

Drop by drop

**Understanding the impacts of the UK's water footprint
through a case study of Peruvian asparagus**



PROGRESSIO

in association with

Centro Peruano de Estudios Sociales

Water Witness International

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About this report

This report is based on collaborative research by Progressio, Water Witness International and CEPES (Centro Peruano de Estudios Sociales / Peruvian Centre for Social Studies), which took place in April and May 2009. The team – Nick Hepworth of Water Witness International, Julio Postigo of CEPES and Bruno Güemes Delgado of Progressio Peru – thank the people, communities, companies and organisations who generously contributed their time, experiences and opinions to the work. Special thanks are extended to Dr Eric Rendón of the Universidad San Ignacio de Loyola and the staff of Progressio and CEPES for their kind support and guidance. Thanks are also due to the expert reviewers who contributed with valuable insights and comments to the final draft. Additional research by Petra Kjell, Progressio.

The opinions expressed in this report are those of the authors and do not necessarily reflect those of Progressio, Water Witness International or CEPES. Together these organisations have researched and analysed the information contained in this report and have made every effort to ensure accuracy and an objective and balanced perspective. The report has also been critically reviewed and checked by a panel of seven international and Peruvian experts in water, environment, trade and development. However, Progressio, Water Witness International and CEPES cannot be held responsible for any errors.

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water witness 

...because we're all downstream

Water Witness International is a research and advocacy charity working for equitable, sustainable and accountable water resource management in developing countries. We see that the poor management of rivers, lakes and aquifers, exacerbated by a changing climate, holds back economic growth, poverty reduction and biodiversity conservation, and fuels conflict. In order to broker consensus-based progress towards a secure water future, we work with our partners to understand and communicate the consequences, causes and solutions to water resource problems. Water Witness International is a company limited by guarantee and a registered charity (registration numbers: 353570, SC041072) with its registered office at the address below.

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Executive summary

This report builds on the concepts of virtual water and water footprinting, to show how these ideas can be understood and practically applied to drive sustainable water management and equitable outcomes for the world's poor.

Through a case study in Peru, the report links the production of fresh, year-round asparagus for the international market to the rapid expansion of the agrarian frontier and the 'greening' of the desert to grow the crop. The research shows how this expansion has become unsustainable given the hydrological context and concurrent demands for water in the Ica Valley, the epicentre of Peru's asparagus boom. Huge increases in water demand to support this agricultural expansion are linked to negative economic impacts on small and medium-scale farmers and contribute to water scarcity and inequity for some of the poorest communities in Peru, fuelling social conflict and enhanced vulnerability to climate change across the Ica Valley and beyond.

The complexity of the links between water use, negative impacts and economic and social well-being in Peru means that a considered response is required, and knee-jerk reactions would be unhelpful. Loss of the asparagus trade could have a detrimental impact on livelihoods in Ica where many poor people rely on the jobs it provides. Instead the factors which have conspired to make the industry unsustainable need to be addressed. Based on the analysis in this report, a set of opportunities for progress are presented to help reverse the potentially disastrous outcomes emerging in Peru, which can help prevent similar water crises elsewhere. The report shows that responsibility for the formidable water problems facing Ica, and their solutions, lies in part with the Peruvian government, but that responsibility also lies with other parties driving the asparagus boom from outside Peru, including investors and retailers. The UK represents the third largest market for fresh asparagus from Peru, behind the USA and the Netherlands. The water consumed in growing the asparagus imported to the UK in 2008 has been estimated to be 9 million cubic metres (Mm³), which equates to about 3,600 Olympic swimming pools of water. Most of this water is used in the Ica Valley of Peru, one of the driest places on earth.

The Ica River rises in the mountain region of Huancavelica, Peru's poorest region, where the catchment has been artificially extended into the Amazon basin to capture water from wetter areas. Here, indigenous communities make a marginal livelihood herding mixed flocks of alpaca, sheep and llama, and already face water problems because of pollution from mining and a highly variable climate. The river flows to the Pacific coast through the region of Ica, which has an average rainfall of less than 1 mm per year. Despite this, the local population have historically managed to survive through a fragile balance of water supply and demand, with a productive agricultural sector using groundwater recharged from the mountains to irrigate crops such as cotton, nuts, fruit and vegetables.

Since the 1990s the cultivation of asparagus in Ica for the fresh export market has exploded from almost nothing to cover nearly 100 square kilometres in 2008. Based on this boom, Peru now dominates the world's asparagus trade, with approximately 95 per cent of the country's fresh asparagus exports originating in Ica. With 40 per cent of Ica's economically active population (EAP) employed in the agro-export industry, the asparagus boom has contributed to near zero unemployment in the area, providing jobs for many poor people.

In the Ica Valley, asparagus is grown intensively in large blocks of land reclaimed from the desert, irrigated by groundwater delivered by drip irrigation through hundreds of kilometres of pipeline. In 2002 this greening of the desert became unsustainable, when the irrigation needs of asparagus began to push the exploitation of the valley's aquifer into the red. With extraction since then significantly exceeding the amount of recharge, the water table in the valley has plummeted, typically by rates of between half a metre and two metres a year, and in places by as much as eight metres each year – almost certainly the fastest rates of aquifer depletion anywhere in the world.

Although the asparagus boom is an opportunity for economic and social development in the valley, unsustainable water resource use has begun to exert a formidable set of negative impacts in the region. These impacts are severe and escalating rapidly, and can be traced directly to the water footprint of developed nations.

The research shows how:

- Overexploitation of the aquifer is already impacting on the asparagus and agro-export industry itself, with spiralling costs incurred in the acquisition of irrigation water. These costs include deepening existing wells, buying up old wells, piping water across great distances, and allegedly trying to beat the ban on new wells through pulling political strings or paying off officials in a race to capture the dwindling resource.
- Pre-existing, 'traditional', small and medium-scale farmers are feeling the brunt of this resource race, forced to go without water because of drying wells and increasing salinity, or pushed into debt and forced to sell land and wells to big agribusinesses because they cannot keep up with escalating costs.
- Water levels in domestic water supply wells are falling rapidly. Already two wells serving 18,500 people in Ica have dried up, and at current rates of exploitation a third of the city's supplies, serving 185,000 people, are likely to dry in the next 25-30 years.
- Poor people in the valley are suffering most. Because of earthquake damage and underinvestment in water supply infrastructure, poor communities sometimes have to survive on as little as 10 litres of water per person per day, compared to the 50 litres specified by the World Health Organisation as the minimum needed for basic health maintenance. As local wells dry up or are bought out by agribusiness, these same communities watch some of the big asparagus farms each use the same amount of water as the entire city of Ica every day. The demands of developed country buyers also mean that water used to irrigate asparagus is often treated to higher quality standards than that provided for public drinking water supply. Furthermore, local people face the problem of groundwater pollution by nitrates from agricultural fertilisers and wastes.
- The increased water demand for asparagus is also driving water scarcity in the mountains above Ica, affecting some of the poorest communities in Peru. Faced with government supported investment to extend a water transfer scheme which already denies them water – diverting drainage from 392 square kilometres of the upper Amazon basin – poor alpaca herders in the hills have resorted to the Latin American Water Tribunal (LAWT) to seek justice. They claim that the water they need to keep their pastures and animals healthy is being diverted to Ica and that this is heightening their vulnerability to climate change. They attest to less snow, less reliable and more intense rainfall, and harsher temperatures. In the face of this changing climate, the water transfer to Ica further limits the livelihood options available to escape the severe levels of poverty experienced by many communities in the mountains.

Unless action is taken, the overexploitation of the aquifer will eventually exhaust the water resources which the city of Ica and its population of over a third of a million people depend on for their survival. In a perverse process of self-destruction, all but the most powerful farmers will be forced out as the resource becomes scarcer and more expensive to access.

The causes and impacts of the overexploitation identified by the research are summarised schematically in the 'problem tree', Figure A, at the end of this summary. It traces how regulatory control over water resource use has failed, partly because of inadequate legal and institutional frameworks. Poorly designed and unenforced water laws have permitted a few large agribusinesses to secure preferential access to and use of water at unsustainable rates. Looking more deeply, a lack of rational development planning and control processes, such as Environmental Impact Assessments (EIAs), has facilitated expansion by agribusiness into areas with insufficient water.

These problems seem to have their roots in a lack of regulatory capacity, the apparent subversion by powerful and well connected elites of the little government capacity that does exist, and a lack of political will to control market forces.

Alongside this failure of public policy and public institutions, responsibility is also shared by the private sector, where investors, insurers and purchasers have failed to take due diligence to ensure that the businesses they support exploit natural resources in a way which is sustainable. Of real concern is the failure of existing lending safeguards and market standards to flag, question or deal with the water impacts of a water dependent industry which is overexploiting a rapidly dwindling and limited water resource in one of the driest places on earth. Such standards and safeguards are specifically designed to ensure that economic development is sustainable – good for the environment and the poor. Examples which deserve particular scrutiny include the performance standards of the International Finance Corporation (IFC), the private sector lending arm of the World Bank, which has made substantial investments in the asparagus industry in the Ica Valley; international production standards of good agricultural practice such as GLOBALG.A.P.; and the social and environmental standards of retailers and supermarkets. These standards, which suggest to the market that sustainable production methods have been adhered to, have all been awarded to agro-exporters in Ica. Whilst they have been associated with improvements in employment conditions, our report shows that they reward production which is far from sustainable in its water use.

This case study of asparagus in Ica provides a potent example of how these failures of regulation and responsibility impose significant social and environmental impacts which are felt most painfully by the poor. The findings shed light on what the ‘water footprint’ imposed by distant consumption means in real terms within developing country watersheds. The lessons learnt are not only relevant for Peru, but have global relevance because:

- The virtual water trade and water footprint serving the developed world is already significant, with a global reach into developing countries, and it continues to grow.
- Weak water resource regulation and challenges in implementing regulatory controls over water resource use are common to most developing countries.
- The failure of corporate responsibility measures, lending safeguards and market standards to adequately consider water resource sustainability is a global phenomenon.

This report does not aspire to provide ‘answers’ to the water problems of Ica. Ultimately there needs to be a realignment of water supply and water demand in the basin. The hazards of focusing just on new supply side solutions are explored in the report as is the danger that regulatory demand management may prejudice the poor rather than control the powerful. To drive positive change, stronger incentives are required to steer water users and markets towards more sustainable modes of production. Through this research a set of opportunities for progress emerged and these were deliberated, developed and refined in stakeholder meetings in Peru. The report categorises these into the roles which must be played by science, regulation, civil society, investors and retailers. They have been divided into national and international recommendations; however, it should be noted that many recommendations are cross cutting.

National level

The role of science

A lack of readily available data, targeted research and understanding of the water resource, its use and the nature and implications of climate change mean that uninformed management decisions risk perverse outcomes. A key requirement for making progress will be a better understanding of the issues within both the social and natural sciences. The role of high quality research, objectively packaged findings and freely available information is particularly important given the political polarisation and misinformation of the past.

The role of regulation

The new Peruvian water law provides the fundamentals for an effective water resource management regime; however, lessons from past failures need to be learnt, and concerns about water privatisation by stealth, which threaten further polarisation, need to be responded to.

The role of civil society

The oversight roles of NGOs and the media are potentially powerful tools in the democratisation of the management of natural resources, incentivising improved performance and greater accountability within government. Within Peru's new water management arrangements these roles and the capacity to fulfil them need to be nurtured. This will require open and cooperative government and constructive, non-adversarial engagement by the NGO sector which focuses on dealing with the shared risks to society brought by poor water resource management.

International level

The role of investors and retailers

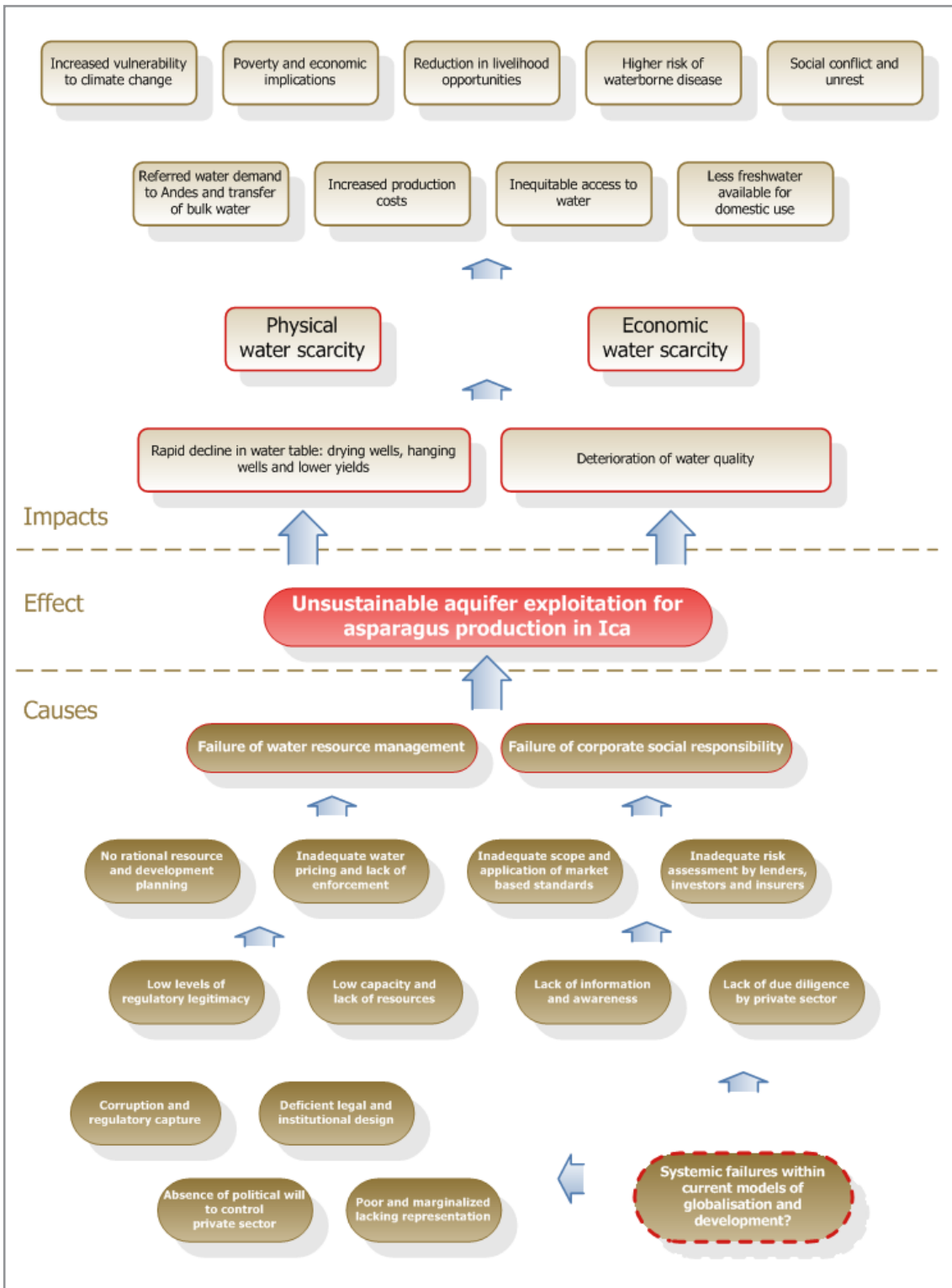
The research provides convincing evidence that the market is a powerful driver of change in Peru's agro-export sector. However, it also shows that existing market standards fail to adequately consider the sustainability of water resource use. Specifically, we found that the failure of standards such as GLOBALG.A.P. and supermarkets' own standards, as well as the IFC's Performance Standards, in relation to water resource use and its impacts, whether through design or lack of compliance, have contributed to the social and environmental problems documented. We strongly recommend that these standards are reviewed and revised to ensure that they only reward production which exploits water resources in a genuinely sustainable way. In addition, production and investments which have been labelled as 'responsible' through compliance with these inadequate standards should be reviewed urgently to check they are not creating hydrological problems comparable to those seen in Ica.

The Alliance for Water Stewardship (AWS) is currently coordinating global efforts to develop new comprehensive standards for sustainable water resource use which better address the complexities of water stewardship. Developed through a participatory approach, these standards will set out what water users must do to ensure that their water use and the catchment they operate in are managed responsibly. The AWS effort will develop a system for independent verification against these standards and will create a recognisable brand in the market place so that responsible water use can be rewarded by consumers, purchasers and investors. We recommend financial and political support for this effort and proactive participation by the full range of water stakeholders.

The role of the donor community

Market based standards, such as those being developed by the AWS, will make an important contribution, particularly where water resource management and regulatory effort by governments falls short. Ultimately, however, sustainable water resource use and allocation must be secured by effective public policy on water. Governments must take responsibility, must act and must be held accountable for ensuring that water resources are managed for the collective 'public good' of their citizens. However, in developing countries external financial and technical support may be necessary, particularly where the powerful forces of commercial agricultural production come into play. Civil society groups, non-governmental organisations, research institutions and the media can play an important role by keeping a watchful eye to ensure that water laws are applied to protect the poor and the environment. Such groups require support for monitoring and communication work, to cap corruption and to ward off resource capture and overexploitation. We therefore call on the UK government to step up its support to civil society and research groups working for social accountability and equity in developing countries, so that the benefits of economic growth are sustained and shared by all.

Further, as we have shown in our analysis, unsustainable water resource use and associated social conflict and inequity, such as that being played out in the mountains of Huancavelica, will be exacerbated by human induced climate change. Developed countries where the majority of greenhouse gas emissions originate clearly have a financial and moral obligation to support countries like Peru and its poorest communities in their efforts to adapt to climate change. The UK should extend its leadership role in supporting climate change adaptation and, given that the impacts of climate change will be felt through changes in the distribution and availability of water resources, we call on the UK government to specifically focus additional support on effective and equitable management of this most precious resource.



➤ **Figure A** The causes and impacts of unsustainable aquifer exploitation for asparagus production in the Ica Valley

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