The Influence of Water Access in Subjective Well-Being: Some Evidence in Yucatan, Mexico

Jorge Guardiola · Francisco González-Gómez · Ángel Lendechy Grajales

Accepted: 14 August 2011
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Abstract The literature on happiness or subjective well-being has explored the determinants of happiness without taking into consideration the role that water plays. In this paper we attempt to draw attention to water in subjective well-being studies. Approximately one hundred million people do not have access to water. A lack of clean water causes diseases such as diarrhea and cholera, responsible for around 5% of the total deaths in the world. Access to water should therefore be a necessary asset in life. In order to consider access to water, we estimate its influence on subjective well-being using data from rural Yucatan, Mexico. Residents in Yucatan suffer from low quality access to water and there are also imperfections in the management of the service, such as water cuts. We estimate the influence of water on subjective well-being, finding a positive and significant relationship. In a second stage of the research, we relate water access variables to subjective well-being, the health and the water domain of life, finding significant results. These results make it possible to formulate political measures concerning access to water and happiness maximization. We demonstrate that access to water is important for well-being in Yucatan and might be important in many other places; we therefore encourage future research to contemplate water satisfaction and water variables in their analysis.

Keywords Water access · Subjective well-being · Policy evaluation · Water policy
1 Introduction

Happiness research has served to understand the formation of welfare in scientific terms as well as to ascertain the influence of certain conditions and variables. Subjective well-being analysis has been applied in order to understand the influence of assets, policies and the environment on happiness, both in developed and developing countries. Some examples that are common in the literature refer mainly to how happiness is affected by income (Easterlin 1974, 2001; Rojas 2007), poverty (Kingdon and Knight 2006; Rojas 2008; Biswas-Diener and Diener 2001), macroeconomic policy (Di Tella et al. 2001, 2006) and the environment (Ferrer-i-Carbonell and Gowdy 2006; Welsch 2006).

In happiness studies there is, however, one asset, basic need or right that is essential for everyone and might have not received the proper attention: access to water. Water scarcity, lack of water quality and water access in general is a fundamental issue in the developing and developed world that has not played a prominent role in happiness research. One exception in the literature is the research by Bookwalter and Dalenberg (2004), which used ordered logit techniques in a survey on South Africa to demonstrate that water plays an important role in the formation of subjective well-being, at least in the rich quintiles. The domains of life approach states that life can be considered as a general construction with many specific domains and satisfaction as a whole is obtained by satisfying these domains. The literature on subjective well-being normally considers domains of life such as shelter, health, friendship, community and job (Cummins 1996; Rojas 2006, 2008; van Praag et al. 2003), but water is not considered in any studies, as far as we are aware. Due to the importance of water access in the lives of people, there is much need for research to understand the relationship between water-related aspects or water policy actions and subjective well-being.

Today, over a century and a half after the worldwide extension of water services, water access is still a long way from being universal, as there are still 884 million people with no access to water (WHO and UNICEF 2010). Lack of water access is mainly a problem for poor people. According to the UNDP (2006), almost two-thirds of the people that lack access to clean water survive on less than $2 a day, while one-third live on less than $1 a day. Even though the lack of water access in households is more pronounced in rural areas, in urban areas there are still some districts in major cities that lack a water distribution network for residential use. The lack of urban access to water in many countries has been influenced by the rapid rate of urban development, which has far exceeded the management and financial capacities of governments in the first half of the twentieth century (Biswas 2006).

Low quality water should affect health of the individuals with the subsequent influence on their happiness. Lack of clean water causes illnesses such as diarrhea or cholera that impact on the happiness of sick people and their relatives, above all when these diseases result in death. Such deaths represent around 5% of the total deaths in the world, thereby creating much human suffering (UNDP 2006). Water quality is set to become even more crucial in forthcoming years. As a consequence of demographic growth, water quality will be negatively affected in many areas both by the increase in water demand for various types of use and also by climate change (Bates et al. 2008).

In spite of the fact that water access could be included in the health domain of life, we would like to test in this research that water access in some societies should be taken into account as a domain of life in its own right. We would like to measure the influence of

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1 In this research we use interchangeably the terms happiness, subjective well-being and life satisfaction.
water access and the water domain of life in subjective well-being using a sample of 373 households from an original survey in rural Yucatan, Mexico. Firstly, we test the influence of the water domain of life on subjective well-being. Secondly, we assess the relationship of water-related variables on subjective well-being and the water and the health domains of life. The results obtained serve to make policy recommendations in order to increase happiness through water policies in Yucatan.

Of course, this region cannot represent the many realities of water access in the world. However, it could serve as a useful illustration of the influence of water access on happiness. In order to ascertain whether water access should be considered a domain of life, it is also necessary to look at the right place in order to choose the characteristics of water access that could influence subjective well-being. We must consider that the reality of water is very complex (Batten 2007); therefore, in this research we provide an example that should be adapted to each scenario.

2 Region of Study and Water Access in the Region

Yucatan is one of 31 regions that, along with the Federal District, make up the 32 Federal States of Mexico. It is located in the southeast of the country, on the peninsula of the same name (Fig. 1) and is divided into 106 municipalities. The population is approximately 1.7 million and it is estimated that 83% of the population live in urban enclaves and the other 17% in rural areas. Most of the inhabitants in Yucatan are Mayans or Mayan descendents. The Mayan people share a traditional culture that has undergone only minor changes over the years. They are experts at growing maize, which is a tradition passed down from their ancestors and maize is part of their traditional staple diet. They conserve their own style of dress, their own language and their own religion and view of the world.

The archeological site of Chichen Itza is a vestige of the Mayan culture and is one of the Seven Wonders of the Modern World, making it an important tourist destination in the area. However, in spite of this tourism, Mayan people still live in poverty. In 2005, more than 60% of the rural population and 32% of the total population lived in areas

Fig. 1 Location of the state of Yucatan. Source National Institute of Geography and Statistics (INEGI)
characterized by combinations of low income, low levels of education and inadequate housing conditions. As much as 63% of the population lived off less than two minimum wages, and almost half of these people live in overcrowded houses (SAGARPA 2011).

Poverty also conditions access to water. According to official data, the service coverage of the water supply stands at 96%. In urban areas it is almost 97%, while in rural areas it stands slightly below 94% (CONAGUA 2008). However, although official data show that the water service is virtually universal, the lax definitions in access to water data gathering result in the publishing of official statistics that might be flattering reality. In fact, there are many households that lack access to clean drinking water (Guardiola et al. 2010).

Due to its topography, Yucatan has no currents of surface water. One hundred per cent of the water used is extracted from groundwater, from perforations or from the ‘cenotes’. Although the quality of underground water might be higher than water from external sources, water quality in Yucatan is still generally low (Gonzalez-Gomez et al. 2011). Yucatan has a problem with infant mortality due to diarrhea, caused by unpurified water. In fact, the quality of the groundwater in the State of Yucatan is bacteriologically dangerous in a significant part of the state (Pacheco et al. 2004). Different government programs helped to reduce the mortality rate associated to infectious intestinal diseases in children under 5 years of age, dropping from 122.7 deaths in 1990 to 14.7 in 2006 (INEGI 2009), but there is still much need for improvement and further policy efforts towards combating and preventing sickness associated to low quality water. If the quality of water is perceived as low, households would prefer to purchase bottled water in the market, provided they have resources to do so. In fact, in 2008 Mexico was the second largest consumer of bottled water in the world behind the United States and topped the ranking of consumed bottled water per capita, with 224 litres per person (Beverage Marketing Corporation 2009). There are no specific data for Yucatan, but this State does not appear to be any different.

A common household in rural Yucatan has access to water through a combination of the following means: from a tap inside the house, from a tap outside the house and from a well. Those who do not have a tap inside the house, nevertheless, do not spend a great deal of time collecting water, even if they only have a well, so the time spent collecting water is not a great problem, in comparison to some regions of Africa, for example. The most serious problem stems from the quality of the water, which depends on the means of access. Every private well in Yucatan is normally used by one or two households, which are responsible for maintaining them. However, households normally pay little or no attention to maintenance. The wells are not deep and therefore are extremely vulnerable to pollutants. In contrast, the water that runs through the pipes comes from a greater depth and normally receives maintenance (Gonzalez-Gomez et al. 2011).

Water cuts are also commonplace in rural Yucatan. In many places in the world, these cuts could be caused by lack of payment, by the lack of the quality of the public or private supplier or by water stress. An old network that breaks frequently could be the cause of water cuts. Another reason for water cuts is water stress, which could motivate a water cut plan during certain hours of the day. In the case of rural Yucatan, cuts are more associated to the age of the network, the denial of access due to lack of payment being less common.

2 ‘Cenote’ is a term used in the Yucatan Peninsula, which comes from the Mayan word ‘dzonot’, which means “abyss”. For the ancient Mayans, before the arrival of conquerers, ‘cenotes’ were the main sources of water, as well as important spaces for ceremonial activities.
3 Description of the Dataset, Methodology and Research Hypothesis

3.1 Data, Variables and Methodology Used in the Study

This research uses data from field work with information from 373 households from 39 different towns in the rural area of Yucatan. The study was implemented from November to December 2008 and the main objective was to investigate subjective well-being, access to water and the perceived nutritional status of Mayan people living in the rural areas. In this study we also gathered variables referring to the domains of life: health, work, money and financial status, quality of the house, nurture, leisure, the community where they dwell and water. In order to value subjective well-being, respondents were asked “In general terms, how happy do you feel with your life?” For each domain of life, they were asked: “how happy do you feel in relation to…” and then the domain of life was named. Interviewees had to grade subjective well-being and the domains of life on a scale of 0–10.

As for the variables related to water, we define a perceived quality index calculated as the perception of water considering various aspects (color, smell, taste) on a scale of 1–5, with 1 being very good, 5 very poor and 3 being normal. The index is constructed as the sum of the three variables and then rescaled to the interval [0,12], so that 0 would be the lowest level of quality perception and 12 would be highest. If quality of water is perceived as bad, households would prefer to purchase bottled water in the market, provided they have resources to do so. Taking this into consideration, we add a variable calculated as the percentage of total income spent on purchasing bottled water in the market.

As referred to above, in Yucatan there are three kinds of ways to access water: access to water in the house, access to water outside the house from a tap and access to water outside the house from a well. We include a variable that indicates whether a household with no tap inside the house, which cannot be as comfortable as having a tap inside. This variable is called outside. Additionally, the household water supply suffers several cuts. We use a variable that indicates the frequency of cuts in the supply by water pipes. This variable is also subjective, as it does not refer to the objective counting of cuts, but to the perception of how frequent they are. Households were asked: “how often do you run out of water during the week as a result of cuts in the supply?” and had to reply; “never (1), rarely (2), sometimes (3), often (4) or very often (5)”. Some households also have wells that could serve as an alternative resource when there is no water in the pipe, which is why we introduce the variable well indicating the presence of a nearby well.

The descriptive statistics of the variables used in the analysis are depicted in Table 1, as well as the description of the variables. In order to assess the influence of water access on subjective well-being, we use the ordinary least square technique. Our regression strategy would consist of relating happiness to the domains of life, in the first place both including and excluding the water domain. In the second place, we relate water access variables to subjective well-being, the health domain of life and the water access domain of life.

3.2 Research Hypothesis

In this section we justify the inclusion of the variables above and we hypothesize about the possible influence they could have on the happiness of the people from Yucatan. Firstly, we expect water access satisfaction to positively influence subjective well-being, this being one of the main hypotheses of this research. As for the rest of the domains of life, we expect them to exert a positive influence on subjective well-being, similar to the results of previous research.
Concerning water access, we expect to find that the variable quality will have a positive influence on subjective well-being and on the water domain. We expect happiness and the valuation of the water domain to increase when the subjective perception of water quality increases. In general, if we had objective data, for example about the chemical composition of water, we might not find such a relationship. Water that is good quality might not be perceived as good, whereas bad quality water might be perceived as good. Therefore, we could assume that perceived quality might have a greater influence on subjective well-being than objective quality if such data were available. On the other hand, in terms of health perception, objective quality would be most interesting to assess. We might expect, however, a positive impact of the perceived quality variable on the health domain of life.

Cuts in the supply of the service are expected to be negatively related to subjective well-being and water satisfaction. When they are more pronounced, the impact should be higher. We expect no impact in terms of health satisfaction. Notwithstanding, cuts could have an indirect impact on health: if there are cuts, people could drink from the well and their health could suffer as a result, but we expect to capture this effect by using the variable well. Again, as in the case of water quality, we have a perception rather than objective frequency, but perception might be more correlated to both happiness measures as a proxy of the importance that households give to cuts in supply.

The purchase of bottled water, when a household can afford to, is a sign of the lack of quality of drinking water, at least as it is perceived by the household. Additionally, it entails an opportunity cost for the household. In our sample, there are 41 households (11%) that do not purchase bottled water, but 28 households (7.3%) spend more than 10% of their income on bottled water. On average, the households in the sample devote 4.2% of their income to bottled water. The money spent on purchasing bottled water could be used for other purposes that could increase the happiness of households. Therefore, both effects (signal of both quality and opportunity cost) lead us to expect this variable to have a negative effect on life and water satisfaction: the greater the proportion of income spent on bottled water, the lesser the satisfaction with life and the water domain. On the contrary,

<table>
<thead>
<tr>
<th>Variable</th>
<th>Variable description</th>
<th>Mean</th>
<th>SD</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Life</td>
<td>Subjective well-being</td>
<td>8.13</td>
<td>1.64</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>Health</td>
<td>Domain of life</td>
<td>7.85</td>
<td>1.81</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>Work</td>
<td>Domain of life</td>
<td>8.81</td>
<td>9.49</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>Money</td>
<td>Domain of life</td>
<td>6.79</td>
<td>2.03</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>House</td>
<td>Domain of life</td>
<td>7.51</td>
<td>1.91</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>Nurture</td>
<td>Domain of life</td>
<td>7.87</td>
<td>1.58</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>Leisure</td>
<td>Domain of life</td>
<td>7.07</td>
<td>2.41</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>Community</td>
<td>Domain of life</td>
<td>7.74</td>
<td>2.14</td>
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<td>10</td>
</tr>
<tr>
<td>Water</td>
<td>Domain of life</td>
<td>8.15</td>
<td>2.12</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>Quality</td>
<td>Perceived quality</td>
<td>6.81</td>
<td>2.19</td>
<td>0</td>
<td>12</td>
</tr>
<tr>
<td>Cuts</td>
<td>Perceived cuts</td>
<td>2.85</td>
<td>1.40</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Bottled</td>
<td>Bottled water expenses/total income</td>
<td>0.04</td>
<td>0.06</td>
<td>0</td>
<td>0.32</td>
</tr>
<tr>
<td>Outside</td>
<td>Equals to one if the tap is outside the house</td>
<td>0.49</td>
<td>0.50</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Well</td>
<td>Equals to one if household has access to a well</td>
<td>0.24</td>
<td>0.43</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

J. Guardiola et al.
we might expect a positive effect on health satisfaction: if the household spends money on bottled water, the influence of drinking bad quality water may be lower.

The situation in which individuals need to leave their homes in order to obtain water could be a possible case of low happiness due to water access. It could be hypothesized that the strain on people’s well-being increases as the distance to the water source becomes greater. The time devoted to collecting water from distant sources means a waste of energy and productivity that could be used by children for their education and by adults to work (WHO and UNICEF 2005). Therefore, reducing the time wasted could improve their subjective well-being providing that time is allocated correctly. This is an opportunity cost that would be interesting to study in terms of happiness. We therefore expect to obtain a negative and significant impact for the variable outside, indicating that the household has no tap inside the house, on life and water satisfaction. However, we must bear in mind that outside taps are not very far from the entrance to houses in Yucatan. They are normally private taps, or might be shared with relatives. This could result in the opportunity cost in terms of time or the cost in terms of comfort not being very high, making this variable insignificant in the estimations. We do not expect this variable to have any effect on health satisfaction.

The variable well is expected to influence both subjective well-being and water satisfaction positively. When cuts occur, it could be useful to have an alternative water source. However, we might find a negative and significant influence on health satisfaction due to the objective lack of quality of the water that comes from the wells. There are also a minority of households (9, 2.4% of the sample) that only have access to water through wells. As mentioned above, all water in Yucatan comes from underground and the water from wells is of lower quality due to a lack of maintenance and greater exposure to contaminants. If households that have wells drink water from them, they might experience health problems and therefore report lower health satisfaction levels.

4 Results

We would like to test two relationships: Firstly, the influence of the water domain of life on subjective well-being and secondly, the influence of water access-related variables in subjective well-being and on the water domain of life.

4.1 The Influence of Water Satisfaction on Subjective Well-Being

For the first relationship, we estimate the following models using ordinary least squares:

$$SWB_i = \beta_0 + \sum_{j=1}^{7} \beta_j \cdot domain_{ij} + \varepsilon_i$$

(1)

$$SWB_i = \beta_0 + \sum_{j=1}^{7} \beta_j \cdot domain_{ij} + \beta_8 \cdot water_i + \varepsilon_i$$

(2)

where the sub-index i refers to the ith person evaluating his/her subjective well-being and the sub-index j refers to the jth domain of life (health, work, money, house, nurture, leisure and community). The parameters of each variable are represented by β, the intercept is β0 and the error term is represented by ϵ. We are interested in the significance and sign of the
parameter $\beta_8$ that measures the influence of the water domain of life. Another issue of interest is to compare the models in terms of explanatory power.

The results of the estimation are shown in Table 2. Concerning model 1, as expected, the domains of life found to be significant have a positive influence on subjective well-being. There were, however, domains of life that have no influence: money, quality of the house, leisure and community satisfaction. In model 2, we add the water domain of life. The water domain of life is significant at 5% and has a positive sign. The $R^2$ increases slightly when adding this variable (around 1%). Nevertheless, the significant and positive sign of the coefficient corresponding to the water variable proves the importance of the water domain of life in the happiness of people, at least in Yucatan.

### 4.2 The Influence of Water Access on Subjective Well-Being, Water Satisfaction and Health Satisfaction

In order to account for the influence of water access, we estimate three different models that allow testing the hypothesis formulated above:

\[
SWB_i = \beta_0 + \beta_1 \cdot \text{quality}_i + \beta_2 \cdot \text{cuts}_i + \beta_3 \cdot \text{bottled}_i + \beta_4 \cdot \text{outside}_i + \beta_5 \cdot \text{well}_i + \epsilon_i \quad (3)
\]

\[
\text{water}_i = \beta_0 + \beta_1 \cdot \text{quality}_i + \beta_2 \cdot \text{cuts}_i + \beta_3 \cdot \text{bottled}_i + \beta_4 \cdot \text{outside}_i + \beta_5 \cdot \text{well}_i + \epsilon_i \quad (4)
\]

\[
\text{health}_i = \beta_0 + \beta_1 \cdot \text{quality}_i + \beta_2 \cdot \text{bottled}_i + \beta_3 \cdot \text{well}_i + \epsilon_i. \quad (5)
\]

Table 3 presents the results of the estimations. The first thing we should highlight is that the $R^2$ of the estimators are quite low. This means that a large part of these satisfaction measures remain unexplained by the models. This should not be a problem, however, as our main strategy is not to fully estimate the happiness of people, which would be impossible using the technique proposed, but to assess the influence of the water variables. The results depicted in the table are therefore useful in order to determine this relationship.

Concerning model 3, we find that perceived quality has a positive effect on subjective well-being. The perceived number of cuts, contrary to our expectations, has no influence. The purchase of bottled water does have a negative impact: the greater proportion of...
income spent, the lower the life satisfaction. The non-significance of the fact that house-
holds do not have a tap inside their homes proves that they do not consider it important for
their happiness. The same goes for wells; having them does not affect life satisfaction.
According to the results, the type and continuity of access do not influence subjective well-
being, but the perceived quality of the water does, as is the case with the pressure on
income of the expense involved in purchasing good quality drinking water.

Similar conclusions can be drawn from the results of the water domain of life, albeit
with some differences. Firstly, the $R^2$ is nearly four times greater than in the previous
model, which indicates that water variables explain much more of the error term in the
water model than in the happiness model. Secondly, the coefficients are higher in the water
domain of life model. Additionally, the perceived number of cuts has a positive influence,
as expected, on water satisfaction, unlike the result from the happiness model.

With respect to the health results, perceived water quality has no effect. This result is
not that surprising: the objective quality of the water they drink would have been a better
indicator. The most surprising result is that purchasing water has no effect on the per-
ception of health. One possible interpretation of this is that the proportion of income spent
on purchasing water might not be a good indicator of the health effects of safe drinking
water. Instead, it would be useful to transform the variable into a dummy that equals one if
households purchase water. However, still we obtain similar results if we estimate the
model with this variable. Undoubtedly, other better indicators to capture this effect would
be more suitable. On the other hand, the fact that the household has access to a well does
have a negative impact on health perception. Due to the objective bad quality of the water
in wells, we might infer that households that use wells and drink the water perceive lower
health.

5 Conclusions, Policy Recommendations and Further Research

The results obtained in this paper show that water satisfaction is a significant domain of life
and water access can influence the perception of happiness, water and health. Water access
is therefore essential for the quality of life. We have shown this in the case of Yucatan,
Mexico, but water satisfaction should be more important in communities where water

access conditions are worse. The worst situations are found in rural areas in less developed countries, especially in Africa, where a large number of people still do not have access to clean drinking water (Showers 2002; Biswas 2007). This scarcity of clean water means long daily walks in order to gather drinking water that might be low quality. In these circumstances, the influence on people’s satisfaction is greater due to the high opportunity costs associated, which are greater in the case of women who are usually assigned the task of gathering water (Hope 2006). Access to clean water and sanitation are essential for health, being the best prevention for illnesses such as diarrhea, typhoid, dysentery or cholera. The many deaths caused by these illnesses can be reduced by providing enough higher quality drinking water and through basic sanitation (UNDP 2006; WHO and UNICEF 2005). Rapid urban development exceeding the management and financial capacity of urban cities also makes water access a problem that requires political attention in some urban areas (Biswas 2006).

Our analysis in rural Yucatan, Mexico shows that water quality perception influences happiness, as well as the money spent on purchasing bottled water. Access conditions and related infrastructures have no influence, maybe because of the reality of water access in Yucatan. Most households have a tap either in their home or outside it, and sometimes a well nearby (Gonzalez-Gomez et al. 2011). Concerning health, infrastructures do have a negative influence if households obtain water from a well. The water from wells is not good quality and results in a lower perception of health. We have also related the water access variables to the water domain of life and obtain similar results to when relating them to happiness, albeit with an improved goodness of fit. Unlike in estimation of happiness, the perceived frequency of cuts in supply plays a negative role in the case of water satisfaction.

The policy recommendations in this research are straightforward. A local policymaker aiming to raise happiness and health in Yucatan should increase water quality, especially in the case of wells, which are not maintained at all in Yucatan and therefore exposed to contaminants. One alternative measure would be to encourage people not to use wells through education programmes. On the contrary, infrastructure measures involving the installation of taps inside houses would not have an impact on satisfaction. As it has been proved that water perception positively affects happiness, reducing cuts in water supply in rural Yucatan would be a useful measure. It could also serve to avoid people using water from wells. This should be not difficult to implement as Yucatan has one of the lowest levels of water stress in Mexico (CONAGUA 2008), which suggests the problem stems from the quality of the organization in charge of managing the water supply.

After recognizing that water quality is the main aspect to take into account when aiming to improve the happiness of citizens, we must pose the question of who would meet the necessary costs of this improvement. If this cost is assumed by the users of the service, it would be convenient to ascertain beforehand the possible influence this would have on their well-being. Citizens may lose more happiness as a result of being burdened with the payment necessary to cover the investment than they would gain from the improvement in the quality of the water. Another option is that the necessary funding were provided by the government or development programmes. In this particular case, it would be interesting to value the possible impact on well-being of the possible alternatives that could be implemented with such funding.

To our knowledge, this is the first attempt to expressly consider the influence of different water access-related variables on subjective measures of welfare. These results, however, represent only a part of the many research possibilities in the field of happiness research concerning water access. An incomplete but useful list of cases to analyze in order
to relate happiness and water access and methodological strategies can be found in González-Gómez et al. (2009). These studies could be useful for both scientific understanding and also policy making that intends to increase happiness in a community.

Acknowledgments The authors would like to thank the comments made by the participants in the 1st Workshop on the Economics of Water that have benefited this research. More specifically, we would like to thank Asit K. Biswas and Cecilia Tortajada for their useful observations. We also acknowledge the financial support from the Spanish Ministerio de Ciencia e Innovación (project ECO2009-08824/ECON and SEJ2007-62081/ECON) and Junta de Andalucía (P07-SEJ-02547).

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