SYNTHESIS REPORT

ITAIPU BINACIONAL

UNDESA - Itaipu Binacional SUSTAINABLE WATER & ENERGY PARTNERSHIP

ITAIPU BINACIONAL AND THE SUSTAINABLE DEVELOPMENT GOALS OF THE 2030 AGENDA

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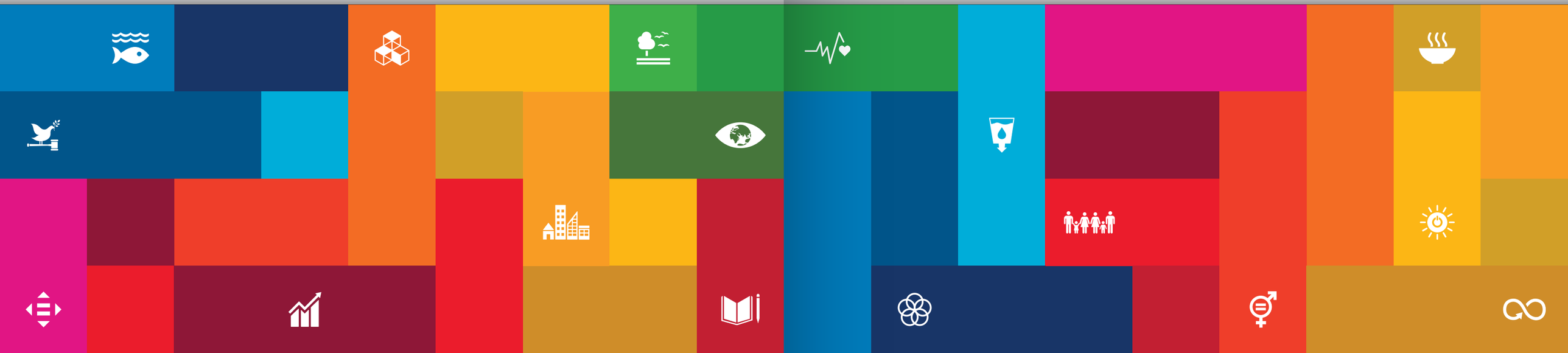

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ITAIPU BINACIONAL
Avda. España N° 850 e/ Perú y Padre Pucheu - Asunción, Paraguay
Tel.: (+595) 248-1909 / 248-1908
www.itaipu.gov.py

Av. Tancredo Neves, 6.731 - Foz do Iguaçu, Paraná, Brasil
Tel: (+55) 45 3520-5252
www.itaipu.gov.br

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Daniel Snege/ITAIPU Binacional

Executive summary

Itaipu is a binational entity created by Brazil and Paraguay in order to generate electricity using the Parana River. The Itaipu Hydropower Plant today is the largest generator of renewable power in the world. By the end of 2018, Itaipu had generated over 2.6 billion Megawatts-hours (MWh) since the beginning of its operation in 1984. The modern and relatively decarbonized economies of Paraguay and Brazil depend on the reliable, clean and sustainable electricity from Itaipu.

Itaipu follows sustainable development principles as reflected by its integrated actions and programs supporting social well-being, economic growth and environmental protection, contributing to regional prosperity. Itaipu supports actions that are directly and indirectly related to the 17 Sustainable Development Goals (SDGs), as social responsibility and environmental management are major commitments, along with power generation and economic development.

For Itaipu, social responsibility is a major commitment constituting one of its most important missions in its different lines of action. Within the social dimension, activities by Itaipu are designed to help to reduce poverty, increase food security and enhance nutrition, improve health, foster better education and promote equality with respect to gender, age, disabilities, race, religion, ethnicity and economic status. They also promote protection of children and adolescents, respect for human rights and peace.

Within the economic dimension of sustainable development, activities by Itaipu are designed to provide clean and reliable electricity, create jobs, foster economic growth, and develop tourism opportunities. Itaipu also supports building infrastructures and sustainable cities, and promoting sustainable consumption and production as well as technology research, development and innovation.

Itaipu recognizes that the effective integrated management, protection and conservation of all terrestrial and inland freshwater ecosystems are key activities supporting sustainability and prosperity. These ecosystems represent a protected belt that includes natural reserves, biological refuges, and ecological corridors that protect native flora and fauna and advance research and conservation initiatives. These areas and the reservoir provide valuable connections among important remnants of the Atlantic Forest located in Paraguay, Brazil and Argentina. Itaipu has partnered with municipalities, communities, private owners and other stakeholders to promote the restoration of riverside forests, the formation of ecological corridors and the conservation of agricultural and forest soils.

This Synthesis Report illustrates how Itaipu, with specific actions, projects and programs, is effectively moving forward the SDGs not only in Brazil and Paraguay but in South America. Itaipu's activities are excellent examples of "Best Practices" in the implementation of the United Nations 2030 Agenda for Sustainable Development. The work presented in this report demonstrates that Itaipu is contributing decisively, through a vast network of partnerships, to a cleaner and more resilient planet, for healthier people enjoying enhanced prosperity and peace.

UNDESA, New York, December 2020.

Alexandre Marchetti/ITAIPU Binacional

"I commend Itaipu Binacional for their decades of commitment to an integrated and trans-boundary approach to sustainable development. With its many activities, Itaipu Binacional has helped bring prosperity for the people both in Brazil and Paraguay over the past 40 years.

Its integrated approach on water and energy in the search for sustainable solutions, is indeed innovative. It represents an excellent example of how synergies can be realized by working together towards the objective of achieving sustainable development.

That is why UNDESA is proud to partner with Itaipu Binacional"

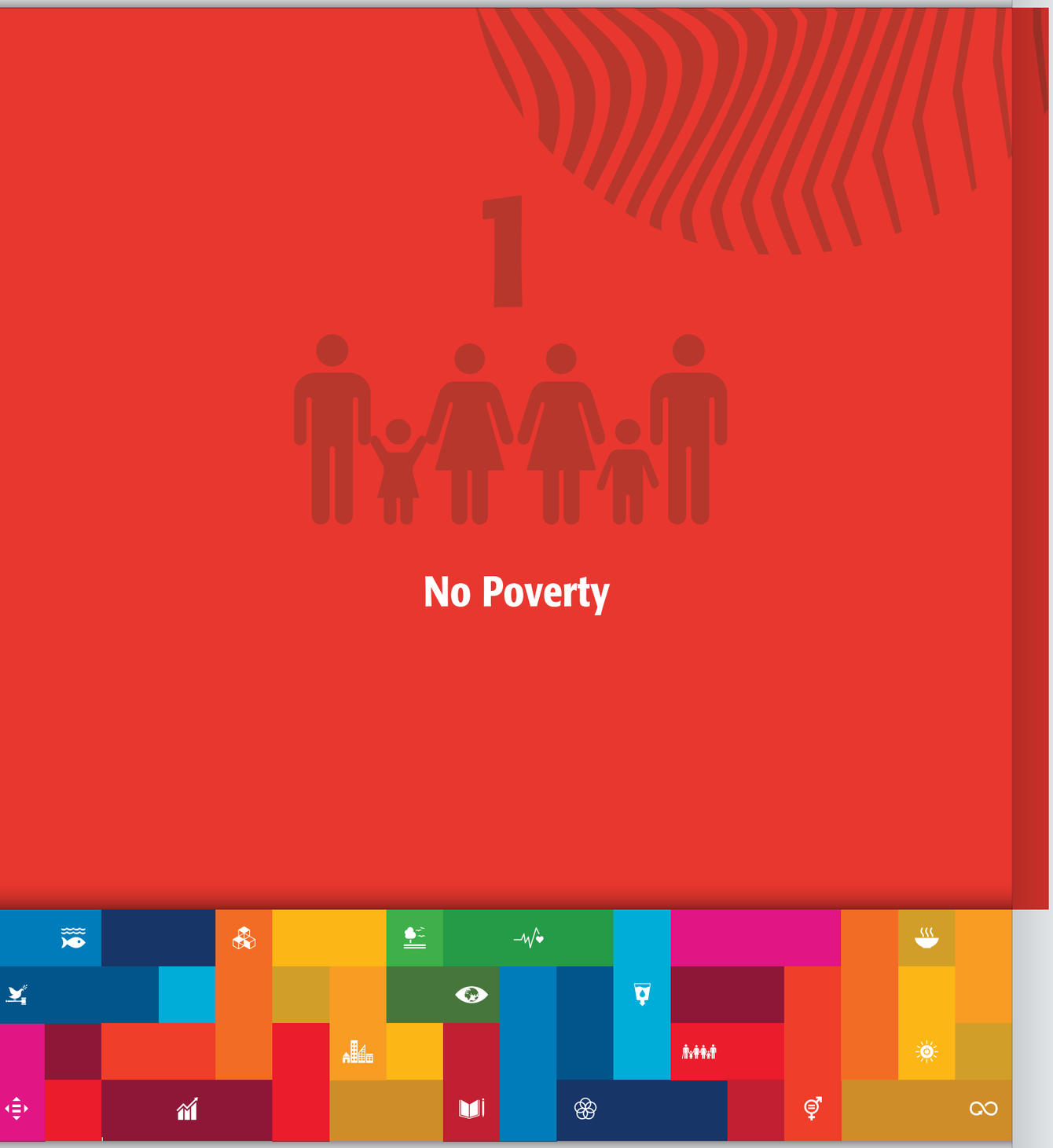
Mr. Liu Zhenmin, United Nation's Under-Secretary General for Economic and Social Affairs

"The synergies between water and energy are essential for Itaipu. In the past 40 years, we accumulated many positive experiences in water care that ensure energy production in the long term and that are also beneficial to nearby communities and wildlife, in line with the UN's Sustainable Development Goals."

Mr. Ernst Ferdinand Bergen Schmidt
Itaipu's Paraguayan General Director

"Itaipu is a successful example of two nations that overcame their differences to promote sustainable prosperity for their peoples, as established by the UN's higher goals. That's why we are very enthusiastic about sharing our experience in the context of this partnership with UNDESA and the Sustainable Water and Energy Solutions Network."

Mr. Joaquim Silva e Luna
Itaipu's Brazilian General Director

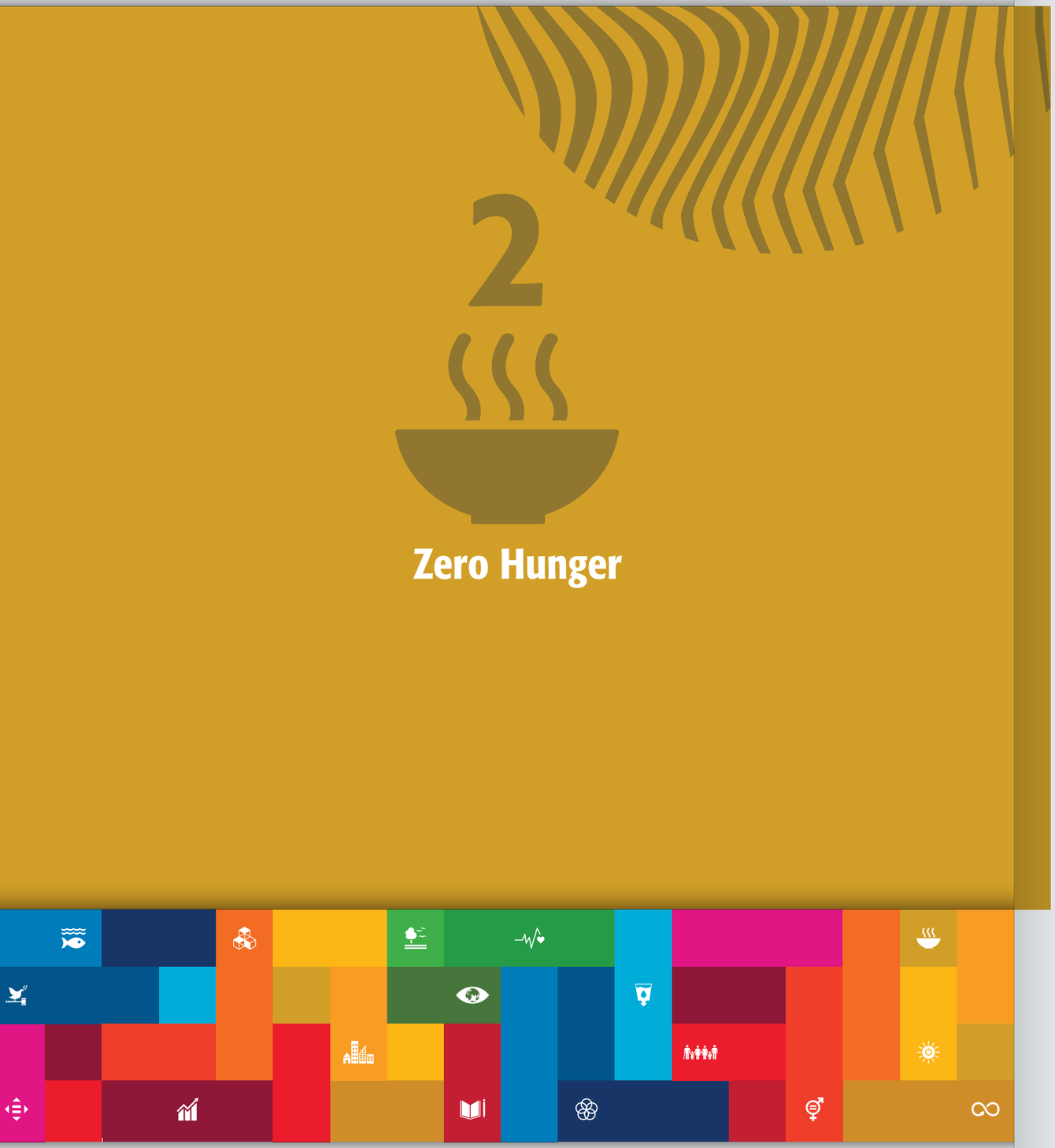


Within the social dimension of sustainable development, activities by Itaipu are designed to help reduce poverty, increase food security and enhance nutrition, improve health, foster better education and promote equality with respect to gender, age, disabilities, race, religion, ethnicity and economic status. They also promote income generation, protection of children and adolescents and respect for human rights.

The most important activities in Itaipu's Sustainable Development Strategy for ending poverty are related to its support for the sustainability of Indigenous communities, its Regional Waste Management Program that generates jobs, its multiple need-based housing initiatives (such as San Francisco Barrio housing project), its aid program for families with disabilities, and its youth initiatives, such as the Program for the Protection of Children and Adolescents (PPCA) and the Initiation and Incentive Work Program (PIIT), that promote employment, capacity building, and protection.

The purpose of the **Sustainability of Indigenous Communities Initiative** is to create conditions that allow for the sustainability of the Guarani way of life in communities in the region of influence of Itaipu, in order to guarantee and strengthen the sense of ethnic identity while valuing Guarani traditions in all their aspects. This activity contributes to infrastructure improvements, agricultural production, food security, health care, education and handicraft and cultural activities. The effort is designed to value the Guarani people and their culture, enhancing their traditions, and way of life with the overall objectives of guaranteeing equal opportunities, reducing inequalities and fomenting economic autonomy. Itaipu support to indigenous communities follows an integrated approach to their multiple demands and needs. These demands mainly referred to the strengthening of indigenous communities and their organizations, focusing attention on the recovery of their natural environment and food sovereignty, seeking to improve wellbeing and reduce dependence on external factors in accordance with socio-cultural particularities and following the current legal framework on Indigenous Peoples.

Itaipu supported the construction of the **Barrio San Francisco in Asuncion, Paraguay.** The new neighborhood provides adequate housing for 1,000 families. The objective was to build a sustainable urban development model with a comprehensive approach for families residing in flooded zones. The project includes 112 single-family homes and 888 apartments in 78 three-story buildings with courtyards and recreational facilities. The neighborhood includes a civic center, multipurpose spaces, public child-care, schools, a police post, a health post, parish services, commercial and public spaces, a market zone, an industrial zone, financial institutions and other community services. About 42% of the total project area is dedicated to public spaces and green areas, while the other 58% is built up on a 23-hectare site. The neighborhood also has all the basic infrastructure services including potable water, sewage treatment plant, sanitation sewer, storm drains, underground electrical installations, and free internet access in public spaces. The neighborhood will have 48 commercial spaces in order to enhance the economic development by the generation of employment, and a space for a textile industry that will provide employment to the residents of the neighborhood. Considering the environmental aspect, more than 6,200 trees were planted including over 1,200 native tree species of high environmental value. Barrio San Francisco is considered a new urban model and the first sustainable neighborhood in Paraguay.



Itaipu conducts important activities related to the objectives of SDG 2 which seeks to end hunger, achieve food security, improve nutrition and promote sustainable agriculture.

These activities are centered on: providing education and technical assistance on sustainable and resilient agriculture; providing technical assistance to farm families for the development and improvement of organic farming; development of aquaculture; providing education and support for more nutritious meals in schools; and conservation of soil and water in agricultural systems.

Activities on **Sustainable Rural Development and Sustainable Agriculture** promote the diffusion of the agroecological production systems through a network of Technical Assistance and Rural Extension (ATER) focused on production and conversion to organic farming. Access to the network is free for all family farms in the region. The program also supports the research, development, and teaching of organic agriculture, meeting the demands of the region. This action is made possible through agreements with universities for the training of teachers, researchers, and students, and the participation in the Paraná Network of Agroecology Research. The initiative also supports technological innovation, such as the development of an organic no-tillage farming system, and relevant seminars and publications. Another line of action is the strengthening of the certification process and commercialization of organic products and family farming with support and advice of associations and cooperatives. The Sustainable Rural Development program also promotes the dissemination of the benefits of organic production to the population, seeking the creation of social, environmental, and commercial links from rural directly to urban locations. The support is implemented through lectures in schools and the promotion and participation in relevant events, promotional materials and facilitation of the sale of organic products from family farming.

The Innovative Technological Assistance and Modernization of Family Farming Initiative includes two actions: (1) modernization of family farming and (2) Innovative Technological Assistance to Family Farming (ATIAF). The action to modernize family farming contributes to improving the living conditions and income of rural producers, promoting the strengthening of agricultural production ventures aimed at integrating markets to regional value chains through services and inputs in order to consolidate technological modernization, increase productivity, and improve the income of families in situations of poverty and extreme poverty in rural settlements. By strengthening the farming families financially, a goal of sustainability can be reached. ATIAF aims to ensure support from the State to low-income farmers and family producers, leading to innovation and technological implementation that will improve and modernize the production systems, increase productivity, and encourage diversification of consumption and promotion of income crops with good market demand. Such innovation will become a means of achieving the socio-economic progress of families in the beneficiary communities.

The objectives of the **Education for Sustainable Agriculture and Food Security program** are to promote environmental and economic sustainability of agricultural activities that support the production and use of agricultural products for healthy diets increasing food security and encouraging the development of healthy living practices. In partnership with municipalities, Itaipu offers training courses on healthy diets and organizes healthy meal recipe contests among the cooks who prepare school meals. Selected recipes are then published in a “healthy recipe book” distributed to all schools and municipal education secretariats as a pedagogical tool to improve nutrition in their corresponding communities and schools.

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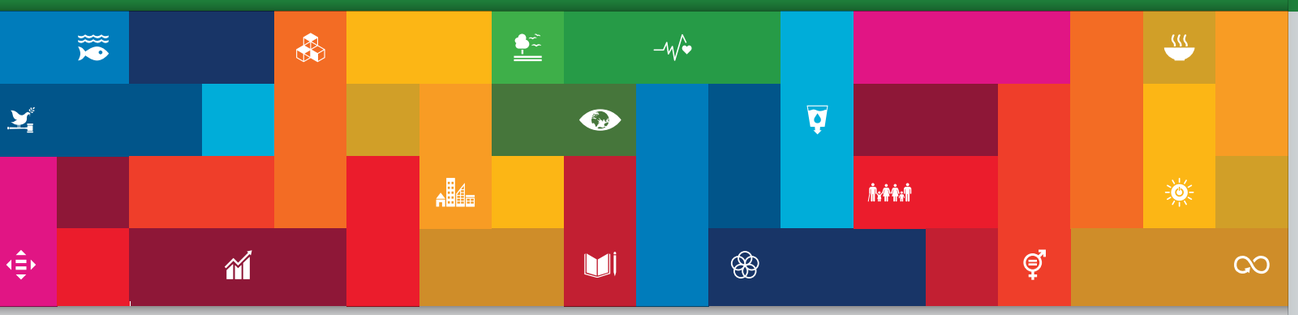
Good Health and Well-Being



Itaipu has multiple initiatives with the aim of ensuring healthy lives and promoting the well-being for all. The most important initiatives linked to SDG 3 are related to a variety of effective health programs benefitting communities in Paraguay and Brazil including: Itaipu's Health Work Group, the Reduction of Maternal, Newborn and Children Mortality Program, Alliances with foundations working in public health and welfare, the strengthening of surveillance and controlling Arbovirosis in Alto Paraná, Project Rescue, SUS Patient Care at Ministro Costa Cavalcanti Hospital, the Tesãi Foundation, and Education in Health for Sustainable Development. As a result of these coordinated health-related initiatives, Itaipu has been able to effectively improve the health of many people living in the region.

The Itaipu Health Work Group aims to contribute to the strengthening of public health policies in the tri-border region, coordinate governmental and non-governmental institutions, and bring together efforts to promote priority impact actions for the health of the population. It also aims to support in the formulation and implementation of policies and initiatives of social and environmental responsibility, including cooperation and compliance with the guidelines of national health systems, emphasizing primary care and equity in health issues. In general, the initiatives approved in the Health WG are tri-national and contain a component of integration and innovation for sharing experiences. Another component focuses on local execution and implementation, attending to the policies, priorities, possibilities and realities of the health systems of each country.

The main objective of the **Reduction of Maternal, Newborn and Children Mortality program**, which is being implemented by Itaipu in Paraguay, is to reduce the number of avoidable deaths to zero by improving the healthcare capacity of the region. An area of great interest is the primary care of pregnant women and the goal of reducing maternal and newborn mortality rates. Itaipu works with the Family Health Units (USF) which are part of the Public Health System in Paraguay. A new model of healthcare and organizational culture, which recognizes parents and family—together with the healthcare team—as being central to the care of pregnant women, mothers, and the newborn is promoted. The initiative aims to foment protection of women and respect for newborn rights. The program is also improving the health infrastructure through building shelters, upgrading physical installations and providing essential equipment for safe motherhood and childbirth. Itaipu also works to ensure that there are adequate hospitals available for early medical emergency care.

Itaipu has key **Alliances with Public Healthcare and Welfare Foundations** in Paraguay, which have been established in order to strengthen the public healthcare program of the country. The support from these alliances allows hospitals and health centers to benefit from infrastructure projects, medicine supply programs and training activities directed to healthcare personnel. The support aims to provide comprehensive quality services particularly to the most vulnerable areas of the country. The support also includes technically advanced medical equipment and ambulances equipped with all necessary medical supplies and health monitoring systems. Itaipu has health alliances with the Ministry of Public Health and Social Welfare of Paraguay, UNICEF and the Tesãi Foundation, among others. The alliance with the Ministry of Public Health and Social Welfare is strengthening public health through the construction, renovation and expansion of the Family Health Units (USF). This alliance also supports enhancing the interconnexion among public hospitals of the country. The alliance with UNICEF allows the implementation of the Zero Maternal and Newborn Deaths campaign.

The main objective of Itaipu's action on **Strengthening Surveillance and Controlling Arbovirosis** in the alto Parana Region is to contribute towards the reduction in the morbidity of vector-borne diseases through prevention and containment actions, effective health promotion, and vector control strategies that help reduce the incidence of arbovirosis (related to Dengue, Zika and Chikungunya) in the department of Alto Paraná, in Paraguay. More specific objectives include: (1) intensify the entomological surveillance and vector control system in an efficient and timely manner; (2) strengthen the capacity of local response, incorporating human resources as well as theoretical and practical knowledge for the development of activities; (2) decrease the rates of larval infestation of Aedes Aegypti – the main vector of Dengue, Zika, Chikungunya, and Yellow Fever virus – in the high and very high risk municipalities of the department of Alto Paraná; and (3) intensify health promotion activities for the prevention of arbovirosis in communities.

The purpose of the **Project Rescue** is to provide care services to men between the ages of 18 and 59 who are users of psychoactive substances. There is the intent to expand care to women as well, but in a separate venue. This action has been active since 2010 and is currently being performed in the Brazilian municipality of Foz do Iguaçu, which has a population of almost 260,000 inhabitants. The initiative takes into consideration the social protection, citizenship rights and human and social development of the beneficiaries. The activities ensure the full protection of individuals who use psychoactive substances, recognizing the conflict processes, the inherent difficulties, and the possibilities for developing their full personal capabilities. Activities with family members aim at rescuing affective ties and overcoming traumatic disruptions among family members, including monitoring accompanying relatives and possible referrals to the municipal social assistance network.

The purpose of the **Health System (SUS) Patient Care at Ministro Costa Cavalcanti Hospital** is to subsidize the attendance of users of the SUS of Paraná, Brazil. The inclusion of social and environmental responsibility in Itaipu's mission reinforced the business desirability of acting as an agent of social integration and regional development, contributing to the mitigation of the health care system problems of the 9th Paraná Health Region, which includes nine municipalities. Itaipu established the Itaiguapy Health Foundation for the purpose of running the Ministro Costa Cavalcanti Hospital, which opened in 1979. This hospital provides medical and hospital care to Itaipu employees and their dependents, as well as community members in the region. It is the only establishment for the 9th Paraná Health Region in the areas of oncology, cardiology, high and intermediate pregnancy, and neonatology, in addition to providing 100% of the usual risk obstetric care for the municipalities of Foz do Iguaçu and Santa Terezinha de Itaipu. This provision of services is central to the SUS users in the 9th Paraná Health Region, covering a population of approximately 400,000 inhabitants.

Nilton Rolin/ITAIPU Binacional

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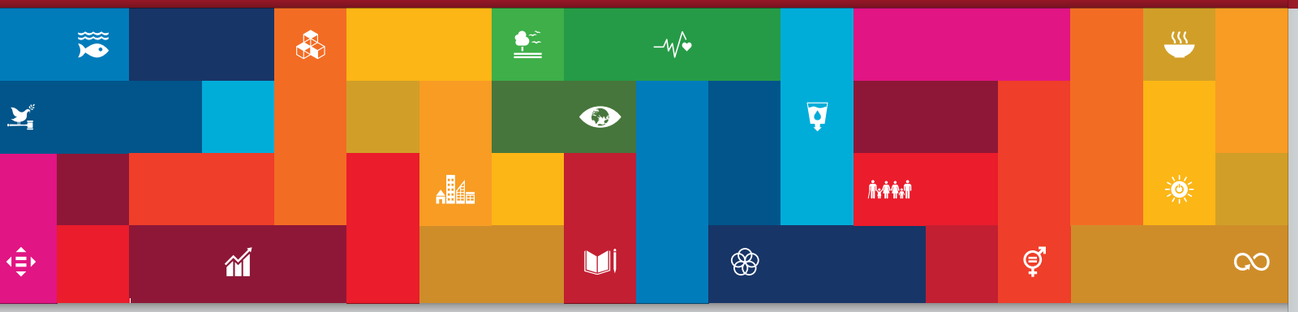
Quality Education



By providing a wide variety of different educational opportunities in fields of relevant sustainability (such as water, energy, health, waste treatment, land and environment, and agriculture), Itaipu has been able to make progress towards many targets within the SDG 4, which calls for ensuring inclusive and equitable quality education, and promoting lifelong learning opportunities for all. Itaipu's educational programs are accessible and broad in scope, affordable, and backed with scholarships as necessary while maintaining a focus on technical and vocational skills as well as with specialized support for people with special needs including the indigenous population of the region. Itaipu has also provided important support to the revitalization of the educational infrastructure and to public schools in Itaipu's area of influence. This support includes equipping education centers that provide services to persons in vulnerable situations.

The **Itaipu Technological Park (PTI, in Portuguese)** has been important in establishing intellectual capital in the region. The rapid increase of population during the eighties and nineties in the region created a need for a new education and skills profile for the people of the region, and thus the PTI was created to implant an enabling environment for technological development. Its four educational strategic objectives are: (1) promoting scientific, technological and innovative development of interest to Itaipu and the territory; (2) contributing to the training of skills, technical qualifications and valorizing the people living in the territory; (3) promoting actions that contribute to social, cultural and environmental development; and (4) contributing to the strengthening of productive activities. One of PTI's primary purposes is to attract university students and to offer specialized courses and degrees (Undergraduate, Master's, Doctorate, and Specialized degrees) focusing on the demands of the region. Some examples of these programs include undergraduate courses such as in electrical engineering, mechanical engineering, and renewable energy. The PTI environment also promotes student exchanges. For instance, laboratories are shared between students from the State University of Western Paraná (Unioeste) and the Federal University of Latin American Integration (Unila). In addition, a branch of the Open University of Brazil (UAB) also operates in PTI.

The **Education for Sustainability Program** aims to promote awareness and train people through content, concepts, practices and methodologies for sustainable development. The activities are designed to promote care for the surrounding communities and those related to educational tourism involve students and teachers of all levels of education, as well as community leaders, municipal authorities, farmers, police, and military personnel. Topics include the importance of renewable energies and hydroelectricity, the rational use of water, conservation of biodiversity, conscious consumption and production, selective waste collection and the consequent reduction of the ecological footprint, as well as the drafting and execution of sustainable environmental projects.

Itaipu seeks to contribute to the **Education for Sustainability of Indigenous Communities**, aiming to improve their quality of life and the environment they live in. Itaipu's actions depend on several partnerships and involve, above all, respect for the cultural identity of the indigenous communities that are located in Itaipu's area of activity. The work strengthens the role of indigenous school education as an agent of social integration, cultural strengthening, environmental preservation, and sustainability of the indigenous communities. All decisions to intervene in the villages with programs related to education, culture, or infrastructure, are discussed and agreed with the indigenous leaders and their school com-

munities. Some examples of actions developed with the support of Itaipu are: the technical and structural support for the construction of vegetable gardens; the acquisition of equipment for a computer laboratory; the construction of a space for environmental studies in schools; technical assistance for collective food production for subsistence and surplus marketing; workshops and meetings to add value to local crafts and tourism; as well as the annual promotion of indigenous games and a cultural week, which involve an integration program among the indigenous villages.

The **Itaipu Scholarship Program (Energy for Education)** was established in 2006 in Paraguay, with the goal of supporting university training of talented people. The program provides opportunities to improve the quality of life and contribute to sustainable development. Since its implementation, the program has awarded more than 15,500 scholarships to young people throughout the country who have pursued their studies in public and private universities at the national level. In 2019, in addition to support for tertiary education, training in technical fields and languages have been included for Paraguayans who belong to low-income families and have achieved academic excellence. Almost 5,500 students applied for the 2019 scholarship competition and about 1,600 scholarships were awarded for study at the university level, of which 28 were for people with disabilities and 32 were for people from the indigenous communities. In addition, 125 scholarships were awarded for technical studies and 68 for languages studies. In total, 1,751 scholarships were awarded in 2019.

Itaipu Binacional, in the framework of corporate social responsibility and the compliance of its business mission and vision, has supported the **Improvement of Educational Infrastructures in Paraguay**, as well as providing equipment to the educational institutions. These actions are mainly taking place in support of the Ministry of Education and Sciences (MEC) and complementing the actions of the national government of Paraguay. In relation to support for educational infrastructure, Itaipu builds classrooms, sports areas, technological areas, and carries out renovations, painting, improvement of sanitary facilities, electrical systems, and structural reinforcement of the public educational institutions and some private schools administered by for-profit institutions that grant services to persons in vulnerable situations. Concerning the task of providing equipment, the majority of the actions are complementary to the technical teams of the first level and are necessary for the efficient development of the classes. Itaipu also provides mobile classrooms to support technical training in the specialty areas of welding, gastronomy, informatics, and mechanics related to motorcycles, electronics, and refrigeration. The goal is to strengthen training in vulnerable areas and isolated zones of Paraguay, to allow for adequate entry into the labor market.

Alexandre Marchetti/ITAIPU Binacional

5

Gender Equality

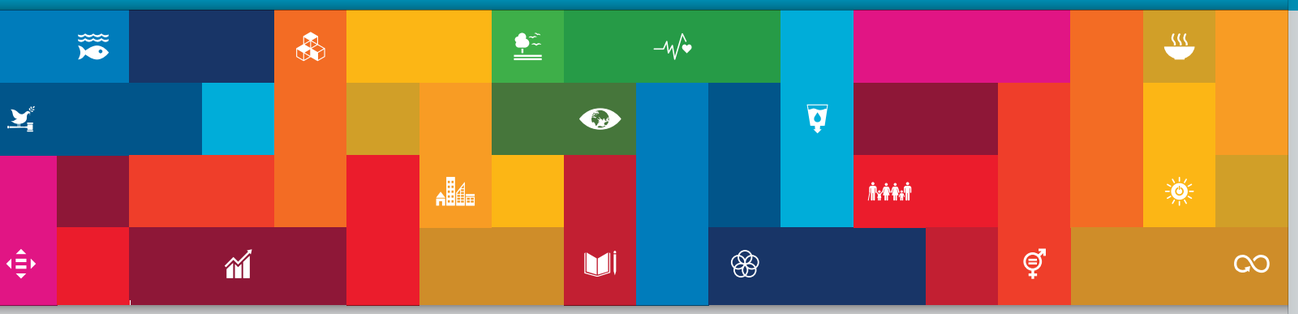
The most important activities by Itaipu related to SDG 5, which seeks to achieve gender equality and empower all women and girls, involve the raising of awareness about the issue of violence against women and supporting gender equity. These activities are benefiting the general public, multiple levels of society and institutions and specialized audiences such as educational professionals and security agents.

Through the **Gender Equity Incentive Program**, Itaipu demonstrates its commitment to gender and race equity, and fair human resources management. The program focuses on two main actions: implementing gender equity guidelines at Itaipu and strengthening public policies regarding women. Over the last 16 years, Itaipu has conducted affirmative action initiatives to raise the awareness of its employees regarding gender equity in the workplace and to strengthen partnerships with different institutions for the development of actions for the general public. The program has been a reference of good practices that contribute to the recognition of human rights and women's citizenship. Since 2018, the program has strengthened internal areas within Itaipu and established external partnerships with public agencies at all levels of government, with non-governmental organizations, with international organizations, and with other private and public entities. Among international organizations, the program has partnered with UN Women and has joined the UN Women's "HeforShe" campaign. In Brazil, the program chose, as partner with UN Women, the organization Papo de Homem, to lead a workshop entitled "What Gender Equity has to do with Men's Lives and Careers" as a way to connect men with the issue of gender equity. The program also partnered with the United Nations Population Fund to implement the "Dating without Violence" project, which conducts workshops for teachers on the issues of violence during dating and how to build healthy relationships. In 2011, Itaipu approved its Gender Equity Policy, basing its actions on guidelines set forth in the Policy. The program, coordinated by Itaipu's Social Responsibility Advisory Board, is overseen by the Gender Equity Committee, which includes representatives (women and men) of the six boards that comprise Itaipu.

The main objectives of the **Protection of Women against all Forms of Violence Program** is to ensure complete protection of women against all forms of violence by promoting and implementing the relevant law of Paraguay. For the dissemination of the law and the strengthening of institutional capacities of entities responsible for the law compliance, two major activities are being carried out. The first consists of a new phase of dissemination of the Zero Violence Campaign with the leadership of the Ministry of Women allowing the training of about 100 key actors from local governments. The second component includes the institutional strengthening of Itaipu in terms of developing mechanisms to address cases of violence against women, with training and awareness of at least 500 employees. This national effort started in 2016 with the implementation of the first phase and is currently in its second phase.

6

Clean Water and Sanitation



The Itaipu Reservoir contains 29 billion cubic meters of water with about 135,000 hectares of water surface. Its borders extend for about 170 kilometers along the boundary between Paraguay and Brazil. The reservoir is not only used for generating electricity but also for agricultural, fishing, aquaculture, touristic and leisure purposes, as a municipal water source and for maintaining wildlife in the area. The effective integrated management of water resources is essential for the optimum long-term operation of the Itaipu Hydropower Plant. Also, the protection and conservation of all water-related ecosystems in the area are key activities supporting sustainability in the region. These ecosystems include the Itaipu Reservoir and nearby rivers, aquifers, lakes, wetlands and forests.

Itaipu's sustainable development strategy recognizes that water security[1] and sustainable development at the influence area require optimum environmental management, besides social, economic, cultural and technological development. Therefore, Itaipu has partnered with municipalities, communities, private owners and other stakeholders for the effective implementation of this strategy.

The programs and actions more directly related to SDG 6 include the protection of springs, the restoration of riverside forests, the formation of biological corridors, conservation of agricultural soils, the installation of communal agrochemical cleaning stations and the use of livestock waste for the production of renewable energy and biofertilizers.

Itaipu supports **Practices for Water and Soil Conservation** that contribute to reduce sediment delivery from roads to rivers and the reservoir and increase infiltration of water in the soil, recharging the underground aquifers and decreasing the sedimentation of waterways, including the reservoir and its tributaries. These activities are key to optimizing the quality and quantity of water for the generation of hydropower and for other water uses. These activities include: selection of important micro-watersheds, prioritizing the springs that contribute to the public water supply system; development of the technical agronomic diagnosis; dynamic participatory engagement with communities to adopt corrective actions, establishing partnerships in favor of sustainability and supporting effective commitments for water and soil conservation; meetings among local partners, for preparing legal instruments for the physical and financial execution of activities; implementation of the Water Pact to enable the execution of actions to correct environmental liabilities; and implementation of "Good Practices" on soil conservation, adaptation and sanding of rural roads, recovery and protection of riverside springs and riparian forests, communal agrochemical cleaning stations and communal waste distributers, among others.

Itaipu conducts **Environmental Monitoring of Water and Sediments** activities that are part of its integrated management program of water resources. Monitoring and evaluation procedures are in place to gather physical, chemical and biological information of the ecosystem, guiding decision making related to water security in compliance with legislation and institutional commitments. Environmental Monitoring supports several actions developed by Itaipu including sedimentometric monitoring, bathymetric and hydraulic surveys and monitoring of water quality, micropollutants and groundwater.

The Sedimentometric monitoring aims to estimate the average lifetime of reservoir and the silting up of the water ways. The automatic monitoring network has 15 stations that determine the solid discharges and estimate

1 - Water security refers to the recovering and preservation of watersheds and reservoirs through permanent and integrated actions that promote the sustainable use of natural resources, better socio-environmental conditions and the best availability of water in quantity and quality for different applications.

sediment production in the basins, also guiding the upstream conservation actions. In 2018 there was significant improvement in the process of monitoring sedimentation due in part to progress in the telemetry network monitoring system. The four-year results indicate that the reservoir has an estimated average lifetime of over 180 years. Bathymetric and Hydraulic Surveys aim to gather submerged terrain physical data, allowing to investigate the degree of sedimentation of the reservoir and its tributaries and to map vulnerable zones to the formation of lagoons. The surveys of the arms in the Brazilian margin occurred in 2017 and in the Paraguayan shore and central body of the reservoir in 2018. Water quality monitoring aims to collect, analyze and manage physical, chemical and biological information of the waters. Water quality can directly affect multiple uses of the reservoir, such as water supply, irrigation, fishing, livestock and biodiversity conservation, among others.

Itaipu conducts activities designed for **Mitigating Impacts of Agrochemicals and other Hazardous Materials from rural areas.** The objective is to reduce the disposal of toxic agrochemicals, hazardous materials and nutrients in the main reservoir and its tributaries. These activities include: **installation of communal agrochemical cleaning stations** for farmers to wash equipment that might be contaminated with pesticides; **acquisition of communal manure spreaders** that encourage proper disposal of organic waste; promoting the use of manure from poultry and pig farming as fertilizers for agricultural production; and construction of biodigesters. The springs are the main sources for supplying water to the communal agrochemical cleaning stations. Therefore, restoration and protection of the springs, ensuring that the communal supplier tanks operate properly. Itaipu leads activities that create community awareness of the need to change customary practices required to improve water quality and reduce pollution. With the installation of communal agrochemical cleaning stations, for example, the population stops washing containers of toxic products on the banks of the waterways. Instead, people use the premises duly installed for this purpose. With the cleaning station, the farmers rinse water from containers and equipment in a platform that directs the contaminated wastewater to a proper reservoir, preventing the chemical product from contaminating the groundwater and rivers.

Major activities on **Conservation of Protected Areas** are implemented to guarantee the protection of springs, wetlands and tributary water courses to the Paraná River and the ITAIPU reservoir, ensuring the integrity of the water related ecosystem services of more than 100,000 hectares of protected terrestrial ecosystems. These activities not only comply with current legislation, they are a strong additional voluntary contribution to protecting the ecosystems and maintaining an optimum management of water resources in the region. They are designed to help maintain the hydrological cycle through the infiltration rate of water in the soil that favors the recharge of aquifers, the attenuation of peak flows, evapotranspiration and the reduction of erosion and underground and superficial runoff that produces silting and eutrophication.

Consequently, the positive impacts resulting from these activities are reflected in the quantity and quality of water that contribute broadly and directly to protecting and restoring the ecosystems of the region. Sensitization, engagement, education and practical activities are planned and executed by a trained multidisciplinary team, involving Itaipu technicians, teaching and research institutions, prefectures and other actors in the region, with knowledge of local specificities, in the form of participatory territorial management.

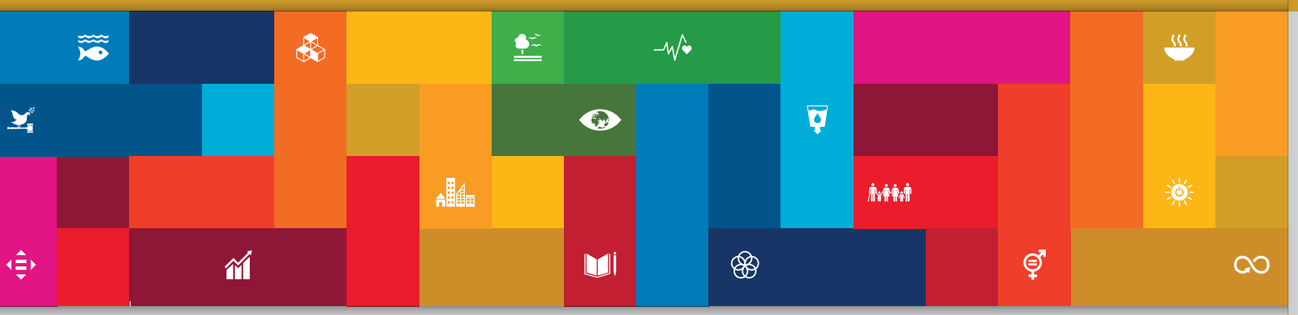
Itaipu facilitates **Access to Safe Drinking Water** to communities in the vicinity of the hydropower plant and to isolated populations with water supply difficulties that cannot be served by the public or private providers of drinking water in the region. This activity illustrates Itaipu's commitment to providing equitable access to safe drinking water for all the people of the region. During the construction of the Itaipu Hydropower Plant, the work zone was sparsely populated; therefore, houses were built with access to basic services for workers. One of those services was the provision of potable water. A water treatment plant and a distribution network were built to serve the homes of the different housing districts that were built. Today these housing districts are currently part of already established cities with access to drinking water supported by Itaipu. The service is provided to communities in the Alto Paraná Department of Paraguay including the cities of Hernandarias, Ciudad del Este and Presidente Franco and other communities of the region with water access difficulties. For isolated communities, Itaipu acts by complementing actions of the national government, serving the needs of communities for the drilling of wells, provision of water tanks and construction of distribution networks. In addition, Itaipu provides support for the drilling of wells, provision of water tanks and construction of distribution networks in isolated communities.

Itaipu facilitates **Rainwater Harvesting** in the region by installing systems for water collection and storage for non-potable uses, which include cleaning sidewalks and floors, irrigating gardens, orchards and grass and animal troughs, among others. In some locations the rainwater is also used for sanitary flushing and cleaning purposes in public bathrooms and other common facilities, supporting healthier and more productive environments. The systems consist of collection channels, water troughs, filtration devices, cisterns and distribution networks. This activity by Itaipu illustrates its support for increasing water-use efficiency, inducing sustainable withdrawals and supply of freshwater in the region. The systems are designed for immediate use of the abundant rainwater available in the region. The use of rainwater through these systems prevents the use of drinking water for non-potable purposes, increasing the water use efficiency in communities located near the hydropower plant and the overall sustainability of water resources in the region. The systems are installed in schools at urban areas and on farms.

The **Biofloc Fish Farming Technology Project** is designed for fish production in sustainable systems (biofloc production) to improve environmental control over aquaculture water and production. The intensification, concentration and growth of freshwater fish aquaculture in the western region of Paraná provides a scenario of unsustainability of the current production model, which can compromise water quality in rivers and the Itaipu reservoir water, and consequently, their multiple uses. The project has two demonstration units to produce fingerlings in a system with minimum water use and exchange in the production cycle. The Biofloc Technology system consists in promoting controlled organic fertilization in order to favor the growth of microorganisms that use the nitrogen compounds for growth, and result in the production of microbial and organic aggregates called biofloc. The microbial system function as a natural biological filter, allowing the maintenance of water quality and reutilization nutrients that would have been wasted when feeding the fish and exchanging the water. The system allows operating with high productivity, biosafety and minimal effluent generation.

7

Affordable and Clean Energy



The Itaipu Hydropower Plant has an installed capacity of 14,000 megawatts (MW) with 20 generating units of 700 MW each. In 2016, Itaipu generated 103.1 million MWh which represents a world record of annual generation for a hydropower plant. Itaipu has played a major role supporting sustainable development in Paraguay and Brazil in the last 35 years by providing access to reliable, sustainable and clean electricity that has powered prosperity for the people of both countries.

The overall sustainable development strategy of Itaipu is based on an integrated approach to renewable energy generation, water resource management, biodiversity and conservation of water ecosystems as well as forest and other terrestrial ecosystems. This approach is intrinsically linked to the overall objectives and specific targets of the SDG in energy (SDG7) and the other SDGs. The Itaipu Hydropower Plant has helped to reduce dependence on coal, oil and natural gas and has also resulted in a more connected relationship between the two countries through their joint partnership.

Itaipu has played a key role in the accelerated increase in the **Access of Electricity** that has been observed in Brazil and Paraguay in the last decades. The total current access of electricity to the population in these countries stands at 100% in Brazil and 99.3% in Paraguay. The reliable electricity access that Itaipu has been providing for over three decades has been translated into an economic boom for the region, characterized by accelerated expansion of cities in the region, rapid economic growth, millions of jobs, new roads and other public services, prosperity and sustainable development. Currently, it is estimated that Itaipu provides electricity access to the equivalent of about 37 to 48 million people based on the per capita consumption of electricity in Brazil and in Paraguay. The modern economies of Paraguay and Brazil depend on the reliable and secure electricity supplies from Itaipu. This reliance on efficient and clean electricity has greatly contributed to the relatively decarbonized economies of Brazil and Paraguay. Today, Itaipu is contributing to the leading position that Brazil and Paraguay maintain as countries with energy systems highly dependent on renewable energy and consequently avoiding large volumes of GHG emissions. The relatively clean energy systems of Brazil and Paraguay translate into very valuable global benefits reflected in the avoidance of negative impacts from climate change. With Itaipu, Paraguay has the capacity to produce five times its national electricity requirements. Paraguay currently generates the highest percentage of renewable energy per capita in the world and is the fourth-largest electricity exporter worldwide, surpassed only by France, Germany and Canada.

Itaipu provides a major contribution to Paraguay and Brazil in terms of the overall **Share of use of Renewable Energy** in these countries. The Plant generated 90% of the electricity consumed in Paraguay and 15% of the electricity consumed in Brazil in 2018. Itaipu is a major contributor to the share of renewable energy use in South America. In 2016 Itaipu generated about 14% of the renewable electricity generated in South America. The electricity generation from the Itaipu Hydropower Plant replaces the equivalent of 550,000 barrels of oil each day or 50 million cubic meters of natural gas. In relation to the impacts of climate change, Itaipu is avoiding the emissions of about 87 tons of CO_2 equivalent daily if it is replacing coal and 38 tons if it is replacing natural gas.

Itaipu promotes the use of different forms of renewable energy including solar thermal, solar photovoltaic, wind and biogas. Itaipu has extensive programs for capacity building in the area of renewable energy and has created an **International Center for Renewable Energy** with emphasis on the development of biogas processes. A total

of 6 units for biogas generation have been established. These units are producing 790,000 cubic meters of biogas and 160,000 cubic meters of biofertilizers.

In 2012, Itaipu adopted a model designed to improve the efficiency of its hydropower plant. The major objective of **Itaipu's Energy Efficiency Program** is to achieve higher levels of efficiency by maintaining excellence in the integrated management of water and energy for the generation of electricity. It requires integrated and coherent work among the teams of hydrology, operation, and maintenance. The model has been termed "The Dance with Waters." It attempts to make the most of all the water that reaches the reservoir for the generation of electricity. In order to ensure and enhance reliability and productivity, Itaipu is starting a comprehensive technological update and upgrade of its power plant and substations. This process is expected to include the assessment and systematic substitution of equipment and systems used for supervision, control, protection, regulation, monitoring, and measurement, as well as their respective interfaces with the generation processes, substations, spillway, and auxiliary equipment of the dam and powerhouse. The estimated duration of the work is 14 years, and the cost is estimated at about US$ 660 million.

Itaipu is **Improving Rural Communities Access to Modern Cooking Technologies** by distributing Eco Stoves that use less amounts of wood due to a technology powered by solar energy. The objective is to reduce the use of native wood for cooking in rural and indigenous communities of Paraguay by increasing the biomass energy efficiency. About 85 per cent of rural households in Paraguay use firewood for cooking. The project contributes to the conservation of forest remnants in the Alto Parana Atlantic Forest corridor covering six departments of Paraguay.

Itaipu along 26 other institutions created the International **Center of Renewable Energies – CIBiogas.** The Center is located in the Itaipu Technological Park. The objective of the Center is to support the development of public policies that regulate and encourage the use of biogas, while also developing strategies related to the generation of knowledge and the transfer of technology. The Center currently has six demonstration units.

Itaipu supported the installation of a **Hybrid Electric Generation System** for secure energy supply in isolated places located in the area of Chaco in Paraguay. The system is based on solar photovoltaic and wind technologies which have been providing reliable electricity. The installation exemplifies Itaipu's commitment to promoting the use of renewable energy in isolated rural areas where there is no access to the grid.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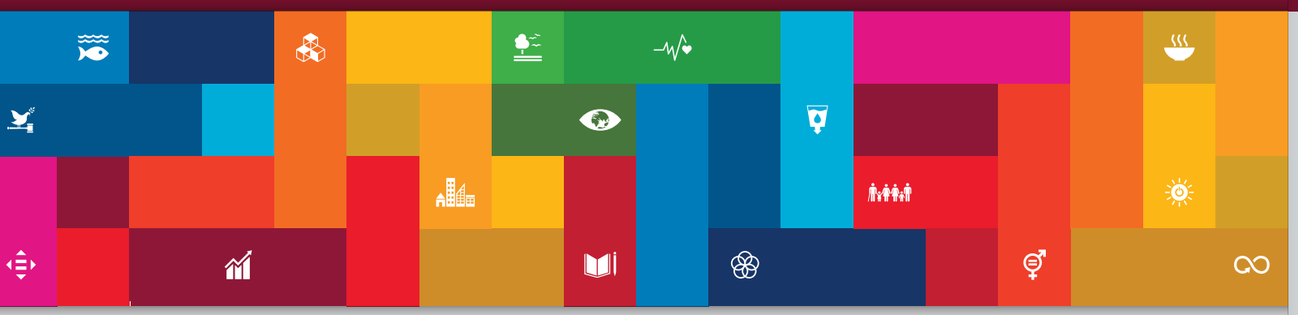
8

Decent Work and Economic Growth



SDG 8 calls for promotion of sustained, inclusive and sustainable economic growth, full and productive employment, and decent work for all. Itaipu has demonstrated its commitment to supporting this goal.

Itaipu's Sustainable Development Strategy includes a comprehensive set of policies, measures and initiatives that are in conformity with SDG 8 and its targets concerning decent work and economic growth. Activities by Itaipu are designed to promote professional development of adolescents, sustainable tourism, employment in solid waste management, sustainable procurement policies, fish farming jobs, sustainable rural development, among others.

Itaipu conducts activities for the **Promotion of Sustainable Tourism.** The Paraná River, the cities of Foz do Iguaçu in Brazil, and Ciudad del Este in Paraguay, the Itaipu Reservoir and the Hydropower Plant form a major tourist destination. The region is also distinguished by the scenic adjacent Iguaçu waterfalls and the Atlantic forest national parks. Today, the Itaipu Tourist Complex (CTI) hosts many popular attractions, ensuring increasing numbers of domestic and international visitors. The activity provides important local employment opportunities, and thus forms a major center of tourist economic activity shared by Brazil and Paraguay. Tourism related services in the cities of Foz do Iguaçu (Brazil) and Ciudad del Este (Paraguay) have continued to grow, and more hospitality-related services are being provided. The establishment of a comprehensive tourism satellite account (TSA) may determine higher economic importance of tourism in the entire cross-border region. Itaipu established its tourism development program with a view to: (a) disseminate Itaipu's work and its social and environmental actions; (b) generate local employment and income opportunities; (c) increase the number of tourists in the region; (d) increase tourist stay time; (e) ensure economic sustainability of the operation; (f) foster cooperation with the local trade association and the community; (g) ensure participation and representation in tourism entities; and (h) promote innovation, excellence, and continuous improvement of services.

The main objective of the **Workplace Safety Management System** is the reduction of accidents and incidents related to work, through the strengthening of a culture of prevention and interdependency in terms of health and work safety. Itaipu recognizes the need to seek continuous improvement in the reduction of work-related incidents and accidents, and of promoting safe and secure work environments for all workers. This system has the objective of verifying the procedures and routines developed by Itaipu and assisting in their improvement through the implementation of modern techniques for the management of risks that exist in activities and environments in its hydropower plant. Initially, an assessment of the management system used by Itaipu was carried out, identifying the points that could be improved. To carry out this initial assessment, the best international practices in force in terms of health and safety at work were taken as a basis, respecting the laws, particularities and cultures of both Brazil and Paraguay. Continuous investment in updating security procedures and internal standards has been necessary, as well as the training of employees to carry out the tasks in the safest way possible. Specific works are being developed together with the maintenance team of the organization, mainly through the adoption of a new health and safety policy. A program of observations for "Safe Work" as well as the dissemination of safety information, through training and safety meetings, is being implemented helping to strengthen a culture of prevention and interdependency in terms of health and work safety.

Over the past two decades, Itaipu has been supporting **Inland Fisheries and Aquaculture** through the promotion of freshwater fish farms on the Itaipu Reservoir, where only small-scale subsistence fishing had been undertaken by impoverished families. Itaipu assisted and mobilized the various stakeholders to join a participatory management committee. The government-supported freshwater aquaculture and fish production initiative became known as the "More fish in our waters" program. It aims at community empowerment and the supply of fingerlings and floating net cages, as well as investments in technical assistance actions to add value to the commercial production. Itaipu provided start-up equipment for modernized fish farming to interested lakeside communities. Equipment included 500 net-pens for raising fish, machines for fish-processing and deboning, equipment for cold-storage and for live transportation of fish, as well as computers, printers and training materials. Itaipu and the related municipal authorities also facilitated the provision of fresh water and electricity to designated fishing points to ensure adequate hygienic conditions. In 2019, an action plan, supported by Brazil and Paraguay, was initiated to modify a decree which prohibits the introduction of non-native species, such as the tilapia, into the Itaipu Reservoir. Based in extensive scientific documentation, Itaipu's Brazilian Coordination Board and the Paraguayan technical team prepared a technical note supporting this initiative which corroborates the viability of the tilapia cultivation in the Reservoir, taking into account that this exotic species was introduced in the Reservoir more than 30 years ago and did not establish significant population nor caused impact on native species.

As a leading corporation, Itaipu upholds all national and international laws and conventions concerning Labor Practices and Human Rights. Brazil and Paraguay are both signatories to the International Labor Organization (ILO) Conventions on Child Labor, including Convention Nr. 138 on the Minimum Age for Admission to Employment and Work (entry into force 1976), and Convention 182 Concerning Prohibition and Immediate Action on the Elimination of the Worst Forms of Child Labour (entry into force 2000). Launched in 2005, the National Pact for the Eradication of Slave Labor in Brazil is a multi-stakeholder initiative involving Ethos Institute, the Social Observatory Institute, the International Labor Organization, and NGO Reporter Brazil. As a signatory of the Pact, Itaipu is committed to maintaining its supply chain free from slave labor. Itaipu also has been committed to the Universal 10 Principles of the United Nations Global Compact since December 2008. Itaipu has regularly submitted its Annual Sustainability Reports and it has actively participated in several of the Global Compact initiatives and events, in particular with regard to the empowerment of women. Furthermore, Itaipu has established a Supplier Code of Conduct. Thus, suppliers that appear in the National Registry File of Companies Not in Good Standing of the Federal Comptroller General's Office are not contracted. In order to sign contracts, suppliers are required to confirm their compliance with national and international labor laws and standards. The Supplier Evaluation System (SAF) analyzes contractors based on criteria and sustainability aspects contained in ISO 14000 and 26000, OHSAS 18001, SA 8000 and the Women's Empowerment Principles (WEPs). Itaipu has also signed the Pact against the Exploitation of Children and Adolescents on Brazilian Highways, and the Declaration of Corporate Commitment to Confront Sexual Violence against Children and Adolescents, as established by the National Secretariat for Human Rights.

Itaipu leads activities for the **Strengthening and Development of Micro Enterprises.** The objective of these activitis is to attract, select and support micro-entrepreneurs in technical and financial areas. The project is a joint action between Itaipu and the Paraguayan Industrial Union, which is an organization with national coverage. The project seeks to strengthen the entrepreneur's profile through general and specific knowledge about the components of Business Management Education. The action includes analysis of presentations of sustainable business plans prepared by participants. The presentations are subject to an important selection process performed via contest. The project is aimed at strengthening those entrepreneurs of small and medium enterprises who have an entrepreneurial culture that requires skills and maturation. The selection process seeks to enhance, improve or expand ventures that are economically and socially viable and that have local and / or international scope. The action promotes citizen development through the advancement of strategies that try to generate job opportunities and economic initiatives, which will strengthen the development of the entrepreneurial culture. The program includes the selection of 40 micro-entrepreneurs during two stages of a contest based on the sustainable business plans. The planned financing is for over US$570,000, and the implementation time is 28 months. The program started in December 2018 and has national coverage.

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9

Industry, Innovation and Infraestructure

Itaipu has been a strong engine for over three decades in the trinational border region building important infrastructure and supporting industrialization while fostering research, development and innovation.

Itaipu's commitment to the sustainable development of Paraguay and Brazil is demonstrated by actions and policies including the construction of bridges between the two countries, the overall Regional Infrastructure Development Program and the Technological Update of the Itaipu Hydroelectric Power Plant. Itaipu has been supporting industrialization since its beginning through its generation of clean and reliable electricity that allows industries to operate and grow developing markets for their products and services. Its programs on Sustainable Rural Development and Sustainable Territorial Management have provided additional support for the economic growth. Itaipu has also boosted important research, development and innovation in the region through its scientific centers, such as the Center for Advanced Studies on Dam Safety, the Electrical Systems Automation and Simulation Laboratory and the Territorial Intelligence Center.

Since its inauguration in 1965, the **Puente Internacional de la Amistad (International Friendship Bridge)** over the Paraná River, which connects the cities of Foz do Iguaçu in Brazil with Ciudad del Este in Paraguay, has been the main socioeconomic logistic link between Brazil and Paraguay in the region. Its strategic location plays a fundamental role in the region's development, boosting export and import trade. In 2018, Itaipu was authorized by the governments of Paraguay and Brazil to support the **Construction of Two New International Bridges** to enhance commercial activities in the trinational region and to improve security conditions at the border. This initiative is consistent with Itaipu's mission of supporting the well-being of local communities and regional sustainable development. The total investment is estimated at around US$ 270 million and construction is expected to take three years, beginning in 2019. The construction of the second bridge over the Paraná River, connecting Foz do Iguaçu (Brazil) and Presidente Franco (Paraguay), will strengthen regional integration by improving the infrastructure for trade and tourism between the two countries. With this new bridge, the International Friendship Bridge will be used exclusively for light vehicles and tour buses. The other new bridge will be built over the Paraguay River, connecting the cities of Porto Murtinho in Brazil and Carmelo Peralta in Paraguay. The construction of this bridge will help to consolidate the integration between the Paraguayan and the Brazilian road systems which are part of the Bioceanic Corridor. The new two bridges between the two countries will be a further spur to regional development, as it will create new jobs, strengthen integration, support freight logistics and mitigate traffic.

The objective of the **Centre for Advanced Studies on Dam Safety (CEASB)** is to work on the development of strategic dam safety solutions via research with universities and the technical community. This integrated partnership arrangement allows the formation of professionals with essential skills for the development of this research. The Centre makes possible a multidisciplinary research environment, integrating the various areas of knowledge surrounding the theme. It also makes possible integration among companies, research institutes and universities. Safety of the dam ranks among the highest of Itaipu's priorities. The purpose of this action is to reduce the possibility of accidents and their consequences by keeping structures safe from any type of accident or

climate extreme event through instrumentation analysis, visual inspections, special studies and other actions. Recognizing the importance of dam safety, Itaipu continues investing in equipment and technology, as well as developing, maintaining and improving highly trained and qualified operation personnel to keep the plant fully safe, thus also ensuring safety for the tri-national border region, where the dam is located, and its population. The safety conditions of the dam are constantly verified by regular inspections and seismic monitoring. The periodic maintenance works for the safety of the Itaipu dam are recognized by other plants for their excellence in the periodicity of monitoring their structures, the qualification of the professionals involved and the level of detail of the criteria to be studied to guarantee the multiple uses of the reservoir.

The Electrical Systems Automation and Simulation Laboratory (LASSE) allows the testing and verification of the dynamic performance of equipment and systems associated with the generation, transmission and distribution of electricity. One important mission of LASSE is to bring greater technological self-sufficiency to Itaipu. LASSE also is supporting Itaipu's technological updating plan through research, development and innovation projects. Since 2008, LASSE has been developing solutions for hardware and software adequate to the needs of Itaipu and other companies in the electricity sector. LASSE provides an effective multidisciplinary research environment, integrating the various areas of knowledge involved in the subject and making possible the collaboration among companies, research institutes and universities.

The main objective of the **Technological Update of Itaipu Hydroelectric Power Plant** is to maintain the reliability of the equipment and systems and ensure the continuity of the high performance of the Itaipu Hydroelectric Power Plant. Technological update is considered an adaptation measure, as modifications to the existing power plant will increase functionality, safety and effectiveness of operation, alleviating climate uncertainties. Taking these factors into account, Itaipu is undertaking the Technological Update of the Plant and its Substations, including in this process the assessment and systemic replacement of equipment and systems for supervision, control, protection, regulation, monitoring, measurement and their respective interfaces with the generation processes, substations, spillway, dam auxiliary equipment, and the powerhouse. Heavy equipment such as turbines and generators have a longer life cycle and are not subject to this update. The expected term of continuous work is 14 years and the investment will be approximately US$ 660 million. Between 2016 and 2018, the Basic Project of the Technological Update was undertaken, consolidating studies, guidelines and technical specifications for the tendering process. Throughout this phase, two workshops were carried out with all interested parties from both countries, clarifying the characteristics of the project and receiving suggestions to be analyzed by the various technical teams of Itaipu. In the second half of 2018, the first stage of the tender for the Technological Update was carried out, called pre-qualification of the companies interested in the execution of the project, classifying Brazilian and Paraguayan companies or consortia that must attend the bidding process (second stage), with planned opening of the proposals in the second half of 2019. In the first half of 2019 the third Technological Update Workshop was held with the presence of only pre-qualified companies and consortia in the bidding process.

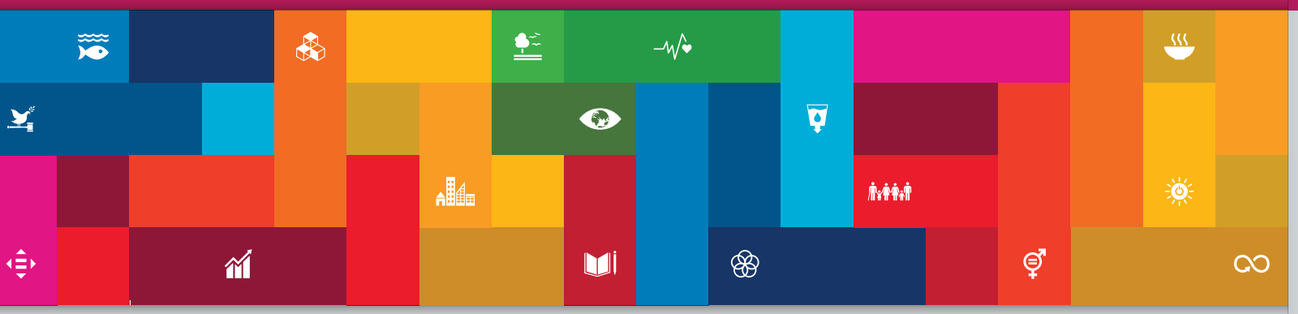
Itaipu is developing an **International Standard for Sustainable Territorial Management.** The objective of this activity is to develop methodology to assess quantitatively the results obtained in actions focused on sustainable development, with emphasis on implications for biodiversity conservation. By developing international standards, Itaipu sustainability actions and programs in a specific region can become a first territorial model for sustainable development with accountable biodiversity conservation results. The Itaipu sustainable territorial development model and the international territorial standards can be replicated in other territories in Brazil, Paraguay and in other countries and territories committed to sustainable development and biodiversity conservation. The standards will be based on principles and criteria approved and recognized at an international level, with guarantee of replicability. The implementation is taking place through an agreement between Itaipu, the Lasting Initiative for Earth Institute - LIFE, and the Itaipu Technological Park Foundation. The work plan also foresees the drafting of the standards, their organization in management system documents, validation tests in selected municipalities, operationalization of the management system through software development and validation, training of future software users, dissemination of the management system, and the accreditation of the standard with the International Social and Environmental Standards Alliance (ISEAL), with the publication of reports in Portuguese, Spanish and English.

The **Territorial Intelligence Center** was created to promote and support science, research and technology for sustainable development applied to areas of interest to Itaipu. Other important objectives include: (1) to implement an environmental knowledge management process with its own spatiotemporal database; (2) to systematize and provide qualified environmental and territorial information to support Itaipu's decision-making towards sustainable development in Western Paraná; and (3) to establish partnerships with non-profit research, technology and education institutions, for the discovery and integration of content related to the areas of activity. In 2018, Itaipu environmental teams and the Itaipu Technological Park (PTI) established a partnership to implement the Territorial Intelligence Center to develop research applied in four strategic areas: water security, biodiversity, climate and territorial intelligence. The Center is a technical-scientific space for associates and partners of Itaipu, PTI and external collaborating institutions organized to ensure that the efforts and resources of research projects on key themes share the same objectives, goals, indicators and results. As a consequence of this process, there is a common knowledge base applicable to the technical, scientific and social development of the region.


Rubens Fraulini/ITAIPU Binacional

10

Reduced Inequalities



The most important activities in Itaipu's Sustainable Development Strategy for the reduction of inequalities are focused on the implementation of programs that promote training and education of people with limited economic means, protection of children and adolescents, sustainability of indigenous communities, inclusion of people with disabilities and equal opportunities for everyone in forward-looking technological and innovative occupations relevant to the sustainable development of Paraguay and Brazil and of particular interest to the region. One important mechanism used by Itaipu to reduce inequalities is the implementation of an extensive program of scholarships designed to empower those with low economic resources.

Since 1988, the **Initiation and Incentive Work Program (PIIT)** has been promoting personal and professional development of adolescents from Foz do Iguaçu and Curitiba, creating conditions for the adolescent to develop the values of responsibility, honesty, and professionalism that contribute to the formation of a model human citizen. The purpose of this initiative is to promote the right to professionalization of adolescents who are members of families in situations of vulnerability or social risk. Students between the ages of 15 and 17 who are attending basic or high school and come from low income families participate in the program. The participants receive a monthly allowance, life insurance, transportation voucher, food stamps and medical and dental assistance. In 2017, the program offered more than 329 young people their first job, as well as courses, workshops and lectures in the areas of education, culture and leisure. More than 6,000 adolescents have participated in the program. At Itaipu, the adolescent works on average four hours a day, for up to 24 months. In addition to the Learning Course, a series of workshops are offered following learning cycles. The workshops total about 170 hours distributed over 18 months of work and are seen as complementary actions to the daily life of adolescents. These workshops are about issues such as sexual education, environmental education, socio-emotional skills, interpersonal communication, drugs, and professional orientation.

The **Inclusion of People with Disabilities Program** aims to strengthen and coordinate groups to promote the inclusion of people with disabilities in productive activities in the region, emphasizing the construction of a more inclusive labor market. It seeks to contribute to the eradication of socioeconomic problems related to the inclusion of people with disabilities. The program is based on the "Collective Impact" methodology seeking to obtain the commitment of important actors in society from different sectors and with a common agenda to solve complex and large-scale social problems. The program uses a tool called the Special Education Development Index (IDEE), which has made it possible to assess and manage the impact of actions through interviews, reports, documents, research, and testimonials. Interviews are conducted with leaders, technical and pedagogical staff and with families and those assisted in order to generate the information that is evaluated by the tool. Through this effort, it was possible to assess the understanding of institutions regarding the inclusion of people with disabilities in the labor market. This effort allows the mapping of the main social and economic gaps for the inclusion of people with disabilities in the labor market.

11

Sustainable Cities and Communities

Itaipu supports the objectives of SDG 11 which calls for making cities and human settlements inclusive, safe, resilient and sustainable.

Itaipu is conducting many initiatives that are helping to ensure safe and affordable housing and sustainable communities while also preserving crucial cultural and natural heritage for the people who live in the region. Some of the most important activities by Itaipu related to SDG 11 include: provision of affordable housing to those who live in vulnerable situations; implementation of the Dam Safety program; support for museum management and institutions that preserve cultural and natural heritage; implementation of the Biosphere Reserve, and implementation of the Itaipu Linear Park and green infrastructure.

Itaipu has provided financial and technical support for the **Provision of Affordable Housing to Families** in Vulnerable Situations, in both Brazil and Paraguay. The programs in each country have been administered based on local criteria. On the Brazilian margin, the Need-Based Family Housing Initiative has sought to build 360 houses in the municipality of Quedas do Iguacu, selected via rankings by the State Department of Family and Social Development of Paraná (SEDS), based on the family vulnerability index (IVF/PR) and the housing deficit of the municipalities. The initiative in Paraguay has focused on the Barrio San Francisco, where Itaipu has built a sustainable urban development model with a comprehensive approach for families who were living in flood zones in Asunción. The project is benefiting 1,000 families who now live in a modern complex built to respond to their social needs with commercial spaces for economic development and green spaces for leisure activities.

Support for Green Infrastructure is also a major activity by Itaipu as reflected by the creation of sustainable, safe and accessible green spaces in different locations in Paraguay. One of the objectives is to enhance access to important green spaces with pedestrian paths, sanitary facilities, sewer systems, parking areas, security booths and other services. An example is the Itaipu Linear Park in Ciudad del Este, which represents an ecological lung for the city with the necessary equipment, facilities and infrastructure for the safe enjoyment of its citizens.

Itaipu provides **support for Museum Management and Institutions that Preserve the Cultural and Natural Heritage.** The effort aims to rescue, preserve, enhance, and disseminate the historical-cultural, technical-scientific, and environmental heritage of Itaipu and the region, becoming a true instrument of communication and education among past, present, and future generations. There are three focal areas: Museum Management and Collection Conservation at the Itaipu Ecomuseum in Brazil; the Valuing Regional and Institutional Heritage program at the Itaipu Tierra Guaraní Museum in Paraguay; and the Technical Advisory Program for professionals of preservationist institutions in Itaipu. In Brazil, the objective is to preserve the collections of the Itaipu Ecomuseum. The action is developed by the technical team of the Itaipu Ecomuseum via conservation efforts that include the archaeological collection of more than 200 sites, including geology, zoology, historical botany, and iconography being the result of research developed during the construction of the hydroelectric dam. In Paraguay, the Valuing Regional and Institutional Heritage program is conducted in the Entity's area of influence, but with some activities being carried out at the national level through cooperation and inter-institutional support, in particular with the National Secretariat of Culture. The activities have been implemented since the creation of the Tierra Guaraní Museum in 1979 and especially since the opening of the new Museum Exhibition in 2016.

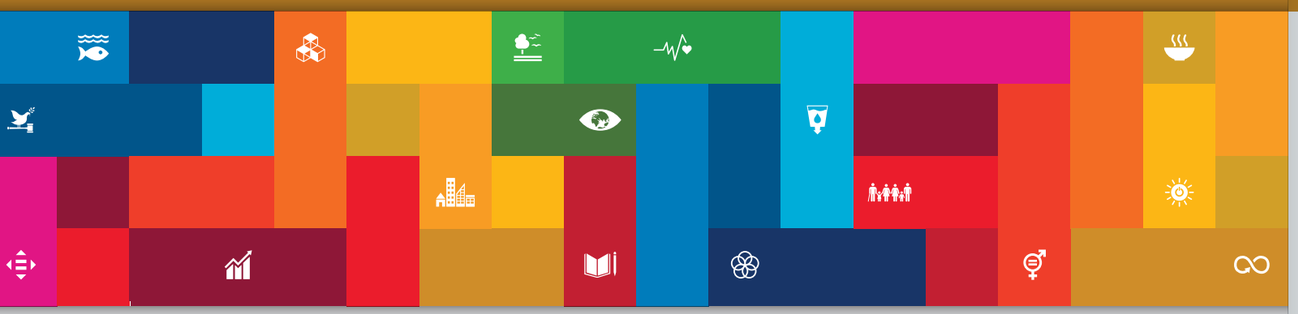
It is very important for Itaipu to contribute towards the Development of Communities in its Area of Influence; therefore, it carries out different activities in order to support the growth of the community school infrastructure development in order to guarantee safe access to education, collaboration with the management of water supply systems, intervention in the improvement of transportation routes, among other actions. Some of these efforts will prepare cities and the communities for future climate scenarios, making them more resilient and adapted. This effort has multiple objectives in different areas including: (1) to provide educational institutions with a safe, efficient, and complete infrastructure where classes can be held; (2) to provide the necessary technical and financial resources for infrastructures for mobile classrooms contributing to the socioeconomic development of citizens, through training and operational skills; (3) to facilitate the transit in the different municipalities of the region by applying asphalt to roads and pavements, in order to promote the development and economic, social and cultural interaction, while also supporting other infrastructure work as necessary for the development of communities; (4) to build emergency social housing; (5) to maintain the drinking water system of the residential areas; and (6) to execute other internal works and services, for which local labor is hired.

Itaipu is the first power plant to become part of the **Global Biosphere Reserve Network.** Its protected areas of more than 100,000 hectares was recognized as a nucleus zone of the Reserve, which is the highest stage of protection in the category of Biosphere Reserves created by UNESCO in 1972. With this status, Itaipu is committed to continue the environmental actions that have already been implemented and will have a set of rules to follow. It can also participate in and benefit from the sharing of research from the other reserves around the world, in addition to strengthening its institutional role as an organization that actively participates in the preservation of the environment. These activities support the sustainability and resilience of cities, human settlements and rural communities in the overall area of influence of Itaipu. Biosphere reserves have three interrelated zones that aim to fulfill three complementary and mutually reinforcing functions: 1) the core areas, which comprises a strictly protected ecosystem that contributes to the conservation of landscapes, ecosystems, species and genetic variation and corresponds to the 100,000 hectares of Itaipu´s protected areas; 2) the buffer zone , which surrounds or adjoins the core areas and is used for activities compatible with sound ecological practices that can reinforce scientific research, monitoring, training and education. It includes the biological corridors between conservation units and indigenous communities, among others; 3) the transition area, which is the part of the reserve where the greatest activity is allowed, fostering economic and human development that is socio-culturally and ecologically sustainable. It corresponds to dispersed and low-impact human settlements or consolidated agricultural areas.

Itaipu is committed to the **Revitalization of Public Areas.** The purpose of this action is to create and revitalize Itaipu's public spaces and those leased to the Municipalities for the development of leisure, sports, cultural and tourist activities and for commercialization of agricultural products. The action is being implemented through agreements with neighboring municipalities and through contracts directly made with Itaipu in its area of influence since 2018. The effort includes the development of bike paths and hiking trails and the creation of a municipal market. The new municipal market will be built in an unused space of Itaipu (the old Cobal building) which will be revitalized to allow residents of Foz do Iguacu and tourists to get closer to the full culture and cuisine of the area. This space will allow the valuing of the regional agro-industry production and commercialization of family farming products and will be configured as another tourist and cultural attraction for Foz do Iguacu and region.

12

Responsible Consuption and Production



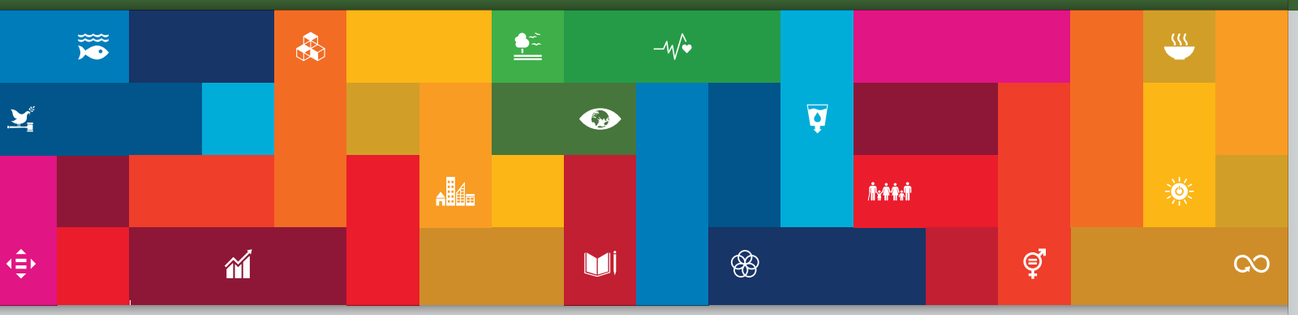
Itaipu is committed to ensuring sustainable consumption and production through important activities designed to promote the region´s agro-ecological-industrial growth, supporting initiatives from families, small businesses, and companies. Itaipu also supports initiatives related to education and capacity building activities to develop, guide, and maintain the sustainability of its programs.

The purpose of the **Territorial Waste Management Program** is to substantially reduce waste generation regionally via prevention, reduction, recycling and reuse to promote reservoir water safety. The program is active since 2003, today comprises 55 municipalities in the state of Paraná and one municipality in the state of Mato Grosso do Sul in Brazil. The project involves: infrastructure support actions (construction, refurbishment and expansion of sorting sheds); continuing training in solid waste management for municipal technicians and waste collector's leadership; environmental education with actions in formal and non-formal education; equipment purchase and truck acquisition for the Recyclable Recovery Units Program under contracts with municipalities, including the Associations and Cooperatives of Collectors; technical support in project management, monitoring of regional selective collection indicators; a recyclable marketing network; and, environmental services incentive payment by municipalities to the collectors of waste. The implementation of this program requires the involvement of all stakeholders in the chain, whether public, private or civil society. Also, the staff has the role of aligning the entire recycling chain with a systemic view of waste management. The social inclusion of the waste collectors and the municipal technical support is of paramount importance in the creation of solid Municipal Selective Collection Programs.

The Sustainable Procurement Program of Itaipu includes sustainability concerns and life-cycle considerations in the entity's supply chains. The program enforces detailed analysis regarding wasteful resource consumption, pollution and other environmental impacts, health, social, and labour issues, as well as the evaluation of the product life cycle (from production to disposal), the total cost of ownership and the applicable laws for the qualification and selection of suppliers and contracts. This procurement criterion is achieved via contracting conditions that permit minimizing potential negative impacts and maximizing positive impacts relative to the products or services to be acquired. To enhance transparency and facilitate the process, under Itaipu's strict sustainability procurement criteria, the self-assessment mechanism called Flexible Matrix, for measuring and monitoring the progress of Sustainable Purchases over time, was implemented. Through this program Itaipu's generates greater environmental, economic and social benefits.

13

Climate Action



The most important activities in Itaipu's Sustainable Development Strategy with respect to climate change and the SDG 13 are centered on the following activities: continuing to provide reliable, efficient and clean renewable power (avoiding GHG emissions from fossil fuels) for Brazil and Paraguay; implementing an integrated management program of natural resources, protecting and restoring water and terrestrial ecosystems with the participation of local communities and all relevant stakeholders; implementing a comprehensive and extensive program of reforestation and remediation in the areas of influence of Itaipu; promoting the use of other forms of renewable energy to satisfy energy needs in the transport, agriculture, industrial, services and residential sectors of the economy, minimizing waste generation and helping to further mitigate climate change effects; and implementing a comprehensive program of data collection, statistical analysis and modelling projection of parameters relevant to climate change.

A major priority for Itaipu is the **Quantification of Emissions and Sequestration of Greenhouse Gases** in the region. Itaipu has been building an inventory of different types of emissions and has been involved in a carbon sequestration process. The main objectives of these activities are enabling a synergistic and integrated analysis of different variables related to emissions and relevant to sequestration processes that will help to mitigate the effects of climate change. These activities should result in proposals for structural improvements to reduce the consumption of non-renewable resources and to promote the further use of renewable energy. The maintenance of the vegetation of its Protection Bet and Wildlife Refuges promotes the fixation of the atmospheric CO2 in the biomass of the trees, both above and below the ground. The donation of seedlings to the municipalities bordering the reservoir also contributes to the increase in the fixation of atmospheric carbon. Itaipu started these activities in 2010 in its areas of direct influence including bordering cities and in places upstream of the reservoir, due to the transfer of seedlings. The inventory related to GHG emissions is carried out based on internationally accepted parameters for quantification of GHG emissions, which are audited annually by third parties. Regarding emissions, the GHG Protocol that is accepted worldwide is used by Itaipu. Based on these emission quantification activities, the annual managerial emissions of GHGs are estimated at around 22,000 tons of CO2 equivalent, whereas the reservoir emissions reach approximately 235,000 tons of CO2 equivalent per year. However, the GHGs fixation by the vegetation of the Protection Belt and Wildlife Refuges reach 5.9 million tons of CO2 (both in Brazil and Paraguay); therefore, the sequestration activities of CO2 outweigh the emissions by around 23 times.

The main objective of the **Climate Monitoring Platform** is to establish a standardized database of meteorological and climate data that allows different actors to analyze variability and climate trends in the region under different perspectives. The Climate Monitoring Platform, with an extensive network and multiple collection points covering many variables, provides valuable support to all the stakeholders for the analysis and understanding of impacts from natural phenomena. Therefore, research projects, public policy planning, interventionist actions and decision-making can be based on a scientific basis,

making results more efficient and accurate. Itaipu supports this activity in all of its areas of influence since 2011 in partnership with the Itaipu Technology Park, the Agronomic Institute of Paraná and the State University of Western Paraná (UNIOESTE). The climate monitoring platform includes stations all around its area of influence. The Climate Monitoring Platform includes four modules: acquisition, transmission, storage and analysis. This structure allows the improved use of particular technology concepts in each of these modules supporting their objectives. The acquisition and transmission modules are based on the Internet of Things (IoT). The storage module is implemented through Big Data processing; and the analysis module uses notions of Artificial Intelligence and Business Intelligence.

Monitoring and Analyzing Climate Variability and Trends is another important activity being conducted by Itaipu. Its main objectives include to identify and analyze extreme climate events in the region during the 20th and 21st centuries, using direct variables and climate indices, and to evaluate, characterize and identify the relationships between temperatures and precipitations. The effort also aims to identify the periods and conditions most favorable to the occurrence of extreme climate events, and to propose new climate indices, adapted to the overall tri-border region. This activity covers all the areas of influence and is being implemented by Itaipu and the Itaipu Technology Park through the Territorial Intelligence Center. As the research progresses, new climate indices are being generated for monitoring purposes. The results of this activity could support future public policies, define interventionist actions and support decision-making activities.

Itaipu has a comprehensive and extensive program for **Reforestation and Restoration of Forest Ecosystems.** For the implementation of the hydroelectric plant complex, Itaipu acquired an area in Brazil and Paraguay of more than 235,500 ha, which includes 135,000 ha for the Reservoir and more than 100,000 hectares of Dry Area, used for forest conservation purposes. The relationship between flooded versus forested area was different from what was usually practiced at the time of construction, if compared to other hydroelectric projects in which small portions of land were preserved. The Dry Area, which refers to the Itaipu Protected Areas, is divided into Biological Reserves, Biological Refuges and Permanent Protection Areas (APP), distributed along the Reservoir in both banks. They are called the Protection Strip. Its purpose is not only to absorb fluctuations in the water level of the Reservoir, but also to contribute to the conservation of water resources, landscape, geological stability, biodiversity, genetic flow of fauna and flora, soil protection and ensure the well-being of the surrounding populations. Conceptually, today, these conservation actions are considered ecosystem based adaptation measures for climate change. In 1979, Itaipu started implementing its largest reforestation program, with the predominant use of native forest. Between 1979 and 1981, approximately 1.3 million tree seedlings were planted. One of the relevant results of such reforestation program is that Paraná, the state in Brazil in which the Plant is located, contributed more to the restoration of the Atlantic Forest in Brazil than any other state. More than 75,000 hectares have been regenerated in the last 30 years, and 28% of this area (or almost 21,000 ha) corresponds to the actions of Itaipu Binacional in the Brazilian margin of the Reservoir. In Paraguay, the reforestation and restoration program began in 1991. It represents one of the main programs being supported and implemented by Itaipu, bringing all kinds of benefits, including global benefits related to climate change. The program covers a very extensive territory throughout all the areas of influence of the Reservoir, stretching from Hernandarias to Saltos del Guaira, for a total of 1,524 km. In relation to the overall objective of conservation of protected areas, Itaipu has developed, and continues to support, the following resilience and adaptive activities: forest inventory; forest regeneration and restoration; collection and germination of seeds and the production of seedlings of native forest species for use in the areas of Itaipu and the Paraná Basin and maintenance of an ex situ genetic bank of native forest species. These activities help ensure the integrity of the biodiversity of more than 100,000 hectares of protected terrestrial ecosystems.

Itaipu conducts various activities designed to **Promote the use of Renewable Energy.** These efforts contribute to the global goals on climate change mitigation by reducing anthropogenic emissions of GHG. Some of these activities include: development of a production chain for silicon-based photovoltaic panels; implementation of solar thermal projects; installation of solar-wind hybrid systems; creation of the International Center for Renewable Energy with emphasis on the development of biogas processes and biogas demonstration units; training courses on solar photovoltaic energy; Western Paraná energy planning; the Atlas of Wind and Solar Potential Energy of Paraguay, and the State of Paraná Solar Energy Atlas, in Brazil. Itaipu also has a representative as the Coordinator of the Observatory of Renewable Energies of Paraguay (OER-PY). The OER is a program of inter-institutional and multidisciplinary technical cooperation that coordinates and promotes sustainable development with the purpose of increasing the use of renewable energy, energy efficiency and the diversification of the energy matrix.

Since 2018, Itaipu has been working on the installation of an **Early Flood Warning System (SATI),** which will provide support by means of preventive actions in real time in cases when rivers could experience rapid overflowing due to unexpected atmospheric and hydrological changes. The Early Warning System for Floods supports decision making processes regarding adverse hydrological phenomena in the Paraguay River and provides essential information to planning processes relevant to the management of associated risks. The system covers vulnerable populations of 24 riverside municipalities in 6 Departments of Paraguay. The implementation of this action is intended to be carried out by the Board of Meteorology and Hydrology. The development of SATI is being carried out by the International Hydrology Center (CIH), interacting with the Directorate of Meteorology and Hydrology and in cooperation with a number of academic institutions. It uses technology fully developed by CIH based on hydrological data used in real time to model river basin behavior. The system allows the elaboration of automated maps depicting possible flooding risk scenarios and is freely available in a web platform. The work carried out has been published in an indexed scientific journal.

Itaipu provides strong support to **Centers for Emergency Supplies** in case of climatological events located in Minga Guazu and Salto del Guaira. The centers were established in partnership with the Paraguayan National Emergency Secretary and other governmental and non-governmental organizations. The main objective of the centers is to provide emergency assistance to families and organizations affected by unexpected catastrophic events, such as floods, windstorms, landslides, hail events, etc. The centers strengthen timely responses with basic supplies such as blankets, mattresses, tents, zinc roof materials, containers and other important supplies critical to families who may have their dwellings partially or totally destroyed due to these unexpected events. The effort includes the use of vehicles specifically acquired for these purposes and temporary living facilities. In addition, the centers are backed by a control informatics system, qualified personnel, emergency offices and drone technologies.

14

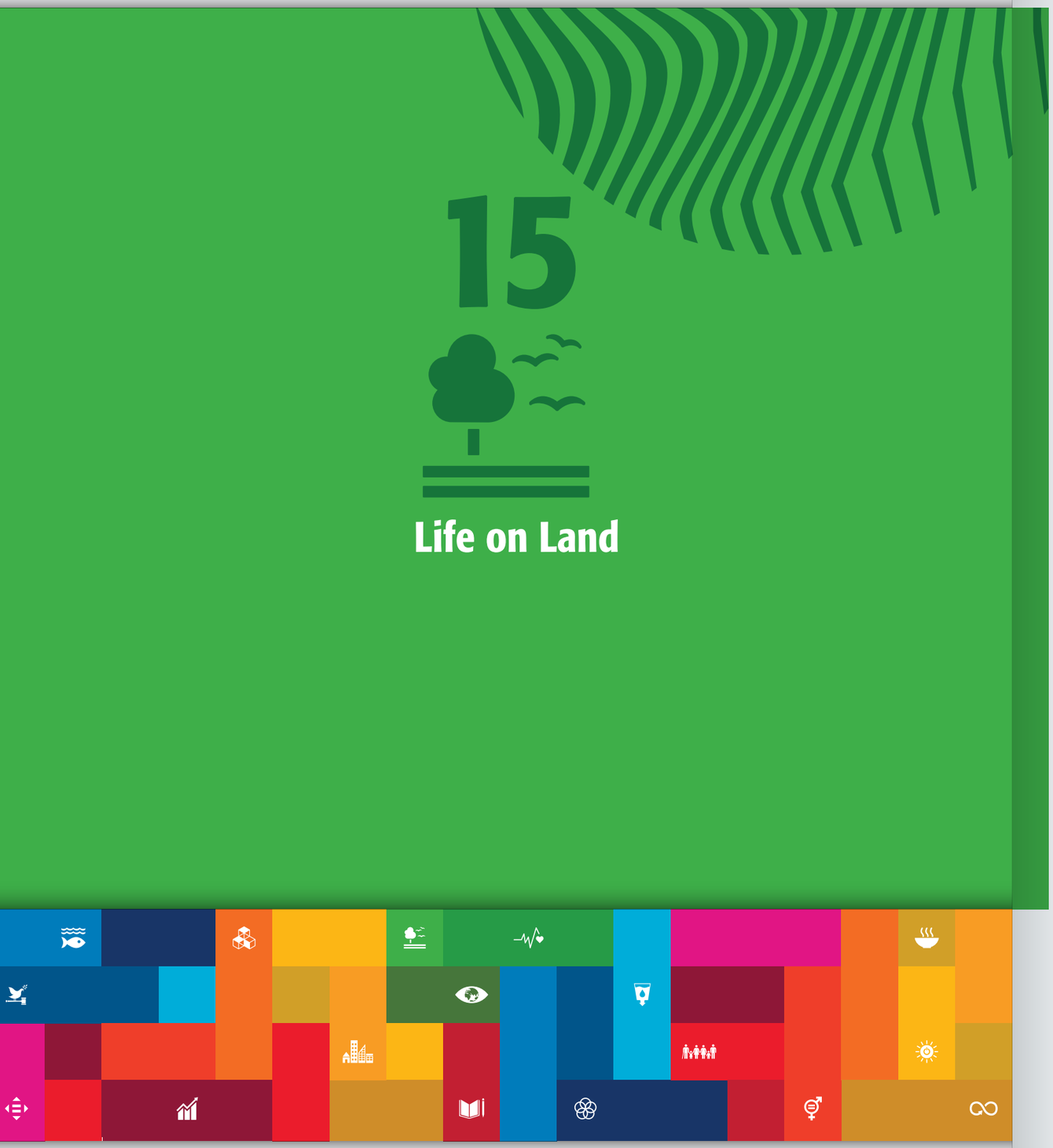
Life Below Water

The most important activities in Itaipu's Sustainable Development Strategy with respect to 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, which acknowledges a continuum system of flows that go from source downstream to oceans. Activities along this chain could have considerable impacts at all stages. Some of the activities that mitigate these source to sea impacts include: practices for soil and water conservation; monitoring of micropollutants; mitigating activities of agrochemicals and other hazardous materials from rural areas; conservation of protected areas; environmental monitoring and control of water and sediments; and Biofloc fish farming, among others.

The **monitoring of micropollutants** and the mitigation of their impacts represent examples of activities by Itaipu that protect water and ecosystems from source to sea. Micropollutants have a direct effect on the water ecosystems of the region including the fresh water in the Paraná River basin and, downstream, the salty water in the Plata estuary in Argentina.

Itaipu recognizes the importance of using the From 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 activities and 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 even global scales. As in the case of climate change, this approach is fully justified to be able to 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 times. Many of the activities being conducted by Itaipu are linked to the flow chain that goes from terrestrial ecosystems, to water ecosystems and ultimately to the Atlantic Ocean creating impacts all along the way. Itaipu, in partnership with several academic institutions, research foundations, municipalities, governmental and non-governmental organizations, develops projects in order to minimize the impacts arising from the use and occupation of the territory under water.



The most important activities in Itaipu's Sustainable Development Strategy with respect to SDG 15 (Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification and halt and reverse land degradation and halt biodiversity loss) are centered on the following activities: implementing an integrated management program of natural resources, protecting and restoring terrestrial and inland freshwater ecosystems with the participation of local communities and all relevant stakeholders; implementing a comprehensive and extensive program of reforestation and remediation in the areas of influence of Itaipu; promoting biodiversity conservation; and implementing a comprehensive program of data collection, statistical analysis and modelling projection of parameters relevant to ecosystems, forests, desertification, land degradation and biodiversity.

A major priority for Itaipu is the **Management, Maintenance and Restoration of Forests in the Protected Belt of the Reservoir.** Itaipu's protected areas were created to guarantee water security and protection of the hydroelectric plant's impoundment, as well as to promote the recovery and conservation of biodiversity of the flora and fauna of the area. These protected areas consist of 101,000 hectares of land in both Brazil and Paraguay along the reservoir. They include the biological refuges, the ecological or biodiversity corridors, and the protected belt which were designed to promote: the conservation of biodiversity within and beyond the area occupied by the reservoir; the genetic recovery of tree species; the continuous action of environmental education; the protection and maintenance of the whole area; and the establishment of forest nurseries for the implementation of one of the largest reforestation programs in the world by a hydropower organization.

In 1975, Itaipu developed the Basic Plan for the Conservation of the Environment, which was a road-map for planned activities and the vital projects, including the constitution of the protected areas of the reservoir. Although reforestation efforts had already begun in 1975 on the Brazilian margin, in 1976 Itaipu and the Federal University of Paraná (UFPR) conducted a forest inventory to identify, classify and qualify forest covered areas in both the Brazilian and Paraguayan margins that found that much of the Atlantic Forest on the Brazilian side had been cleared away for agriculture and livestock. On the Paraguayan margin, however, such agricultural development had not yet occurred, and much of the original forest was still preserved. In this sense, the reforestation program of forest ecosystems of Itaipu began earlier in Brazil than in Paraguay.

In 1979 Itaipu started implementing its largest reforestation program on the Brazilian margin, with the predominant use of native forest. Between 1979 and 1981 approximately 1.3 million tree seedlings were planted. Beginning in 2001, efforts were made to connect remnants of Atlantic Forest, resulting in the Santa Maria Ecological Corridor (1,400 km long), linking the National Parks of Iguaçu and Ilha Grande. In Paraguay, the reforestation and restoration program called Itaipu Preserva began in 2014. The program covers an extensive territory throughout all the areas of influence of the reservoir on the Paraguayan margin, stretching from Hernandarias to Saltos del Guaira, corresponding to 1,900 hectares and cultural care of restored areas and management of 409 hectares of areas under natural regeneration, located in the protected belt of the Itaipu Reservoir. A total area of 2,309 hectares has been affected and it includes the natural reserves of Tati Yupi, Pikyry, Itabo, Yvyty Rokai, Limoy, Pozuelo, Carapa, and the binational biological refuge of Maracaju, which is managed jointly with Brazil.

The Paraguay Biodiversidad program has worked with groups of rural producers, non-governmental organizations, and indigenous communities to restore and conserve parts of the Atlantic Forest of the Upper Paraná. A second stage of this program is focused on consolidating the Biodiversity Corridor of the Atlantic Forest of the Western Region of Paraguay. These efforts are supported by an agreement of technical cooperation with the Inter-american Institute of Cooperation for Agriculture (IICA) and an agreement with the World Bank for international technical assistance.

Itaipu conducts **Genetic Conservation for Ecological Restoration** activities supporting the environmental dimension of sustainable development. The creation of forest germplasm banks was mainly motivated by the recognition of the biodiversity risk situation in forest remnants of a region in the Paraná river basin, a region that covers 8,000 km2, and the need to provide material for the production of millions of seedlings for the ecological restoration of the protected areas and the hydrographic basin.

On the Brazilian margin, in the nineties, activities were conducted to test silviculture models and experimentally evaluate the development of previously little-known species of the regional flora, in addition to executing a project to restore the flora and implement the **Germplasm Bank of the native Atlantic Forest biome.** Genetic recovery was done through the collection of seeds in matrix trees in the region, aiming to increase the genetic base of the seeds that would be used in future restoration projects, respecting the ecological limits of the original forest. Initially, three nurseries were designed and built in the municipalities of Foz do Iguaçu, Santa Helena, and Guaíra, Brazil, to meet the demand for the recovery of Itaipu's protected areas and biological refuges. In these nurseries, more than 20 million seedlings were produced, destined for the organization's protected areas and, currently, also distributed to other areas in the region of the Paraná Basin.

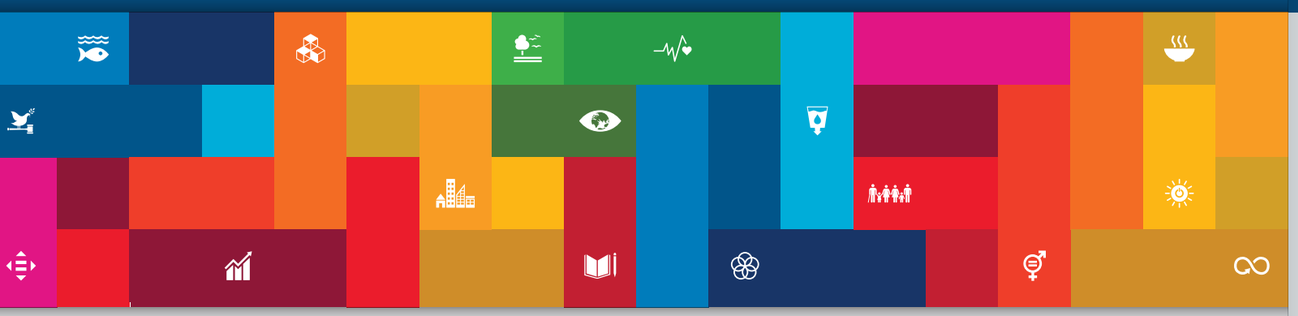
On the Paraguayan margin in Hernandarias, since 1976, the **forest nursery** of the Environment Center has been producing seedlings of native forest and fruit species of interest for conservation, urban tree planting, and forest restoration in Itaipu's protected area, as well as in its area of influence, today recognized by UNESCO as the Reserve of the Itaipu Biosphere, and in other areas of interest nationwide. The nursery has a total area of approximately 7,000 m2. There also is a warehouse for storage, processing and planting of seeds. The average annual production of the forest nursery is about 1.2 million seedlings of some 90 forest, fruit and ornamental species.

The **Conservation of Regional Wildlife Biodiversity** effort for the preservation of biodiversity of fauna native to the Itaipu area of influence began with the Mymba Kuera project in 1982, even before the reservoir was filled in. Through this initiative many animals were captured in the area that would be flooded in order to be relocated and saved. Biologicals Reserves were then created to be refuges for thousands of plants and animals affected by the flooding that formed the Itaipu Reservoir. In 1978, the Itaipu Wildlife Research Center (CIASI) was created in Paraguay as a refuge for animals, many of which were threatened with extinction. CIASI has species of mammals, birds and reptiles that mostly represent the Atlantic Forest of Alto Paraná biodiversity, as well as some species from other regions of Paraguay. One of its main objectives is the reproduction in captivity of wildlife species with conservation problems, for their release in protected areas as population reinforcement. **The CIASI complex** in Hernandarias includes a veterinary hospital to care for the animals in the collection and others brought from the surrounding region. CIASI has an agreement with the Institute of Conservation Biology of the Smithsonian Institution for training in nutrition and care of animals. In 1984, the Wild Animal Breeding Center was built as part of the **Bela Vista Biological Refuge,** in Foz do Iguaçu, Paraná, Brazil, to house the region's species and host the conservation and research of wildlife. Representatives of the different species are kept and allowed to reproduce in properly prepared environments, with a veterinary hospital where animals from the Itaipu refuge and animals brought by the public inspection agencies receive treatment and/or rehabilitation.

The **Monitoring of Invasive Exotic Aquatic Species** began in 1985 to find out the ecological factors that favor their proliferation and their influence on the structure of aquatic communities. The monitoring of aquatic species is performed in the Itaipu Reservoir, in outlets distributed in the reservoir and in the eight main arms of the Brazilian margin, in the case of fish and aquatic plants. The actions developed by Itaipu in relation to invasive exotic species are carried out within the scope of the Environmental Monitoring Program, which evaluates the water and water fauna conditions of the reservoir and its tributaries. The invasive exotic species in the monitored area are the Golden Mussel (Limnoperna fortunei), some fish species and the Aquatic Macrophytes (Hydrilla verticillata and Urochloa subquadripara). Over the years, control measures have been tested for several species. Itaipu has also been actively participating in governmental initiatives to control species dispersal and bioinvasion. Currently, evaluations of a filtration system are being carried out (in loco) to contain the larvae of this species. Monitoring of invasive exotic fish species occurs through the compilation of information from professional and amateur fishing activity, as well as biological information obtained from fish disembarkation assessments. There are records in the Itaipu Reservoir of at least 11 exotic species. Among them, four species come from the Amazon and Tocantins basins and have established themselves as invaders with high abundance in the area, such as Tucunare (Cichla kelberi and Cichla piquiti), Cara (Geophagus sveni) and Corvina (Plagioscion squamosissimus), species present in the region before the formation of the Reservoir. To reduce possible impacts, Itaipu disseminates information and encourages the capture of these species through professional and amateur fishing activity. The monitoring of aquatic plants (aquatic macrophytes) began in 1996, and aims to identify the factors that affect the communities of macrophytes, and those that propitiate the success of invasions and the effects of invasive plants on the communities. Five exotic species are recorded in the Reservoir, with only two invasives: Hydrilla verticullata (native to Asia and North Africa) and Urochloa arrecta (native to Africa). In monitoring, the biodiversity index and the relative abundance of the species are calculated. In each arm of the Reservoir, the maximum depth of occurrence of the main invasive species is also calculated as a way of predicting the occurrence limits and the places where these plants can cause problems for the multiple uses of the waters of the Reservoir.

16

Peace, Justice and Strong Institutions



The most important activities in Itaipu's Strategy for the promotion of peaceful and inclusive societies for sustainable development are related to the protection of children and adolescents, the building of peaceful societies that guarantee respect for women without any type of violence and the enhancing of the well-being of indigenous population valuing their culture, language and heritage. With respect to the goal of building inclusive societies, Itaipu has a variety of programs, initiatives and projects that facilitate the inclusion of everyone regardless of economic situation, ethnicity, gender, disabilities, etc.

The extensive program of scholarships sponsored by Itaipu provide the opportunity of higher education for students of limited economic means, as well as those from indigenous communities and people with disabilities. Through capacity building activities and partnerships, Itaipu is also committed to building effective, accountable and inclusive institutions and organizations at all levels. Promoting and providing incentives for good jobs, especially for young people, is another major goal for Itaipu as reflected by its many educational programs. Internally Itaipu has comprehensive and integrated policies that promote equality and inclusiveness covering areas such as anti-discrimination, management and salary fairness and unbiased contracting that support diversity and respect for human rights.

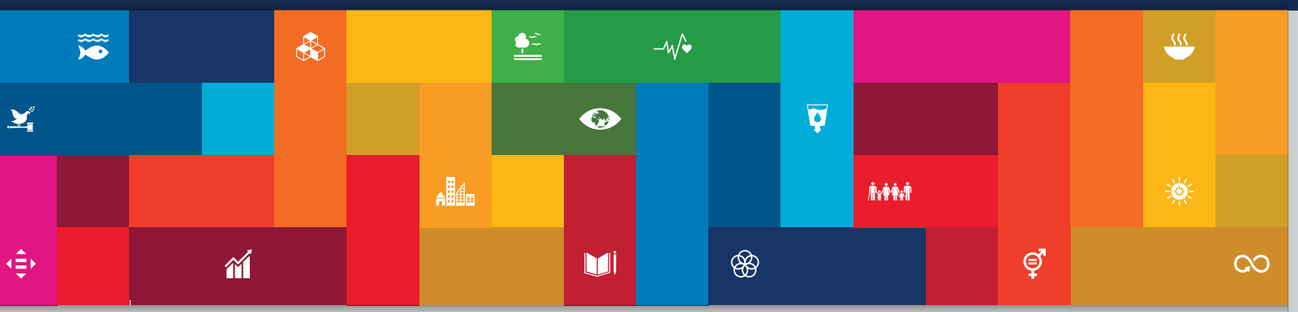
The **Program for the Protection of Children and Adolescents (PPCA)** is a regional initiative aimed at protecting, promoting and defending the rights of children and teenagers, combating child labor, sexual exploitation, use of narcotics and other forms of violence. The program promotes actions related to social inclusion of children, teenagers and their families, thus strengthening relevant protection mechanisms of local civil society that encourage peaceful and inclusive societies for sustainable development. The PPCA also aims to keep children and teenagers out of the risk of being approached for illicit acts, to reduce school drop-out rates and to improve school performance. The effort creates awareness about human rights, the rule of law and justice for all. The PPCA is an example of how Itaipu is helping to promote a culture of peace in partnership with civil society and other local and regional stakeholders, always following a principle of inclusiveness without any form of discrimination. Additionally, the PPCA promotes sports, education, culture and leisure activities through continuous and structured activities and through partnerships with specialized local institutions. These initiatives are important risk reduction actions in relation to violations of the rights of children and teenagers and develop and strengthen personal skills and social values for life that are important for the formation of healthier, happier and more supportive individuals. The activity represents an option for the younger generations that is rewarding and with positive outcomes and an effective alternative to violent and illegal activities that could develop in the streets.

The main objective of the **Integrity and Compliance System** of Itaipu is to establish a formal governance model in Itaipu that integrates the actions of various agencies to prevent, detect and curb the practice of unlawful acts, detrimental to the entity's assets. Following a diagnostic phase in the business environment, steps were taken to improve business practices, business processes, and corporate governance procedures. In 2018, the Compliance Office was created to plan, coordinate, integrate and align the activities relevant to the Integrity and Compliance System, the Corporate Risk Management System and the Internal Control environment. In addition, Itaipu has already adopted strict corporate governance policies in line with global market requirements and international regulations. In 2006, Itaipu adopted the corporate governance by the rules of Sarbanes-Oxley Act. These are the most stringent rules in the international financial market. The implementation of this Act is coordinated by the Sarbanes-Oxley Management Group. Through this effort, Itaipu has strengthened its internal control structure, preventing fraud and ensuring adequacy and transparency, thus constantly improving its economic and financial management. The Integrity and Compliance System is being implemented internally since the beginning of 2018 in all areas of Itaipu, and it also seeks to promote good integrity practices with external stakeholders.

Alexandre Marchetti/ITAIPU Binacional

17

Partnerships for the Goals



For Itaipu, inclusive participation through multi-stakeholder partnerships is a major commitment intrinsically linked to its management system. Itaipu follows policies and practices in partnership with many organizations and civil society that promote prosperity and contribute to improving the well-being of the population in many communities in both Paraguay and Brazil. Itaipu leads important partnerships for the advancement of sustainable regional development, helping to build more responsible, equitable and solidary societies. In Brazil these actions take place mainly in the area of influence Itaipu and extend to many municipalities in the western region of the Paraná state. In Paraguay, many actions have national coverage and benefit different regions of the country.

Through effective multi-stakeholder partnerships at the local, national, regional and international levels, Itaipu is leading and supporting important activities to reduce poverty, increase food security while enhancing nutrition, improve health, foster better education and promote equality with respect to gender, age, disabilities, race, religion, ethnicity and economic status. These partnerships also promote income generation, protection of children and adolescents, respect for human rights, conservation of biodiversity, and sustainable means of production and consumption.

Itaipu, the **Binational Partnership**, was created by Brazil and Paraguay in order to generate electricity from hydropower using the Paraná River, between the Salto de Guaíra to the mouth of the Iguaçu River. Itaipu has the mission of "Generating quality electricity, with social and environmental responsibility, promoting economic, tourism, and technological development, sustainably, in Brazil and Paraguay". Located on the Paraná River, on the border of Paraguay and Brazil, Itaipu Binacional is the result of cooperation between these two nations. It is not only the result of the mechanical, civil, and electrical engineering required for the construction of the plant, but also the result of major diplomatic, financial and legal arrangements. The diplomatic arrangements ensured fair treatment between two independent countries and resolved border issues. The financial arrangements allowed the hydroelectric plant to be financed almost entirely, with debt payments to be made from the electricity generated. Diplomatic understandings between the Brazilian and Paraguayan governments began in the 1960s, after initial studies pointed to the great hydroelectric power potential of the Paraná River. These understandings resulted in the Act of Iguaçu, a document signed on June 22, 1966. The diplomatic studies and understandings between Paraguay and Brazil resulted in the Treaty of Itaipu (and its annexes), signed on April 26, 1973. Itaipu Binacional would be created the following year, on May 17, 1974. The construction of the plant (civil works) would extend until 1982, with the completion of the dam and filling of the reservoir. The electromechanical assembly of the 18 generating units foreseen in the initial project took place until 1992. Another two units were added and opened in 2007 so that total installed capacity reached 14,000 Megawatts (MW). The commercial operation began on March 1, 1985, and, as a result, Itaipu began to pay royalties to the national treasures of Brazil and Paraguay, as financial compensation for the flooded areas to form the reservoir. Since 1985, Itaipu has paid more than US$ 11 billion in royalties, half for each country. It guarantees extra revenue to state entities, such as government agencies and municipalities, to prioritize investment in health, safety and education. Today, Itaipu is the largest hydropower generator on the planet, and a fair example on how two countries can mobilize and redistribute benefits, in a sustainable way, to assist their people, protect the environment and boost both economies. Through its extensive partnership network, Itaipu Binational has emerged as one of the most suc-

cessful and respected binational partnership efforts in sustainable development and environment and biodiversity. Itaipu operates in the physical space occupied by the plant and its Reservoir, on the border of Brazil and Paraguay, as well as in the area of influence in Brazil (over 50 municipalities) and Paraguay (the entire country). Both countries benefit from the payment of royalties and Itaipu's power generation reaches all electricity consumers in Brazil and Paraguay. Today, Itaipu is a major partnership aligned with and committed to the United Nations 2030 Agenda for Sustainable Development, also achieving a world-leading reference position resulting from its work, progress and advance regarding the Sustainable Development Goals and its targets. The Itaipu Binacional Partnership, by going beyond the boundaries of its own original nature and conquering the gaps between these two important nations, has extended its efforts and determination by forming some of the most challenging partnerships at a global level with important world organizations but also at the regional level and with official and private organizations. In addition, Itaipu has extensive partnerships with all stakeholders at the local and national levels, including civil societies and rural and urban communities. Therefore Itaipu is well positioned with its sustainable development transformation network of collaborative and complementing partnerships to support the implementation of the 17 Sustainable Development Goals and its targets and the universal 2030 Agenda of the UN, concretely and factually integrating the indivisible balance required of the economic, social and environmental dimensions of sustainable development. This powerful partnership network of Itaipu has generated a successful account of a significant, outstanding and measurable binational sustainable improvement and development to the region, through the various socio-economic, technological, educational and environmental programs, of different magnitude and scope, that have strategically impacted the whole socio-economic well-being with steady growth and full inclusion, reaching out even to the most vulnerable population sectors in urban and rural areas and indigenous communities.

The Sustainable Water and Energy Solutions partnership between Itaipu and the United Nations Department of Economic and Social Affairs (UNDESA) was created in 2017. The objective of this initiative is to build a global multi-stakeholder partnership and network to enhance capacities, dialogues and cooperation at all levels, for enabling cross-sectoral approaches, advocacy and knowledge management that address the Sustainable Development Goals on water (SDG 6) and energy (SDG 7) and interlinkages with other SDGs holistically, in order to accelerate progress towards the 2030 Agenda for Sustainable Development. Partnership objectives include sharing best practices, experiences and lessons learned, skills development, and global awareness.

The Sustainable Water and Energy Solutions partnership works toward the vision of a world where there is an equitable and sustainable use and management of water and energy resources for all, in support of human well-being and ecosystem integrity in a robust economy, under the umbrella of the 2030 Agenda for Sustainable Development. The vision calls for a new way of thinking and a new form of international cooperation on water and energy. It calls for strong partnerships between countries that share common water and energy resources. It calls for the implementation of a new global business model in which governments, businesses, investors and civil society come together to spearhead action toward sustainable water and energy for all. At the national level, it will require major changes in policies, strategies and regulatory frameworks, as well as changes in institutional arrangements and management practices.

The Sustainable Water and Energy Solutions aims to be a global sustainability network on water (SDG 6) and energy (SDG 7) interlinkages, with a large number of members from all regions and constituencies, including governments, businesses, civil society and international organizations. It provides a unique platform for all stakeholders to enhance capacities and signal their high-level commitment to support the implementation of SDG 6 and SDG 7 in a holistic manner. The goal is for the global network to become one of the largest global multi-stakeholder-based knowledge networks on energy and water.

One of the main objectives of the **International Center for HydroInformatics (CIH)** is to improve the management of water resources with hydroinformatics solutions, promoting development and innovation, building capacities to use and disseminate them in the field of science and water. The International Centre on Hydroinformatics was created through a partnership between the Brazilian and Paraguayan Governments with UNESCO's support to develop innovative solutions and hydroinformatic tools, capacity building and knowledge-sharing in the field of sustainable management of water resources and energy generation. The CIH has been actively contributing to UNESCO's International Hydrological Program (IHP). The IHP promotes the development of scientific and technological bases for the generation of methodologies favorable to a coherent administration of water resources. The existence of the CIH represents a new perspective for the management of the world's waters and benefits all UNESCO member countries, especially those which lack access to technologies, such as those in Africa, Asia and Latin America. Based on the evaluation of the methodology of the management Itaipu applies to hydrographic basins and because of its efficiency regarding the necessary care for the water and the environmental sustainability of activities developed in the region, UNESCO decided to offer Itaipu as a reference to the other 70 watersheds overseen by the IHP on the five continents.

The Center represents a major partnership of Itaipu with a variety of partners including: the UNESCO International Hydrological Program, the Itaipu Technological Park Foundation, the Latin American Energy Organization, the Federal Technological University do Paraná (UTFPR), the National Water Agency (ANA) of Brazil, the National Institute of Space Research (INPE) of Brazil, the Federal University for Latin American Integration (Unila), the Brazilian Federation of Direct Planting and Irrigation (FEBRAPDP), the Federal University of Minas Gerais (UFMG) and the Santa Catarina State University (UDESC).

Itaipu Binacional is a partner of the **International Hydropower Association (IHA)** and an active member of its Board since 2016. The International Hydropower Association is a nonprofit organization committed to advancing sustainable hydropower. The objective of the partnership is to identify, promote and disseminate best practices, and advocate for continuous improvement around the world. IHA researches and shares hydropower statistics and knowledge, and brings together public and private organizations, concessionaires, agencies, consultancies and institutions related to hydro-based energy production. IHA members are active in over 100 countries. The IHA Protocol is the main international instrument for assessing and certifying the sustainability of hydroelectric power practices. To make it acceptable to all sectors, IHA promotes a number of forums in various countries, where the terms of the Protocol are discussed. The actions by Itaipu related to the IHA partnership are implemented at the plant itself and in its area of influence or at the international level through participation in international events. Itaipu's participation in IHA has enhanced its international image and global recognition as a model organization supporting sustainable development and the UN SDGs and 2030 Agenda.

Itaipu has an important partnership with the **Smithsonian Institution.** Today, Itaipu holds under its management the largest Atlantic forest remnants of the Alto Paraná Atlantic Forest, with many species of concern for conservation. The protected areas of Itaipu represent one of the last shelters that safeguard the region's biodiversity, in addition to protecting the hydroelectric resources, reducing erosion and sedimentation of the Reservoir and contributing to mitigation and adaptation to climate change. In that context, researchers and scientists from the Smithsonian Conservation Biology Institute's Center for Conservation and Sustainability joined Itaipu Binacional for a 5-year partnership. The main goal is to exchange

knowledge in order to optimize the effective management of flora and fauna in Itaipu's protected areas, to promote excellence in ex situ conservation of native endangered fauna at the entity's Wildlife Research Center (CIASI), and to promote the conservation of flora at a regional level. This project closely links CIASI and protected areas in a holistic and comprehensive ecological restoration effort at local and regional levels, and seeks to turn it into a global environmental reference center. Scientists and experts from the Smithsonian's National Zoo and Conservation Biology Institute also are working with CIASI and the Center for Protected Areas (CIAP) to become the biodiversity conservation leaders of the Alto Paraná Atlantic Forest of Paraguay.

In the region where it operates, Itaipu Binacional develops a series of initiatives, actions and programs focused on territorial sustainable management, which have received various national and international awards. The International Standard Agreement for Sustainable Territory Management is providing a methodology that enables the objective measurement of the results obtained from actions taken for the sustainable regional development of the municipalities reached by Itaipu, and how actions have really contributed to the conservation of biodiversity and the improvement of the population's quality of life. **LIFE territorial methodology, proposed by the Lasting Initiative for Earth (LIFE) Institute and Itaipu**, represents an important advance in business and citizens' involvement in biodiversity conservation. Instead of looking only for a company by its performance on accountable actions for biodiversity, the territorial methodology development aims at the regional integrated approach to measure and recognize efforts towards sustainable development and positive impacts on biodiversity conservation. In addition to providing this measurement of the efforts, the final outcome of the Agreement will make it possible to integrate the areas of influence and the Brazilian and Paraguayan banks, by participating in the conceptual development phase of sustainable territorial management standards, the empowerment of citizens and the application of standardized tests (PGST), consolidating, moreover, the socio-environmental management process that Itaipu already promotes under the new systematized model that can be used to calculate and measure results. Also, the Agreement is important in that it allows the final product to be taken over by the Itaipu Technological Park Foundation (FPTI) and may then be replicated in Itaipu Binacional's area of operation in the Paraguayan and Brazilian sides. The final product of the Agreement is the standard for Sustainable Territory Management, with national and international recognition, in addition to software developed and tested in the region. Itaipu, with the participation of the institutions involved, will rely on the structure and experience in collecting and analyzing regional sustainability data from the FPTI and the recognized expertise of the LIFE Institute in coordinating groups and technical work to the development and operationalization of international management and certification systems.

In 2003, Itaipu Binacional expanded its mission to encompass a more global, comprehensive approach to sustainability by launching the "Cultivating Good Water" program, a systemic and participatory water management model focused on the environmental conservation, strengthened protection, and the communities around the region where the hydroelectric plant is located in the Paraná Watershed 3. The former Cultivating Good Water program was expanded and is now called the Watershed Program. **Itaipu Binacional's Watershed Program** works according to the concept of the river watershed, so the planning and execution of socio-environmental actions are carried out by micro-watersheds, with a strong participatory component. It is then based on the integrated management of river basins and operates in the basin, sub-basin and micro-basin, aiming to guarantee the quantity and quality of the waters and also the sustainability of the territory. The program depends on community partnerships, between Itaipu Binacional and more than 2,100 partners in the 29 municipalities that make up the Paraná Basin 3, an area of 8,000 square kilometers inhabited by more than one million people. The program is developed in more than 200 micro-basins and their respective communities. The performance transcends the political-administrative division of the municipalities respecting the planning unit of nature itself. The immediate beneficiaries of the program are the residents of the microbasins of the Hydrographic Basin of Paraná 3 (BP3). The program represents a multi-stakeholder partnership that includes environmental organizations, researchers, universities, associations, cooperatives and NGOs. It also includes community representatives, municipalities, state and federal agencies, cooperatives, rural producers, universities, companies, schools, indigenous communities, city halls, local communities, environmental organizations, researchers, universities, associations, cooperatives and NGOs, among others. By 2014, the program had proved that strategic infrastructure projects (especially hydro power plants such as Itaipu Binacional) should be managed on the firm basis of new governance and social participation to become poles of sustainable local development and positive stakeholder engagement in their areas of influence. It also has shown how an ecosystem services approach including climate change adaptation strategies and the nexus among water, energy and food can be put into practice in a strong and feasible way. In addition to all the results in terms of environmental protection and in social and economic inclusion, the cultural change in the relationship among people inside the communities, and in the relationship between people and nature, is another legacy of the program.

The objective of the **Itaiguapy Health Foundation** and partnership is to provide high-level preventive and curative medical and hospital care to the community, through agreements with the public and private health systems and provide conditions for the training and improvement of medical and health personnel. This activity includes partners from federal, state and municipal governments, Itaipu and educational and research institutions. Since 1994, the hospital has been managed by the Itaiguapy Health Foundation and starting in 1996 the hospital began serving patients from the Brazilian Unified Public Health System (SUS). The hospital now has over 16,000 square meters of floor space. In 2007, it achieved a level 1 Hospital Certification, which serves as proof of its quality. Currently, Costa Cavalcanti Hospital ensures emergency room and high complexity hospital services to the entire population of Foz do Iguaçu and the surrounding area. The hospital maintains an agreement with Brazil's Unified Public Health System (SUS) and has 200 beds, 120 for SUS users and 80 for private health plan and agreement users. In 2018, the Foundation was accredited as the first Level III of Excellence institution in Paraná. There were more than 3,400 births, over 2,000 surgeries performed, 5,688 emergency room patients, over 42,000 outpatient visits, and close to 19,700 patients attended at the Oncology Center. In 2019, Itaipu decided to invest R$ 64,7 million in the expansion of the hospital.

The Tesãi Foundation was created by Itaipu in Paraguay to provide medical services to its staff, beneficiaries and to people without economic resources in the region. Itaipu provides financial assistance to the Tesãi Foundation in order to cover its social agreement designed to support health services at no cost for communities in need located in the area of influence of Itaipu. The Tesãi Foundation provides health services to the Infant-Maternal Hospital of Ángeles, District of Franco Hospital, the Maternal and Emergencies Hospital of Yguazú, and the District Hospital of the City of Hernandarias. The Foundation has focused on strengthening health institutional arrangements, personalized treatment and excellent services to its beneficiaries and the communities, always trying to optimize available resources. In addition to this, Itaipu works in partnership with civil society organizations and multilateral organizations to finance and execute projects related to the strengthening of public health care in Paraguay. The objective of these associations is complementary to the work of the Ministry of Public Health of Paraguay, supporting the improvement in infrastructure, the provision of medicine, equipment and ambulances, as well as the training of medical personnel in areas with

limited or poor coverage of health services. The activities focus on health care centers that care for pregnant women, newborns, children, indigenous populations and vulnerable people.

The objective of the **Border Health Program** and partnership is to support health actions in the area of influence of Itaipu and at the trinational border region, including neighbor municipalities from Brazil, Paraguay and Argentina, in line with the respective public sector policies. Members of this partnership include Ministries of Health of Brazil, Argentina and Paraguay, health secretariats, health professionals, and public and private institutions. Itaipu Binacional, via the Health on the Border program, helps increase the number of hospital beds in the area and promotes vaccination, epidemic disease control campaigns, and waterborne diseases. This program has been developed in collaboration with the Brazilian and Paraguayan Ministries of Health, city administrations and state sanitary institutions. It operates in 28 Brazilian cities and 31 cities in Paraguay, reaching 1.5 million people. In Foz do Iguaçu, bed numbers are on the increase, and high complexity services like oncology and heart surgery are provided. In Ciudad del Este, mother and child related specialties have been given more emphasis. In the area of preventive medicine, Itaipu supports binational anti-rabies vaccination campaigns and child multi-vaccination efforts in Paraguay, besides the Binational Campaign against Dengue. The Health on the Border program has its own budget. Funding and the technical and political bases are defined by the Itaipu Health Work Group made up of Brazilian and Paraguayan representatives from various governmental spheres related to the public.

Conclusions

The successful operation and management of the Itaipu Hydropower Plant has guaranteed access to reliable and sustainable renewable electricity to Paraguay and Brazil. Currently, Itaipu is the largest generator of hydropower on the planet, with an annual electricity generation record of 103.1 million MWh achieved in 2016. In 2018, it supplied 90% of the Paraguayan and 15% of the Brazilian electricity consumption.

Itaipu has played a major role creating prosperity in Paraguay and Brazil and in the region for over three decades. Itaipu has successfully supported the expansion of electricity access, effectively inducing the development of the region since 1984. Industrialization, urbanization and transport road expansion have occurred with extraordinary benefits bringing prosperity to the people and enhancing the social, economic and environmental dimensions of sustainable development in the two countries. Itaipu works on research, development and dissemination of new technologies for sustainable development. It stimulates tourism and supports several projects aimed at improving the infrastructure of the region. It generates jobs and economic growth supported by education and training activities and through its extensive partnership network creates an enabling environment for entrepreneurships. The reliable electricity generated through the years has translated into an economic boom for the region, characterized by accelerated expansion of cities and enhanced public services.

Itaipu recognizes that the effective integrated management, conservation and restoration of all terrestrial and freshwater ecosystems are key activities supporting sustainability and the protection of the planet. These ecosystems include forests and wetlands surrounding the Itaipu Reservoir and representing a protected belt with natural reserves, biological refuges, and ecological corridors that protect native flora and fauna and advance research and conservation initiatives. These areas and the reservoir provide valuable connections among important remnants of the Atlantic Forest located in Paraguay, Brazil and Argentina. Itaipu has partnered with municipalities, communities, private owners and other stakeholders to promote the restoration of riverside forests, the formation of ecological corridors and the conservation of agricultural and forest soils.

The strong interconnection between climate change and energy, water and ecosystems are evident for Itaipu, and the current activities and policies related to climate change are key to supporting global efforts on climate change mitigation, resilience and adaptation, inducing sustainable development and prosperity. Itaipu has been able to generate clean and reliable energy since 1984, avoiding the use of fossil fuels and the emission of millions of tons of GHGs to the atmosphere annually.

Itaipu contributes to poverty eradication, food security, good health and education, improving the quality of life of the people in the border region. Its extensive program for affordable housing is illustrated by the creation of the Barrio San Francisco in Paraguay. Its scholarship programs have benefitted thousands of students with limited means, allowing them to pursue tertiary education. Its comprehensive programs in support of indigenous communities have been key for the rescue of the culture and tradition of the Guarani people. Itaipu has strong programs promoting sustainable agriculture, organic farming and food security, which are benefitting over 8,000 family-owned farms. Through its Health Work Group, the Itaiguapy Health Foundation in Brazil and the Tesai Foundation in Paraguay, Itaipu is providing important medical and hospital support for people in the region and especially to those with limited resources and at risk. Education is a major priority for Itaipu as reflected by its many programs on capacity development that are accessible and broad in scope, affordable, and backed with scholarships as necessary while maintaining a focus on technical

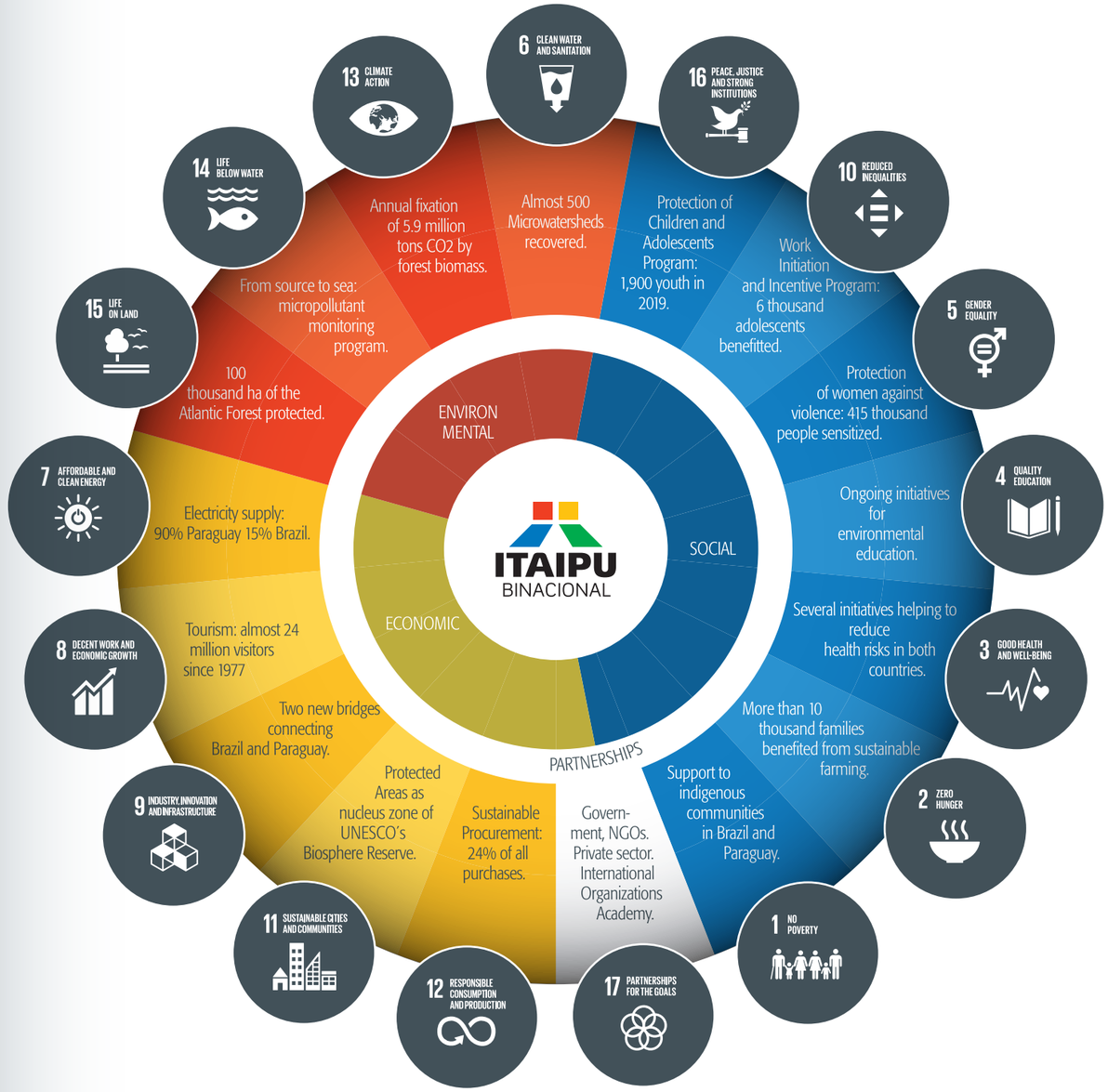
and vocational skills as well as with specializations greatly relevant for the people of the region. Its Itaipu Technological Park is an enabling environment for sustainable innovative solutions promoting entrepreneurship and economic growth.

Itaipu contributes to peace in the region by leading activities for the reduction of inequalities and the promotion of peaceful societies including programs for the protection of women against violence and for gender equity incentives. It also has programs in cooperation with regional partners for the protection and well-being of youth including the Program for the Protection of Children and Adolescents and the Initiation and Incentive Work Program. Itaipu's programs of activities related to peace and inclusiveness, coupled with the promotion of effective and transparent institutions and of the rule of law and the end of discriminatory practices, have translated into a well-recognized and respected organization in the region. One of the main pillars of Itaipu's strategy is its inclusive and fully participatory policies and practices. Through effective multi-stakeholder partnerships at the local, national, regional and international levels, Itaipu leads effective activities inducing sustainable development. For Itaipu, inclusive participation through multi-stakeholder partnerships is a major commitment intrinsically linked to its management. Itaipu follows policies and practices in partnership with many organizations and civil society that promote prosperity and contribute to improving the well-being of the population in many communities in both Paraguay and Brazil. Itaipu leads important partnerships for the advancement of sustainable regional development, helping to build more responsible, equitable and solidary societies. Partnerships among companies, government agencies, institutions and academia are fundamental for the success of Itaipu's actions.

This Synthesis Report illustrates how Itaipu, with specific actions, projects and programs, is effectively moving forward the SDGs not only in Brazil and Paraguay but in South America. Itaipu's activities are excellent examples of "Best Practices" in the implementation of the United Nations 2030 Agenda for Sustainable Development.

UNDESA, New York, December 2020.

ITAIPU AND THE SDGs



UNDESA – Itaipu Binacional SUSTAINABLE WATER & ENERGY PARTNERSHIP

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Alexandre Marchetti/ITAIPU Binacional

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