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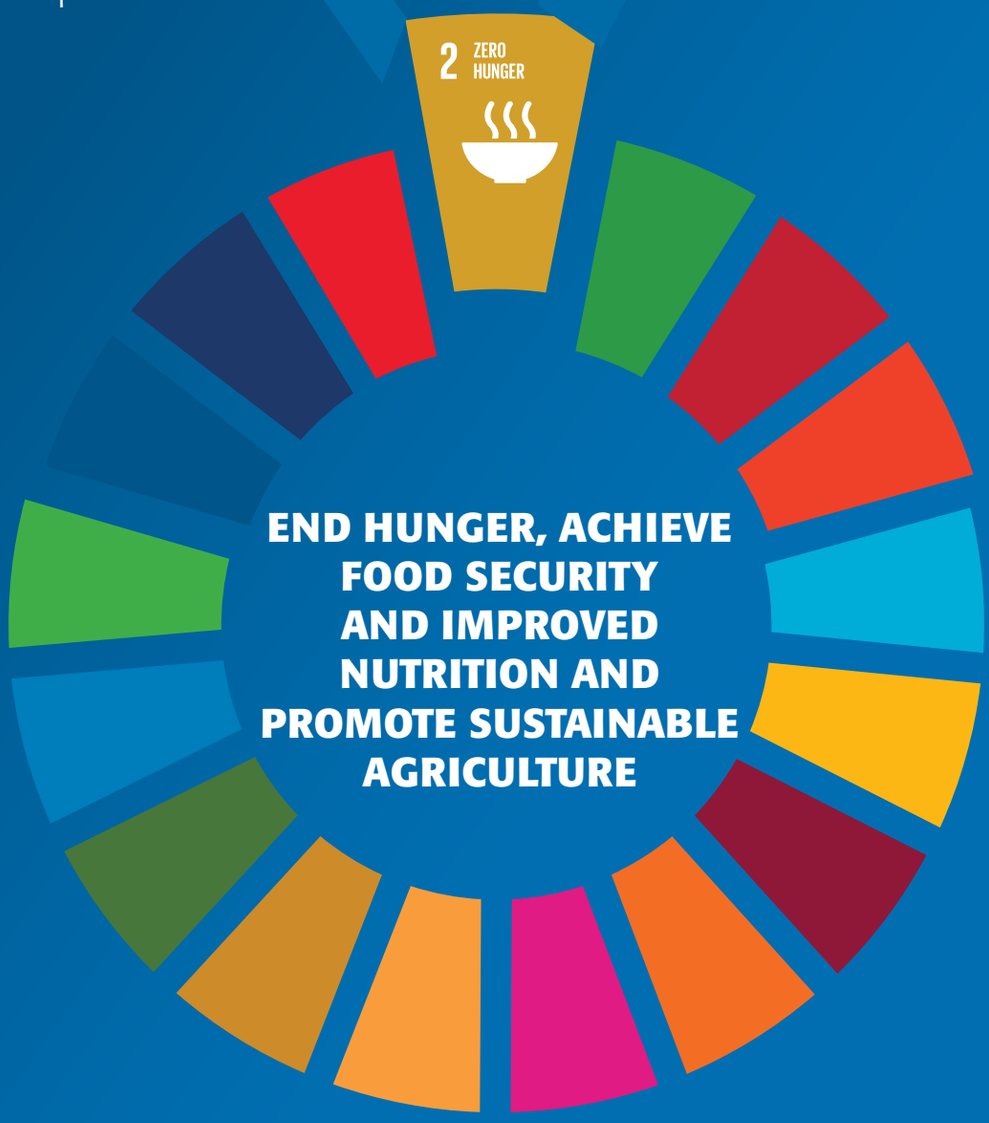
Asociación de Azucareros de Guatemala

SUSTAINABLE WATER & ENERGY SOLUTIONS NETWORK

CASE STUDY:

Activities by the Guatemala Sugar Agroindustry supporting the implementation of the Sustainable Development Goal 2 (SDG 2) of the United Nations 2030 Agenda for Sustainable Development.



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END HUNGER, ACHIEVE FOOD SECURITY AND IMPROVED NUTRITION AND PROMOTE SUSTAINABLE AGRICULTURE

ASAZGUA
Asociación de Azucareros de Guatemala

SUSTAINABLE
WATER &
ENERGY
SOLUTIONS
NETWORK

End hunger, achieve food security and improved nutrition and promote sustainable agriculture / Asazgua

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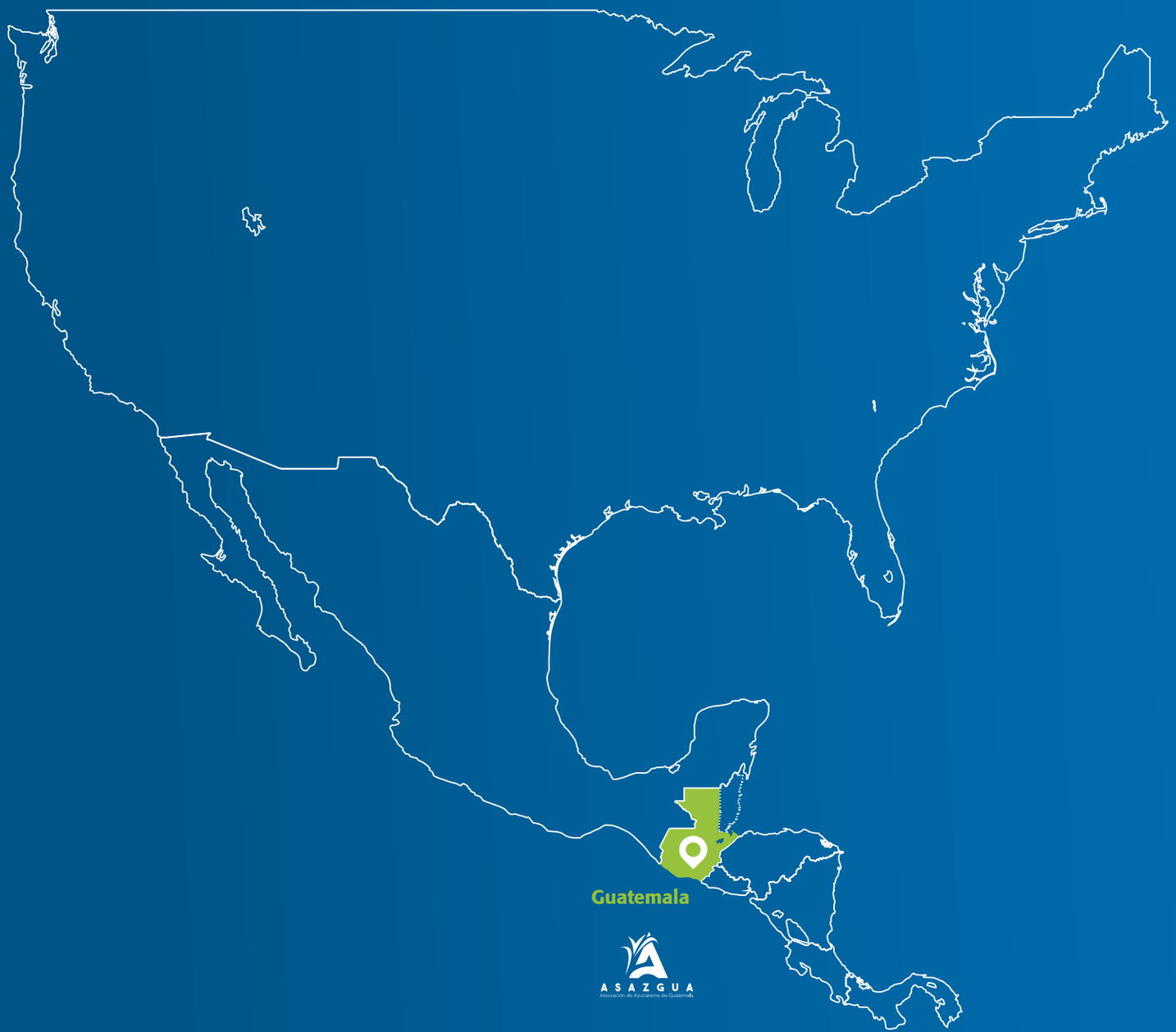

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END HUNGER, ACHIEVE FOOD SECURITY AND IMPROVED NUTRITION AND PROMOTE SUSTAINABLE AGRICULTURE

Target 2.1 By 2030, end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round.

Target 2.2 By 2030, end all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under 5 years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women and older persons.

Target 2.3 By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment.

Target 2.4 By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality.

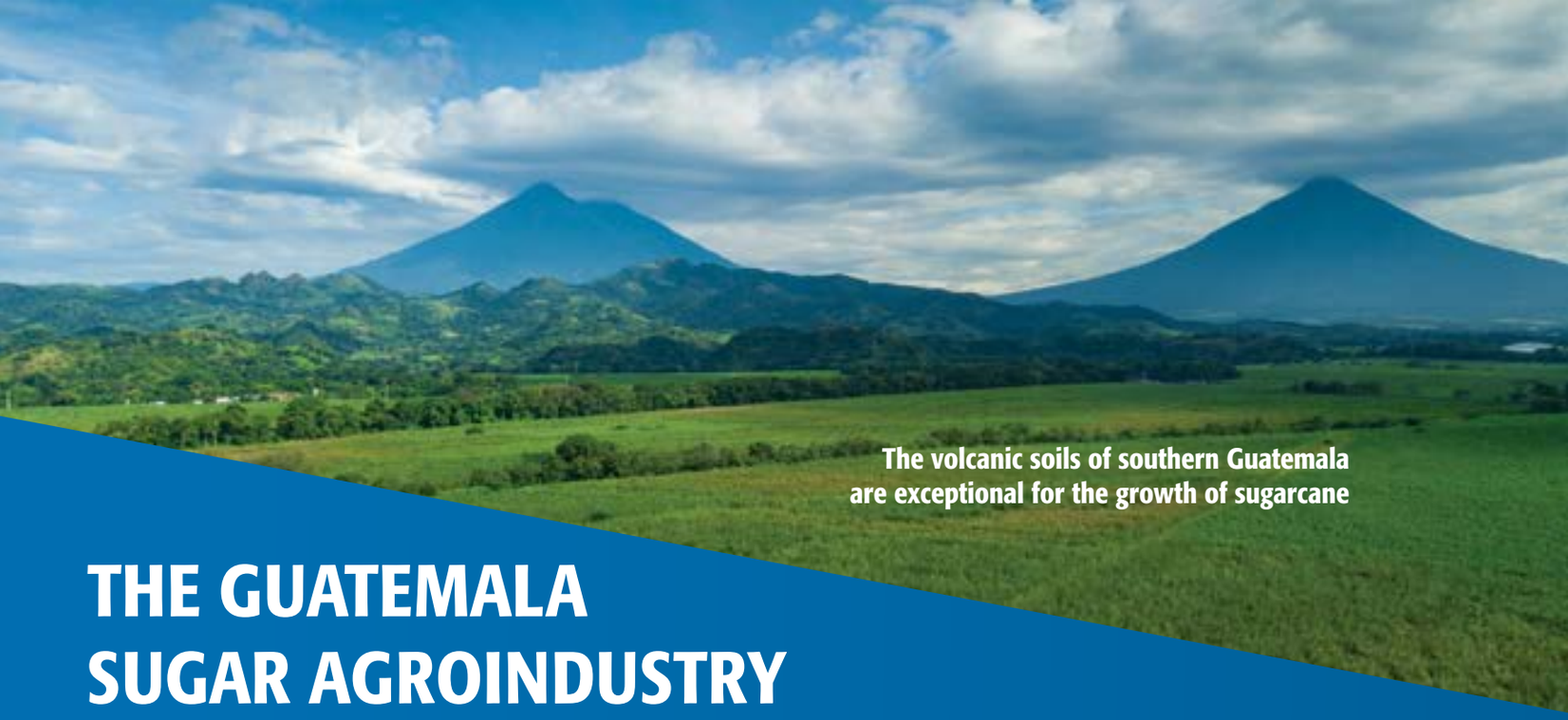
Target 2.5 By 2020, maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild species, including through soundly managed and diversified seed and plant banks at the national, regional and international levels, and promote access to and fair and equitable sharing of benefits arising from the utilization of genetic resources and associated traditional knowledge, as internationally agreed.

Target: 2.a: Increase investment, including through enhanced international cooperation, in rural infrastructure, agricultural research and extension services, technology development and plant and livestock gene banks in order to enhance agricultural productive capacity in developing countries, in particular least developed countries.

Target: 2.b: Correct and prevent trade restrictions and distortions in world agricultural markets, including through the parallel elimination of all forms of agricultural export subsidies and all export measures with equivalent effect, in accordance with the mandate of the Doha Development Round.

Target: 2.c: Adopt measures to ensure the proper functioning of food commodity markets and their derivatives and facilitate timely access to market information, including on food reserves, in order to help limit extreme food price volatility.

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 well-being 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, coordinates the work of enterprises of the guild, 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 factories.
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 factories, 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 objetives 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 2

The Guatemala Sugar Agroindustry has multiple initiatives in place with the aim of reducing hunger, achieving food security, improving nutrition and promoting sustainable agriculture which are the main objectives of SDG 2. Activities supporting these objectives are being conducted by Fundazúcar, Cengicaña and ICC. Fundazúcar conducts activities related to food and nutritional security and capacity building on behavioral change with a focus on preventive health. Cengicaña performs research and development on sustainable sugarcane production. ICC supports the sustainable use of terrestrial and water ecosystems.

The most important activities of the sustainable development strategy of the Sugar Agroindustry supporting the objectives of SDG 2 include: the different programs related to the Sustainable Production of Sugarcane, Fortification of Sugar with Micronutrients and the Better Families Program. As a result of the combination of these initiatives, the Sugar Agroindustry is able to continuously support improvements in food security and nutrition in Guatemala particularly in the region of influence of the Sugar Agroindustry as well as in the implementation of sustainable agriculture methods for the production of sugarcane.

1. SUSTAINABLE SUGARCANE PRODUCTION

Sugarcane biomass is a source of renewable energy.

1.1 Sustainable Sugarcane Production

Objective and Description

The Guatemala Sugar Agroindustry conducts important activities designed to promote the sustainable production of sugarcane. Most of these activities are conducted by Cengicaña through all its innovative research and development programs. Additional activities related to the sustainable use of terrestrial and water ecosystems and the conservation of biodiversity are being implemented by the ICC.

The Guatemalan Sugarcane Research and Training Center (Cengicaña) was created by Asazgua in 1992 to support the technological advance of the sugar agroindustry, with the aim of improving the production and productivity of the sugarcane crop and its derivatives. It is funded by the Guatemala Sugarcane Agroindustry.

According to the Strategic Plan (2015-2025), the Vision of Cengicaña is "To be leaders in creating technology to increase the competitiveness of the Sugarcane Agroindustry in the region." Its Mission is "To be the organization of the Sugar Agroindustry responsible for generating, adapting, and transferring quality technology for profitable and sustainable development."

Research activities are carried out through the following research programs: Varieties, Integrated Pest Management, Agronomy, Industrial Research, and Training and Technology Transfer. Also, Cengicaña conducts activities in its Agronomical Laboratory.

Cengicaña has created a research and technological development system for sugarcane. Thus, it has established policies, a regulatory framework, plans, quality management, and a technology management system. Also, it conducts applied research for the cultivation of sugarcane in diverse areas of the agronomic system to increase the productivity. The research areas include: Plant Breeding, Plant Pathology, Biotechnology, Integrated Pest Management, Fertilization and Vegetal Nutrition, Irrigation, Agrometeorology, Geographic Information System and Sucrose Recovery. The research is performed jointly with the associated sugar mills.

The Guatemalan Sugarcane Research and Training Center (Cengicaña) was created by Asazgua in 1992 to support the technological advance of the sugar agroindustry, with the aim of improving the production and productivity of the sugarcane crop and its derivatives.

The main programs by Cengicaña related to the sustainable production of sugarcane include the Program on Sugarcane Varieties and the Program on Agronomy. The Program on Sugarcane Varieties includes Plant Breeding, Plant Pathology and Biotechnology. The Program on Agronomy includes Fertilization and Crop Nutrition, Irrigation and Precision Farming.

The area of Plant Breeding is responsible for obtaining and developing new varieties of sugarcane with characteristics of economic importance: high sugar concentration, high sugarcane yield, good stunting ability, resistant to major pests and diseases and good adaptability to different climate conditions, soil and management of the Guatemalan sugarcane area. The breeding strategy consists of the enrichment of the genetic base by introducing varieties obtained by the exchange with other programs in the world and by crossbreeding to give rise to new complex hybrids, the selection program and the release of new varieties and support to increase adoption. The Phytopathology area conducts studies of resistance and effect on disease production in varieties and is responsible for import quarantine and export of varieties. In addition, the area offers analysis services for the detection of pathogens in seedlings.

Modern biotechnology has emerged, comprising three groups of techniques: tissue culture, molecular markers, and genetic engineering. Cengicaña uses modern biotechnology techniques as tools that contribute to the genetic improvement process of sugarcane, through DNA and RNA analysis for disease diagnosis, genetic diversity analysis, assisted selection with markers and varietal identification.

The objective of the Fertilization and Plant Nutrition area is to generate recommendations for the optimal use of fertilizers and soil modifiers for the different environments in which sugarcane is grown in the region. The objective of the activities on Irrigation is to generate, validate and transfer technology to optimize the use of water for irrigation purposes through the management of water resources at the basin level. The activities help to determine the optimum time and amount of irrigation as well as the best methods. Precision Farming aims to identify homogeneous climatic and edaphological zones within the great variability of environments that exist in the region. This is achieved in two stages. The first consists of the grouping of soils from the region, soil fertility, agroclimatic and crop management mapping, as well as identification of limiting factors at lot level. The second stage is related to general information, validation and feedback, as well as implementation.

Cengicaña uses modern biotechnology techniques as tools that contribute to the genetic improvement process of sugarcane, through DNA and RNA analysis for disease diagnosis, genetic diversity analysis, assisted selection with markers and varietal identification.

The Sugar Agroindustry has been very successful in the last decades achieving high levels of efficiency and increasing sugarcane productivity as a result of numerous initiatives and programs with multiple benefits.

Photographer: Victoriano Sut, Cengicaña

The area of Plant Breeding is responsible for obtaining and developing new varieties of sugarcane with characteristics of economic importance: high sugar concentration, high sugarcane yield, good stunting ability, resistant to major pests and diseases and good adaptability to different climate conditions, soil and management of the Guatemalan sugarcane area.

Photographer: Victoriano Sut, Cengicaña

Related Targets

The activities related to the sustainable production of sugarcane supports the objectives of Target 2.4 on implementing resilient agricultural practices that increase productivity and, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality. It also supports the objectives of Target 2.5 on maintaining the genetic diversity of seeds and cultivated plants.

Challenges

One of the main challenges in the sustainable production of sugarcane is the continuous need to implement very innovative technologies and methodologies in different areas and processes following an integrated approach that allows the satisfaction of major objectives in the environmental, economic and social dimensions of sustainable development.

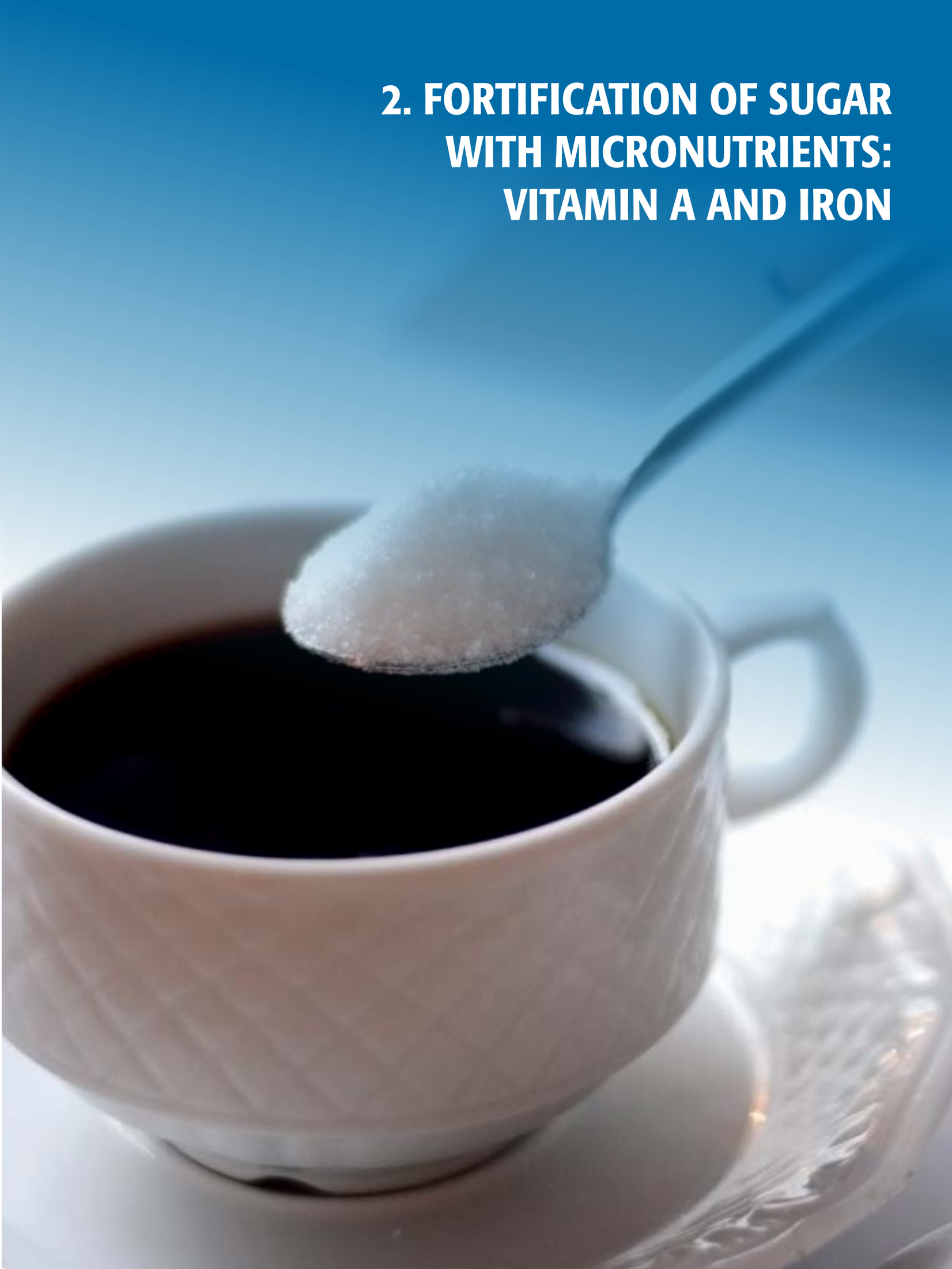
Lessons Learned

A major lesson learned from the implementation of the complex and integrated process for the sustainable production of sugarcane is that there should be a continuous and dynamic planning of activities and actions. Research, testing and demonstration of innovative technologies and methods are key activities to continue improving the efficiency and sustainability of sugarcane production. These actions are particularly important for the strengthening of capacities for adaptation to climate change impacts.

Results

The Sugar Agroindustry has been very successful in the last decades achieving high levels of efficiency and increasing sugarcane productivity as a result of numerous initiatives and programs with multiple benefits. The statistics demonstrate the effectivity of the programs on Plant Breeding, Plant Pathology and Biotechnology as well as on Fertilization and Crop Nutrition, Irrigation and Precision Farming.

2. FORTIFICATION OF SUGAR WITH MICRONUTRIENTS: VITAMIN A AND IRON



2.1 Fortification of Sugar with Micronutrients: Vitamin A and Iron

Objectives and Description

Vitamin A deficiency is a public health problem in developing countries, affecting the poorest segments of the population, with serious consequences to children health and survival. Guatemala and other countries in Central America have decades of experience in the application of fortification processes for the reduction of vitamin A deficiency. To reach children in vulnerable families suffering from malnutrition with a micronutrient such as vitamin A, it is essential that a food commodity be chosen that is widely consumed, inexpensive, available for purchase in the local markets and manufactured by relatively few producers. Sugar is one of the few commodities with these characteristics in some developing countries in Central America, Africa and Asia (USAID, 2000).

Vitamin A helps to improve vision, strengthen the immune system, eradicate blindness in children and reduce child mortality. During the 1965-1967 period, a national survey conducted in Guatemala identified that 26.2% of children under 5 years old suffered from vitamin A deficiency which affected their immune system and produced night blindness. During the 1969-1974 period, the Institute of Nutrition of Central America and Panama (INCAP) determined that sugar was the best vehicle for providing vitamin A to the most vulnerable population and moved forward developing the corresponding technology for the fortification of sugar with this vitamin. The Guatemala Sugar Agroindustry started the fortification of sugar with vitamin A in 1975.

After the fortification of sugar with vitamin A, the percentage of children with blindness was reduced from 26.2% in 1965/1967 to 16% in 1995/1996 and to 0.3% in 2009/2010. In 1996 UNICEF recognized the Guatemala Sugar Agroindustry as a pioneer on the fortification of sugar with vitamin A, given the positive impacts in the health of children.

The Sugar Agroindustry continues to maintain an appropriate level of fortification in some of the sugar produced in Guatemala as recommended by INCAP and has invested over $2.3 million in technology updates, process modifications, laboratories, testing, quality control and capacity building since 2008. The Agroindustry has two centers for the fortification of sugar with vitamin A.

Iron deficiency in the nutrition of vulnerable communities prevails in many developing countries. Iron deficiency is a recognized cause of anemia. Iron is a necessary mineral for the transport and storage of oxygen in the blood and muscles. It is also essential for the synthesis of DNA, which is vital for growth, healing, reproduction and immune function. Iron is used by enzymes involved in the synthesis of collagen and hormones. Iron deficiency is more common in premature newborns, infants and preschool children, women of reproductive age, and people with chronic blood loss, such as hemorrhagic gastritis and parasitic infections.

According to data collected in the National Micronutrient Survey of 2009/2010 about 26.3% of children in Guatemala lacked adequate levels of iron. At that time, 47.71% of children in the country suffered from anemia, of which 72.06% between six and eleven months of age had anemia. In the case of women of childbearing age, 18.4% presented iron deficiency, of which anemia was found in 29.12% of pregnant women and 21.43% in non-pregnant women.

The Guatemala Sugar Agroindustry is voluntarily adding iron to the sugar that is mostly sold in western Guatemala since 2008, helping to reduce anemia in vulnerable populations. This activity benefits particularly the western region of the country where people are experiencing the highest nutritional deficiencies.

The Sugar Agroindustry continues to maintain an appropriate level of fortification in some of the sugar produced in Guatemala as recommended by INCAP and has invested over $2.3 million in technology updates, process modifications, laboratories, testing, quality control and capacity building since 2008.

The Guatemala Sugar Agroindustry has played a very important role in maintaining the capabilities for the fortification of sugar with micronutrients and is keeping its production for the benefit and wellbeing of the children of Guatemala.

Related Targets

The fortification of sugar with vitamin A and iron supports the objectives of Target 2.2 on ending all forms of malnutrition in particular in children.

Challenges

One of the main challenges of this activity is related to the need to continue monitoring the health of children through time. Many children in vulnerable communities could benefit from the fortification of sugar with vitamin A and iron but still suffer from malnutrition due to other causes with serious implication to their health and wellbeing.

Lessons Learned

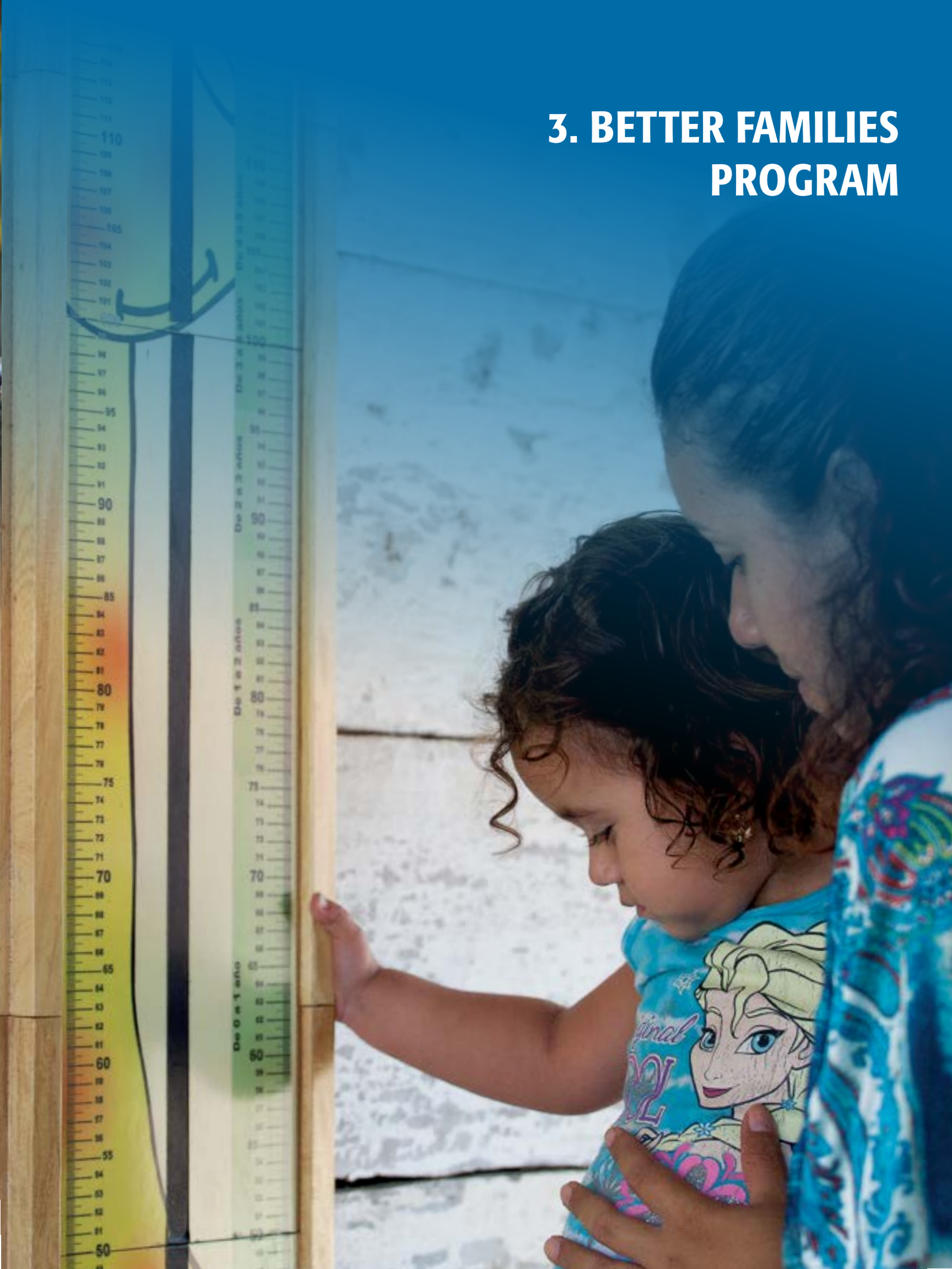
An important lesson from the experience of decades of fortification of sugar with micronutrients in Guatemala is that the combined effort of the public and private sectors is critical to achieve success through time and should be responsive to the continuous changes in the social and economic conditions of the country and in particular of the most vulnerable communities.

Another important lesson derived from the experience in Guatemala is that fortification with a locally produce commodity can become a regular practice and can be maintained through time. It is indeed an effective strategy to reduce micronutrients deficiency in the vulnerable communities in developing countries.

Results

The fortification of sugar with micronutrients has proved to be a very successful strategy in Guatemala as demonstrated by the relevant statistics of the last several decades. Today vitamin A deficiency is not a public health problem in Guatemala. The Guatemala Sugar Agroindustry has played a very important role in maintaining the capabilities for the fortification of sugar with micronutrients and is keeping its production for the benefit and wellbeing of the children of Guatemala. The program represents a social protection mechanism covering the poor and vulnerable people.

3. BETTER FAMILIES PROGRAM



3.1 Better Families Program

Objective and Description

The Better Families Program is an innovative model that promotes Food and Nutrition Security, self-confidence, self-management and leadership in women, as agents of change for the development and well-being of their families and their communities. It is aimed at women of childbearing age and children under the age of 5.

The objective is to train women in practices for the adequate selection, preparation and consumption of food, as well as educating mothers in preventive health with sustainable actions to improve mother-child, family and community conditions and supporting poverty eradication objectives. It also seeks to strengthen community organization to ensure processes of self-management and to make Food and Nutrition Security sustainable.

The program places women as the catalyst for development of their families and communities. It also fosters behavioral change and women empowerment. The Food and Nutrition Security part of the program is based on four pillars: (1) availability, (2) access, (3) consumption and (4) biological use of food.

The program has a monitoring and evaluation system with measurable and quantifiable indicators that allow evaluating the behavioral change in a gradual manner. Due to its positive results, the program has been used by relevant government entities in Guatemala and Honduras. It has also been implemented by 18 social investors which include companies, foundations and international organizations. Social Investors are individuals or companies that wish to replicate the Fundazúcar programs with their own resources in their geographical areas of interest. They are called "Investors" because they provide a social investment with a commitment to the development of human capital.

Better Families / SPOON BID Program

Fundazúcar was selected by the Interamerican Development Bank (BID) for the implementation of the regional strategy on behavioral change program called Better Families / SPOON BID Program. The objective of this program was to develop capacities of women of childbearing age on behavioral changes for the improvement of infant nutritional practices. The strategy is based on social communication and interpersonal advice focusing on the first 24 months of the lives of children. The program included the distribution of nutritional supplements for children between 6 and 24 months old. The program started in 2019 in partnership with the Ministry of Public Health covering 80 communities in 8 municipalities in the department of Baja Verapaz. The program incorporated monitoring activities of the nutritional state of children. It also included capacity building activities for women on site and through household visits and counseling to participating families.

The Better Families Program is an innovative model that promotes Food and Nutrition Security, self-confidence, self-management and leadership in women, as agents of change for the development and well-being of their families and their communities.

Related Targets

This initiative is related to the objectives of Target 2.1 on ending hunger in children and of Target 2.2 on ending all forms of malnutrition and addressing the nutritional needs of children.

Challenges

One major challenge of this initiative is related to the need to convince participants about the benefits that can be derived from a change of behavior in nutritional, health and leadership practices. Also, participation of women in this program has been limited since women are sometimes not allowed to take part in meetings by themselves given gender restrictions due to cultural reasons.

Another main challenge is to ensure that the Law of Food and Nutritional Security of 2005 is implemented as the mechanism that allows the elimination of malnutrition in Guatemala. This law defines the responsibilities of the different institutions that promote the food and nutritional security.

Lessons Learned

A major lesson learned is that positive changes can be achieved for the benefit of women and families when women are empowered with knowledge and skills in nutrition, health, education and leadership prioritizing their freedom, autonomy and self-management. The decades of experience have proved that women who have participated in this program are no longer passive receptors but have become active agents of change achieving major positive transformations of themselves, their families and their communities.

Results

Since 1998, the Guatemala Sugar Agroindustry has supported the implementation of the Better Families Program with measurable and verifiable results that confirm its contribution to the welfare and sustainable development of the population. Since its inception, the program has trained more than 532,000 women in Guatemala and Honduras. The program supports efforts for the reduction of poverty and is making a direct impact in the reduction of chronic child malnutrition by up to 7%.

INTERLINKAGES WITH OTHER SDGs

Activities by the Guatemala Sugar Agroindustry related to "End Hunger, Achieve Food Security and Improved Nutrition and Promote Sustainable Agriculture" (SDG 2) include interlinkages with other SDGs. One clear interlinkage is Health (SDG 3) as the Sugar Agroindustry supports nutritional programs that improve the health and wellbeing of the people in the communities of the area of influence of this agroindustry. Another important interlinkage is in relation to the sustainable use of terrestrial ecosystems (SDG 15) given the extensive programs being implemented on the sustainable production of sugarcane. These activities are also related to SDG 1 (Ending Poverty), SDG 4 (Education), SDG 5 (Gender Equality), SDG 6 (Water) and SDG 17 (Partnerships).

CONCLUSIONS

The Guatemala Sugar Agroindustry has important activities in its sustainable development strategy strongly supporting food and nutritional security and sustainable agriculture in Guatemala. These activities include: the diverse and innovative programs supporting the Sustainable Production of Sugarcane, Fortification of sugar with vitamin A and the Better Families Program. By implementing and monitoring the results and efforts of these activities, the Sugar Agroindustry has been able to ensure major improvements in food and nutritional security and preventive health of people inducing better life quality and wellbeing particularly for those living in vulnerable communities. The effort represents a critical part of the integrated approach followed by the Sugar Agroindustry in its social strategy that promotes healthy lives and sustainable development. Also, the extensive programs being conducted to ensure the sustainable production of sugarcane represent excellent examples of sustainable agriculture which has translated into benefits in the social, economic and environmental dimensions for the benefit of the people of Guatemala.

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