Water emergency in oasis of the Peruvian coast. The effects of the agro-export boom in the Ica Valley

Maria-Teresa Oré, David Bayer, Javier Chiong, Eric Rendon

université PARIS DIDEROT PARIS 7

UFR LSHS _LETTRES, SCIENCES ET DES SOCIETES DE L'HOMME

UNIVERSITÉ PARIS 13 NORD

Oasis dans la mondialisation : ruptures et continuités

Oases in the globalization: ruptures and continuities

Conception : direction de la communication, Université Paris 13 - Novembre 2013

Actes du colloque - 16/17 décembre 2013 - Paris

Proceedings of the Colloquium - 2013 December 16th/17th - Paris

Organisé par / organized by
Anaïs MARSHALL, Emilie LAVIE, Jean-Louis CHALEARD, Monique FORT & Jérôme LOMBARD

CRESC
Centre de Recherche sur les Espaces, les Sociétés et les Cultures

CENEL Centre d'Etude des Nouveaux Espaces Littéraires

rés-EAU WATER -network P10
Réseau d'Études et d'Échanges en Sciences Sociales sur l'Eau
Université Paris Ouest Nanterre La Défense

Panthéon-Sorbonne – Université Paris 1

PRODIG UMR 8586 CNRS Paris 1, Paris 4, Paris 7 ephe

L'Université Paris 13 est membre fondateur de Sorbonne Paris Cité

CAMPUS CONDORCET Paris-Aubervilliers

Water emergency in oasis of the Peruvian coast
The effects of the agro-export boom in the Ica Valley

María Teresa ORÉ, David BAYER, Javier CHIONG, Eric RENDON
Pontificia Universidad Católica del Perú, teresa.ore@pucp.edu.pe
Consultor, Benavidesdavid7@gmail.com
Proyecto Sub sectorial de Irrigación PS, chiongampudia@yahoo.es
Universidad Nacional Agraria, ericrendonschneider@hotmail.com

Résumé :
Dans cette communication, nous analysons l'effet du boom de l'agro-exportation dans l'écosystème aride de la vallée d'Ica au Pérou, y compris les effets environnementaux sur son aquifère et la montée d'un nouveau type de conflits sociaux et environnementaux qui révèlent les différents intérêts économiques et sociaux dans le bassin de l'Ica.
Fin 2010, la vallée a été déclarée en état d'urgence hydrique à cause de la surexploitation de son aquifère. Paradoxe, dans une région qui avait vécu un miracle de l'agro-exportation, avec les asperges.
Nous analysons des éléments conceptuels pour montrer les effets de l'eau souterraine par rapport à la possession de la terre, la relation entre le secteur agro-exportateur et les chaînes commerciales internationales et l'absence d'une législation réglementant l'utilisation de l'eau souterraine et ses conséquences pour une gestion intégrale des sources d'eau.

Keywords: Water scarcity, groundwater, watersheds, social and environmental conflicts, users organizations
Mots-clés : manque d'eau, eau souterraine, bassins, conflits sociaux et environnementaux, organisations d'usagers.

A new agrarian structure

The Ica Valley is located in a large arid zone on the Pacific coast. The scarce and irregular rainfall that feeds the Ica River has shaped agricultural development in the area. In the mid 20th century, the scarcity of surface water led to the exploitation of groundwater in order to expand agriculture and permit the establishment of modern cotton plantations (Oré 2005).
The exploitation of the Ica aquifer , the most important in Peru, began to increase in the 1990s with the introduction of new crops such as asparagus, paprika, artichokes, red globe grapes, etc., for which there is high demand on the international market. Production was undertaken by new national and international agro-export enterprises that use modern irrigation technology, relying exclusively on groundwater, which is characterized by its quality, purity, and especially, for being permanently available. Due to this new agro-export boom, Ica is now the principal agro-exporting valley in Peru, with asparagus as its star product.
The article will discuss two questions: To what extent did overexploitation of the aquifer make possible the concentration of water and land in fewer hands? Is the intensification of new conflicts over water in the valley and basin the result of this process?

The Ica River Basin: Geography and Agriculture

The source of the Ica River is on the western slope of the Andes mountain range in the region of Huancavelica in small lakes located in the high altitude areas of the basin. The total length of the natural basin is 7,711 km^2, including the Ica River, which has a total area of 8,103 km^2 and includes the Choclococha irrigation system with an area of 392 km^2. Politically, it is located within the jurisdiction of the regional governments of Ica and Huancavelica (see Figure 1).

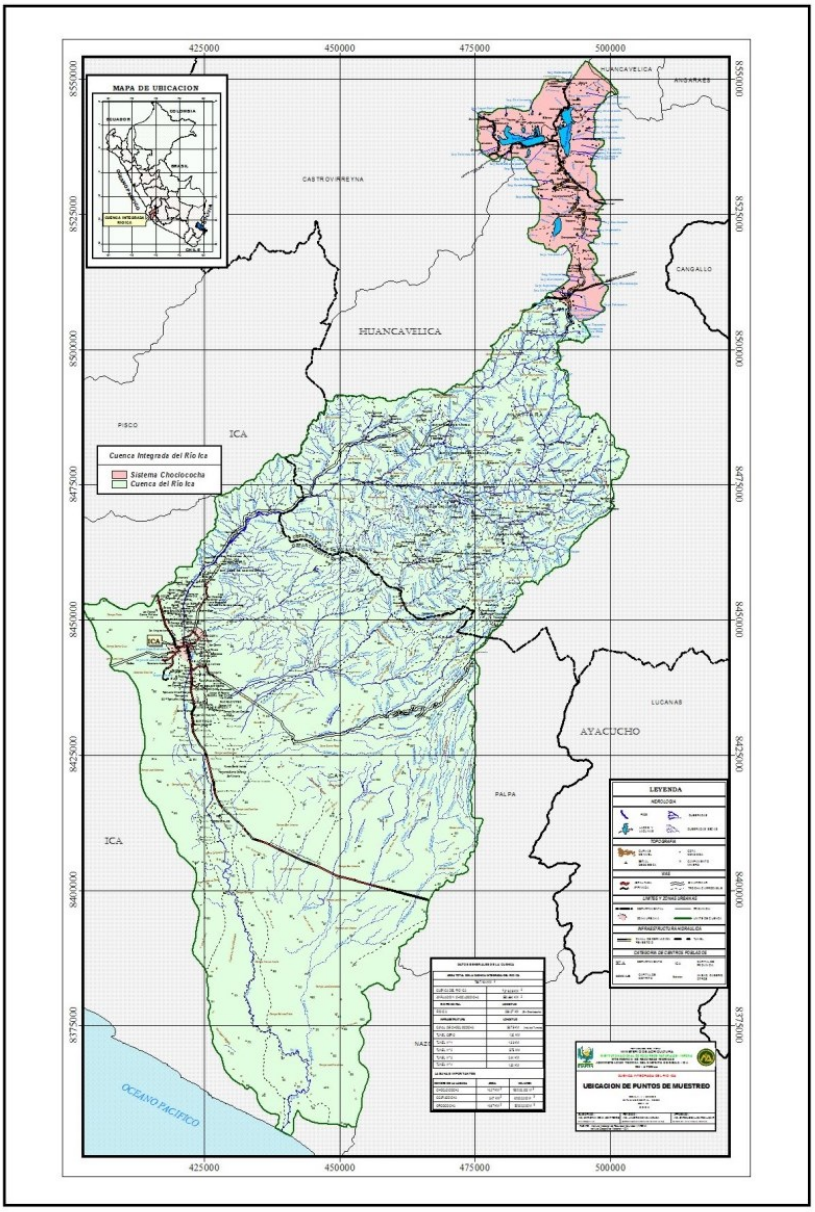


Figure 1: **Ica RiverBasin**
Source: Intendencia de Recursos Hídricos (Lima), 2007

Rains fall in the upstream basin during the summer months, between December and March. The river has water flow only during this season, with highly variable volumes. After the rainy season, the river receives stemflow and then dries out in April. The rainfall totals are

very low, even the highland areas, making the Ica River one of the driest in the Peruvian coast. The water regime includes irrigation water from the Choclococha system from September to October. The humid watershed is at 2500 meters above sea level, in the region of Huancavelica; while it is not fed by large areas of snow or glaciers, 150 small lakes have been inventoried (INRENA 2008) which play an important role in the hydrological cycle of the basin. The intermediate section of the basin is located between 300 and 480 meters above sea level in Ica. This is the zone with the largest area under cultivation in the valley, with small traditional agriculture, former smallholders, medium-sized farm owners, and the principal agro-export enterprises. The lowest area of the basin extends from the Ocucaje depression to the mouth of the river. This has small, traditional agriculture as well as recent investment in hydraulic infrastructure for possible ecological agriculture for export.

From the beginning of the 20th century, the Ica Valley has expanded its agricultural frontier by improving surface water infrastructure since landowners were counting on an increase in international demand for cotton. At the end of the 1950s, 10,000 new hectares were made available for agriculture through the construction of the Choclococha Project in Huancavelica, which made available more surface water for Ica. At the same time, there was a boom in exploitation of groundwater which made it possible for landowners to quickly expand their plantations in the southern area of the valley. In the 1960s, modern cotton plantations that used both surface water and groundwater were established.

The Ica-Villacurí Aquifer

With 40% of the hydric volume of subterranean waters the Ica-Villacurí aquifer constitutes the largest one in Peru. This explains its importance for the recent development of agriculture in Ica. The exploitation of groundwater was introduced in Ica in the 1930s and experienced its first boom in the 1950s, making possible the establishment of large and modern cotton plantations in the 1960s (Oré 2006). Access to groundwater was through wells which required an initial inversion in infrastructure. Because the wells constituted a permanent source of groundwater and were privately owned, they guaranteed their owners constant and stable access to the resource during the whole year. Given its high level of purity, it has been the principal source of drinking water and everyday use by the population of Ica since the 1960s. In the 1990s, the groundwater in the valley provided 50% of the volume of water utilized in agriculture. Currently, this percentage has risen to 65%. While the traditional crops in the valley – grapes, beans, various fruits, and cotton – are irrigated with surface water, the new crops introduced in the 1990s are irrigated exclusively with groundwater extracted using modern irrigation systems.

The vast majority of people engaged in agriculture in the Valley (97%) use only surface water irrigation. Nevertheless, the users of groundwater use the largest volume of water and own the most hectares under cultivation in the valley.

Organizations of users

There are two organizations of surface water users in the Ica Valley that bring together small farmers, former smallholders, and owners of medium-sized farms. The Organization of Users of the Ica River (JUDRI) has nearly 7,000 members who irrigate along the right bank of the

river. The Organization of Users of La Achirana (the main irrigation canal in the valley) and Santiago de Chocorvos (JURLASCH) has 9,000 members who irrigate along the left bank. Both engage to operate and maintain surfacic water irrigation systems and their members pay a water tariff. Both are monitored by governmental bodies.

Groundwater users organizations were not founded until 2005 because of a serious decline in the water table, delays in the granting of rights to use groundwater, and the neglect of organizations of users of surface water to groundwater users requests. These organizations required the payment of a water tariff, which provided the funds to maintain themselves, carry out monitoring, and recharge the aquifer. A groundwater users' association was created in the Villacurí Pampas and a new irrigation district was created in the interbasin of the Pisco and Ica rivers in 2008. This provided useful experience for the creation of the Organization of Users of Groundwater in the Ica Valley (JUASVI) in 2009. However, this organization functioned only intermittently both because of a lack of regulations regarding groundwater and the characteristics of its members.

The users of groundwater are large Ica landowners as well as national and international agribusinesses. The appropriation of water resources is individual; there are no measurement instruments in the wells for regulation or control –the extraction of water takes place day and night, not subject to any control or monitoring. The local government agency has not taken action to regularize the use of groundwater nor created regulations for the functioning of wells or induced users to participate. These are difficult tasks to accomplish because there are no previous studies about the condition of aquifer. Large landholdings are surrounded by armed guards who make access impossible. In 2009, with the enactment of the new Hydric Resources Law, for the first time, a water tariff for groundwater used in agricultural production was established; nevertheless, it is very difficult to implement this law, since large property owners do not always allow local water authorities on their property.

The new agro-export 'miracle'

Today, Ica is one of the principal agro-exporting valleys in Peru, accounting for 30% of the country's exports in vegetables and fruits. Its principal markets are in Europe, followed by the United States and some Asian countries. The largest number of hectares under cultivation are dedicated growing asparagus which has replaced cotton as the main crop in the valley, followed by crops such as the red globe grape, together with artichokes and paprika.

In contrast to cotton or the traditional crops grown in this valley, fresh asparagus requires a large quantity of water to maintain its stalk fresh, which is required by the international market. It is also a product that can be grown throughout the whole year. Its water footprint[84] is approximately 1.17 m^3 per kg. Paradoxically, this occurs in an area whose principal problem is water as detailed in the most recent report from Progressio (Hepworth 2010).

The main issue discussed in the Progressio report is the export of *virtual water* contained in fresh asparagus exported from Ica. The term *virtual water* was introduced at the beginning of

[84]A water footprint is the volume of water necessary for the production of goods and services utilized by a person or group. The term *net agricultural water footprint* indicates the net quantity of water used for each crop, without taking into consideration the efficiency of irrigation systems.

the 1990s by J.A. Allan (1992), who defined the term as the water used in the production of any good, whether agricultural or industrial. Thus, if a country exports a product that demands more water than the average amount used to produce other similar products, this is the equivalent of exporting water because the importing country does not need to use its own water to obtain this product and such water can be assigned to other uses. Of the groundwater used for agriculture, 95% is destined for export crops. Asparagus is the crop that uses the largest volume (35%) (Rendón 2010).

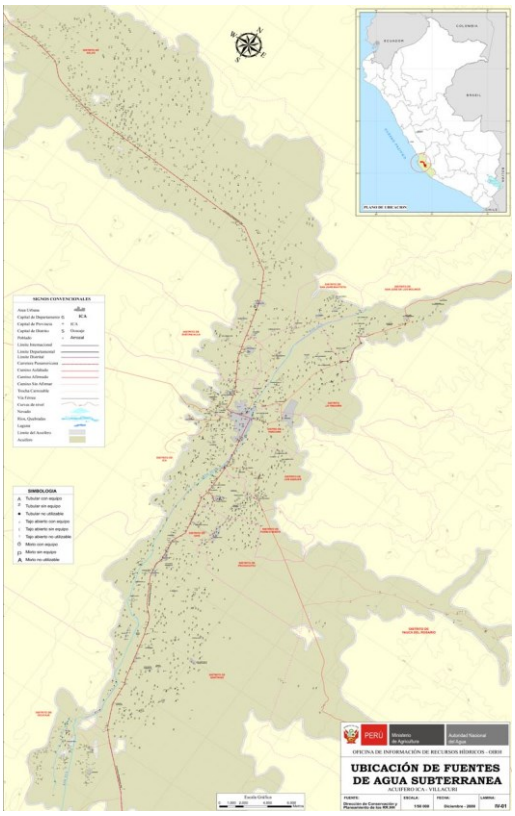
Expansion of the agricultural frontier.concentration of water and land

In 1969, under the agrarian reform program carried out by the military government of Velasco Alvarado, all the plantations were expropriated and transferred to their workers who became administrators of new agrarian production cooperatives (CAAPs). In the mid 1980s, with the failure of the cooperative model as well as the state model of agricultural development, the cooperatives were divided up by the workers themselves. As a result small and medium-sized properties predominated in the Ica Valley. In the decade of the 1990s the government of Alberto Fujimori provided legal incentives for private investment. National and international businesspeople arrived in the valley and the Villacurí Pampas to grow new crops such as asparagus, paprika, flowers, artichokes, red globe grapes. They introduced modern irrigation technology, especially drip irrigation. Demand from international markets increased; this led agro-export firms to intensively exploit wells –up to 18 hours a day– and, at the same, to increase their landholdings in the direction of the wasteland terrains of the Valley and Villacurí Pampas.

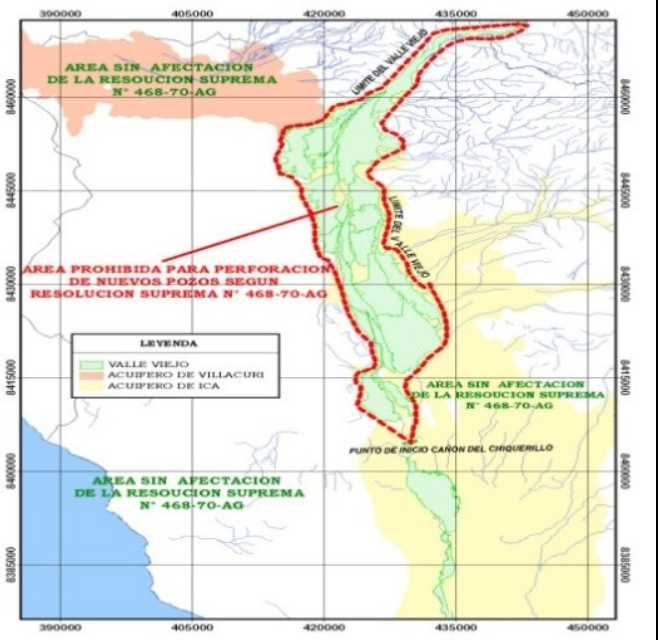
In the beginning these enterprises were established first renting the lands of smallholders and medium-sized farmers from Ica; the lands were later bought up. Within a short time, there were new agro-export plantations of 1000, 1500 and 2000 hectares while before the Agrarian Reform, properties in this area were no larger than 300 hectares. As they expanded, the new plantations concentrated both land and water and expanded the agricultural frontier through the exploitation of groundwater. The Ica desert started to change to green. Through this process many peasant *minifundistas*, smallholders, and small farmers lost their lands, Most of them stayed on to work as employees or salaried workers in the agro-export enterprises. Among these, there was high proportion of women workers. Others had no choice but to migrate to the city or end their agricultural activities.

Exploitation of the Aquifer

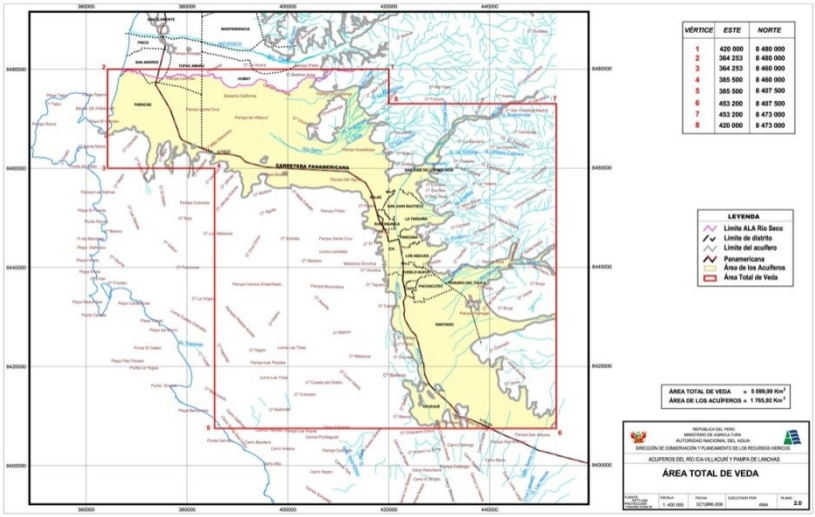
The Ica-Villacurí aquifer is a hydrogeological unit whose volume of sustainable exploitation is 252,99 million cubic meters a year according to studies and models prepared by the National Water Authority (ANA). Nevertheless, according to official statistics, exploitation of the aquifer in 2009 was 543,15 millions m^3 it was being overexploited. This led to declaring this aquifer in a state of emergency in 2009 thereby imposing restrictions on some areas and expanding temporal bans in others. At the beginning of 2012, the Regional Government of Ica declared the Ica Valley in a state of hydric emergency. While a temporary ban in the 1970s only affected the Ica Valley, the area currently covered has been extended to the Villacurí and Lanchas Pampas in the valley of the Pisco River (see maps below).



Map 1 : The Total Area of Temporary Bans in the Ica Valley-Villacurí Pampas and Lanchas Pampas in 2010
Source: Oficina de Información de Recursos hídricos. ANA, Perú 2010



Map 2: The Area of Temporary Bans in the Ica River Aquifer in the 1970s.
Source: Oficina de Información de Recursos hídricos. ANA, Perú 1970.



Map 3: The Total Area of Temporary Bans in the Ica Valley-Villacurí Pampas and Lanchas Pampas in 2010
Source: Oficina de Información de Recursos Hídricos. ANA, Perú, 2010.

The agro-exporters demand to the government: "Save Ica agriculture"

Facing this emergency situation, the JUASVI demanded that the central government take on the project of widening the Ingahuasi canal that carries waters from the Choclococha lagoon to the Valley. The government issued a ministerial resolution approving studies of the problem; however, when the project was about to be carried out, members of indigenous communities in the Huancavelica region protested. Later, the communities obtained a ruling from the Latin American Water Tribunal against the government of Peru, the Regional government of Ica, and the Special Project Tambo Ccaracocha. This ruling has stopped work on the project to date. Meanwhile, the Organization of Users of the Seco River from Villacurí and Lanchas, also demanded that the central government carry out a new project widening the canal from the Pisco River to the Villacurí. It is important to note that the purpose of these projects is to secure the viability of lands that are already under cultivation and not to increase the agricultural frontier. The water sources that are to nourish Villacurí would come from the Pisco River.

In order to avoid losses of water for Lanchas crops, it was necessary to propose two different projects that reflect the interests of two different groups of agro-exporters, one in Lanchas and the other in Villacurí. These projects were approved through urgent decree laws. National media and lobbying by agro-exporters of government institutions argued that "Ica agriculture has to be saved," "we are the main producers of asparagus in the world," "agro-export offers full employment for the population" and "Ica is the principal agro-export valley in the country." (Boletín de la JUASVI, 2011) However, the environmental and social impact of this new agro-export "miracle" has continued to be silenced.

The other strategy that agro-exporters have started is to try to recharge the aquifer with surface water. This is being done primarily on the left slope of the valley where the largest plantations are located. On this slope flows La Achirana, the principal irrigation canal in the Ica Valley and a symbol of the small agricultural sector in Ica (Oré 2006). One of the first objectives of the agro-exporters, therefore, is to convince the Organization of Users of La Achirana to join this action. The current Law on Hydric Resources (Law No. 29338) introduces, for the first time, the concept of monitoring, management, and recharging of aquifers. Thus, the aquifer is subject to management of groundwater and its users organizations are also recognized. Nevertheless, thus far, there is no monitoring being carried out and the mechanisms to control the exploitation of groundwater are not in place.

'Water wars' in Ica and Villacurí?

The expansion of the new agro-export enterprises are concentrating water on their plantations and thus diminishing the water available to small rural villages, small and medium farmers in the valley, larger urban centers such as Parcona and Pachacútec, and the highland part of the basin where the Huancavelica indigenous communities are located. This has resulted in an increase in new social conflicts among different social actors and sectors over access to water. They occur, as noted by Bebbington, "in order [to] demonstrate opposition to levels below which certain resources (water, land) are reduced as a consequence of industrial extractive

activity" (2007: 49). In addition, Ostrom (1995: 582) perceives the lack of institutionality in the management of natural resources as a determining factor in the persistence of social and economic conflicts.

Newspapers such as *El País*, *The Guardian*, *The New York Times*, and others, are characterizing these conflicts as new "water wars". They are also sometimes referred to as *social movements*. However, we consider that conflicts over water in Peru – except for the conflict in Cajamarca over the Conga project – should be categorized as *social conflicts* because they are localized, spontaneous, and lack the level of organization that, according to Sydney Tarrow (1997), are required for them to be considered as *social movements*.

Businesses vs. the rural and urban population in the Ica valley and basin

In rural areas, the new plantations belonging to large enterprises have been buying up lands and wells, transporting groundwater large distances and using underground aqueducts that cross up to 14 districts in the Ica Valley. In this way, they have diminished or totally eliminated the irrigation and drinking water available to the population of neighboring villages. In urban areas, the overexploitation of groundwater by agro-export enterprises is diminishing the drinking water available to some of the most populated urban districts in Ica. All these developments are currently resulting in regular conflicts in the Valley that are receiving no publicity on the national level and are not part of local and regional public policy agenda.

Conflicts between regional governments in the same basin and between sectors

The most important bilateral conflict was between Ica farmers and indigenous community members in Huancavelica.

The communities opposed a new canal project named Tambo Ccaracocha that drained water into the Ica Valley to recharge the aquifer. The Carhuancho community in Huancavelica, which was most affected by the project, initiated a legal action in the Latin American Water Tribunal, headquartered in Mexico, in order to stop the project which was affecting the wetlands and *bofedales* which the community owned and used to feed its animals. The regional governments of Huancavelica and Ica took on this conflict and confronted each other violently. The dispute escalated rapidly and made headlines in the local media. As a result, the canal project was paralyzed.

An example of a conflict between sectors is the dispute between Aceros Arequipa, a steel company, and large landholders in Lanchas. The industrial firm wanted to dig more wells. This would have diminished the water available to the agro-export sector in Lanchas. The agricultural sector mobilized and impeded the digging of wells. In another case, the municipality of Paracas planned to dig two wells and to build a reservoir for drinking water. These new wells could have affected the water available to farmers in the area. This conflict reveals the competition for water that exists between the industrial sector and the needs of the urban population, on one side and the agro-export sector on the other.

All the conflicts in the Ica Valley are characterized by being spontaneous and, except for the case of the conflict between the regional governments of Ica and Huancavelica, there has been little or no participation in these conflicts by local community leaders or political parties.

Local and regional water authorities have not been able to solve these conflicts and referred them to national level authorities. It is noteworthy that conflicts over water have not been added to local policy agendas or to the agendas of regional political movements.

Conclusion

The new agro-export boom that began in the 1990s is exclusively sustained on the exploitation of groundwater and the use of modern irrigation technology, and benefits from government policies promoting private national and international investment. The modern irrigation technology that has been introduced has not only permitted enterprises to successfully compete on the international market but also to dodge governmental supervision and ignore the demands of small irrigators. The exploitation of groundwater is associated with an irrigation technology that only large investors can afford and which has made the new boom possible. The non-implementation of the new Hydric Resources Law of 2009, together with extremely fragile local government institutionalityhave led, in practice, to a state that is inoperative. The lack of control and monitoring has permitted the overexploitation of groundwater, which allows agro-exporters to expand their landholdings in agricultural areas and into the desert but puts the aquifer in serious danger. The importance of the aquifer to arid zones is little known and researched in Peru. Even though such knowledge is becoming more important in the context of climate change, unfortunately no academic environmental studies have been done on this subject as yet.

Thus, modern irrigation technology, whose principal virtue is *saving* water, in a context of policies promoting private investment and the absence of a governmental role results in just the opposite: serious depletion of the aquifer. While crops can grow with less water than is required using traditional methods, investors are no less thirsty for earnings and have a tendency to go to the limit. Once the resource that makes earnings possible disappears, investors will need to turn elsewhere – to another coastal valley.

It is interesting to note that the current conflicts in the Ica Valley are over water and not over land since, paradoxically, there is now more concentration of land than existed before the Agrarian Reform. This reveals a new panorama: peasants no longer have an identity as such. While in the 20th century, land was a commodity that included those who worked it, now land and labor are separate and enterprises turn to a fluid labor market of salaried workers.

In contrast to what happens when there are droughts, which occur when there is an absence of surface water, recharging the aquifer is something that takes years to complete and therefore severe measures need to be implemented. They require ample agreements between all the parts involved**;** however water policies of the central government have favored one of the parties instead seeking a balanced policy. Current policies do not offer a vision of sustainable development in the long term.

References

Allan, J. A. 1992 *Virtual Water Trade*. London: University of London.

Bayer, David. 2010 En Ica, Los dueños del agua serán los dueños de la tierra. *La Revista Agraria* No. 119, June. CEPES.

Bebbington, Anthony. 2007 La sostenibilidad social de los recursos rurales: Apreciaciones a partir de los conflictos mineros en Latino América. *Debate Agrario* Nº 42, November. CEPES.

Boletin de la Junta de Usuarios de Agua Subterránea de Ica (JUASVI). 2011. March.

CEPES (Centro Peruano de Estudios Sociales). 2009 La gran propiedad vuelve al campo. *La Revista Agraria* No. 107, May.

Hepworth Nick, Julio C. Postigo, Bruno Guêmes Delgado. 2010 *Understanding the impacts of the UK´s Water Footprint through a case study of Peruvian Asparagus.*CEPES, PROGRESSIO, WaterWitness International.

Oré, María Teresa. 2005 *Agua: bien común y usos privados*. *Riego, Estado y Conflictos en La Achirana del Inca.* Lima: Fondo Editorial de la Pontificia Universidad Católica del Perú, University of Wageningen (Netherlands), Water Law and Indigenous Rights (Walir) and Soluciones Prácticas (ITDG).

Oré, María Teresa. 2011 *Las luchas por el agua en el desierto Iqueño: El agua subterránea y la reconcentración de tierras y agua.* In BoelensRutgerd, Leontien Cremers y Margreet Zwarteveen… *Justicia Hídrica. Acumulación, conflicto y acción social.* Lima: Fondo Editorial de la Pontificia Universidad Católica del Perú, Instituto de Estudios Peruanos and Justicia Hídrica, pp. 423-434.

OSTROM, Ellinor. 1995 *El gobierno de los bienes comunes: la evolución de las instituciones de acción*. México: Fondo de Cultura Económica.

RendonSchneir, Eric. 2009 *Agro-exportación, desempeño ambiental y propuesta de manejo sostenible de recursos hídricos en el valle de Ica: 1950 – 2007.* Doctoral dissertation. México: Universidad Nacional Autónoma de México.

TarrowSydney.1997 *El poder en movimiento. Los movimientos sociales, la acción colectiva y la política*. Translatedby Herminia Bavia and Antonio Resines. Madrid: Alianza Editorial.