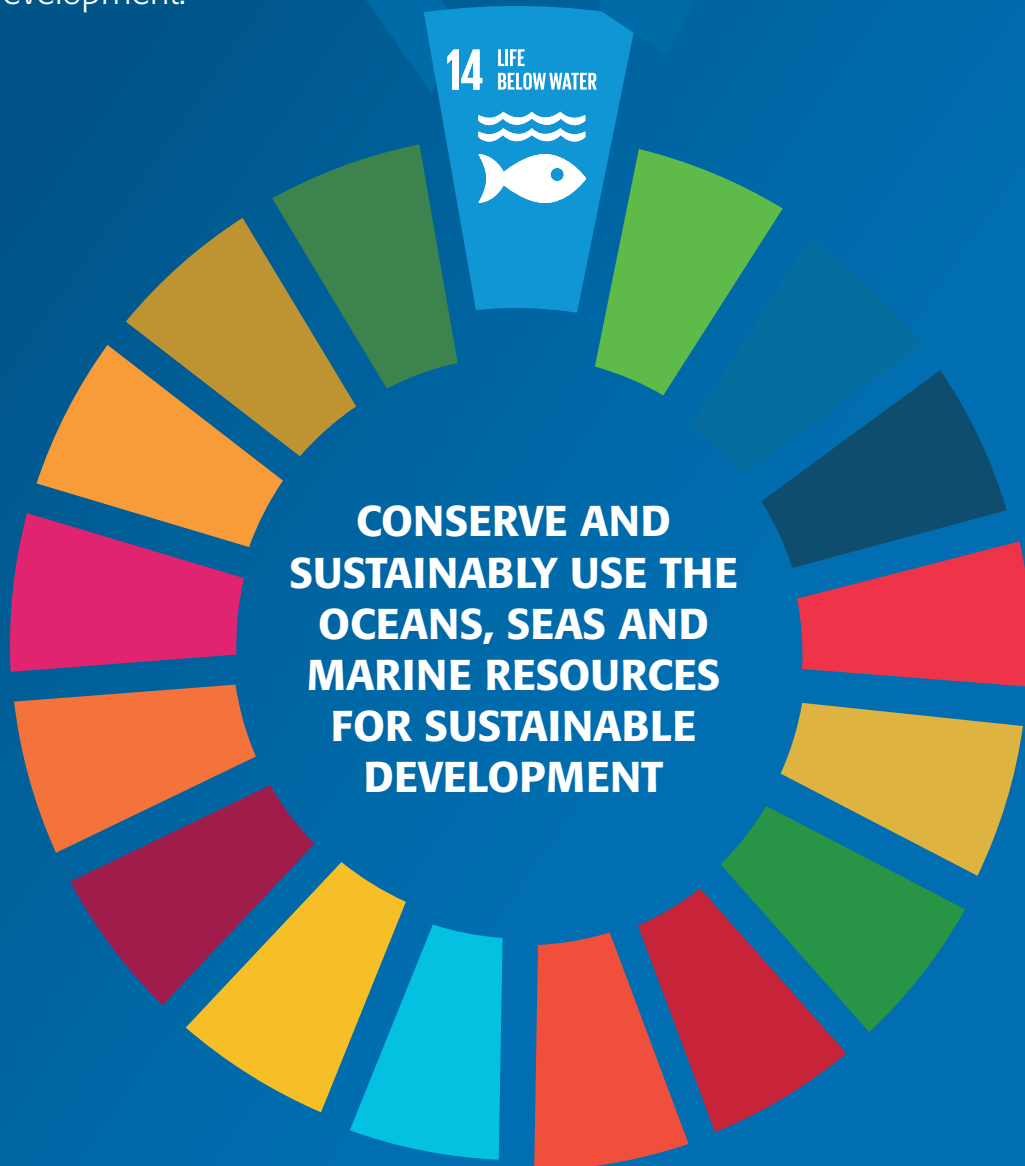


## CASE STUDY:

Activities by the Guatemala Sugar Agroindustry supporting the implementation of the Sustainable Development Goal 14 (SDG 14) of the United Nations 2030 Agenda for Sustainable Development.









**CONSERVE AND  
SUSTAINABLY USE THE  
OCEANS, SEAS AND  
MARINE RESOURCES  
FOR SUSTAINABLE  
DEVELOPMENT**



SUSTAINABLE  
**WATER &  
ENERGY**  
SOLUTIONS  
NETWORK





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Conserve and Sustainably Use the Oceans, Seas and Marine Resources for Sustainable Development / Asazgua

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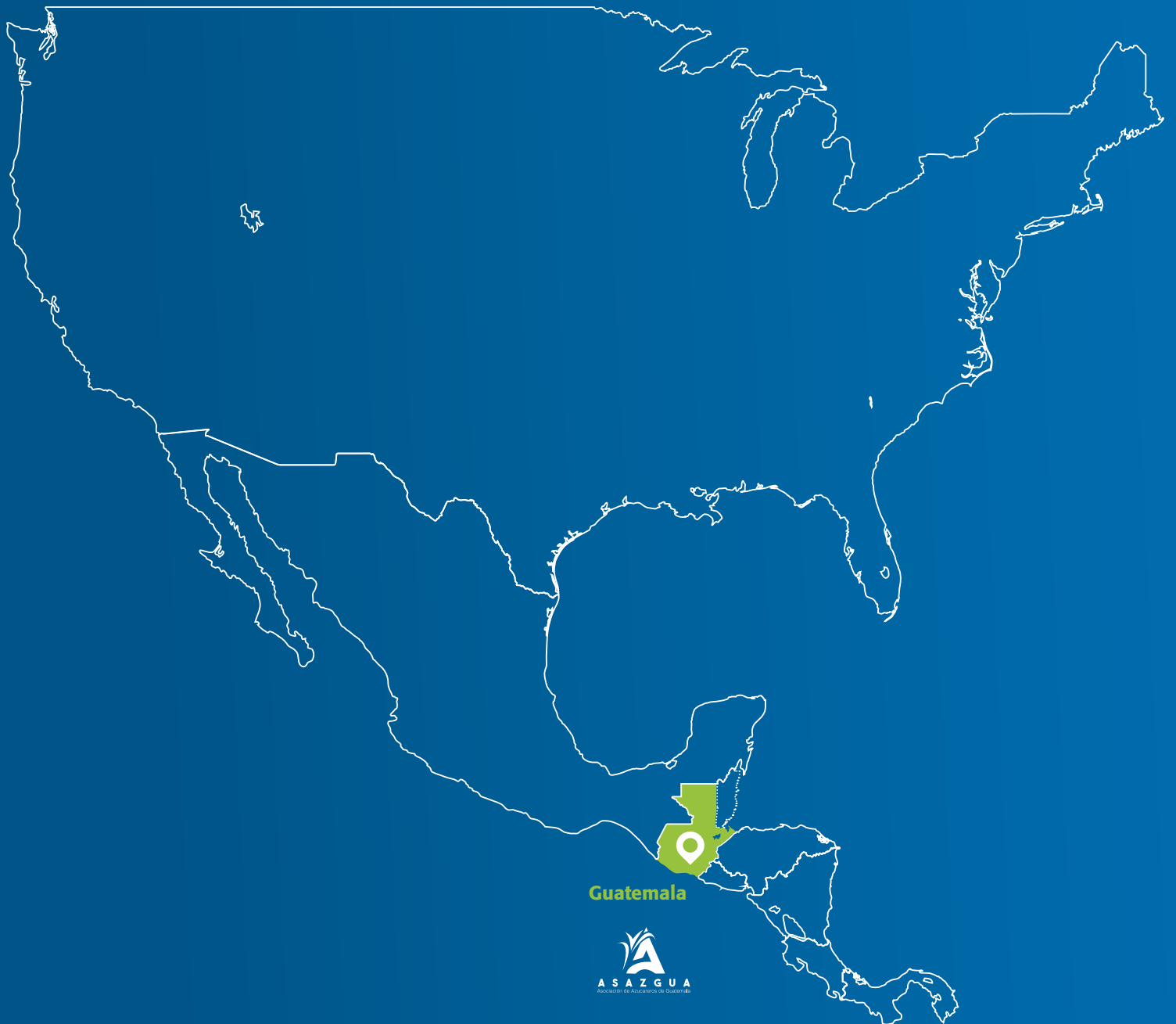
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# Association of Sugar Producers of Guatemala (Asazgua)



Guatemala



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# SDG 14: CONSERVE AND SUSTAINABLY USE THE OCEANS, SEAS AND MARINE RESOURCES FOR SUSTAINABLE DEVELOPMENT



**Target 14.1:** By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution.

**Target 14.2:** By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans.

**Target 14.3:** Minimize and address the impacts of ocean acidification, including through enhanced scientific cooperation at all levels.

**Target 14.4:** By 2020, effectively regulate harvesting and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices and implement science-based management plans, in order to restore fish stocks in the shortest time feasible, at least to levels that can produce maximum sustainable yield as determined by their biological characteristics.

**Target 14.5:** By 2020, conserve at least 10 per cent of coastal and marine areas, consistent with national and international law and based on the best available scientific information.

**Target 14.6:** By 2020, prohibit certain forms of fisheries subsidies which contribute to overcapacity and overfishing, eliminate subsidies that contribute to illegal, unreported

and unregulated fishing and refrain from introducing new such subsidies, recognizing that appropriate and effective special and differential treatment for developing and least developed countries should be an integral part of the World Trade Organization fisheries subsidies negotiation.

**Target 14.7:** By 2030, increase the economic benefits to small island developing States and least developed countries from the sustainable use of marine resources, including through sustainable management of fisheries, aquaculture and tourism.

**Target 14.a:** Increase scientific knowledge, develop research capacity and transfer marine technology, taking into account the Intergovernmental Oceanographic Commission Criteria and Guidelines on the Transfer of Marine Technology, in order to improve ocean health and to enhance the contribution of marine biodiversity to the development of developing countries, in particular small island developing States and least developed countries.

**Target 14.b:** Provide access for small-scale artisanal fishers to marine resources and markets.

**Target 14.c:** Enhance the conservation and sustainable use of oceans and their resources by implementing international law as reflected in the United Nations Convention on the Law of the Sea, which provides the legal framework for the conservation and sustainable use of oceans and their resources.

**Source:** United Nations, 2015.





**The volcanic soils of southern Guatemala are exceptional for the growth of sugarcane**

# THE GUATEMALA SUGAR AGROINDUSTRY

As of 2021, Guatemala was the third largest producer in Latin America and the sixth largest exporter of sugar in the world. Sugar is the second agroindustrial product most exported of Guatemala. The Guatemala Sugar Agroindustry generates almost US \$700 million in foreign exchange annually and provides more than 55,000 direct jobs and 278,000 indirect jobs in the country. Besides, the sector receives products and services from more than 6,000 small, medium-sized and large enterprises, which also generate more employment. Only 2.97% of the cultivable land in Guatemala is used for sugarcane production. Asazgua, the Association of Sugar Producers of Guatemala, was created in 1957 to coordinate the activities of the Guatemala Sugar Agroindustry. It includes 11 sugar producers and five technical organizations specialized in research, climate change, sugar exportation and social responsibility (Asazgua, 2020). In addition, since 2022, it counts with an organization specialized in innovation. The sugar producers that are members of Asazgua include: Pantaleon, Concepción, Palo Gordo, Santa Ana, Magdalena, Santa Teresa, La Unión, Madre Tierra, Trinidad (San Diego), La Sonrisa and El Pilar.

The Guatemala Sugar Agroindustry is committed to generating opportunities and prosperity for the people of Guatemala that support the country's sustainable development. It promotes decent and valuable jobs for the wellbeing of the population, while at the same time promoting environmental protection and conservation.

The Guatemala Sugar Agroindustry follows sustainable development principles as reflected by its strategic objectives and integrated actions and programs, supporting social wellbeing, economic growth, industrialization, and environmental protection. The activities of the sugar industry

in Guatemala are recognized as examples of "Good Practices" in the effective implementation of the United Nations 2030 Agenda for Sustainable Development and the Sustainable Development Goals.

Associated organizations supporting specific sustainable objectives of the Guatemala Sugar Agroindustry have been created in the last decades. In 1990 Fundazúcar was launched as the social branch for the development and implementation of programs and projects on health, education and development. In 1992 Cengicaña started research activities to develop new varieties of sugarcane, to have integrated pest management, to study land quality and to implement more efficient processes for the cultivation of sugarcane and for the production of sugar. In 1994 Expogranel, one of the most efficient boarding terminals for sugar export in the world, was launched to cover international markets in a more efficient and competitive manner. In 2010, the Private Institute for Climate Change Research (ICC) was created to perform research, activities and projects related to climate change. In 2022 the Innovation Hub was created to develop a program of innovative projects through the identification and optimization of products, activities, processes and business models of the Sugar Agroindustry.

At the international level, the Guatemala Sugar Agroindustry supports the work of ICC on climate change mitigation and adaptation with other countries of Central America. Also through Asazgua, it participates actively in the Global Network on Sustainable Water and Energy Solutions. This is an initiative led by the Division for Sustainable Development Goals of the United Nations Department of Economic and Social Affairs (UNDESA). The Network promotes integrated water and energy solutions that address climate change objectives worldwide.

# SUSTAINABLE DEVELOPMENT STRATEGY

The Sustainable Development Strategy of the Guatemala Sugar Agroindustry is based on its vision, mission and objectives which promote a comprehensive and forward-looking transformative pathway to prosperity and peace for the people of Guatemala, at the same time supporting a healthy and sustainable planet. It follows an integrated approach based on transformation and adaptation to changes expected in the future due to new challenges. With its inclusive participation policy with multi-stakeholder

partnerships, the Sugar Agroindustry, through Asazgua, is committed to coordinating the work of enterprises, governmental entities and civil society to achieve the final goal of prosperity and sustainable development for Guatemala. The Guatemala Sugar Agroindustry is a global example of efficiency and technological advance representing a very relevant factor for the economy of Guatemala with important positive impacts also on the social and environmental dimensions of sustainable development.

## Objectives

1. Increase productivity through development and improvements in the field and in sugar refineries
2. Provide technical training and capacity building for human resources
3. Develop projects and programs that increase the capacity of the production systems in the field and in sugar refineries, in distribution and commercialization of products, and of the export boarding systems.

## Vision

Before 2025 the Guatemala Sugar Agroindustry will be the most respected productive sector of the country due to diversification, competitive efficiency, generation of dignified jobs, and respect for the environment, suppliers and communities with whom it relates.

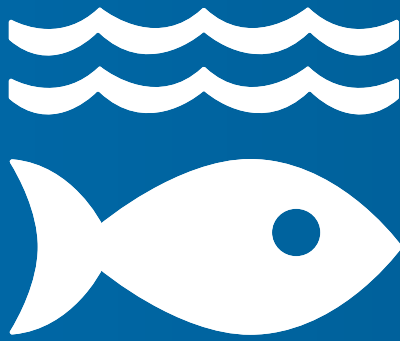
Given its policy of unified action, proactive attitude and strong socioeconomic support, the Sugar Agroindustry leads as a positive agent of change for integral development, boosting the progress of its members and the country.

One of the objectives of the Guatemala Sugar Agroindustry is to increase productivity through development and improvements in the field and in sugar refineries.



## Mission

The Guatemala Sugar Agroindustry mission includes the following: to act in united manner to cultivate and process sugarcane to produce sugar, electricity, ethanol and other products; to undertake other activities to increase the value of the associated enterprises with a positive impact on the integrated development of the country; to innovate constantly improving competitive efficiency; to facilitate national and international commercialization of sugar; and to ensure sustainability while building trust responsibly.



## **THE GUATEMALA SUGAR AGROINDUSTRY AND THE SDG 14**

The most important activities of the Guatemala Sugar Agroindustry supporting the objectives of SDG 14 (conserve and sustainably use the oceans, sea and marine resources for sustainable development) are centered on a number of activities that follow the “Source to Sea” approach. This integrated approach acknowledges a continuum system of flows that goes from different sources downstream to oceans and that activities along this chain could have considerable impacts at all stages. Some of the initiatives of the Agroindustry supporting this approach include practices for soil and water conservation, mitigating activities of agrochemicals and other hazardous materials introduced in sources, conservation of protected areas and of biodiversity, and environmental monitoring and control of water and sediments.



# 1. FROM THE SOURCE TO THE SEA

## 1.1. From the Source to the Sea

### Objectives and Description

Guatemala's geographic location between the Pacific and Atlantic Oceans with contrasting conditions and diverse physical regions imply that human activities could have a direct impact in oceans. The country includes 10 physical regions, 7 biomes, 66 ecosystems (41 natural and 25 affected by anthropogenic activities) and 14 ecoregions, according to the Holdridge system. The topography of the country has played an important role for the Pacific plains, since it has created an important area for agricultural development (SGCCC, 2019). Therefore, activities should aim at the sustainable management of the many flows guided by the rational use of natural resources. The main focus of the "Source to Sea" approach is to minimize contamination of water ecosystems. If large quantities of upstream water are used for different purposes including agricultural irrigation and if the water is polluted, the effects accumulate downstream and ultimately reach marine ecosystems.

The Guatemala Sugar Agroindustry recognizes the importance of using a Source-to-Sea approach in the management of natural resources to be able to achieve sustainable development. A Source-to-Sea system approach considers the very many flows that exist of water, flora, fauna, sediments, pollution, materials, etc., which can carry significant impacts on ecosystems from the source downstream and all the way into the sea. This integrated perspective calls for comprehensive management, assessment and monitoring not only of separate parts or zones but of the overall natural regional system including crossing national borders if necessary. The idea is to look at the water-terrestrial flows as a "continuum" at the broader regional or global scales. As in the case of climate change, this approach is fully justified since it can identify the real links between the causes and the effects even though these links may be associated with large physical distances and long periods of time.

Many of the activities being conducted by the Sugar Agroindustry could be considered linked to the flow chain that goes from terrestrial ecosystems to water ecosystems and ultimately to the Pacific Ocean having impacts all along the way.

Asazgua, Cengicaña and Fundazúcar, in partnership with academic institutions, research foundations, communities, municipalities, governmental and non-governmental organizations, conduct activities and projects in the area of influence of the Sugar Agroindustry in order to minimize the impacts over water resources arising from the use and occupation of the territory.

The more specific actions being conducted in the region range from soil conservation and integrated watershed management to the restoration of riparian forest and mangroves. The Sugar Agroindustry also supports community water supplies and waste-water systems and recycling that help mitigate the contamination of waters.

The Sugar Agroindustry performs wastewater monitoring in all the sugar mills to ensure the fulfillment of standards established by the environmental regulation in force since 2006.<sup>1</sup>

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. Water saving has made wastewater management easier because there are smaller volumes to be treated. As a result of water saving and reuse for irrigation, there are virtually no discharges to water bodies.

In 2012 the Climate Change Research Institute (ICC) started actions with members and partners, including the sugar agroindustry, to increase forest cover in riverbanks of the

riverbanks of southern Guatemala. The first activity was to design tests to restore native species. In 2014 and 2015 these tests were evaluated, and a baseline was generated about the biodiversity of forests in the riverbanks. This includes tree species, birds, reptiles, butterflies, fish, amphibians and dung beetles. This activity contributes to biodiversity conservation of both water and terrestrial ecosystems. Also, research was conducted on the implementation, follow up and evaluation of the restoration zones. The ICC in partnership with enterprises, communities and governmental institutions has reforested with native species more than 86 kilometers of riverbanks in Southern Guatemala since 2010, covering about 410 hectares. These areas are constantly monitored to document their development and to allow improvements in the way these actions are conducted. As of 2020, there are 40 plots for monitoring restoration of these riverbank forests (ICC, 2020a).

In 2012 ICC with partners such as the Instituto Nacional de Bosques (INAB) and the Consejo Nacional de Áreas Protegidas (CONAP) started to conduct tests of mangrove species in a nursery stage and of different restoration practices. Subsequently, the mangrove restoration plan for the Pacific slopes was developed in 2016 with strategies for conservation, restoration, and other complementary activities. The plan is a key tool supporting conservation and restoration of the mangrove ecosystem of the Pacific slopes of Guatemala. More than 81 hectares of mangroves have been recovered in the Guatemalan coast. This work has been done through the creation of the Restoration Network of Southern Guatemala<sup>2</sup> that is integrated by communities, municipalities, enterprises, the CONAP and the INAB (ICC, 2020a). The sugar agroindustry has been an active member of this network, which in 2022 became part of the Global Landscape Forum.<sup>3</sup>

## Related Targets

The activities being conducted by the Sugar Agroindustry support the objectives of Target 14.1 on preventing and reducing marine pollution of all types, especially from land activities. Environmental monitoring actions also support Target 14.1, since they detect water contamination. These activities are also related to the objectives of Target 14.2 that call for the sustainable protection of marine and coastal ecosystems to avoid significant adverse impacts including through their restoration.

<sup>1</sup> ACUERDO GUBERNATIVO 236-2006: Use and management of wastewater and sludge treatment, issued by the Ministry of Environment.

<sup>2</sup> <https://glf.globallandscapesforum.org/topics/31747>

<sup>3</sup> <https://www.globallandscapesforum.org/>



## Challenges

High demand and contamination of water resources, linked to both human consumption and agricultural production, represent challenges faced when pursuing environmental and productive sustainability objectives that avoid negative impacts on the oceans. This is a particular challenge in the Pacific slope region of Guatemala because it is the most densely populated with large human settlements and the most economically active. Raising awareness and transferring knowledge about the Source-to-Sea approach represent another major challenge, especially when relevant activities are conducted far away from the oceans.

In general, methodologies to assess the overall impacts of actions using the Source-to-Sea approach are still being developed and represent a very challenging task. Nevertheless, progress is being made to define appropriate ways to analyze, plan and assess systems considering the entire social, environmental and economic aspects of the flows from the sources to the coastal areas and even to the open ocean (Granit et al, 2017).



## Lessons Learned

This experience by the Guatemala Sugar Agroindustry related to the sustainable management of water and terrestrial ecosystems has demonstrated the need to follow a Source-to-Sea approach to avoid negative impacts in the Pacific Ocean. Following an integrated approach to the management of natural resources is indispensable to ensure sustainable development and prosperity.

Another important lesson derived from the experience in Guatemala is that the participation and involvement of the communities and local authorities, in addition to the participation of all the sugarcane producers and other economic sectors, is essential to ensure the sustainability of water and terrestrial ecosystems and consequently the conservation of oceans and marine resources.

## Results

The activities being conducted by the Guatemala Sugar Agroindustry related to terrestrial and water ecosystems and its integrated approach to sustainable development support the concept of "Source to Sea". These actions demonstrate the commitment of the Sugar Agroindustry to the minimization of negative impacts that could affect all the different stages of the flow from sources through different ecosystems and ultimately affecting the Pacific Ocean.

There are ongoing efforts, particularly on water management and forest restoration, where the Sugar Agroindustry is a key stakeholder. These efforts are reducing the impact on rivers and ultimately on the Pacific Ocean.



## INTERLINKAGES WITH OTHER SDGs



The interlinkages between oceans (SDG14) and other SDGs include those related to water (SDG 6) given the considerable number of activities being conducted by the Sugar Agroindustry with respect to water. It is also related to the terrestrial ecosystems (SDG 15) since the Sugar Agroindustry has a very strong program on conservation, biodiversity and on reducing impacts from agrochemicals and other hazardous materials. Another major interlinkage is climate change (SDG 13) since actions being taken related to mitigation and adaption to climate change support the objectives of SDG 14 on conservation of the oceans, seas and marine resources.



# CONCLUSIONS



The activities being conducted by the Guatemala Sugar Agroindustry related to water and terrestrial ecosystems and its integrated approach to sustainable development support the concept of “Source to Sea” and the objectives of SDG 14. These actions demonstrate the commitment of the Sugar Agroindustry to try to minimize the negative impacts that could affect all the different stages of the flows from the different sources to the Pacific Ocean.

In order to reduce the impact on oceans, there have been actions within the production system (water management), and actions in the area of operation in partnership with other key stakeholders. Assessments and monitoring are needed in order to measure more clearly the success of these actions.

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