

# **Economic Effects of Climate Change on Scarcity Costs and Residential Water Prices in Cyprus**

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## **Abstract**

This paper presents an assessment of the cost of water scarcity in Cyprus, today and in the next 20 years, taking into account the effect of projected climate change in the region. It focuses on the residential sector, accounting also for tourism and industry. Using a simple demand function, total scarcity costs in Cyprus are computed for the period 2010–2030, and three scenarios of future water demand are presented. The central estimate shows that the present value of total costs due to water shortages will amount to 72 million Euros (at 2009 prices), and, if future water demand increases a little faster, these costs may reach 200 million Euros. Using forecasts of regional climate models, costs are found to be about 20% higher in a climate change scenario. Compared to the loss of consumer surplus due to water shortages, desalination is found to be a costly solution, even if environmental damage costs from the operation of desalination plants are not accounted for. Finally, dynamic constrained optimization is employed and shows that efficient residential water prices should include a scarcity price of about 40 Eurocents per cubic meter at 2009 prices; this would constitute a 30–100% increase in current prices faced by residential consumers. Reductions in rainfall due to climate change would raise this price by another 2–3 Eurocents. Such a pricing policy would provide a clear long-term signal to consumers and firms and could substantially contribute to a sustainable use of water resources in the island.

**Keywords:** Consumer surplus, desalination, pricing, water shortage.

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