



Peru Case Study 5: A Water Stewardship Case Study on

Agrokasa

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Context

Retailers and consumers globally are urging the supply chain to enhance its understanding of water usage and promote sustainable practices. Responding to this imperative, Worldwide Fruit Limited (WFL) has agreed to the Courtauld Commitment 2030. Therefore, they actively invested in water stewardship initiatives across their supply base. As part of their commitment, they present a series of case studies from their strategic suppliers growing crops in water-vulnerable regions. These case studies aim to:

- Raise awareness of the current water challenges that growers deal with daily as well as future risks.
- Address the social-ethical impact of crop production in terms of water use and quality on the workforce, local communities and the environment.
- Showcase the initiatives implemented to overcome these challenges along with plans for improving sustainability in the future.
- Share lessons learned and success stories from the suppliers' journeys to sustainability.

This case study represents a Peruvian company, Agrokasa, which is a strategic supplier partner of avocado for WFL.



Report compiled by Malissa Murphy Blue North Sustainability

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Agrokasa is a renowned Peruvian company dedicated to the agricultural export of produce since 1996 and has been a strategic supplier partner of avocados for WFL since 2019.

Lima

Ica

Agrokasa delivered **432 t of Hass avocado** to WFL in 2024.

p.5 2. WATER CHALLENGES IN PERU AND AGROKASA'S AVOCADO-GROWING REGIONS

Peru's coastal regions, where Agrokasa's avocado farms are located, face **severe water challenges**. The desert climate, while ideal for avocado cultivation, exacerbates water scarcity, a problem worsened by **climate change**.



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Agrokasa **PTAR Project** involves treating and reusing Ica's wastewater through a world-class Wastewater Treatment Plant.

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Agrokasa's **1,200-ha avocado farm in Lima** depends on the Pativilca River, but rising temperatures and glacier retreat threaten water scarcity, flooding, and declining quality by 2030.

p.15 4. FUTURE PLANS FOR AGROKASA

Agrokasa plans to continue diversifying its water sources and crops, employing the best available technical resources to ensure the efficient and responsible use of water. Agrokasa cultivates **420 ha of avocados in Ica**, a region heavily reliant on the Ica-Villacuri Aquifer. The aquifer's dynamic nature makes **groundwater measurements challenging, raising sustainability concerns.** The region

also faces strained resources due to **inadequate WASH** services, population growth, and inefficient infrastructure. Although groundwater levels have recently stabilised, ongoing agricultural, social, and climate pressures continue to threaten water security.



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3. AGROKASA'S RESPONSE TO WATER AND WASH CHALLENGES

Agrokasa addresses water scarcity and sustainability in its avocado-growing regions by implementing **advanced irrigation systems**, **diversifying water sources**, **aquifer recovery** and **utilising treated wastewater**. Their comprehensive stewardship includes **safe WASH** facilities and **free meals** for workers. Agrokasa also employs integrated pest management, promotes soil health through mulching, and maintains preservation zones for biodiversity, highlighting their commitment to environmental and social responsibility.

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Agrokasa's sustainability efforts in Ica, including advanced irrigation and wastewater projects, highlight their **commitment to both environmental stewardship and worker welfare**, though improvements in water data, WASH services, and government support are still needed.



1. About Agrokasa

Agrokasa is a renowned Peruvian company specialising in the agricultural export of table grapes, avocados, and blueberries. Since 1996, Agrokasa has been dedicated to exporting safe and high-quality products, committed to sustainability throughout their processes, from the field to the consumer's table. They export to over 50 countries across five continents, reinforcing its mission to foster wellness and development globally.

Agrokasa has been a strategic supplier partner of avocados for WFL since 2019. The company cultivates 1,620 hectares of avocado, with 420 hectares in the Ica region at its La Catalina Farm and 1,200 hectares in the Lima region at its Virgen de Las Mercedes Farm (Barranca area). Agrokasa also operates a packhouse on La Catalina and one close to Virgen de Las Mercedes. In 2024, they delivered 432 t of avocado to WFL, mostly sourced from the Virgen de Las Mercedes Farm.

As part of its mission to promote wellness, Agrokasa is dedicated to ensuring the well-being of its workforce through robust policies encompassing an Occupational Health and Safety Management System Policy, Human Rights, and Gender Equality Policy. This commitment underscores Agrokasa's dedication to creating a positive impact not only through its products but also through its practices and values.

The company has voluntarily adopted non-mandatory protocol requirements, integrating them into their work practices to ensure they are properly implemented, maintained, and continuously improved. Third parties periodically audit these protocols and, when applicable, it is certified. Agrokasa's current certifications include:



Agrokasa's mission is to cultivate well-being and development for the world.



2. Water Challenges in Peru and Agrokasa's Avocado-Growing Regions

Peru, known for its abundant water resources with 106 river basins and significant annual rainfall, paradoxically faces severe water challenges, particularly in its coastal regions where most agricultural activities are concentrated. Despite being near the equator, the coast or Pacific basin, including the Ica and Lima regions where Agrokasa has farms, has a desert climate and only 1.8% of the country's renewable water resources. The steady temperatures of the Pacific basin make it ideal for crop production, such as avocados but also exacerbate water scarcity.

Barranca, Lima Region

The Lima region, the third-largest avocado producer in Peru, has experienced notable growth in avocado farming, with cultivated areas expanding from 3,268 hectares in 2017 to 5,635 hectares in 2021 (Agraria.pe, 2022). A key contributor to this growth is Agrokasa, which cultivates approximately 1,200 hectares of avocados at its Virgen de Las Mercedes Farm, located north of Lima near Barranca. This farm is integral to Agrokasa's supply chain, serving as the primary source of avocados for WFL.

The farm's irrigation depends entirely on the Pativilca River, sustained by rainfall and glacier meltwater from the high Andes. While the water supply remains reliable for now, rising temperatures and glacier retreat threaten future stability. According to the WWF's Water Risk Filter, Barranca and the broader Lima region face significant physical risks, including water scarcity, flooding, and declining water quality (see the image below on the left), with these risks expected to intensify by 2030 due to socio-economic pressures and intermediate greenhouse gas emissions (see the image below on the right). This could potentially lead to a global mean surface temperature increase of approximately 2°C by the end of the century.



Current physical risk (left) and expected risk in 2030 (right) for the Lima region of Peru according to the WWF Water Risk Filter.

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Ica Region

Like the Lima region, the Ica region has also seen substantial growth in avocado cultivation, with the area under cultivation expanding from 3,209 hectares in 2017 to 5,428 hectares in 2021. This makes Ica the fourth-largest avocado-producing area in Peru (Agraria.pe, 2022). This growth is particularly noteworthy, considering that the Ica region accounts for only 1.7% of Peru's total surface area (OECD, 2021). Currently, Agrokasa cultivates 420 hectares of avocados at its La Catalina Farm, although these orchards are still young and not yet in full production.

The Ica River Integrated Basin, which spans the Huancavelica and Ica departments, plays a vital role in supporting the region's agricultural activities, with its water supply largely sustained by rainfall in the upper and middle parts of the basin. The Ica River nourishes the Ica Valley, where groundwater from the Ica-Villacuri Aquifer serves as the primary source of irrigation. In 2012, the National Water Authority (ANA) noted that the Ica-Villacuri Aquifer was the most heavily utilised in Peru, accounting for 35% of the country's total groundwater use (ANA, 2013). This extensive use has contributed to a reduction in groundwater levels, prompting concerns about the potential for saline intrusion from the coast (ANA, 2013).

Accurately determining the current rate of groundwater usage in the Ica region remains challenging. The aquifer's dynamic nature, with fluctuating water levels across the valley, complicates precise measurements of water use and recharge rates. These complexities highlight the challenges in evaluating the sustainability of groundwater use in this important region.

Despite difficulties in obtaining the most up-to-date data, earlier studies offer valuable insights. According to Salmoral et al. (2020), the blue water footprint (WFblue) of croplands in the Ica Valley, based on 2017 data, primarily relies on groundwater, which constitutes 87% of the total WFblue of 483 Mm³. Of this, 286 Mm³ is used at a rate that exceeds the aquifer's recharge capacity. Asparagus and grapes are identified as the largest groundwater consumers, followed by avocado, jojoba, pomegranate, and maize. Although high water productivity is achieved in areas with intensive groundwater use, these areas also face significant sustainability challenges. Modeling suggests that while small-scale farming in peri-urban and middle valley regions shows some sustainability, large-scale farms—which use the majority of groundwater—may contribute less to aquifer recharge. Restoring the water resources used by these farms could take an estimated 3.7 to 5.9 years (Salmoral et al., 2020).

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Recent data from the Board of Groundwater Users of the Ica Valley (JUASVI) indicates that groundwater levels have stabilised between 320-380 meters above sea level, alleviating immediate concerns about saline intrusion and suggesting that aquifer reserves may not currently be depleting (Delgado, 2024). However, this stabilisation does not fully eliminate the long-term risks associated with groundwater depletion.

The Choclococha Transfer, a project that has been in place for over 70 years, diverts regulated and natural water resources from the upper Pampas River basin to the Ica River, increasing water availability during the dry season (April-October). This transfer system, which carries over 100 Mm³ of water annually to the coast, is being expanded to reinforce and enhance conveyance infrastructure (Gesaam, 2016). While this transfer supports economic growth and eases some water stress in the valley below, it also has ecological and social impacts on upper basin communities, contributing to ecosystem degradation and water resource challenges.

Additionally, the Ica region faces increasing pressure on its water resources due to a growing population. Over the past 35 years, more than 50,000 immigrants have moved to the area, often settling in informal communities along the Ica River. These settlements, in turn, have led to the extraction of water from unauthorised wells and increased pollution, further stressing the aquifer.

Social Issues and WASH Services

Beyond environmental challenges, the Ica region struggles with significant social issues, particularly water, sanitation, and hygiene (WASH) services. Despite efforts to close these gaps, the state apparatus requires substantial improvement. Inadequate access to water services is due to inefficient state management, infrastructure gaps, and poor maintenance. The influx of immigrants exacerbates the situation by increasing demand for limited water resources and straining existing infrastructure.

EMAPICA S.A., the local public water utility, faces financial and managerial difficulties, hindering the maintenance and expansion of water infrastructure, particularly wastewater treatment. The existing sewerage system, which includes a wastewater treatment plant built in 1971, was reported in 2018 to be capable of treating only 34% of the current demand (Zegarra, 2018). This shortfall has resulted in pollution and biodiversity loss in local rivers and canals. The COVID-19 crisis further highlighted the urgent need for improved WASH services.



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National Perspective on Water and Sanitation

Water and sanitation issues are not confined to the Ica region but are prevalent throughout Peru. An estimated 3 million Peruvians (9.2% of the population) lack access to water services, and 8.2 million (25.2%) lack access to sewerage services (OECD, 2021). Significant urban-rural divides exist, with 25.3% of the rural population and 4.7% of the urban population lacking access to public water supply networks. Moreover, 22.8% of the population lacks access to public sewerage networks, with rural areas particularly disadvantaged (OECD, 2021).

Climate Change Challenges and Future Risks

Climate change has led to an alarming increase in extreme weather events in Ica over the past two decades, including increased rainfall, floods, and huaycos (flash floods and mudslides). These events complicate water resource management. Climate change further complicates water security with 51% of Peru's glaciers having melted over the past 50 years. Predictions suggest further decreases in rainfall by up to 20% in the Andes by 2030, worsening water scarcity.

The WWF's Water Risk Filter states that the Ica region faces high physical risk, encompassing water scarcity, flooding, water quality, and the status of ecosystem services (see the image below on the left). These risks are projected to worsen by 2030 under current socio-economic development trends and intermediate greenhouse gas emission levels, potentially increasing the global mean surface temperature by approximately 2°C by the end of the century (see the image below on the right).



Current physical risk (left) and expected risk in 2030 (right) for the Ica region of Peru according to the <u>WWF Water Risk Filter</u>.

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3. Agrokasa's Response to Water and WASH Challenges

Agrokasa has long recognised the critical issue of water scarcity in its main avocado-growing regions, particularly in Ica, where climatic changes exacerbate the problem. Understanding that this challenge extends beyond agriculture and significantly impacts water availability and safe water, sanitation, and hygiene (WASH) for local communities, Agrokasa has implemented a range of water stewardship and environmental initiatives to ensure sustainable water use and the well-being of their workforce. These initiatives are briefly discussed in the following sections:

3.1 Sustainable Use of Water Resources

These three pillars support Agrokasa's strategy for sustainable water use:

- 1. Recovery of the aquifer
- 2. Efficient use of the resources on the farm
- 3. Diversification of water resources

Aquifer Recovery

Surface water reservoirs designed to capture floodwaters for irrigation are constructed without impermeable coatings, allowing natural infiltration to recharge aquifers and help reduce groundwater depletion. Agrokasa currently operates one such reservoir that supports aquifer recharge. JUASVI leads initiatives for aquifer recovery in different parts of the Ica Valley.

While managed aquifer recovery (MAR) has seen significant growth globally over the past 60 years as a solution to groundwater extraction, relying solely on replenishment is not enough to reverse the damage caused by overuse (Dillon et al. 2018). Reducing water demand through improved water-use efficiency and conjunctive use with other water sources is essential to complement Agrokasa's MAR efforts.

A surface water reservoir supplements groundwater for irrigation and support aquifer recovery.

Efficient Use of Resources on the Farm

To optimise water usage, Agrokasa employs advanced irrigation systems on both its avocado-growing farms, including:

- **Closed Pipeline Water Conduction**: Minimises water loss through evaporation and infiltration.
- Drip Irrigation System: Ensures water is delivered directly to the plant roots, optimising water use.
- Pulse Irrigation System:
 Improves efficiency by applying water in pulses.
- Automated Irrigation System
 Allows precise control over irrigation schedules.
- Multiple Irrigation Pipes: Broadens the irrigation bulb, reducing irrigation time while meeting crop needs.

Additionally, permanent soil moisture monitoring using capacitance probes and dendrometers helps determine the precise amount of water needed, ensuring optimal water/air ratio and timely irrigation.



Diversification of Water Sources

At the Virgen de Las Mercedes Farm in Barranca, surface water is a stable and the sole source for agricultural activities. However, at the La Catalina Farm in Ica, Agrokasa uses a combination of groundwater, surface water, and reclaimed water.

To reduce groundwater extraction, Agrokasa has invested in infrastructure to capture, store, and use surface water from the Ica River during flood seasons. This allows wells to rest and supports the aquifer's recovery. Since 2016, Agrokasa has been exploring the use of treated wastewater as a third water source, leading to the development of the AGROKASA PTAR Project.

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Re-use of Treated Wastewater – AGROKASA PTAR Project

In 2018, EMAPICA, the municipal water and sewage company of Ica, launched a tender for a wastewater treatment and reuse project. Agrokasa successfully secured the bid for the project, leading to the construction of a state-of-the-art Wastewater Treatment Plant (WWTP) in Ica. Operational since late 2021, this WWTP is among the most advanced facilities in Latin America and globally, utilising cutting-edge MBR (Membrane Bioreactor) technology. Robust monitoring and control systems ensure that all safety parameters are met, with results reported to ANA. The plant produces exceptionally high-quality water, exceeding both Peruvian regulatory standards and the World Health Organisation for agricultural use.

By 2023, 5,753,427 m³ of treated water from the WWTP was used at Agrokasa's La Catalina Farm in Ica. The project has delivered several significant benefits to the region:

- Significant reduction in groundwater extraction: Achieved a 35% decrease in groundwater use from wells in Ica by 2023 (Table 1).
- **Sustainable expansion of arable land:** Added 400 hectares to La Catalina Farm between 2020 and 2023, generating many job opportunities.
- Improved sanitary and environmental conditions in the city of Ica.
- Prevention of soil and water source contamination.
- Cost reduction and additional income generation for EMAPICA.



Green Loan

Interbank granted AGROKASA a US\$60 million green loan to facilitate using technology and resources for sustainable water use in the company's expansion and growth plans. This funding supported the construction of the WWTP using state-of-the-art technology to ensure the responsible use of water resources in Agrokasa's avocado, blueberry, and table grape plantations.

This financing aligns with the sustainability credentials and scope of the Loan Market Association (LMA) Green Lending Principles, and it was validated by a second opinion report from Pacific Corporate Sustainability (PCS).

Agrokasa's Water Use, Avocado Expansion and Workforce Evolution in the Ica Region

Since Agrokasa initiated its water source diversification strategy in 2009, groundwater use has significantly reduced, as shown in Table 1. Using 2009 as a baseline—the last year groundwater was the sole hydric resource—Agrokasa extracted 35% less groundwater from its wells in Ica by 2023.

Although there was an increase in hectares of avocado production in 2020, this expansion was only possible by incorporating treated residual water from the WWTP into their water sources. The growth of the workforce in Ica has paralleled the increase in planted areas, yet Agrokasa continues to uphold the same people care policies for all workers.

Table 1: Evolution of Agrokasa's groundwater consumption (all crops and activities), avocado production area (hectares), and workforce (all crops) since 2009.

Year	Groundwater consumption (m ³) (all crops and activities)	% Groundwater not consumed	Hectares Avocado	Average labourers (all crops)
2009	16,737,582	-	26,57	-
2010	14,990,840	10	26,57	2,739
2011	11,917,961	29	26,57	2,589
2012	9,741,434	42	26,57	2,607
2013	11,203,538	33	26,57	2,333
2014	13,057,275	22	26,57	2,489
2015	10,188,865	39	26,57	2,418
2016	11,182,145	33	26,57	2,318
2017	8,683,756	48	26,57	2,377
2018	10,327,046	38	26,57	2,532
2019	9,647,155	42	26,57	2,524
2020	12,310,675	26	183,39	2,828
2021	12,418,920	26	304,98	3,450
2022	11,067,230	34	420,19	3,974
2023	10,928,122	35	420,19	3,845

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3.2 Caring for People

Agrokasa maintains a strict people-care policy with a strong emphasis on safe work practices and the well-being of their workers by providing them with the following:

Free Meals and Transport

The company owns and operates a modern food preparation plant that supplies free meals to its workers every day of the year. Additionally, as part of their commitment to caring for people, they provide free and safe transportation for their staff.

Safe WASH Facilities

Agrokasa ensures safe WASH facilities segregated by gender for its workers, located in all canteens and at various points in the field. These facilities are within 500 meters or less from where the workers carry out their tasks. All sanitary facilities have sinks with potable water, antibacterial soap, paper towels, and toilet paper. These facilities are under constant maintenance and supervision to ensure proper use and safety for the staff.

The sanitary facilities comply with the requirements outlined in national legislation (D.S. N° 006-2021-TR and R.M. N° 200-2021-TR), which specify the technical criteria for the type and number of sanitary devices in the workplace for the agricultural, irrigation, agro-exporter, and agro-industrial sectors that do not qualify as buildings and or urban facilities.

Safe Drinking Water

Agrokasa's facilities include water treatment plants that produce drinking water, which is distributed to all work areas. Regular testing ensures its quality and suitability for consumption. The water is regularly tested to control suitability.

Agrokasa maintains a strict people-care policy.

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3.3 Soil Moisture and Health

All tree pruning material is left in the orchards to serve as mulch, aiding soil moisture retention, weed prevention, and soil revitalisation.

3.4 Other Sustainable Initiatives

Integrated Pest Management

Currently, the agro-food industry promotes the development of integrated pest management practices, which have been used at Agrokasa since the company's inception. They employ beneficial predatory insects such as *Anagyrus* wasps. Additionally, they use control nematodes such as *Heterorhabditis* to target pest insects that inhabit the soil. Each crop has its own ecosystem where plants, pests, and their biocontrol agents interact, so Agrokasa utilises different species tailored to each specific case.



Agrokasa uses falconry to deter birds from crops. They have also published the book "Birds of the Ica Desert".

The practice of falconry is used as a method of biological control at Agrokasa, employing hawks to effectively deter predatory birds from crops such as grapes.

Birding Books

In 2007, Agrokasa published "Birds in the Ica Desert, The Experience of Agrokasa," documenting bird observations in Ica. Following over twenty years of bird studies in Barranca and Ica, their second book "Desert Birds of the Central Coast of Peru" presents a decade of scientific research results. The farms host over one hundred bird species.

Preservation Zone

Preservation Zones are intangible areas within Agrokasa's farms where flora and fauna thrive. These zones also encompass areas of high conservation value, such as locations with archaeological remains (e.g., Virgen de Las Mercedes Farm).

4. Future Plans for Agrokasa

Agrokasa is committed to adapting and evolving its agricultural practices in response to changing water demands in the Ica region. Recognising the critical need for sustainable water use, Agrokasa plans to diversify its crops to achieve a perfect balance in water consumption. This diversification will complement their ongoing efforts to expand and optimise their water resources.

A major milestone in Agrokasa's journey toward sustainable agriculture was the development of the wastewater treatment plant (WWTP). This initiative not only supports sustainable crop production but also provides significant benefits to the local municipality by enhancing water and sanitation services. Building on this success, Agrokasa intends to continue collaboration with the local municipality to expand the WWTP, ensuring even greater positive impacts for the community.

In addition to environmental sustainability, Agrokasa is dedicated to improving the livelihoods of its workforce and their families. The company's decisions prioritise the well-being of people, aligning with its broader mission of social responsibility.

Agrokasa plans to align all its initiatives to contribute to Peru's efforts to achieve the United Nations Sustainable Development Goal 6 (Clean Water and Sanitation) by 2030.

Agrokasa plans to diversify its crops to achieve a perfect balance in water consumption.

5. Conclusion

In summary, this case study highlights Agrokasa's innovative approach to tackling water scarcity in its avocado-growing regions. By implementing advanced irrigation systems, diversifying water sources, and investing in wastewater treatment technology, Agrokasa not only optimises water use but also contributes to replenishing local aquifers. Initiatives like the AGROKASA PTAR project underscore their commitment to sustainability, reducing groundwater dependency, and improving environmental conditions in the Ica region.

Additionally, Agrokasa's dedication extends to workforce well-being, providing free meals, safe transport, and high-standard WASH facilities. These efforts align with global sustainability goals, reflecting their holistic approach to responsible agriculture.

While Agrokasa has made significant progress, ongoing efforts are needed to address broader regional challenges. Enhanced transparency, expanded WASH services, and stronger government support are crucial for sustaining these positive impacts. Agrokasa believes that through collective action, this could be achieved. Worldwide Fruit Limited (WFL) shares this belief, deeply understanding the risks associated with human rights in water-scarce regions. WFL's involvement in collective action projects, such as the Ica Water Road Map Project, demonstrates its dedication to long-term sustainability in these vulnerable areas.

Through continued innovation and collaboration, Agrokasa can set a benchmark for sustainable agriculture in Peru.



Sources:

- · All photos, unless otherwise indicated, were acquired from Agrokasa.
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