



## Water Stewardship Case Studies

### Peru Case Study 2:

#### Virú



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### Contents

1.	Context .....	2
2.	Summary .....	2
3.	About Virú .....	3
4.	WWF Water Risk Filter: Water Risks for Peru .....	4
5.	The current water situation in Peru and Virú's main avocado growing region...	5
6.	Virú's response to the challenges in its main avocado-growing region .....	7
7.	Social Initiatives .....	13
8.	Conclusion .....	13



Report compiled by Malissa Murphy  
Blue North Sustainability

# 1. Context

Worldwide Fruit Limited (WFL) is investing in Water Stewardship across its supply base. As part of their commitment, they are presenting a series of Water Stewardship case studies from supplying farms. These case studies aim to raise awareness of the challenges that WFL's growers deal with on a daily basis. Water management challenges and the solutions implemented to overcome them are explored, but we will also see how growers are driving ongoing good management of water resources. Apart from water, case studies will also look at current sustainability strategies implemented and plans for improving sustainability in the future.

This case study presents Virú, who is based in Peru and is a strategic supplier partner of avocado for WFL.

# 2. Summary

Virú proudly holds the distinction of being a global leader in the agro-industrial sector and stands as the largest producer of canned and frozen fine fruits and vegetables in Peru. Beyond processing and exporting, the company is deeply involved in the cultivation and harvesting of premium-quality vegetables and fruits across an expansive 13,000 hectares in Peru. Notably, 1,600 hectares are dedicated to avocado production in the La Libertad region. The company secures its water supply through the Chavimochic Irrigation Project. While water availability is not currently limited by this project, the region faces potential challenges due to climate change. The Chavimochic project relies on the River Santa, sourced from rainwater and meltwater from the Andes. Climate change-induced deglaciation, rising temperatures, and erratic precipitation patterns pose a threat to the region's water supply, making irrigation water less predictable. The increased frequency of extreme weather events, such as El Niño, could exacerbate the situation, leading to heavy rains and flooding, potentially damaging the Chavimochic project's water canals and causing periods of water scarcity for irrigation.

In response to these challenges, Virú is committed to integrating sustainability into its corporate strategy and operational decisions. The company has taken proactive measures, including the construction of new reservoirs, the installation of retaining walls (geobags) around existing reservoirs, and the adoption of modern technologies like drip irrigation. These initiatives aim not only to mitigate the impact of potential water scarcity but also underscore Virú's dedication to responsible and sustainable agricultural practices in the face of evolving climate conditions.

### 3. About Virú

Virú stands as a global leader in the agro-industrial sector, holding the title of the largest producer of canned and frozen fine fruits and vegetables in Peru. For 30 years, they have been cultivating, processing, and developing tailor-made solutions for the most demanding markets and consumers around the world. Virú is a modern and dynamic company that leverages the latest advances in production technology and streamlined logistics, ensuring the efficient delivery of its products to five continents.

Virú S.A. serves the main markets of the Americas from its main headquarters in Perú. Recognizing the importance of strategic logistics, the company has optimized its operational efficiency to better serve European and Asian markets by establishing commercial offices in Europe, namely Virú Iberia, Virú France, Virú Italy and recently founded Mensajero-Virú. The establishment of Mensajero-Virú marks the first step towards global canning production, strengthening the company's supply capacity on a global scale. In 2023, Virú also acquired Superior Foods International in the USA.

Virú has formed a partnership with Agroberries Peru to offer a range of fresh and frozen blueberries. Additionally, Virú operates a specialized division, Caynarachi S.A., which is dedicated to bridging the global market with unique products from the tropical jungles of Peru.

The company is currently present in 5 countries around the world and is structured by:



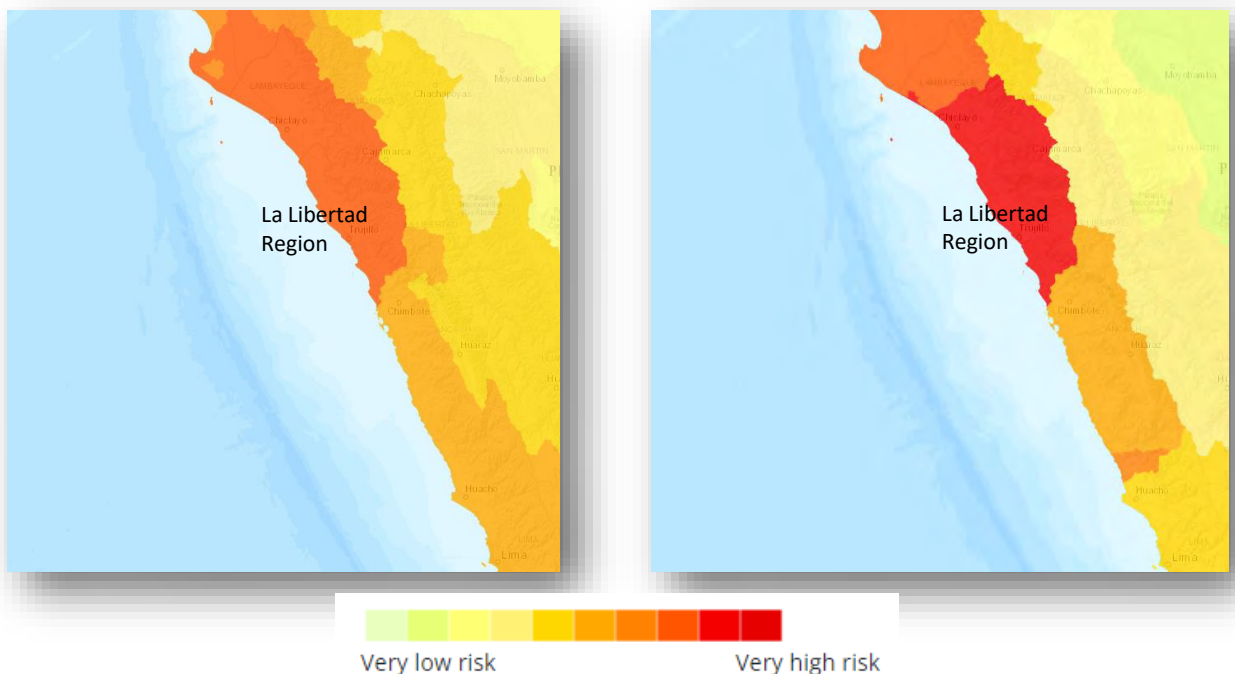
Virú cultivates and harvests premium-quality vegetables and fruits across expansive fields in Peru. With ownership and leasing rights covering over 13,000 hectares, they specialize in cultivating white and green asparagus, artichokes, avocados, peppers, hearts of palm, blueberries, and various other crops. Notably, Virú is a key supplier to WFL, providing them with fresh avocados of the HASS variety. In the 2023 season, Virú successfully delivered 504,000 kilograms of premium avocados to WFL.

Virú adheres to a philosophy centred on ensuring food safety and traceability across the entire production chain, from the fields to consumers. They firmly believe that integrating sustainability into their corporate strategy and operational decisions not only benefits their business but also has a positive impact on the planet, their customers, and the communities they serve - both today and for future generations.

Virú is a modern and dynamic company that leverages the latest advances in production technology.

#### 4. WWF Water Risk Filter: Water Risks for Peru

Virú in the La Libertad Region marks a main avocado production area for Virú. This area is particularly at risk as can be seen in the WWF Water Risk Filter results below.



Physical risk results map (LEFT) and water scarcity results map (RIGHT) of Peru. Virú S.A grows 1556,91 hectares of avocados in Virú, La Libertad (Source: <https://riskfilter.org/water/explore/map>)

The physical risk layer represents both natural and human-induced conditions of river basins. It is based on global data and comprises four risk categories covering different aspects of physical risks: water scarcity, flooding, water quality, and ecosystem services status. Therefore, physical risks consider if water is too little, too much, unfit for use, as well as the ecological health of surrounding ecosystems and associated ecosystem services.

Water scarcity refers to the physical abundance or lack of freshwater resources, which significantly impact business such as production/supply chain disruption, higher operating costs, and growth constraints. Water scarcity is human-driven, and can be aggravated by natural conditions (e.g., aridity, drought periods), and it is generally calculated as a function of the volume of water use/demand relative to the volume of water available in a given area.

## 5. The current water situation in Peru and Virú's main avocado-growing region

Peru has a large amount of water resources, with 106 river basins and a long-run average annual rainfall of 1,738 mm. However, there is a distinct lack of precipitation in the dry Pacific basin, or coastal strip of Peru, where most of the country's agricultural activities take place. According to Peru's National Water Authority (Autoridad Nacional del Agua – ANA), the dry Pacific basin, accounts for only 1.8% of Peru's renewable water resources. The Pacific basin's 53 rivers, flowing west from the Andes, supply the bulk of the water to the coastal region. Of these rivers, only about 30% are perennial. From 1984 to 2000, the average water availability in the Pacific basin decreased from 37.4 km<sup>3</sup> to 33 km<sup>3</sup> per year and from 2003 to 2004 to 20 km<sup>3</sup> per year. Water scarcity in Peru, particularly in the Pacific basin, is thus getting worse as a result of climate change.

Peru holds 70% of the tropical glaciers worldwide, yet total glacial area coverage has reduced by 43% since 1970. The deglaciation process increases peak river flow and heightens the risk of flood events occurring. A study conducted by the Peruvian Meteorological Agency (SENAMHI) suggests that by 2030 rainfall could decrease by up to 20% in the Andes. Predicted temperature increases due to climate change will also increase evapotranspiration in coastal Peru, reducing surface water availability and groundwater recharge rates. Deglaciation, coupled with increased temperatures and erratic precipitation, means that watersheds may lose their capacity to provide sufficient water to meet demand. A 2019 World Bank report evaluating drought risk in Peru concluded that current strategies to manage drought – dams, reservoirs, and storage under the capital city (Lima) – will be inadequate by as early as 2030.

Typical for the Peruvian Andes is a seasonal climate with a wet season between October and April and a dry season between May and September. During the dry season, people depend strongly on glacial melt water, which feeds the rivers that support agricultural activities in the catchments and also contributes to water springs that are important sources of domestic

demand in rural areas. Irrigation has always been a determinant factor in agricultural growth and human development of rural areas in Peru's Pacific basin. Most of the irrigation relied on surface water distributed through inefficient systems: old channels, leaky distribution and outdated gravity or flooding practices. This combination caused high inefficiencies in water use and increased soil salinization due to under-irrigation. However, to harness the potential of the coastal climate, large-scale water projects (e.g. Olmos and Chavimochic projects) have been set up in the Pacific basin in recent years, making it possible to take advantage of the water reserves from the Andes mountain range.

## 5.1 Chavimochic Irrigation Project, La Libertad Region

La Libertad is the leading area in Peru in terms of avocado production. The region went from 7,871 ha devoted to avocado in 2017, to 12,826 ha in 2021. Virú cultivates 1556,91 ha of avocados in this region, made possible by the water supplied through the Chavimochic Irrigation Project.

In the mid-1990s, the Chavimochic Irrigation Project started to transform this desert land into agricultural land. Chavimochic is an acronym formed by the first letters of the names of the valleys where the water is used, namely, Chao, Virú, Moche and Chicama. It draws from some of the waters of the River Santa, a powerful and regular river that feeds the Pacific basin, thanks to its large catchment area at the heights of the Andes (rainwater and meltwater). Three of the four valleys have now been developed, to cover a total of 75 000 ha.

The Chavimochic Project supplies water by open canal. The water quality is excellent, even though high turbidity, especially during the rainy season, requires a sedimentation process to be applied. The production system is highly original and high-tech. While water availability for irrigation from the Chavimochic Project is not limited, water is subject to increasing prices. The irrigation level in the Chavimochic zone is generally 16,000 to 18,000 m<sup>3</sup>/ha (the estimated avocado requirement is 14,000 to 15,000 m<sup>3</sup>/ha).



Water in the Chavimochic region is supplied by open canals as part of the Chavimochic Project.



Water in the Chavimochic Project flows through 15 reservoirs to clean it from sediment. A flocculant (top, left photo) is added to the first reservoir as part of the sedimentation process.

## 6. Virú's response to the challenges in its main avocado-growing region

In early 2017, extreme precipitation during a 'coastal El Niño' triggered landslides and flooding in the La Libertad region. This event inflicted severe damage to the Chavimochic 'mother canal' and its associated infrastructure, resulting in the disruption of irrigation water delivery and jeopardizing the water supply for Trujillo's 800,000 inhabitants. The impairment of the mother canal prevented the utilization of the irrigation system for several days, necessitating the use of cisterns for gravity irrigation. Unfortunately, this alternative approach led to issues such as erosion and water loss.

In July 2023, the World Meteorological Organization announced the onset of a global El Niño, marking the first occurrence in seven years. This phenomenon, characterized by the

warming of the Pacific has a far-reaching impact on global weather patterns and traditionally brings heavy rains and flooding to Peru. Such conditions could pose significant challenges once again for Virú's main avocado-growing region. Furthermore, it is anticipated that the increasing frequency of extreme weather events is a foreseeable consequence of ongoing climate changes. Therefore, Virú has implemented the following to mitigate the impact of future flooding:

- **Construction of new reservoirs:**  
Strategically located to mitigate potential water damage during heavy rainfall.
- **Maintain maximum reservoir levels:**  
Ensure reservoirs are consistently kept at 100% storage to capitalize on periods of water abundance. The contingency plan involves a 25-day water supply in the event of canal damage, supplemented by water from wells.
- **Protection with Retaining Walls (Geobags):**  
Implement protective measures, such as geobag retaining walls, around reservoirs and wells to safeguard against potential damage caused by the flow of rainwater.



A landslide caused damage to a canal in the Chavimochic Irrigation Project in La Libertad in 2017.  
(Source: [El Comercio](#))



Geobags (retaining walls) are built around reservoirs and wells to protect them against potential damage caused by the flow of rainwater.

Virú acknowledges that continuous adaption to climatic changes are necessary. Therefore, they have implemented, or are in the process of implementing, several water stewardship and other environmental initiatives across their operations. Some of these initiatives are briefly discussed in the following sections:

## 6.1 Water consumption

Virú is committed to responsible water management, employing drip irrigation to precisely control and measure water usage. Additionally, the company has implemented various measures to ensure sustainability and efficiency:

- **Certifications:**
  - Holds Rainforest Alliance sustainability certification.
  - Possesses GLOBALG.A.P. Certification with the SPRING addendum.
- **Infrastructure Improvements:**
  - Constructed a 60,000 m<sup>3</sup> sedimentation pond for dry-season water use and enhanced irrigation treatment.
  - Installed ultrasound equipment with solar panels to control algae and enhance irrigation water quality in Virú reservoirs.
- **Water Conservation Practices:**
  - Redirects water discharged from pressure relief valves to crop curtains, minimizing waste by at least 13,3 m<sup>3</sup>.

Water usage is further managed through regular maintenance and calibration of irrigation equipment. The Chavimochic Project oversees water distribution, providing monthly quality reports. While there are no specific limitations on water quantity, stringent controls are in place to monitor usage throughout the year and across cultivation stages.

Virú continually reviews adherence to SPRING objectives, proposing new goals each year to further enhance water conservation and environmental stewardship.

Virú's certifications and social initiatives:



Virú operates 10 processing facilities, including one fresh fruit packaging plant in Virú, La Libertad. The packaging plant has a line capacity of 27 tons per hour, allowing for the packaging of up to 540 tons of avocados per day. It uses about 20,574 m<sup>3</sup> of water, sourced from tubular wells and extracted using electric pumps, that undergoes a filtration process before being transferred through a network of pipes to the packinghouse. Within the facility, the water is stored, chlorine is applied, and it is then distributed to all areas of the packhouse.

To ensure sustainable water use in the packhouse, Virú has implemented the following measures:

- **Staff Awareness:**  
Raise awareness among staff members about the responsible use and conservation of water.
- **Water Use Control:**  
Implement strict controls to monitor water usage and promptly identify and address leaks to prevent wastage.
- **Wastewater Treatment for Reuse (PTAR):**  
Implement wastewater treatment processes (PTAR) to treat and recycle wastewater, promoting reuse within the facility.

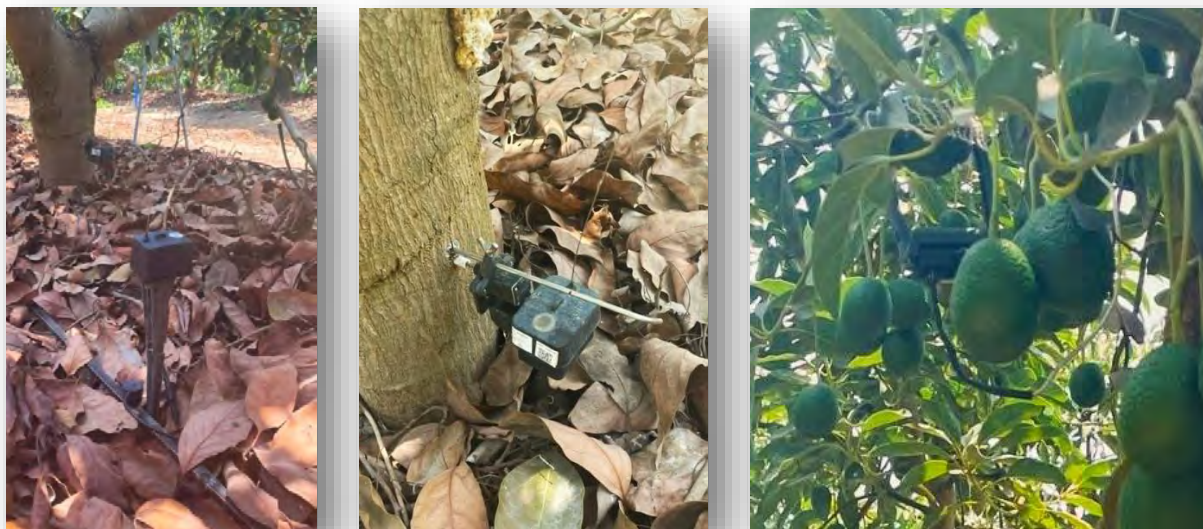
These actions underscore Virú's commitment to sustainable water practices in its packaging operations.



Wastewater from the packhouse undergoes a treatment process and is reused within the facility.

## 6.2 Soil moisture and health

All of Virú's farms employ drip irrigation systems and Phyttech technology to ensure efficient irrigation practices. The Phyttech system includes sensors to measure fruit stress, tree stress and humidity of the soils. The sensors are connected to an integrated site where an accurate calculation of a tree's water requirement can be made.



Phyttech sensors are used to measure fruit stress, tree stress and humidity of soils.



Drip irrigation is also used in the nursery.

In addition, soil diversity and health are enhanced by incorporating beneficial microorganisms and organic soil amendments. Organic material generated on the farms is used to make compost for the nursery. At this stage, no mulch or cover crops are being utilized.

## 6.3 Integrated Pest Management

Organic products for pest and disease control are being utilized in the orchards. Weekly pest evaluations are conducted to inform timely control measures, which include the following:

- Employ the breeding and release of biological controllers in the field.
- Establish buffer zones and living curtains to support beneficial fauna, both domestic and wild.
- Install molasses traps for lepidopteran control and identification.
- Conduct tests with new organic pesticides for rotational purposes.



Molasses traps in the orchards are used for lepidopteran control and identification.

## 6.4 Biodiversity conservation

Virú continuously conducts a comprehensive census of wild fauna and flora on their farms to guide their protection. Specific attention is given to the preservation of forests, ensuring care to avoid any adverse impact on the residing flora and fauna. They own 3,700 bee hives that are cared for by the team.

## 6.5 Other initiatives

Avocado leaves and fruits can get sunburned if exposed to prolonged, intense sunlight, especially during hot weather. The trees may also experience heat stress and increased evapotranspiration can lead to water stress. Virú is currently conducting trials where sunscreens are utilised to reduce stress on the trees and fruits.

Other sustainability initiatives are:

- Solar panels have been installed for field automation to reduce energy consumption.
- A wastewater treatment plant generates biogas which feeds into the electricity supply.
- The establishment of a new forest is in progress.

## 7. Social initiatives

Virú strives to maximize its positive impact in the social, employment, and human rights sectors. They care for the well-being of their staff and the quality of life of communities living within the areas of influence of their operations at a national level. A few of Virú's social initiatives include "My Little Virú" Day Care Centre, various health campaigns, Educational Institution N°2117, Project Fair and Building Hope.

## 8. Conclusion

Virú is uniquely positioned with abundant water supplied through the innovative and advanced Chavimochic Irrigation Project. Despite this advantageous position, the company remains unwavering in its commitment to employing efficient water-use methodologies, leaving no room for waste. This dedication is evident in the extensive list of international standard certifications, including Global GAP and SMETA, that Virú proudly holds. The company is not only implementing but also consistently developing new strategies to proactively address and mitigate the challenges posed by floods and water scarcity resulting from the impacts of climate change.



### Sources:

All photos, unless otherwise indicated, were acquired from Virú.