

ECONOMIC VALUATION OF IRRIGATION WATER: IMPLICATIONS FROM A META-ANALYSIS

D. LATINOPOULOS

Department of Civil Engineering
Aristotle University of Thessaloniki
E-mail: dlatino@civil.auth.gr

EXTENDED ABSTRACT

The choice of appropriate pricing levels, the design of efficient allocation systems, the removal of subsidies that cause high financial costs and adverse environmental impacts, the implementation of feasibility tests on new irrigation projects and the estimation of opportunity costs to industrial and domestic water uses are some of the reasons that justify the necessity for the valuation of irrigation water. The methodology followed for this valuation can be classified in two main categories: (a) direct methods, including water markets and contingent valuation, and (b) indirect methods, such as crop production function analysis, farm crop budget analysis and hedonic pricing. The present research is focused on studies belonging to the second category.

The main objective of the work presented in this paper is to examine the variation of irrigation water values derived from several case studies in order to attribute it to specific determinants of water value. In order to achieve this, a specific form of quantitative analysis, known as a meta-analysis, is used. This analysis, quite innovative for this particular field of research, includes, compares, evaluates and apprehends the common elements comprised in irrigation water studies.

More specifically, these common elements are subject to a statistical analysis that is performed by means of a regression model (named as a meta-regression-analysis), where the dependent variable is the value of irrigation water, whereas in the set of explanatory variables different valuation methods and quite a few physical (e.g. climate, water resources), and economical (e.g. crop values, development level of a country) characteristics of the study area are included.

The results of this analysis denote that certain physical characteristics, such as the main source of irrigation water (surface or groundwater) and the annual precipitation rate, have a significant impact on the final outcome. In particular, water values seem to be high depended on both availability and use of groundwater resources as well as on dry climate (as presented by a low mean annual rainfall). Furthermore, it was found that the choice of the valuation method is also possible to affect irrigation water values significantly, while some economic characteristics, initially supposed to influence these values, were found statistically insignificant.

Key words: irrigation water, economic valuation methods, meta-analysis