Drought Policy in Spain – Past, Present, and Future

Policy Note 01-0810, August 2010

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Introduction

The agro-climatic characteristics of Spain are basically conditioned by the alternation of the Azores anticyclone, located west of the Iberian Peninsula, which predominates in winter and summer, and the Atlantic area of low pressure in autumn and spring. Drought is a common climate event in Spain, affecting all regions. Based on the Standardized Precipitation Index (SPI) used to characterize meteorological drought, the Spanish State Meteorology Agency (Agencia Estatal de Meteorología, AEMET), a branch of the Spanish Ministry of Environment and Rural and Marine Affairs (Ministerio de Medio Ambiente y Medio Rural y Marino, MARM), monitors and assesses droughts at a national level using daily precipitation and climate data obtained from its Spanish National Climate Data Base.

Since the accession of Spain in 1986 to the European Economic Community (today European Union), the Common Agricultural Policy (CAP) has supported Spanish farming activity, especially since 1992 CAP reform, which introduced aids per hectare according to historical yields per area. Later, the 2003 CAP Reform introduced decoupled payments whose level still reflected the historic aid received during a given period. The most recent 2008 CAP reform, known as “CAP Health Check,” has consolidated its market orientation and the decoupling of payments.

In addition, Spain has used the decision granted by this late reform to adopt a national program to promote crop rotation, which will be applied to one million hectares affected by aridity to maintain crops that are well adapted to hard agronomic conditions while respecting both the fallow index and the traditional cereals and leguminous crop rotation.

Irrigation farming is based on the supply of water to the crops through artificial irrigation methods and requires important economic investments in water infrastructures. Some of the most important irrigation crops include cereals and rice, olive trees, vineyards, citrus and other fruit trees, fodder crops and vegetables. Spain is currently engaged in a process of continuous improvement through joint efforts of farmers with water use rights and both regional and national governments.

Structure of water supply and demand

Surface water and groundwater resources follow an irregular distribution pattern in Spain and are often insufficient to meet the country’s water demand. Public authorities have undertaken important projects to increase the availability of water resources in order to keep pace with the need for water in both agricultural production and consumption – direct human consumption, recreational use and hygiene.

The country’s water supply includes the more traditional surface and ground water as well as new alternative sources, such as treated and regenerated waste water and desalinated water. Spain has more than 1,200 reservoirs, those with more than 3 hm³ (1 cubic hectometer=810.71 acre foot) of reservoir
volume, reaching a storage capacity of over 54,000 hm$^3$.

Spain has 2,335 wastewater treatment plants, processing an approximate volume of 3,400 hm$^3$ of water per year. Part of this treated water is further regenerated with a production capacity of around 450 hm$^3$ of water per year, which represents 13 percent of all the treated water. The use of regenerated water is distributed as follows: 71 percent for agricultural use, 7 percent for recreational use, 4 percent for urban services, 17.7 percent for environmental uses and 0.3 percent for industrial use.

In 2004, publicly financed desalination plants operating in Spain began contributing 140 hm$^3$ of water per year. Spain’s investment of more than 2,000 M€ is intended to generate more than 730 additional hm$^3$ by late 2011. This alternative resource of up to 870 hm$^3$ of water per year could supply almost 10 million people and reinforce water availability for about 25,000 ha of irrigated land.

Changes introduced by the Water Framework Directive

The current Water Framework Directive (WFD) promotes the recovery of ecosystems with the objective of preserving the environment, reducing the risks of natural disasters and recovering the recreational and symbolic value of water landscapes.

This WFD is mainly oriented towards water scarcity and quality. Although water shortages may be prevented with appropriate management and planning of the available water resources, it is not possible to have full control over droughts and, as a result, water policy can only mitigate their impacts through surveillance and management strategies.

Currently, Spanish Central Administration is designing the new river basin plans adjusted to the European Community water policy. These plans refer to the uses, availability and reserves for every Spanish river basin, from a perspective of dialogue and social participation.

Water infrastructure policy

Different supply systems are also being fostered in order to guarantee water supply: conduction systems, reservoirs, desalination plants and regeneration of treated water, according to the particular needs of each territory, pursuing infrastructure sustainability to solve the supply problems in regions with structural deficits. Among these includes the project to interconnect the desalination plants located in the Mediterranean basin to ensure water availability regardless of the hydrological situation. Likewise, special efforts are being made in water purification treatments through the Spanish National Plan for Water Quality 2007-2015 to fulfill the requirements of the Framework Directive, which states that surface and groundwater must reach a high ecological status in all Member States by 2015.

Strategies to prevent and respond to droughts

The establishment of efficient drought-detection systems is necessary so pre-established plans can be activated in emergency situations. Early drought detection entails the need to develop alert indicators, based on the information usually available, such as precipitation in the last periods, water reserves stored in the reservoirs, and level of aquifers. They are periodically monitored in order to foresee the beginning of a drought and to predict its development phase.

The Spanish National Hydrologic Plan established a drought indicator system, which is the pillar for the implementation of special action plans for situations of alert and temporary drought. The main objective of these management plans, devised by basin authorities is to minimize the environmental, economic, and social impact of drought situations. The plans also include exploitation rules and measures to be implemented according to the severity of the drought.

In emergency situations such as extraordinary droughts, the Water Act considers “the adoption by the government of the necessary measures to overcome the drought situations, as regards the use of public water resources.” In addition, this Act provides for the enactment of regulations concerning urgent exceptional measures, which may imply the declaration of urgent works as of public interest, drillings and/or the compulsory purchase of private goods, such as land, and water rights.
Some of the measures introduced by the different regulations on droughts adopted in recent years follow:

1. Water transfers: urgent measures to regulate the transfer of water use rights and voluntary reassignment of water rights.
2. Establishment of support measures for holders of water use rights in regions affected by drought when water supply has fallen below 50 percent of the average.
3. Exemption of certain water tariffs and levies.
4. Establishment of water restrictions: 75 percent of the average supply for farms using traditional water-collection methods, and 50 percent for the others must be assured.
5. Cancellation of groundwater extractions.

**Emergency measures**

Emergency and urgent works are authorized when the mitigation of drought effects cannot be attained through management measures, infrastructure action being needed. The Spanish government is actively enacting these measures, which reached 402.289 million euros in the hydrological year 2004-2005, 182.510 million euros in 2005-2006, 67.73 million euros in 2006-2007, 58.367 million euros in 2007-2008 and 140 million euros in 2009. With these investments supply restrictions could be avoided.

The development of agriculture has always been linked to the search for ways and means to mitigate the impact of droughts and other adverse climate phenomena on farm production. When producers cannot avoid the occurrence of damages, they have to adopt instruments that facilitate the internalization of drought effects. Traditional instruments include the following:

1. **Informal instruments for risk sharing.** In farm economies that have not undergone an important development, sharing crops or other reciprocity or solidarity methods, can be agreed among farmers.
2. **Exceptional post-disaster public aids.** In the absence of formal management instruments, after the occurrence of catastrophic damage, governments must grant public aids to the affected farmers.
3. **Special Funds for disasters or calamities.** The population exposed to the risk must contribute to a joint fund in order to mutualize the risk.
4. **Crop insurance.** It constitutes a formal method of adding the risks to which a large group of people is exposed to, which are then transferred to a specialized insurance entity. The premiums paid by the insured farmers must be high enough to cover the compensations expected for those affected, plus the administration costs, the reserves required by law, the business profit of the insurer and the reinsurance costs.

The Spanish farming insurance system, which started more than 30 years ago, belongs to this last category. Regarding drought risk insurance, it relies on voluntary annual payments by farmers, supplemented by public aid. Thus, risks are covered by contract whereby private insurance firms, specialized in risk management, undertake to indemnify eventual losses caused by drought. Current coverage against drought is quite comprehensive for both livestock and dryland farming. In 2008, 1,086,734 animals were insured against drought risk in pastures, with a production value of 67.26 million € and 3.7 million hectares of cereals, oil crops and leguminous had a yield coverage with a production value of 1,382.2 million €.

The future CAP and the national policies made by the European Union Member States must answer to the needs of modernizing the existing irrigation systems to achieve a more efficient water use, promote water saving, and increased environmental respect. The future evolution of irrigation lies on the improvement of the efficiency and sustainability of water management in irrigated areas.

In order to ensure the future of irrigation, farmers need proper training and advice to facilitate the adoption of techniques that will improve water use efficiency. Research is needed, both in the field of genetics, the improvement of vegetable varieties and in the field of irrigation techniques.

This policy note is based on a paper presented at the International Drought Symposium, http://cnas.ucr.edu/drought-symposium/