



**PARTNERS
FOR WATER**

Country Update Argentina

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1) Personal preface Bianca Nijhof, Managing Director NWP

In Argentina, climate change is rapidly changing the country's water situation. Historically water abundant regions have to deal with increasingly frequent droughts and arid areas are faced with ever more frequent floods. Amid these climatic challenges, Argentina's water sector becomes even more complex due to the 2019-2021 COVID-19 pandemic and the economic recession the country has faced during these years.

However, Argentina has a strong market profile, well-educated workforce and great innovation capabilities, which make it an ever-promising market, certainly in the field of water.

It is the Netherlands Water Partnership's (NWP) ambition to connect the extensive knowledge and expertise of the Dutch water sector with international water challenges and experts, among others through the Partners for Water Programme of the Government of the Kingdom of the Netherlands. Excellent examples of already existing cooperation in Argentina are the Arroyo Morón project in Buenos Aires city and the Zaraté project in Buenos Aires province, where Dutch and Argentinian water experts teamed up, leading to innovative solutions for Argentina's water challenges.

Within this context, the Latin America team of NWP is happy to present to you this Argentina Country Update, realised under the framework of the Partners for Water Programme. The update shows a clear picture of the complex Argentinian water sector and the water challenges in the country, an outlook to the future and opportunities for Dutch involvement. Hereby, we encourage the continuation of good water cooperation between Argentina and the Netherlands in order to find futureproof solutions together.



Bianca Nijhof

Managing Director NWP

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3) Introduction

This report elaborates on Argentina's main water challenges and implications for investments that can contribute to the sustainable development of the Argentinian water sector. Groundwater and surface water resources are seemingly abundant in Argentina, but unequally divided between different geographic locations and between groups in society. At the same time, some water resources are threatened to be polluted or overexploited. There also remains work to do in terms of unequal or insufficient access to drinking water and sanitation services. All of the aforementioned poses a challenge for the sustainable development of the country's water sector and the progress towards SDG 6; Clean Water and Sanitation, and also impacts other related SDGs. Extreme weather events, urbanisation, pollution of water and soils and changing land use patterns threaten the agricultural sector, which is true for many countries with a strong agricultural identity. These trends are important in that they jeopardize Argentinian food security and the country's economic sustainability (SDGs 2, 8 and 15).

While it has been difficult in Argentina to effectively address its water challenges, big steps have been taken to work towards a sustainable development of the water sector. A National Water Plan was introduced in 2016 with ambitious goals to improve access to water, sanitation, food and energy and adaptation to extreme weather events (OECD, 2019). This shows a political willingness to improve. Moreover, there is a unique momentum to transition faster and better from crisis to risk management (OECD, 2019). Furthermore, Argentina has a high-skilled labour force. And despite recent political changes that have caused a seemingly slow transition on the National level, the Federal system provides significant authority at regional levels, where much good work is being done in terms of water-related challenges and respective solutions.

We must not forget that despite an economic crisis and a slow political transition, the water-related challenges that Argentina has faced in recent years have not gone away, and the country could benefit from an appropriate response and possibly international influx of best practices and innovative, cost-effective ideas.

Argentina in times of COVID-19

At the time of the development of this report, the world continues to battle the COVID-19 pandemic. Argentina is no different and in May 2021, infection cases continue to rise in a fourth wave, but it remains complicated to predict future trends. By May 2021, the Argentinian Government indicated to have vaccinated approximately 20% of the population with one dose and approximately 6% with the full 2 doses, mainly with the Russian vaccine Sputnik V.

Gaining control over the pandemic outbreak – worldwide, but particularly in Argentina – should allow the Government to gain some more political momentum and public support in their success of bringing an end to the health crisis. Furthermore, it will allow Argentina to return its focus on problems other than the pandemic, particularly to address the economic situation (including water-related challenges).



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Figure 1: Daily confirmed cases of Covid-19 in Argentina

Source: John Hopkins University, retrieved from:

<https://ourworldindata.org/coronavirus/country/argentina?country=~ARG> at 26-05-2021

4) Climatic conditions and geographic information

Argentina is the second largest country in South America with diverse geophysical landscapes ranging from tropical climates in the North to tundra in the far South. The country covers desert areas and rainforests, large wetlands as well as densely populated urban areas. Argentina has a population of around 45 million people of which one third lives in the metropolitan area of the capital Buenos Aires. 92% of Argentina's population lives in urban areas (OECD, 2019). The Andes mountain range in the West that stretches over the full length of the country forms the frontier with Chile and on the eastern side Argentina borders the Atlantic Ocean. Furthermore, Argentina is home to the third largest Delta in the world, sharing the Paraná River with neighbouring countries Brazil, Paraguay, and Uruguay.



Figure 2: Map of Argentina

The Paraná Delta is an estuary delta and a wetland, and it is part of the Río de la Plata Basin. The Río de la Plata Basin is inhabited by 22 million people and is of major hydrological importance, draining water from a large part of the continent (Zagare, 2011). 85% of the total surface water available in Argentina is found in the Río de la Plata Basin, where most of the population and economic activity is

concentrated (OECD, 2019). In the Paraná Delta, the Paraná River flows into the Río de la Plata, creating the Río de la Plata Estuary. In the Paraná Delta, different types of land uses compete, and the difficult objective is to balance urban growth, economic activities - like agriculture, logging and tourism - and environmental conservation of the wetland's ecosystem (Zagare, 2011). App. 24.000 people depend on the wetlands for their livelihoods, for fishing and farming. The wetlands are under pressure due to infrastructure development, large-scale livestock farming and (mainly rice and soy) agriculture (Wetlands International, 2015).



Figure 3: Location of the Paraná Delta and Río de la Plata estuary system. Source: Zagare, V., (2011).

Argentina is rich in water resources, but they are unevenly distributed in the country. Whereas the Paraná Delta and the Río de la Plata Basin have abundant water resources, other areas are arid or semiarid, such as the San Juan or La Rioja province, with limited annual rainfall and scarcely available surface water.

As is generally the case for regions with limited rainfall and insufficient access to surface water to meet all user needs, groundwater becomes an important source for both domestic and agricultural use. Groundwater abstraction in Argentina consists of 30% of total water withdrawal (OECD, 2019). Argentina has significant groundwater resources available and is home to one of the world's largest aquifers: the Guaraní Aquifer. Argentina shares the Guaraní Aquifer with Paraguay, Uruguay, and Brazil. Argentina is only responsible for 1% of withdrawal rates for the aquifer, with Brazil withdrawing 94% (Sugg et al., 2015). In 2010 the four countries signed the Guaraní Aquifer Agreement (GAA) about shared governance of the groundwater resource. After signing the agreement, Argentina and Uruguay were the first to endorse it in 2012, and in April 2018, Paraguay was the last country to officially ratify the GAA (Leite and Ribeiro (2018).



Figure 4: The Guarani Aquifer region. Map credit: Lily House-Peters. retrieved from Sugg et al., 2015

5) Economic situation and opportunities for investment

5.1 Economic sectors

Argentina's powerful economy is mainly dependent on services and manufacturing (Britannica, retrieved on 26-02-2021). Furthermore, agriculture is an important economic sector in Argentina, contributing 7,2% to the national GDP in 2019, and being one of the world's most productive global crop exporters (World Bank, 2020). Most agricultural ground (30-40 million hectares) in Argentina is rainfed. Only 2.1 million hectares are irrigated land. The agricultural sector represents the biggest water user in the country. The main crops grown in Argentina include maize, wheat, and soy, which are mainly grown in the Pampa Húmeda region. Grapes are mainly grown in the Northwest, in the provinces Mendoza and San Juan, the wine areas. In the northern provinces with a warmer climate, sugar cane is grown, combined with citrus fruits. The Río Negro (Black River) irrigation district in Patagonia mainly produces fruits, particularly apples and pears (Britannica, retrieved on 26-02-2021).

Livestock including cows and chickens are also an important source of income. Wheat, soy products (including grain, oil, and soy flour) and maize are the agricultural products that are most exported (International Trade Center).

Argentina has extensive gas and oil reserves (World Bank, 2020). Argentina holds one of the largest oil and gas reserves in the world: in the Vaca Muerta shale formation in the Neuquén province, located in northern Patagonia (Nacla, 2020). The energy secretary announced in the summer of 2020 that he plans to promote oil and natural gas production and increase energy production. The aim is to increase energy exports as a strategy to pull the economy out of the economic crisis and to safeguard domestic energy needs. Specific focus will be on increasing the export growth of the Vaca Muerta formation (S&P Global, 2020). Fracking, the process that is used to extract the shale gas, is extremely water consuming. Wells that are used for the process, use up to 640 water trucks and after the fracking, the water is too contaminated to put back in nature. There is also a risk that the process contaminates groundwater reserves (Americas Quarterly, 2019). At the same time, there are big concerns about human rights violations as a result of the oil and gas industry, the contribution of fossil fuels to the climate crisis and even the economic viability of the sector (Nacla, 2020). Nonetheless, it is clear that the reserves present an enormous economic potential for a country that is in need of an economic resurgence. Therefore, it is expected that the reserves will be exploited, even though the timeline and scale remain uncertain. It is a matter of responsible and sustainable exploitation, carefully balancing economic and environmental considerations. The international water and energy sectors will keep a close eye on these developments.

In 2016, the mining sector contributed 1% of the Argentinian GDP. In 2017, Macri's Government signed a new mining deal to attract more foreign investment in the mining sector (Oxford Business Group, 2018). Mining activities pose a threat to water access for communities surrounding the mines. Especially in the Western provinces, that are arid and semi-arid and are dependent on water resources from glacier water from the Andes, conflicts about water and protests against mega-mining have occurred in recent years (Revista Pueblos, 2016). Moreover, mining represents a serious threat to water quality and health, due to chemicals and heavy metals used in the mining process. There have been several incidents of cyanide leaks to water basins in the gold mining industry (gcap, 2017). However, as with the gas reserves, there is an economic potential in the mining industry that is simply too important to overlook. Increasing sustainability in mining practices will be a significant step forward in the development of the mining sector (not exclusively in Argentina).

There is great potential for renewable energy in Argentina; it is home to the Western Hemisphere's best wind resources and some of the world's best solar resources. Argentina was rated 9th globally on the Renewable Energy Country Attractiveness Index by Ernst & Young, which is the highest ranking for a Latin American country (Forbes, 2019). In 2018, energy derived from renewable sources represented 4% of the total capacity (KPMG, 2019). In 2017 the Argentinian government launched a renewable energy bidding programme called RenovAr, with the target to produce 20% of Argentina's electricity from renewable sources by 2025 (World Bank, 2017). The RenovAr programme secured 730 million dollars in partial project guarantees from the World Bank (Forbes, 2019). As part of the programme, the FMO has signed an agreement for 51 million dollars with Genneia, an Argentinian renewable power generation company, for wind farm construction (FMO, 2019).

5.2 Macroeconomic snapshot

With a Gross Domestic Product (GDP) of approximately USD 450 billion, Argentina is one of the largest economies in Latin America (World Bank, 2020). Nevertheless, Argentina does have a long history of political and economic instability, with significant growth fluctuations every year. The Argentinian

economy has been characterised by recurrent cycles of growth and recession and that is unlikely to change in the short term. In 2018, the currency depreciated sharply, and gross public debt reached 81% of the GDP in the second quarter of 2019. In 2019, the country had a negative GDP growth of 3.1%. South America's second largest economy is expected to contract for a negative third year in 2020. Argentina has been facing yet another economic crisis, triggered by mounting deficits and debt, and political instability with sharp swings between governments of the right and left.

In an attempt to solve its historical debt problems and recurring economic crises, Argentina received an USD 57 billion loan for the International Monetary Fund (IMF) in 2018 during the administration of President Mauricio Macri. Argentina has received numerous debt relief packages from the IMF throughout its history and has entered into tough negotiations, and sometimes even animosity, with the Fund just as often. The USD 57 billion, however, was the biggest loan in the IMF's history. In 2020, the administration of President Alberto Fernandez opened negotiations to restructure the loan as it failed to lift Argentina out of the economic crisis (Porzecanski, 2021).

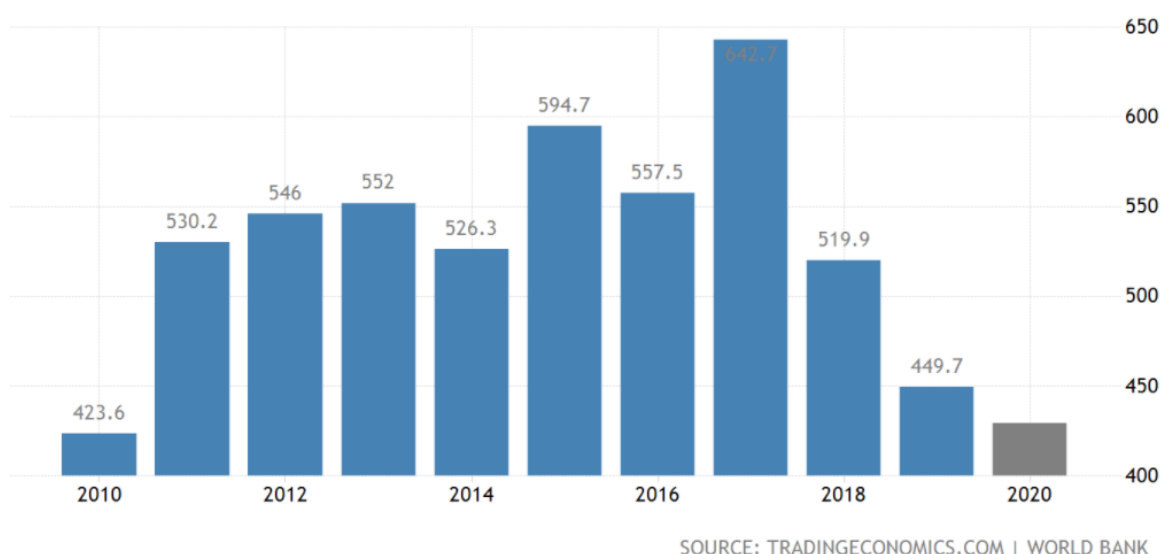


Figure 5: Argentinian GDP 2010-2019 (with expectation of 2020). Source: tradingeconomics.com

The Argentinian Government has faced difficulties in fighting high levels of poverty and unemployment, and almost half of the national workforce is thought to be employed in the informal sector. The social situation of the country is characterised by constant underlying tensions between the Government and trade unions over reforms. The country is also split between central and decentralised authorities over the distribution of federal revenues. Infrastructure networks require more investment as access to electricity and water in rural areas is not always ensured.

While these statistics and forecasts are anything but uplifting, there is a silver lining. As mentioned, there is historic precedence with regards to growth and contraction alternating cyclically. Additionally, the size of the market is undeniable, as is its potential. But much will ride on international sectors finding smart ways to invest in Argentina, as well as the Argentinian Government supporting its productive sectors and improving hinterland connections between production and ports and related logistic channels to facilitate export flows.

5.3 Investment climate

Due to strict fiscal requirements attached to a loan from the International Monetary Fund, investment conditions for the Government are challenging (OECD, 2019). Because of the macroeconomic situation

and a high level of risk and uncertainty, there has been a reluctance from private investors to invest in water-related infrastructure projects.

According to the OECD, the current investment framework does not enable the mobilisation of the required finance to achieve Argentina's water policy objectives and the overall investment environment is weak. The national Government has limited ability to execute international financing due to limited fiscal space. Secondly, there is a lack of investment strategies which lowers the impact of public investment. Some provinces lack the local capacity to plan, operate, maintain and finance projects, which undermines the effectiveness of public investments. The favouring of capital investment does not lead to many investments in water-use efficiency measures. Lastly, there is not an adequate system to prioritise projects according to criteria, which implies that the most efficient and adequate projects are implemented and that project selection is potentially influenced by political interference. The Ministry of Finance and the Chief Cabinet Office establish the public investment budget and shortlist projects, but it is unclear how this selection is made (OECD, 2019).

The Inter-American Development Bank (IADB¹) also acknowledges the challenging business climate, due to macroeconomic balances, state inefficiency, infrastructure and energy shortcomings, absence of a disaster risk management strategy and climate change mitigation strategy and high levels of insecurity (IADB, 2016).

The international investment community, including the IFIs, are in need of a certain stability in policies and investment framework to justify infrastructure development with a long Return on Investment (ROI) window.

Investments are and will continue to be complicated by the macroeconomic situation and inefficiencies, affecting continuity and predictability of public water policies. At the same time, it creates a unique momentum to transition faster and better from crisis to risk management (OECD, 2019).

5.4 Impact COVID-19

The impact of COVID-19 has been significant in Argentina. Argentina's reaction to the pandemic has been one of the toughest in Latin America, with a strict lockdown and closure of almost all industries, a ban on flights and out-of-house social activities. The pandemic hit Argentina at a bad time: the country was already in an economic crisis with high debts and a new government had just started three months before the pandemic hit Argentina (Financial Times, 2020). In the second quarter of 2020, the country had a decline of 16,2% in its GDP, the largest retraction in its history. The Argentinian Government has aimed to mitigate the impact of the crisis by a package of emergency measures to protect the most vulnerable groups and support companies. This programme is expected to bring the fiscal deficit in 2020 to more than 10% of GDP, which is the highest deficit in more than three decades. Estimations are that inflations will accelerate in the coming months. Samples show that 92% of Argentinian SMEs consider the benefits granted of the Government insufficient (Palacio, 2020). That is worrying in a country where 70% of jobs are provided by SMEs and they represent 45% of the GDP (Financial times, 2020). Social isolation has led to dramatic increase in unemployment and poverty. The crisis aggravated the long impasse that the economy has been facing for a decade and will increase uncertainty about the political future of president Fernández, with parliamentary elections coming up in 2021 (Palacio, 2020).

And yet, despite this gloomy economic picture, Argentina remains a land of opportunities, especially in the sectors where the Netherlands are strong such as port development, logistics and value chains, agri-food and the energy sector. Not coincidentally, water runs a connecting thread through most of

¹ Sometimes also abbreviated as IDB or BID, after its Spanish name *Banco Interamericano de Desarrollo*.

these sectors, as will be demonstrated in chapter 4 in the Partners for Water Programme overview. Furthermore, opportunities manifest itself in both public and private sector spheres, as well as academic interest from both sides.

6) Partners for Water Argentina – the Netherlands

Argentina and the Netherlands have maintained a good bilateral relationship over the years. In the water sector the cooperation started in 2016 with the first DRRT missions in the province of Buenos Aires. The relationship was further intensified in 2017 through a memorandum of understanding under the umbrella of the Partners for Water Programme, which has resulted in a variety of projects and activities. In this chapter, projects that are executed under the Partners for Water Programme are elaborated to provide insight into what has been done and is still being done.

The Partners for Water Programme 2016-2021, jointly implemented by NWP and the Netherlands Enterprise Agency (RVO), supports and promotes the Dutch water sector in urban deltas and catchment areas. Rapid urbanisation is putting pressure on these regions' food, water and energy production chains. The Dutch water sector can play a significant role in mitigating the effects of this pressure.

Within the Partners for Water Programme, various projects have been proposed, in some cases implemented, while others are in varying stages of development.

The programme was subdivided in three focus areas within the Argentinian context: the Paraná Delta, the Metropole area of Buenos Aires and the supplying hinterland (Pampas).

6.1 Paraná delta

Main Goal: Contributing to the sustainable, integral development of the Paraná delta.

6.1.1. Sustainable Development of the Paraná Delta

Strategic study into the sustainable development challenges (and thus opportunities) in the Paraná Delta, finalised in 2018 by a collaboration of Deltares and the national Argentinian water institute INA. Other organisations that contributed to this project were FABRICactions, One Architecture, and H+N+S.

6.1.2. Pilot Zaráte

The Zaráte Project in the Paraná delta has the objective to develop a vision for a sustainable development and spatial planning, design its implementation strategy and sketch a start-up project for the island sector of Zárate. The emphasis in this process is on the application of Building with Nature's (BwN) design methodology. The programme was completed in Q2 2021.

6.2 Metropolis Buenos Aires

Main goal: improving the water quality and sustainable management of water quality and sustainable wastewater treatment for 14 million people in the Buenos Aires region.

6.2.1. Pilot Arsenic Removal from drinking water

AySA, KWR and Royal HaskoningDHV started the Low Energy Arsenic Free (LEAF) project in 2019 focusing on removing arsenic from groundwater. This pilot project focuses on drinking water supply technologies and arsenic-removal treatment systems that use less energy, in the metropolitan area of Buenos Aires. The goal is to expand this project to other provinces if it is successful. After some initial delays due to COVID-19 and changes in AySA leadership, the programme will be implemented in 2021.

6.2.2. Pilot Morón-Hurlingham in watershed of the Reconquista River

Argentinian water management authorities, AySA (a drinking water and wastewater company) in collaboration with the Waternet water authority, the Department of Urban Planning and Sustainability of the City of Amsterdam and Deltares have developed a strategy to improve the water quality in the Reconquista / Morón river basin. This strategy is an integrated, collaborative approach which includes technical solution, urban planning, solid waste management and models for sustainable financing (Deltares, 2019).

6.3 Delta Supply System (Pampa)

Main Goal: interventions in the productive region of the Pampa, focused on improving the hydrological balance in the agricultural heart of Argentina. Furthermore, stimulate integral corridor development including multimodal transportation and logistics.

6.3.1. Project Regional corridor development

Research (by STC and Deltares) into the feasibility of a Hidrovía Canal connecting the agricultural hinterland of Argentina with the export ports, considering logistic zones, inland waterways connections and water storage functionality.

6.3.2. Improve Water Balance Pampa Húmeda - Laboulaye

The Laboulaye project, in collaboration with the Provincial authorities of Cordoba, has been in various phases of preparation throughout 2019 and 2020. Finally, in 2021, the project will get its implementation, seeking an integral vision for economic development, with a specific emphasis on the use of model data in conjunction with agricultural activity. Furthermore, inclusive stakeholder participation in the Pampas region is a key component of this project.

6.3.3. Opportunity for concession contract for inland dredging of Paraná River between Paraguay and export ports of Argentina.

This is ongoing, as the current contract is about to expire, and the embassy maintains close watch on the development of the new tender on behalf of the Dutch dredging and port development sector.

6.4 Other Activities & Projects

- Port Consultants Rotterdam was involved in an advisory project for Port of Bahia Blanca, the main port in the Buenos Aires Province. Port Consultants Rotterdam developed the vision and later the master plan for Port of Bahia Blanca. This strategic plan aims to manage sustainable growth of the port and promote economic development of the region and the country.

- Port of Rotterdam advises / collaborates with Port of Buenos Aires on redevelopment of port (MoU March 2017).
- IHE Delft and AySA have entered a collaboration to co-develop training for Urban Sanitation. This was done through FUTRASAFODE, the legal entity used by AySA to channel these types of capacity development activities. Trainings consisted of 9 short courses in 2018 and 2019.
- Water Governance project “Blue Deal General Lavalle” (and partially the metropolitan area of Buenos Aires) – with a focus on the supplying system.

The Blue Deal Programme is an initiative of the Dutch Water Authorities, the Dutch Ministry of Foreign Affairs and the Ministry of Infrastructure and Water Management. For this project, the Brabantse Delta Water Board supports the province of Buenos Aires with improving water governance in the Tandil – General Lavalle river and delta area. Activities include the stimulation of the establishment of local cooperative water management cooperatives and the supporting the development of a water management plan for the river basin.

- Buenos Aires [Climate Action Plan 2050](#)

The City of Buenos Aires has developed a [Climate Action Plan 2050 in line with their commitment to being carbon neutral, resilient and inclusive by 2050](#). Buenos Aires is clearly experiencing the effects of climate change, with more heatwaves and sustained annual rainfall. The Climate Action Plan is designed to give guidance by formulating actions, instruments and strategies for adaptation and mitigation to climate change to reduce the vulnerability of people and natural systems.

7) Water-Related Challenges and Opportunities

While it would be incorrect to assume that all water-related challenges can be successfully captured in this report, we do see specific attention being given to (and related opportunities arising in) the areas of groundwater, surface water contamination, climate change-related developments and drinking- and wastewater access. Particular attention needs to be paid to the context of the discussed challenge. Problems in urban areas – even about the same topic such as groundwater or drinking water access, for example – are likely to be fundamentally different from these same topics in rural regions.

7.1 Groundwater

Groundwater abstraction is an important source of Argentina’s water use. It makes up for 30% of the total water withdrawal in the country and it an important resource for both rural and urban areas (FAO, 2015). However, the groundwater challenge is not a universal concern across the country. Whereas some regions are dealing with overexploitation, others are specifically dealing with an elevated water table, and waterlogging and flooding as direct consequences.

7.1.1. Exploitation of groundwater resources

Especially in the western regions, that are arid and depend heavily on agriculture, there are large, exploitable aquifers. Groundwater management brings along a variety of challenges (GWP, 2013):

- Decreased recharge due to land-use changes,
- Overexploitation
- Contamination

As mentioned before, the Guaraní Aquifer is considered one of the largest groundwater sources of the planet and it underlies 4 countries. Transboundary management of the aquifer is a challenge, because of the invisibility and geological specifics of the aquifer and the political tensions and institutional fragility. Argentina is only responsible for 1% of withdrawal rates for the aquifer, with Brazil withdrawing 94%. In 2010, these 4 countries signed a formal cooperation agreement, which is an important step in managing the groundwater sources. In 2018, Paraguay was the last country to officially ratify the agreement. However, this does not solve the challenges, especially since the water demand is ever growing (Almeida Leite & Ribeiro, 2018).

7.1.2. Contamination of groundwater in urban areas

In Argentina's urban areas, many aquifers are at risk due to human and natural pollution. Groundwater bodies are threatened by pollutants of natural origin (arsenic and fluorine) and anthropogenic origin (nitrates, fecal contaminants, pesticides). In some areas, drinking water supply that is provided by groundwater resources surpass the threshold of levels of arsenic recommended by the World Health Organization (OECD, 2019).

7.1.3. Challenges and opportunities

Opportunities for this challenge are in (transboundary) groundwater management and in understanding the groundwater – surface water interaction and subsequent water resource availability. For managing aquifers, it is necessary to understand and identify the geological specificity of the aquifer, its potential of use, water quality and possibility for recharge. At the same time, efforts should continue to be made to strengthen the involved institutions (Leite & Ribeiro, 2018).

“Pollution of groundwater sources of water due to bad aquifer management (...) and the deficiencies in the sanitation systems resulting in direct contamination of water supply sources are considered the most important environmental problems in Argentina. Substituting groundwater resources with surface water can help limit exposure to natural contamination. However, with increasing surface water pollution, this option is less feasible and water treatment prior to consumption actually becomes mandatory.” (OECD, 2019 p25).

7.2 Pollution of surface water

Pollution of water resources is increasingly threatening the Argentinian water supply. The primary source of pollution of surface water is industrial and domestic discharge without adequate treatment (OECD, 2019). Pollutants such as arsenic, chromium, copper, zinc and lead, derived from industry, urban areas or agriculture are found in rivers. In 2013, the Riachuelo River was named one of the ten dirtiest places on Earth (Waller, 2017).

In dry areas, salinisation of water resources and soils is a serious threat, especially for the agricultural sector. Polluted water resources present a serious risk to the public health, especially since a big part of the population is not connected to drinking water supply and is dependent on ground or surface water for their water requirements (OECD, 2019).



Figure 6: Garbage along the Riachuelo River. Source: <https://www.americasquarterly.org/article/oil-sewage-heavy-metals-the-pollution-plaquinq-latin-americas-water/>

7.2.1. Challenges and opportunities

Contamination issues can be addressed with a wide range of tools, ranging from behavioural change to introduction of anti-dumping regulations and enforcement. The problem is well-known, but the solution is a lengthy process. Opportunities include smart filtering for both domestic and industrial applications. Furthermore, increased water quality monitoring, to identify hotspots of contamination, and detection methods for heavy metals and arsenic can also be extremely valuable in densely populated urban areas around major river arteries.

7.3 Extreme weather events

Extreme weather events are a threat to Argentina's economy. Floods cause 95% of the economic damages due to disaster events (World Bank, 2016a). As a result of trends of population growth and urbanisation, more cities are nowadays located in low-lying and flood-prone areas. Therefore, an increasing number of people are exposed to flood risk, with large economic losses and tragic consequences. This disproportionately affects lower income groups (OECD, 2019). Argentina is one of the world's 14 countries most affected by flood disasters (IADB, 2016). This was an important driver behind the development of the Laboulaye project for example.

Droughts also have a significant impact on Argentina's economy, particularly for the important agricultural sector. In 2017-2018, Argentina faced one of the worst droughts in 50 years, with an estimated economic impact of 2% of the GDP (OECD, 2019).

In Mendoza, Argentina's wine region, wine production is under threat due to extremely low water availability. In 2019, the province received just 10% of the expected snow melt, due to rapidly melting

glaciers (Americas Quarterly, 2019). This development has a high economic impact considering that total wine exports amounted to USD 804 million in 2019 (OEC, 2021).

7.3.1. Challenges and opportunities

The IADB reports that Argentina has limited capacity to manage natural disasters, which has led to considerable losses. Most large-scale disasters are related to floods and landslides due to heavy rains. They recommend fostering environmentally sustainable solutions and support for climate change-related disaster risk management (IADB, 2016).

Opportunities exist in areas of climate-smart agriculture, circular resource usage and overall increased efficiency of water usage. Additionally, flood protection measures (grey and green), nature-based solutions and regional risk assessment studies are needed. Finally, water governance models emphasising equitable division of available resources and priority structures under various conditions are difficult to implement, but necessary in a scarcer environment.



Figure 7: grapes in Mendoza. Source: Carolina Marinelli via Unsplash



7.4 Access to drinking water and sanitation services

In 2015, 84,4% of the Argentinian population was connected to a public drinking water network and 58,4% to sewerage. However, there are large inequalities in drinking water access; in rural areas almost half of the population (45,3%) is not connected to drinking water supply, and only 6,4% is connected to sewerage (OECD, 2019). A 2016 survey showed that in informal settlements, 98% of people do not have regular access to a sewerage network and 95% do not have access to running water (GCAP, 2018).

The overall performance of the water services providers in Argentina is low when compared to other water companies in Latin America (OECD, 2019). Efficiency is generally low and staff costs include a large share of overall expenditure. In the outskirts of large cities, there are risks of poor water quality and pollution due to poor maintenance of networks. Water losses are high; leakage rates are average 40% to 45%. There is room for improvement in terms of available technical capacity to carry out socio-economic assessments or to monitor implementation in project development. Moreover, there is a lack of available training of personnel and lack of maintenance of infrastructure, as is to be expected in an economic recession where funds get otherwise allocated. The decentralisation and fragmentation of water and sanitation services makes it difficult to coordinate the sector and implement national decisions. The Secretariat of Infrastructure and Water Policy has set up various local mechanisms to coordinate this; the Metropolitan Water Board (AMBA), the Plan Belgrano Executing Unit and the management and results plans (PGRs).

The revenues from water tariffs do not cover the costs of the Argentinian water sector. Partly, this is because the real costs are not reflected in the price of water and because of the large amount of non-revenue water and because of low staff efficiency (OECD, 2019). The tariff system is based on a fixed rate regardless of the consumption and this does not encourage rational water use (World Waternet).

Moreover, there is a lack of incentives to promote efficiency in the operation of assets. According to the OECD, there has been more focus on investing in the building of new infrastructure than on improving efficiency and increasing sustainability of projects over a long timeframe. National plans particularly locate funds to large infrastructure to increase access to water services. Less funds target water losses, such as non-revenue water (OECD, 2019).

In the 1980s, the provision of drinking water and sanitation services was transferred to the provinces, with the decentralization of the state-owned Obras Sanitarias de la Nacion (ONS).

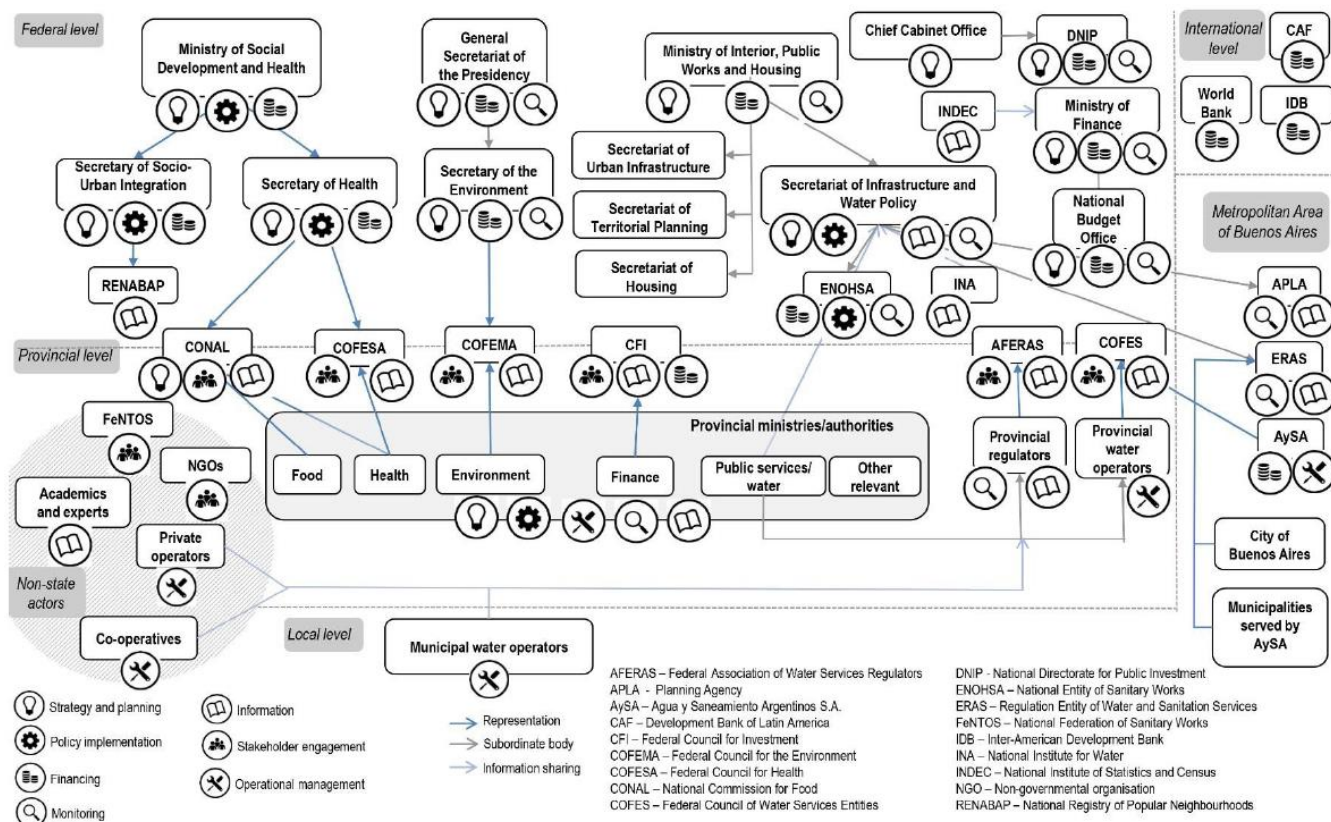


Figure 8: Institutional framework for water and sanitation services in Argentina. source: OECD, 2019

In the 90s, several provinces privatised water services, but in the economic crisis in 2001-2002, most concession contracts were terminated, and water services were transferred back to the public sector. Each of the provinces have their own water legislation (OECD, 2019).

The National Entity for Sanitation Water Works (ENOHSA) is a decentralised body with legal status and administrative autonomy. It has the authority to contract and execute projects for the construction, maintenance and replacement of sanitation infrastructure. At the national level, the Secretariat of Infrastructure and Water Policy (SIPH) is in charge of managing the water and sanitation sector.

In the main cities, water and sanitation services are generally provided by provincial companies. These companies are owned by provinces, municipalities and unions. In smaller cities and communities, services are provided by a municipal administration, user cooperatives or community entities. There are an estimated 1828 water and sanitation services providers in urban areas in Argentina, of which 23 are provincial and regional. Water and sanitation services of Buenos Aires and 26 municipalities of Greater Buenos Aires are provided by Agua y Saneamientos Argentinos SA (AySA). AySA is the largest

regional provider and is 90% owned by the state and 10% by the employee union. See picture 8 for an overview of the institutions involved in water services provision.

7.4.1. Challenges and opportunities

Opportunities are present in terms of water utility efficiency (knowledge exchange), measures to counter non-revenue water, such as leak detection technologies and other methods to improve infrastructural operations, and overall capacity development on the operational level.

8) Institutional framework

Argentina has a multi-leveled, decentralised governance system, with the most legal power for natural resources management devoted to the 23 provinces and the city of Buenos Aires. Water policy and design and implementation in Argentina is highly fragmented and involves many levels of government and policy areas (OECD, 2019). See picture 9 for a pictogram of the institutional framework of water resources management.

On the National level, COHIFE, the Federal Water Resources Council, is responsible for water resources management. However, there is currently no national water law or authority focusing on water resources management of water services provision. There are various national water policy documents: the National Water Plan (NWP), the National Irrigation Plan (NIP) and the Belgrano plan. The latest water policy plan is the National Water Plan (NWP) which was published by the national Government in 2016. This plan has ambitious objectives to address Argentina's most pressing water risks and recognises water as the key for economic and social development. In the National Water Plan, the goal is set to raise access to potable water and sanitation from 60% to 75% in 2022. Moreover, it aims to increase protection against floods and droughts through actions that combine hard infrastructures with early warning and information systems (OECD, 2019).

As mentioned before, provinces have a lot of authority in creating and executing water resources management policies; all provinces have set their own water codes or laws. This can lead to incoherence between regional policies. Large differences in legal framework for water resources management exist between provinces. Some provinces have well-developed legislation while others have little to no regulation. There are currently seven provinces that do not have a legal framework for surface and groundwater resources management. Therefore, the capacity of provinces to design and implement water-related policies and finance water infrastructure, varies across the country (OECD, 2019).

OECD argues that in the development of these plans, there was little involvement from provinces, which resulted in a lack of ownership over the goals and objectives and lack of engagement with their capacities and needs.

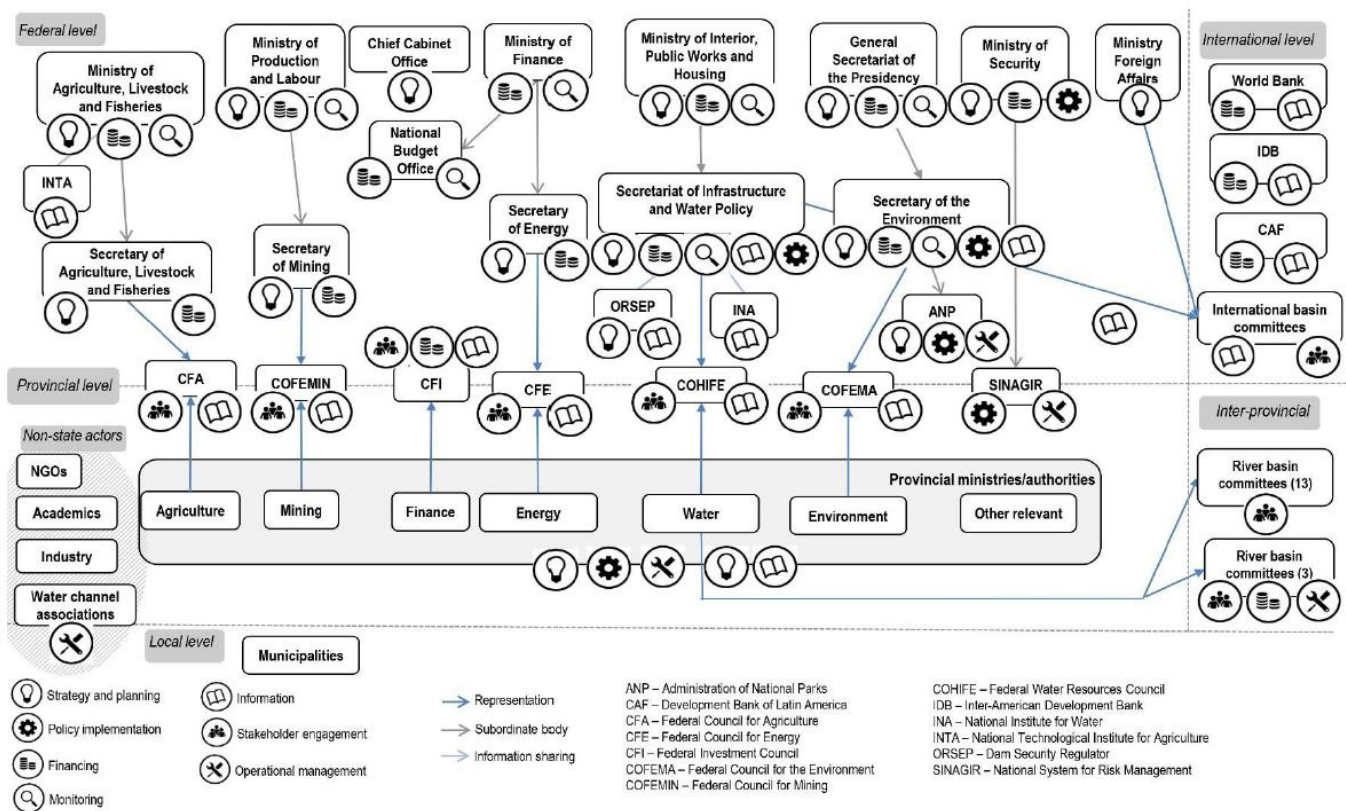


Figure 9: Institutional framework for water resources management in Argentina. source: OECD, 2019

9) International Funding & Country Strategies

9.1 Inter-American Development Bank (IADB)

The country strategy 2016-2019 for Argentina of the IADB (IADB, 2016) was to redirect the economy, with more involvement of the private sector. Country strategies remain active one year beyond stated dates, while new country strategy is in preparation.

Three strategic priorities were:

- **Business climate improvement:** the report states that the current business climate in Argentina is challenging and does not favour investment or productivity.
- **Strengthening of private-sector integration and insertion into value chains:** according to the report, Argentina's integration into global trade and global value chains are unsatisfactory. The percentage of foreign value added in exports is low. Also, the agricultural sector, which is

important for export, has been limited by tariffs and quotas, negatively affecting investments. Because of this, Argentina's export contributes relatively little to long-term growth.

- **Poverty and inequality reduction:** Argentina has challenges in reducing poverty, and there are high percentages of people without access to basic needs. This is especially the case in the Norte Grande region and the Buenos Aires conurbation. There is low coverage and unequal distribution of water and sewerage services and inadequate flood prevention infrastructure, and this has been determined as a priority. Especially in the Buenos Aires Metropolitan Area there are gaps in coverage, between the city and the conurbation.

Specific focus for interventions is given to the region Norte Grande, which is particularly addressed in the Belgrano Plan and the Buenos Aires conurbation, which is targeted by the Pobreza Cero plan. Both these plans are supported by the IADB, specifically in reducing poverty, developing infrastructure and basic services and improving access to water and sanitation services. Crosscutting areas of action that are incorporated in the country strategy are issues of gender and diversity, institutional capacity/strengthening and climate change. Approvals for the period 2016-2019 were projected at 6 billion US dollars.

Worth mentioning is the fact that Argentina has incurred significant economic and human losses because of extreme weather events. The majority was water-related, such as floods and landslides due to heavy rainfall. "In the 1970-2015 period, Argentina was affected by 97 large-scale disasters (EM-DAT, 2016): 93% were of hydrometeorological origin (floods and landslides due to heavy rains), affecting 14 million people and causing USD 10 billion in economic losses, and the remaining 7% were of geological origin (earthquakes and volcanic activity), affecting 110,000 people and causing USD 180 million in economic losses. More recently, floods occurring in the province of Buenos Aires in 2013 resulted in losses of around USD 1.3 billion, while the effects of the floods that occurred in the country's north in 2015-2016 are still being quantified." (IADB, 2016).

9.2 Latin American Development Bank (CAF)

The Latin American Development Bank (CAF, Spanish acronym) provides technical and financial support in infrastructure, telecommunications, social and environmental development, investment management and public credit, and productive sector and SMEs strengthening, through financing tools, technical cooperation, training support and knowledge generation, in order to promote development, growth, competitiveness and inclusion in Argentina.

In December 2019, CAF reconfirmed the support for sustainable development in Argentina through projects that contribute to the development plan of the country and aligning with the integrated strategy of CAF.

Key areas for development according to the CAF are urban mobility, modernisation of infrastructure, strengthening of institutions and promotion of urban and regional competitiveness. The CAF indicated in November 2019 to have confidence in the Argentinian economy in the coming 4 years and has approved for over USD 4.000 million through programmes, projects and technical cooperation. The CAF has approved USD 2.500 million for programmes and projects in priority areas for the current Government: Infrastructure (logistics, urban transportation, water resources (sewerage, aqueducts, irrigation, flood mitigation) as well as futureproof city programmes (integrated interventions in poor neighborhoods). '

Specifically in the topic of water, CAF has approved funding for projects in the area of emergency response post-floods in the Northern regions of Argentina (2015/2016) and has supported various programmes in the development of new irrigation areas in the country in recent years.

9.3 World Bank

The Country Partnership Framework (CPF) for 2019-2022 aims to contribute to a reduction of poverty through promoting sustainable and inclusive growth (World Bank, 2020). The pillars of this strategy are:

1. **Supporting the country in the creation of long-term private financing sources:** Fiscal consolidation and strengthening of market institutions, promote productivity-led growth and increase exports.
2. **Contributing to improving public sector management and service provision:** Enhancing the efficiency of public administration and hereby improving basic public service delivery such as water and sanitation by strengthening interjurisdictional coordination.
3. **Promoting actions to reduce the country's vulnerability to climate change:** Supporting the transition to a low carbon economy, increasing electricity generation from renewable sources and promoting the adoption of climate smart agricultural practices and increase urban resilience.

Argentina has an active portfolio of 22 investment projects from the World Bank with USD 6.2 billion in committed loans, a guarantee for USD 466 million and two grants for an amount of USD 10 million. The portfolio focuses on supporting programmes in the areas of health, environment, education, infrastructure, labour market and social protection (World Bank, 2020). The World Bank Board of Directors has approved several projects last years.

Specifically, around the topic of water, following projects are worth reviewing (<https://projects.worldbank.org/en/projects-operations/>, accessed February 2020):

A 2020 project regarding water utilities services includes sanitation of the Matanza-Riachuelo basin. Additional Financing supports the Government's Integrated Basin Clean-up while simultaneously improving sanitary conditions along the banks of La Plata River and providing a long-term and cost-effective solution for safe disposal of wastewater from the Buenos Aires Metropolitan Area (AySAs concession area). For this project, there is an additional financing of USD 245 million to continue the reduction of industrial pollution and flood control, in order to improve the quality of life of 4.3 million of inhabitants.

A 2017 project in the Salado River Basin towards Integrated River Basin Management Support to enhance flood protection and strengthen the capacity of the responsible institutions for integrated water resources monitoring and management in the Salado River Basin. The project has three components: (1) integrated water resources management; (2) river training works and upgrading associated infrastructure; and (3) project implementation, supervision and communication. These components will support the Project Works Coordination and Execution Unit (UCEPO) in project management, including the carrying out of the project audits, and Provincial Department of Hydraulic Works (DPOH) in the supervision of the river works.

10) Conclusions / Recommendations

As indicated in this report, Argentina has always been a country of economic ups and downs. Even in difficult times, it has found a way to change the tide and climb out of an economic downturn. It currently finds itself at the low point of the curve in terms of the economic situation. Any government would be challenged to turn things around, so the Fernandez-Kirchner administration will have their work cut out for them. If we assume that COVID-19 will indeed be handled with – not just in Argentina – and it will end (with vaccines) in 2021, then the Government can focus on countering this economic recession and related inflation and currency devaluation. It is widely expected that a renegotiation of

current IMF loans and terms will be the starting point. However necessary, it still puts pressure on the investment climate initially, as outside investors will be hesitant to step in knowing that much of repayment will go towards the IMF loans. However, in this report, we have mentioned the political and economic situation to provide the right context, but the focus is on water. And regardless of politics or economics, these problems will not go away by themselves. Rather than speculating, in this report we have focused on the water-related challenges and opportunities in Argentina.

The main water-related challenges – and associated opportunities - in Argentina were elaborated, and centre around 4 topics:

10.1 Groundwater

Argentina has extensive groundwater resources, such as the Guaraní Aquifer which underlies four countries. When discussing groundwater in Argentina, one must always be aware of the spatial context, as urban and rural issues are distinctly different. Furthermore, the specific challenge, be it scarcity, unsustainable abstraction or waterlogging, is very much regionally dependent. Groundwater abstraction is an important source of Argentina's water use, but groundwater resources are increasingly threatened by contamination. Especially in areas with higher population densities, contaminants in the aquifers threaten the safety of using the resource. In arid areas, overexploitation of groundwater resources is a challenge. Finally, in a cruel twist of fate, some regions have an extremely high water table, leading to flooding and waterlogging of agricultural lands.

- Opportunities are in the strengthening of the involved institutions to improve (transboundary) groundwater management and address the challenges.
- At the same time, opportunities are in gaining a better understanding of the geological conditions of the groundwater source and its interactions with surface water, to get more insight of the overall water availability and to provide a positive impact to agricultural activities on the surface.

10.2 Pollution of surface water

Argentina faces issues with surface water contamination particularly in heavily populated urban deltas such as Buenos Aires. Having the doubtful distinction to be home to one of the most polluted rivers basins in the world, a solution must be found for industrial and domestic waste discharges in waterways without adequate treatment.

- Opportunities lie in wastewater treatment technologies suitable to the region and country.
- Furthermore, there is an identified need for tools and processes to encourage behavioural change. Stricter rules and regulations are necessary to counter illegal and untreated solid and liquid waste disposal.
- On the water technology level, possible interventions include smart filtering to counter point-source pollution, but also monitoring and detecting for a wide range of pollutants.

10.3 Extreme weather events:

Extreme weather events such as floods and droughts are a threat to Argentina's economy that depends on agriculture, and of course to the public safety.

- For the agricultural sector, opportunities for drought adaptation exist in areas of climate-smart agriculture, circular resource usage and overall increased efficiency of water usage.
- For adapting to floods, opportunities include grey and green flood protection measures and risk assessment studies.
- In general, nature-based solutions are an interesting opportunity for climate change adaptation.

- Within these solutions it is important to keep focusing on an equitable division of water resources, to prevent an even more inequitable division and decreased access for marginalized groups.

10.4 Access to drinking water and sanitation services:

Large inequalities exist in terms of access to drinking water networks and sewerage, particularly in rural areas and informal settlements with extremely limited access.

- Opportunities exist in promoting water utility efficiency, measures such as leak detection to tackle the issue of non-revenue water and capacity development of infrastructure overall.

If we take a page from the books of reputable organisations present and active in Argentina, we can add the following policy recommendations (as per OECD, 2019).

- Argentina must take critical decisions regarding its current and future water policy direction to fit for the future and better cope with pressing and emerging risks:
 - Incentivise inter-governmental co-operation through a rejuvenated multi-level enduring mechanism for better planning and strategic investment, basin governance, and regulation of water services.
- Shift from the old paradigm focusing on infrastructure solutions to more systematic strategic basin planning to address socio-economic, urbanisation, environmental pressure of water bodies, and drive water allocation and investment decisions while managing trade-offs among competing uses.
- Provide a national overarching legal framework to set common water supply and sanitation policy criteria across the country and support regulation consistency. The framework should provide minimum requirements for the quality of the service.
- Foster financial sustainability of water services, not only through revenues raised through tariffs (in addition to subsidies), but also by:
 - Seeking efficiency gains in operation and maintenance.
 - Developing a sound accounting system to enable an optimal accounting management and a documented tariff calculation.
 - Changing the tariff structure (towards progressive schemes) in areas where metering level is high; “canilla libre”² system should be gradually phased out.
 - Improving and strengthening the subsidy scheme to ensure that vulnerable families have access to water services through better targeting and coordination with social policies.” (OECD, 2019).

Finally, it is worth noting some of the Delta Alliance’s considerations towards managing the Paraná Delta. “The most relevant issues that must be considered to generate management policies for the area are related to finding a balance between economic activities, urban growth, climate adaptation and environmental conservation. Land use regulations and other policies must take into consideration the conservation of the natural land, avoiding great changes in island’s land levels and water courses. In fact, one of the most important issues on the Delta is land use changes (from pasture to agricultural or residential use). It is also important to give the natural inhabitants the possibility of economic development and to generate new strategies for agricultural activities facing climate variations.” (Zagare, 2011 p13).

In 2021, the Netherlands and Argentina will continue the development of their bilateral relationship and the Partners for Water Programme will continue to support those efforts, particularly through involved stakeholders on the Dutch side, including the Dutch Ministries of Infrastructure and

² Canilla Libre – Literally “Free Tap”, meaning free of charge in this case

Environment and the Ministry of Agriculture, as well operational support and project management through RVO and NWP, in close collaboration with the Embassy in Buenos Aires.

11) Netherlands Water Partnership & Latin America Team

Adept at matchmaking, NWP is the first point of call for anyone seeking expertise on water management issues or contact with the Dutch water sector. Given its wide and growing network, NWP is also the first point of call for its members in the Netherlands who are seeking partnerships and business opportunities internationally.

NWP facilitates country-specific platforms for organisations in the Netherlands. They regularly meet to discuss opportunities, collaboration and ongoing activities in their country of interest. NWP has a broad network in the whole region and can catalyse opportunities for enterprises that are interested to either collaborate with or operate in Latin America. With our broad network, experience with the water sector and knowledge of the region, we can connect different partners and create impactful projects.



11.1 Team Latin America

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