

« Between abundance and scarcity »: water and societies in the Arab-Mediterranean world and the countries of the South

Topic 3: Water and agricultural production systems in dry lands

The case of Almeria (Spain)

The situation of the southeastern province of Almeria in Spain has changed radically over the last five decades. Almeria has passed from being one of the poorest provinces in Spain to becoming one of the richest by the implementation of intensive agriculture. This radical transformation has constituted one of the most interesting recent economic phenomenon's of Spain. With the perforation of wells, the introduction of the sand plot technique and the development of vegetable production using plastic greenhouses, the region became suitable for intensive agricultural activity (Sanchez et al., 2011). This semi-arid province has been transformed into the widest greenhouse area in the world, with an area of 30,000 ha. The result of this agro economic transformation is the paradoxical situation in which one of the most arid regions in Europe is also the continent's most productive agricultural area (Downward and Taylor 2005). Water shortage and drought have always been a recurring problem in the region. This problem is now intensified as a result of agricultural activity and climate change and will be even more so in the following decades.

Despite great economic performance, the future prospects of this model seem uncertain due to the social and environmental consequences. The expansion of intensive agriculture can be both a source of wealth and a general problem regarding sustainable development and desertification. This industrial agriculture implies a strong environmental impact provoking the pollution of the scarce water resources, land erosion, loss of ecological diversity, deforestation and the consumption of fossil fuels and the release of greenhouse gases. Desertification in this region has not only been accelerated by intensive agriculture but also by a growing touristic sector. Poor agricultural practices (pesticides, irrigation, and invasive plant species) together with modern economic development have damaged the land and the scarce water resources. In the beginning, this new agricultural model was entirely dependent on subterranean water sources. The continued growth of greenhouses between the 1980s and 1990s placed an enormous demand on water supplies and its impact became noticeable when the quality of the underground water began to deteriorate and salinize (Sanchez, Aznar, Garcia, 2011). The process of exhaustion of aquifers and unsustainable water management is the process that is most closely linked to desertification in Spain (Puigedefábregas, Mendizábal, 2006).

However, action has been taken since the mid 1990s to fight the negative externalities of the model and authorities seem to have an increased awareness of the environmental issues involved. The drip irrigation system of southeastern Spain is now the most efficient in the country. From a policy point of view, the AGUA program in 2004 replaced the Hydrological Plan of 2001 that was based on large inter-basin water transfers. The new program is now committed to desalinization as a way to address water deficits (Downward, Taylor, 2007). Desalinization plants and reservoirs have been constructed to increase the water supply and regulatory frameworks have been implemented to control aquifer overexploitation. Measures have also been taken to improve the collection and use of rainwater (Gómez-Orea, 2003). All

of these measures have significantly decreased water needs and the pressure exerted on aquifers (Picón, Aznar, Latorre, 2011). The productive efficiency of the model has been significantly improved with constant technological innovation. However, water scarcity remains the fundamental environmental challenge for an economy that is based on irrigated agriculture. There is a need for policies to treat water as the scarce resource that it is. Up until now, scarcity has been correlated to the idea that technique can solve the problem of water rarefaction. Even though the agricultural production methods are among the most water-efficient ones, technical evolutions have led to a expansion of irrigated areas and therefore to an increase of the total withdrawals (Buchs, 2010). Almeria will have to balance the projections of agricultural development and the environmental consequences of a future supported on desalinated water (Downward, Taylor, 2007). Measures that will allow adaptation to climate change include an adequate management of cultivation techniques, better irrigation systems and reforestation.

Whilst the model of intensive agriculture in Almeria is attracting the attention of many desertified regions in the world that would wish to experience a similar development, an analysis of the sustainability in the use of the fundamental resource, water, appears to be essential. In this paper we will firstly examine the consequences that this agro economic transformation has had on the water resources in the region. Policy choices and institutional discourses have equally had a substantial impact on water use standards. This paper will therefore secondly analyse the impacts that regional, national and international policies have had on water utilisation. The conclusions will aim to advance policy recommendations for making agricultural development compatible with sustainable water use.

Sara Vigil
Research fellow
(PhD candidate) F.N.RS
CEDEM/University of Liège