

Assessing domestic water use habits for more effective water awareness campaigns during drought periods: a case study in Alicante, Eastern Spain
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Response to reviewer 2

(Reviewer 2's comments are in italics)

First of all we really appreciate all the comments made by Reviewer 2 (R2), which have helped to critically reflect on how to improve the manuscript.

We will deal with the comments point by point:

1. The objective and core ideas of the paper: utmost importance of **knowledge** about the internal **heterogeneity** of the social behavior and socio-demographic features of each concrete case. The explicit objective of the paper is to contribute to “increasing **knowledge** about existing domestic water behavior and therefore to improve the design and implementation of future water awareness campaigns” (6860). Some paragraphs bellow, this objective is defined again as the intention “to provide a more **accurate knowledge** of existing behaviors in water use by urban households in Alicante” (6861), “for the design and application of water awareness campaigns facing **multiple urban and social realities** involving areas with predominant indoor and outdoor water uses and also areas with mixed populations” (6873).

Thus, the paper proposes a quite applied and practical objective, which, presented in those terms, perhaps corresponds more to a technical report than a scientific article.

*The basic rationale supporting the importance of this objective is that “in order to be successful it is much needed that the conservation messages and actions are aligned with existing uses and **acknowledge heterogeneity** of water users and uneven territorial development” (6861). Some lines bellow the authors insist that “water awareness campaigns need to **acknowledge** already existing behaviors and the structural factors that may influence these behaviors” (6862), and that “the **information** gathered could be useful in designing better campaigns...” (6862).*

*“If water awareness campaigns have to leave a longer imprint in the behavior of water users it is fundamental that they begin from certain **knowledge** of the residential and socio-demographic characteristics of the population targeted” (6872). “It is crucial to ascertain whether recommendations for particular behaviors are grounded on a sound **appraisal** of existing water habits” (6873). “Awareness campaigns during droughts therefore should be aware of the **heterogeneity of users** as well as the uneven territorial model where they are applied if they are to have a significant impact on users” (6874).*

Thus, the more general notion that we can derive from the article is the underpinning of the relevance of concrete geographical, institutional, socio-demographic, behavioral... context, which requires specific and rigorous field research. All right It seems an important and basic idea, but perhaps not original enough to become the axial argument of a scientific article.

RESPONSE 1: The reviewer is right in pointing out that the form in which is presented the objective may correspond more to a technical report than a scientific paper. We agree to reformulate the objective along more academic lines. We can do that by adding a paragraph or two on water awareness campaigns and their effects adding references. For example, Sauri (2013) has a section discussing water conservation campaigns in a variety of settings (Australia, USA, Spain).

1.1. Consequences of lacking accurate knowledge:

The ignorance of real behavior and socio-demographic features leads to situations as those found in Barcelona (unnecessary stress on shower, when people already do not take baths) (6862) and in Alicante, where water awareness campaigns “are still strongly associated with drought periods and, for the most part, insist on the change of certain water consumption habits. The issue, however, is whether or not this change of habits constantly demanded by public authorities and private companies is already a part of the behavior of Alicante’s water users...” (6866).

So, according with the examples presented, we can understand that they exist frequent situations of ignorance concerning real characteristics of users and habits of use.

RESPONSE 2: Yes, indeed. What we try to convey is the existence of situations where the lack of knowledge concerning real characteristics of habits of use and of users may hamper the effectiveness of water conservation campaigns.

1.2. Reasons for the lack of knowledge:

The most part these campaigns have focused on the rather homogeneous world of Anglo-Saxon (Australia and the Western United States in particular) urban and especially suburban neighborhoods (6872).

*Obviously, the authors have developed this thesis in other works (see for instance Saurí, D.: Water conservation. Theory and evidence from the urban areas of the developed world, *Annu. Rev. Env. Resour.*, 38, 1–22, 2013), but the reader feel somehow frustrated for not getting more about this issue taking into account that the type of knowledge, what knowledge, why not always the appropriate knowledge and son on, is the backbone of this paper.*

RESPONSE 3: Again, we do agree with R2 and we acknowledge that this should be the backbone of the paper. We will develop further this issue and take this into account when reformulating the objective along more academic lines. We can add discussion and references in then paper by Sauri (2013).

2. Ideas concerning the awareness campaigns and droughts: the ‘temporal horizon’ problem.

The authors defend a multidimensional approach to drought management, that should be confronted “through a combination of economic, technological and behavioral measures including awareness campaigns targeting especially urban and tourist uses” (6861). But, they say, it is important to deal with the ‘temporal horizon’ problem, i.e. effectively engaging citizens in conserving water and, more importantly, making this engagement durable and less dependent on the occasional occurrence of drought periods (6863). Since most water awareness campaigns are implemented during drought periods of a variable length, their effectiveness may be limited to the duration

of what is often considered an exceptional and not a normal event. Furthermore, the success of awareness campaigns, especially in the long run also appears to be strongly related with the frequency and severity of drought conditions.

RESPONSE 4: We want to stress that the examples of many cities in Spain (for instance Barcelona and Alicante) show that water use levels per capita have been diminishing or stabilizing in the past years. As a matter of fact, in Barcelona after the drought of 2007-2008 water use levels have not recovered to pre-crisis levels. We will include this information. But bearing in mind that water awareness campaigns are one among many factors intervening in the reduction of urban consumption in many cities. In fact, some scholars, most notably economists, are skeptical about the effects of water conservation campaigns compared with other policy alternatives such as pricing (see for example Olmstead and Stavins, 2007, which could be added in the manuscript).

Olmstead, S. M. and R. N. Stavins 2007 Managing Water Demand Price vs. Non-Price Conservation Programs A Pioneer Institute White Paper No 39. Boston, MA: Pioneer Institute for Public Policy Research

*The authors argue that information about household water uses and behaviors may improve the efficacy of messages aimed at **consolidating conservation beyond the duration of droughts**, which is one of the major challenges faced by policy makers in this topic” (6860). And again, in the next page, that “information can serve to design more effective water conservation campaigns during times of drought and even to consolidate reductions in water use after drought periods” (6861).*

So the relation between awareness campaigns and drought is a basic issue of this paper. However, throughout the whole article there is neither an explicit presentation of this link nor a clear explanation of the different nature of water conservation measures, awareness campaigns and drought contingency programs as well as the existing relations among them.

RESPONSE 5: We thank the reviewer to point out at this flaw. In the revision of the paper we will strength the link between drought and awareness campaigns. Empirical evidence (e.g. the Barcelona case) appears to indicate that water conservation attitudes become more incorporated into behavior after the occurrence of continued drought periods.

3. The debate between awareness campaigns and economic instruments

Water awareness campaigns tend to produce mixed results, and for some experts, who prefer economic instruments, are not very effective in curbing water consumption (6861). Furthermore, “More positive effects appear to be related to the intensity of campaign or when awareness campaigns are implemented together with other measures such as price increases (6862).

*“Nevertheless, although the debate as to the relative merits of awareness campaigns vis à vis other alternatives of drought management and, more generally, water conservation (especially economic instruments) will continue, it is important to acknowledge that **non-economic behavioral** change such as that induced by these campaigns may last longer than that induced by **rising prices or taxes** while at the same time, avoiding to a large extent the traditional problems of equity and fairness that many times hamper the social effectiveness of economic measures (6874).*

Another relevant issue that is just mentioned, without clear relation with the empirical work done and without the farther development that it merits.

RESPONSE 6: Again, we do agree that this critical issue is somewhat overlooked in the paper and we acknowledge that we should develop it further in the revised version. We must insist in this point and again the critical factor appears to be repeated exposition to drought periods as the geographical literature on natural hazards asserted long ago (see Burton, Kates and White, 1978)

Burton, I., R.W. Kates and G.F. White 1978: *The Environment as hazard*. New York: Oxford University press.

4. Survey main results

The paper investigates water use in 10 municipalities of a drought prone province (Alicante) of Spain, through a survey encompassing 450 households of ten different municipalities with.

*Through contingency table analysis the authors found a significant relation between the **remembrance of water campaigns** and the presence of water saving measures and certain ecologically friendly attitudes. However, they cannot be confident about the direction of the relation: that is, whether people concerned with water use tend to remember water campaigns more than those not concerned; or whether water awareness campaigns contributed to changing some habits and make more people concerned with water use (6871).*

*Respondents from **low income homes significantly remembering less water campaigns** than respondents with high income homes. The latter fact raises an important issue, as it may indicate that channels used by water awareness campaigns did not reach the whole population in the same manner (6872).*

A couple of really significant findings. The authors should make the most of these information and reflections in the section devoted to presentation of results.

RESPONSE 7: These are indeed significant findings that merit much more attention and reflection. We develop further those arguments in the results section.

5. Main concrete recommendations

*The authors consider that despite the important efforts made in recent years, there are still ample margins to continue with water **conservation campaigns**. An important area of **awareness campaigns** concerns water saving fixtures in households. In this respect, the case study identifies them as a potential area to increase savings in the future (6873). Awareness campaigns might take also a more proactive stance encouraging consumers (possible in combination with some subsidies) to purchase relatively inexpensive water saving mechanisms such as flow regulators for taps or showers (6874).*

In areas such as some of the municipalities studied, ended the authors, where low-density urbanism is dominant, awareness campaigns targeting outdoor uses may be more relevant that campaigns targeting all uses (6874).

Again we have the feeling that the authors situate the final reflections in an helpful operative/applied but quite basic level.

RESPONSE 8: The final reflection will be brought to a more academic standard by means of contrasting our results with other findings in the scientific literature on water conservation campaigns.

General comment

I find the paper somewhat unstructured, not in a formal perspective but as regards its content. The paper lacks precise development and clear explanation of the arguments it includes. Possibly due to lack of enough space to develop rigorously every issues that the article arises

There is a basic idea, defining the central objective of paper, but then, without sufficient clarity and strength of arguments, several other ideas are presented throughout the text, in an insufficiently articulated way.

This is my main impression. I believe that behind this article there is a long research experience, a relevant empirical work and significant bibliographic review, which fails to be reflected adequately in the text. The paper does not take advantage of the material upon which it is drawn.

My overall assessment is that the manuscript requires a general revision, aimed at the improvement of the argument's structure, developing more clearly and precisely the research questions, hypotheses, objectives and results.

RESPONSE 9: We really appreciate this general comment by reviewer 2. We agree that the arguments should be clearer and more structured. In the revision and rewriting (when necessary) we will strengthen the main and central objective, research questions and hypothesis of the paper and we will make the most of the empirical material to present a much improved results and discussion section.