGUA 10 program. Some include:

- Involving people from the beginning has led to greater acceptance, understanding and sustainability of the program. Active involvement of local communities is crucial to program success.
- Raising awareness and continuing education over the importance of safe drinking water and proper hygiene practices have been essential to ensure the sustainability of the program. Ongoing campaigns at student and community levels are necessary.
- Continuous information and recognition campaigns are essential to maintain the interest and participation of students, teachers and the community, and to ensure long-term sustainability.

Results

Since its inception, the AGUA 10 program has achieved significant results. Some include:

- Improved hydration and sanitation facilities in 46 educational centers, benefiting 9,960 individuals by 2023. In 2023, 9 educational centers and 1,080 were benefited.
- Awareness about the importance of drinking clean water and good hygiene has been raised in students, teachers and communities. Families have also participated in these initiatives.
- Reduced absenteeism due to

preventable illnesses related to poor water quality consumption. Schools now provide clean, safe water and functional bathrooms for a healthier long-term quality of life for students, teachers and the community.

- Students have learned the importance of hygiene practices. They have adopted the habit of handwashing with soap and water.
- A Sustainability Committee, responsible for maintaining the facilities and ensuring that hygienic practices continue over the long term, has been established in each educational center.
- The program's engagement with neighboring communities fosters a sense of community ownership and responsibility.

Interlinkages with other SDGs

The AGUA 10 program framed within SDG 6 also bears interlinkages with:

- **SDG 3** (Good Health and Well-being) on ensuring healthy lives and promoting well-being for all at all ages, by the program's actions focused on improving access to safe drinking water, and the promotion of hygienic practices in school communities.
- **SDG 11** on making cities and human settlements inclusive, safe, resilient, and sustainable, as shown by the program's comprehensive approach, construction of proper sanitation infrastructure, hygienic and healthy practices and education at all community levels, including parents, teachers and community volunteers through Sustainability Committees, and others.
- **SDG 17** on partnerships that strengthen the means of implementation as evidenced by Grupo CASSA's alliances with international institutions such as USAID, and clients such as ED&F MAN in the execution of the AGUA 10 program.

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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, Bahía de Jiquilisco and Río 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. Reuse of gray water for potential agricultural use in the irrigation of small-scale plots and orchards.
c. 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.
d. 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; a feasibility evaluation for constructing a water level regulation system to manage floods in the Olomega Lagoon; and implementing civil works for protection against high rainfall.
e. Improve savings and efficiency in water use, integrated management of solid waste, and training in water security systems.

Related Targets

The project's actions are framed within the SDG 6. These are related to: Target 6.4, on increasing water-use efficiency to address water scarcity, as shown by the program's main activities: rainwater harvesting systems, improvement of water quality for human consumption, well walls restoration, disaster risk mitigation, others. Target 6.5 on implementing integrated water resources management at all levels, by actions on water use savings and efficiency, integrated solid waste management and water security systems training. Target 6.6, on protecting and restoring water-related ecosystems, as shown by the installation of rainwater harvesting systems for domestic and agricultural use, an early warning system (EWS) for water increases and overflows, a water level regulation system for floods, civil works to protect against floods, gray water reuse, others. And, Target 6.b, on supporting and strengthening the participation of local communities to improve water and sanitation management, by training on improving water quality for human consumption, water use savings and efficiency, through solid waste integrated management and water security systems. Delivery of artisanal filters.

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.

- The program has benefited more than 39 sugarcane communities and more than 43,000 Salvadorans.

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: 73% completed.

- Restoration of walls in community wells: 23% completed.
- Contribution to quality of water for human consumption. Goal: 30 – Total: 125 completed.

Interlinkages with other SDGs

This program's actions under SDG 6 have interlinkages with: SDG 13 on Climate Action, by implementing actions relevant to water resources, biodiversity conservation and climate change adaptation, based on watershed and landscape-scale integration; SDG 9 on Industry, Innovation and Infrastructure/ Build resilient infrastructure, as evidenced by the construction of civil works for protection against high rainfall and flooding, water level regulation systems, gray water reuse, capacity building for communities, others; 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; and, 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.

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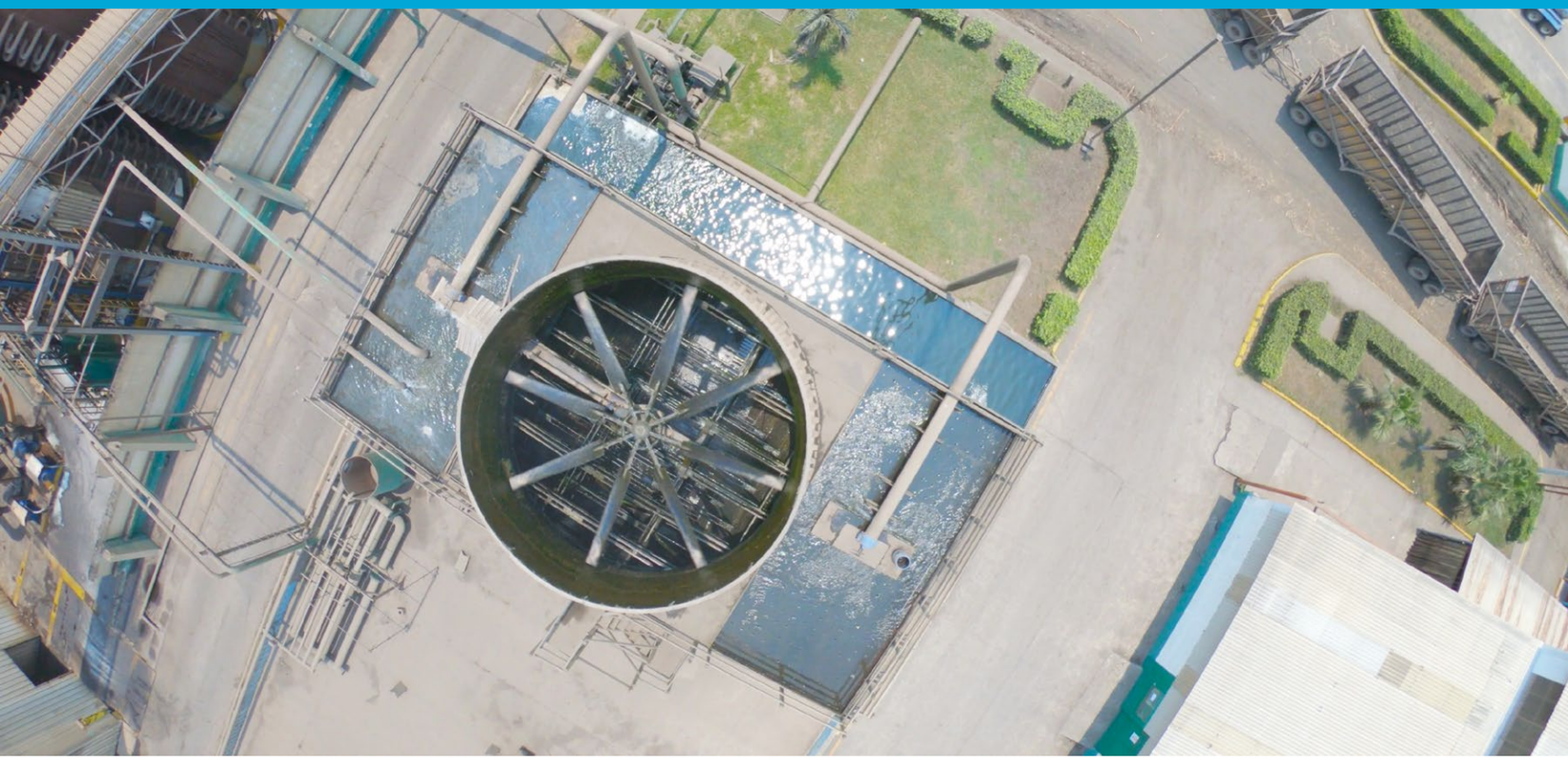
WATER USE IN AGRICULTURAL AND INDUSTRIAL PROCESSES
ASAZGUA/GUATECAÑA
Guatemala



Objectives and Description

The Guatemalan Sugarcane Agroindustry (Guatecaña) operates within the framework of its own environmental management policy of guild compliance that has allowed the standardization of practices in the management and use of water, air quality, use and application of agrochemicals, solid waste management and conservation of biodiversity.

Water is essential for living and for agricultural and industrial processes. Due to climate change impact, and natural phenomena (such as El Niño), the sugar industry has come to implement better management practices to reduce water consumption and make a rational use of the resource.

The Sugarcane Agroindustry participates in roundtables with community, local authorities, institutions and governmental and human rights organizations, as well as other companies and sectors, to coordinate the rational use of water from the rivers.

Water use in agricultural processes has been reduced by implementing more efficient irrigation systems and by the application of new technologies and processes. Investment by the Sugarcane Agroindustry in irrigation systems has allowed the development of practices for the rational use of water in agriculture.

In the industrial process, used water is sent to cooling systems (towers or sinks) to be reused later in the process. Industrial wastewater from the sugar production is also reutilized after being treated for

fertigation which allows a timely supply of water and fertilizer application. Sludge treatment systems are connected to irrigation systems to allow the conditioning of soils with essential nutrients for the growing of crops. One of the measures adopted by some of the sugar producers was to eliminate the use of water to clean the sugarcane before the milling process. The sugarcane is cleaned by vibration devices to eliminate the solids transported by the sugarcane. This practice has represented the most significant water saving strategy for those using it.

The Sugarcane Agroindustry performs wastewater monitoring in all the sugar mills to ensure the fulfillment of standards established by the environmental regulation in force since 2006.

In 2018 studies were initiated on the water footprint of sugar and sugarcane. This refers to the quantity of water used in production, including rainwater (green water footprint), both ground and surface water (blue water footprint), as well as wastewater (grey water footprint).

For Harvest 2020-2021, the average water footprint of sugarcane cultivation in Guatemala is estimated at 1129 m3 of water per ton of sugarcane, which is 38% below the world average. Some 77 % of the water used for the sugarcane crop in Guatemala is provided by rainfall and 19 % by irrigation from surface and underground sources (ICC, 2021).

Related Targets

The activities related to water use are directly related to Target 6.4 which calls for substantially increase water- use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater and reduce the number of people suffering from water scarcity. These activities also support Target 6.3 on improving water quality by reducing pollution and reducing the proportion of untreated wastewater and increasing recycling and safe reuse of water.

Challenges

One of the main challenges is continuing to move towards more efficient irrigation systems. The knowledge dissemination and the creation of awareness for the responsible and efficient use of water is a task that needs constant attention. Other major challenges include the need to modify water efficiency practices to adapt to the new impacts from climate change and performing additional research to learn more about the behavior of groundwater.

Lessons learned

It is clear that investment in research and development of innovative technologies and software is necessary to ensure sustainability of water resources.

Results

The Sugarcane Agroindustry has been able to effectively reduce the use of water through the implementation of efficient water use techniques. It has improved agricultural practices and has made major investments in efficient irrigation systems. Major water savings have continued to increase through the years both in the field and in industrial processes. In the field (crop management), progress has been made in the implementation of more efficient irrigation systems, the development of sugarcane varieties that are more resistant to droughts and the participation in water governance models. In industrial processes, good results have been obtained from water reuse, recirculation

and recovery from industrial plants. Today the Guatemalan Sugarcane Agroindustry has a water footprint of sugarcane cultivation which is considerably lower than the rest of the world average.

Interlinkages with other SDGs

The interlinkages between water use in agriculture and industrial activities (SDG 6) of the Guatecaña and other SDGs are considerable. The strongest interlinkages are in relation to climate change (SDG 13), terrestrial ecosystems/forests (SDG 15) and food security and sustainable agriculture (SDG 12). 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 which strongly depend on water uses and management. Another strong interlinkage is with respect to partnerships (SDG 17), given that the Guatemalan Sugarcane Agroindustry, Asazgua, ICC, Fundazucar and Cengicaña have many partnerships with national, local and regional organizations committed to protecting water and terrestrial ecosystems and to the pursuit of sustainable development in Guatemala and Central America.

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Durman
Durman
PROYECTO DE AGUA POTABLE
COMUNIDAD: GERMAN POMARES
DONADO POR:
Pantaleon
Ingenio Monte Rosa
TRANSFORMAMOS RECURSOS RESPONSABLEMENTE

WATER FOR ALL PROGRAM
ESASA, S.A.
Pantaleon Group/ Monte Rosa Sugar Mill
Nicaragua

Objectives and Description

In Nicaragua, 31 % of the population in rural areas does not have access to drinking water. Gastrointestinal and parasitic diseases have significantly increased as a result of lack of proper water purification systems causing considerable mortality worldwide.

The Water for All Program, through the implementation of a comprehensive drinking water system, which includes education and community management, contributes to the improvement of the living conditions of the residents of rural communities in the Monte Rosa Sugar Mill's operation area of influence. This program covers the following specific objectives: (1) reduce cases of water-borne diseases, through the implementation of safe drinking water systems, health education and changes in the daily habits of families; (2) promote responsible management of water resources, generating community empowerment and commitment to the sustainability of the project; and (3) strengthen the capacities of the Drinking Water and Sanitation Community Committees to ensure sustainability of the water systems.

The water projects are executed in three phases:

Phase 1. Provision of infrastructure: drilling a well, pumping station and electrical system, pump house, purifying plant, perimeter fence, primary pipeline to the tanks, storage, distribution line and home connection to the meter.

Phase 2: Strengthening the capacities of the members of the Drinking Water and Sanitation Committee for the administration, operation and maintenance of the drinking water system, through training in topics such as legal framework, functions of the Drinking Water Committee Board of Directors, reading of meters and consumption tables, accounting books filling (basic accounting), assertive communication, negotiating with difficult people and rational consumption and use of the water resource.

Phase 3. Follow-up for sustainability: The Community Development team at Monte Rosa Sugar Mill provides advice for two years on administrative, operational and legal issues.

Related Targets

The Water for All Program implementation is in alignment with Target 6.1 of achieving universal and equitable access to safe and affordable drinking water for all, Target 6.2 on achieving access to adequate and equitable sanitation and hygiene for all, Target 6.4 on substantially increasing water-use efficiency across all sectors and ensuring sustainable withdrawals and supply of freshwater to address water scarcity and substantially reducing the number of people suffering from water scarcity, Target 6.5 on implementing integrated water resources management at all levels, including through transboundary cooperation as appropriate, and Target 6.b on supporting

and strengthening the participation of local communities to improve water and sanitation management.

Challenges

The major challenges faced by The Water for All program in the communities include: the promotion of the adequate and equitable sanitation and hygiene component in upcoming drinking water projects and in systems already in place; the stablishing of strategic alliances to expand drinking water and sanitation coverage in the rural area of the department of Chinandega; and, the strengthening of community participation in water and sanitation management.

Lessons learned

In addition to the provision of safe drinking water and its related objectives, in order to achieve the sustainability of the projects, it is necessary to have the involvement of all beneficiaries and for them to take ownership of their system, which can be attained by requesting a community counterpart (unskilled labor, land donation, etc.); and, to promote the full and effective participation of women in drinking water committees, in all phases of the system, to reduce gender gaps and achieve equality and equity between genders. Another important lesson learned has been the need to perform the socioeconomic analysis of the communities where the project will be developed to determine the type of system to install.

Results

The program has developed 18 drinking water systems that benefit more than 20 communities, where each drinking water committee manages its bank account for the maintenance and operation of the system. The communities benefiting from these projects have access to quality water, in adequate quantity, daily availability and affordable rates.

Interlinkages with other SDGs

The Water For All program is interlinked with the following SDGs: SDG 3, by providing access to clean and safe water, diseases transmitted by unsafe drinking water are reduced thus improving the health and well-being in communities; SDG 4 on Quality Education, through the implementation of health and sanitation education to empower communities with knowledge, skills and improved daily habits to manage water resources sustainably; SDG 5 on Gender Equality, by reducing the responsibility and burden on women and girls for collecting water and promoting their effective participation in the drinking water committees; SDG 11 on Sustainable Cities and Communities, by improving water infrastructure and ensuring sustainable management through strengthening capacity building, administration, operation and maintenance of the water systems, the program contributes to build inclusive, safe, resilient, and sustainable communities and human settlements; and SDG 17, Empresa de Servicios Azucareros, S.A. (ESASA), and the Pantaleon Group/ Monte Rosa Sugar mill has developed various partnerships with national, local and regional organizations to ensure the success and sustainability of the program.

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INTEGRATED WATER RESOURCE MANAGEMENT PROJECT.
Construction of rainfall reservoirs for water harvesting through precipitation catchment AZUCALPA
Santa Rosa Sugar Mill, Azucarea Nacional, S.A.
Panama

Objectives and Description

The objective of the project is the construction of storage reservoirs for harvesting water through precipitation generated in the micro-watersheds, recharging each structure for resource collection. The harvested water is used in the cultivation of sugarcane through irrigation during the summer, providing water according to the phenological stage of the plantation. This practice helps to mitigate the impact of climate change on crop development. Water harvesting reduces the use of water sources from rivers or confined aquifers, which are utilized by communities for animal or human consumption, especially in times of high demand when the resource is scarce.

Water reservoirs (artificial lakes) were built to harvest water from regional rainfall as an effective solution to the water scarcity caused by the impacts of climate change. This system allows water requirements to be met without negatively impacting the environment or causing adverse economic effects by consuming water resources from other sources.

An important consideration for the construction of these reservoirs has been that climate change caused by global warming has altered the amount and frequency of rainfall in many regions over the years, causing flooding and land erosion. By channeling rainwater into water reservoirs, excess water and sediments carried by runoff (water erosion) are prevented or minimized from damaging the viability of soils.

Climate change is a global problem. To reduce water scarcity in agriculture and avoid a negative impact on natural hydrological sources such as rivers and confined aquifers that are easily accessible to the communities, 4 rainfall reservoirs (artificial lakes) were built. These are located as follows:

1. Province of Cocle Lake Baxter, located in Finca Santa Rosa, with an area of 53.16 Ha and a water capacity of 1,293,847.92 m3.
2. Province of Herrera. Lake Orange, located in Finca Los Canelos, with an area of 225 Ha and a water capacity of 2,907,000 m3.
3. Province of Herrera. Lake Saenz, located in Finca Santa Anita, with an area of 92.74 Ha and a water capacity of 4,405,150 m3.
4. Province of Herrera. Lake 2, located in Finca Santa Anita, with an area of 41.25 Ha and a water capacity of 1,898,941 m3.

An environmental impact study was conducted to assess the potential effects of constructing these structures on each of the sites.

To determine the most suitable locations, areas within the sites most susceptible to the natural accumulation of water during the winter season were identified based on the topography of the area under study. Topographic surveys were then conducted in these areas of interest to evaluate the appropriate dimensions for each structure and to identify the sections that required cuts to channel water to the most suitable outlets to facilitate its use when needed.

After analyzing the topographic data, each structure was built using heavy machinery for earthworks and the compaction of retaining walls. The retaining walls must be well structured to withstand the hydrostatic pressure generated by the harvested water. The construction of each structure took approximately 3 to 4 months.

Related Targets

The Integrated Water Resource Management Project, aligned within SDG 6, contributes to: Target 6.4 on substantially increasing water-use efficiency across all sectors, this is achieved through water harvesting in rainfall reservoirs to ensure a sustainable supply of water for sugar mills' operations, reducing dependency on external water sources and mitigating the impact of water scarcity; Target 6.5 on implementing integrated water resources management at all levels. The project involves planning and managing water resources in a comprehensive manner, considering the entire water cycle, the needs of various stakeholders and ensuring that water is used sustainably and equitably; and Target 6.6 on protecting and restoring water-related ecosystems, this is achieved by the project supporting the natural hydrological cycle and health of surrounding ecosystems. The rainfall reservoirs contribute to reducing runoff and erosion, which degrades soil and water quality.

Challenges

Climate variability has been one of the major challenges encountered for the construction of the rainfall reservoirs and the implementation of the project due to the change in rain patterns (amounts and frequency) generated by global warming, causing flooding and land erosion in many regions over the years. Climate changes have significantly impacted water availability and the effectiveness of water harvesting systems.

Lessons learned

Important lessons learned during the implementation of the project include: water harvesting from regional rainfall is a viable option for water supply, as it allows for the accumulation of runoff water in micro-watersheds, which is then deposited by gravity in confined water reservoirs. The areas selected for these structures must be extensive, capable of holding adequate volumes of water to meet crop irrigation demands. Technological advances must be implemented to improve the efficiency of water resource utilization, thus ensuring the sustainable use of water collected during the winter.

Results

Even under the climate changes of recent years, the volumes of water harvested have successfully met the water needs of the crop. Due to low rainfall in recent years, the recovery of water levels to maximum water capacity in each structure has been prolonged. The use of more efficient irrigation equipment, such as mini-sprinkler systems and semi-mechanized systems (wheel line irrigation) has improved water application and use, allowing the use of smaller volumes of water for irrigation in the production areas.

Interlinkages with other SDGs

This project's actions under SDG 6 have important interlinkages with: SDG 13 on Climate Action. The project contributes to climate resilience and adaptation. The construction of rainfall reservoirs helps mitigate the impacts of climate change by managing water resources more effectively and reducing vulnerability to weather events; SDG 15 on Life on Land, by protecting and restoring water-related ecosystems, reducing soil erosion and maintaining water quality, the project helps preserve biodiversity and promotes the sustainable management of forests, wetlands, and other natural habitats, thus supporting the conservation and sustainable use of terrestrial ecosystems; and SDG 17 on Partnerships for the Goals, by fostering collaboration between various stakeholders that include government agencies, private sector entities and local communities the project assures a sustainable development.

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