

## **Levels of Concern about Water Problems in Five Arab Countries**

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### **Abstract**

*Levels of concern about water problems in five Arab countries including Bahrain, Jordan, Saudi Arabia, Qatar, and Kuwait are examined in this study. Opinions about water pollution, underground water, desalinated water, and an inadequate management of wastewater were explored. In particular, respondents were asked whether they agree that: (a) water problems are very serious environmental problems, and (b) whether these problems deemed to be the most serious environmental problems in their countries. Results show that while most of water-related problems were considered serious, almost none of them were seen as the most serious environmental problem. All, but the Saudi sample believed that Ozone layer depletion, not water, is the most serious environmental problem in these five countries.*

**Keywords:** Water problems, Environmental concern, Water resources, Arab World.

### **Introduction**

The terrain of the Arab World and its surrounding (AWS) has one of the driest natural environments in the world. Scarcity of water pose enormous social, economic, and political challenges for countries like Bahrain, Jordan, Saudi Arabia, Qatar and Kuwait (BJSQK). Without a doubt, scarcity of water in BJSQK spawns many other problems. Dealing with a serious problem like this requires higher levels of public concern about water and effective and efficient water public policy (Yaghi, 2004; World Bank, 2006; Gill, 1999). Despite the need for wide-ranging environmental studies in the AWS region, attempts to answer such question have been very few (See, Alibeli and Johnson, 2009). Undoubtedly, environmental concern in the Arab World was overlooked by major cross-cultural studies conducted like Dunlap, Gallup, and Gallup, 1993; Alec M. 1993; Strohm, 2002; Jacobs, 2002; Inglehart, 1995; Tuna, 1998; Zelezny, Chua, and Aldrich, 2000). Indeed, we know far less about levels of environmental concern in the Arab World than we know about it in many other regions. To bridge a gap in the literature, the current study examines levels of concern about water problems among samples of college students in BJSQK. Although college students do not represent the general public, their views may provide a glimpse of the way the larger communities perceive water and its related problems (see, Ozden, 2008; Bowman, 1977).

### **Environmental Concern**

Environmental concern including concern about water is best described as “the degree to which people are aware of problems regarding the environment and support efforts to solve them and or indicate the willingness to contribute personally to their solution” (Dunlap and Jones, 2002: 485). Environmental sociologists prefer using “concern” instead of “attitude”: concern in this respect implies a positive attitude toward the environment compared to the neutral “attitude” (See, Van Liere & Dunlap, 1980: 181; Adelabu & Akinsolu, 2009). Regardless of terminological differences, environmental concerns or having positive attitude toward the environment is considered “a prerequisite to building a culture that cares about the environment and work to challenge the conditions imposed by environmental problems like scarcity of water” (Bell, 2005: 181).

### **Factors affecting Environmental Concern**

Concern about the environment is influenced by, but not limited to, national country, economic development, and socioeconomic and demographic factors. In terms of this, a number of cross-cultural studies examined the effect of national country and economic development on concern about the environment across scores of developing and developed nations. For example, after studying environmental concern in 24 developed and developing countries, Dunlap, Gallup, and Gallup (1993: 36) found that “residents in poor nations expressed as much concern about environmental quality as do those living in wealthy nations.” Although Inglehart (1995) conceded Dunlap’s finding, he claimed that environmental concern in the developing nations is no more than a reactive response to elevated air contamination, high levels of water pollution, and other environmental risk to humans and human health.

In contrast, environmental concern in the developed world is viewed by Inglehart as proactive and ecocentric. Such argument is strongly criticized not only because environmental concern does not depend on “affluence or affluence-based postmaterialist values” (Dunlap and York, 2008: 529) but also because “environmental activism and public support for environmental protection have become global phenomena and no longer-if they ever were -limited to the wealthy nations of the world” (Dunlap and York, 2008: 550). Despite being criticized for associating environmentalism with postmaterialism (Bell, 2009), Inglehart is supported, in part, by Tuna’s (1998) and Olofsson and Ohman’s (2006) studies. Tuna’s study of 18 developed and developing nations showed higher levels of anthropocentric (human oriented) environmentalism among the less developed countries compared with higher levels of ecocentric environmentalism among the more developed ones. Furthermore, Olofsson and Ohman (2006) reported more concern about the environment among those with post-materialistic collective beliefs than those with individual materialistic ones across North America and Scandinavia.

Besides affluence and economic development, gender has been an important factor that is believed to influence environmental attitudes and behavior. However, gender’s influence is found to be vague and inconclusive as different studies yielded different outcomes. For example, Arbuthnot (1977), Blocker & Eckberg (1989), Arcury and Johnson (1987), and Arcury (1990) indicated that men are more active, more knowledgeable, and more concerned about the environment than women. On the other hand, McStay and Dunlap (1983), Stern, Dietz, & Kalof, L., (1993), Zelezny, L. C., Poh-Pheng, C. & Aldrich, C. (2000), Uyeki and Holland (2000), Dietz, H., Kalof, L., & Stern, P. (2002), and Olofsson and Ohman (2006) stated that women are more concerned about the environment than men. In particular, Uyeki and Holland (2000) reported that women are more concerned about the environment, nature, and animals than men. In contrast, Hayes (2001: 657) argued that gender does not influence environmental concern and women “are not more concerned about the environment than men.” On the other hand, Brody (1984), Blocker & Eckberg (1989), Stern and associates (1993), Mohai (1991), Davidson and Freudenberg (1996), and Bord and O’Conner (1997) contended that the difference, if any, in environmental concern between men and women is more due to the different perceptions of the consequences of environmental problems on humans and humans’ health rather than to gender per se.

Finally, Arcury and Johnson (1987) played down the effect of gender on environmental concern noting that such effect is weak and inconclusive and no definite conclusion could be drawn about the relationship between gender and concern about the environment. Broadly speaking, literature associates the middle class with the environment and environmental concern (Buttel & Flinn, 1978a, 1978b, Buttel, 1987, Van Liere & Dunlap, 1980, Mohai, 1985, and Morrison & Dunlap, 1986). Middle class has been a strong supporter for the preservation of the environment and the conservation of natural resources. In addition, middle class has led the efforts to preserve wilderness, to conserve natural resources, to raise public awareness about environmental problems, and to lobby policy makers to curb air and water pollution. Yet, the literature is not clear as to whether environmentalism is a middle class value or whether class differences in concern about the environment is due to the influence of middle class attributes such as higher education, occupation, and social activism. Finally, the literature indicates a positive relationship between educational attainment and environmental concern. Therefore, as the level of education increases, so does environmental concern (Arcury, Johnson & Scollay, 1987, Arcury & Johnson, 1987, Buttel & Flinn, 1978b, Van Liere & Dunlap, 1980, Olofsson and Ohman, 2006, and Buttel and Flinn, 1978b). For example, Buttel and Flinn (1978b: 436) claimed that “education has been the indicator most closely related to environmental concern.”

### ***Water Resources in BJSQK***

Due to its arid nature, the Arab World is considered among the water-poorest regions on earth (FAO, 2010). With few exceptions, BJSQK lack reliable renewable sources of freshwater like rivers and lakes. Thus, BJSQK are left with few choices like underground water, desalinization, and wastewater recycling to satisfy their ever-increasing demand for water (FAO, 2010). Underground water is very crucial for BJSQK. It is the main source of fresh water in Saudi Arabia, Bahrain, Qatar, and Kuwait and is the second source of fresh water after in Jordan (King Abdullah, 2011; Swain, 1998; Government of Bahrain, 2011). Although it is scarce and cannot sustain current consumption levels, underground water has been over-extracted and over-used for unsustainable agricultural activities (World Resources Institute, 2010). Desalinization is considered a great potential option to alleviate water shortage in BJSQK. Desalination is “the intensive process of converting brackish water or seawater to freshwater” (Hiniker, 1999: 10). Desalinization has been widely utilized in the region. Actually, major portion of the world’s desalinization capacity is installed in the Arabian Peninsula (Yolles and Gleick, 1994; World Resources Institute 2010). However, desalinization remains limited because it is expensive to many who cannot afford it in the region like Jordan (Gleick, 1998). Recycling or ‘wastewater management’ is another source of freshwater in BJSQK.

Recycling is a process of treating wastewater to a level suitable for use in a variety of applications like irrigation and industry (Gleick, 1998). Recycling can save the environment “from untreated water, reduce pollution and water contamination” (Gleick, 1998: 28). Recently, more wastewater is being treated and reused in the countries under study. Although recycling has the potentials to alleviate water shortage, it remains an imperfect option and the technology used in the process is still developing. In the end, it is safe to say that while aridity and water shortage are not totally human-made problem, the way people view water problems, use and manage those limited water resources may make all the difference. Besides, lack of awareness of the saliency of water-related problems, unsustainable consumption of water resources, and mismanagement of such precious sources may indeed make such problems difficult to handle.

### Research Problem

Citizens play significant roles in sensing environmental problems, urging solutions, and responding to governmental policies. Since citizens are consumers as well as participants in consuming, conserving, and preserving water, their levels of concern make a significant difference in policy-making, policy implementation, and evaluation. In this sense, policy makers would have little success had their water-policies not been supported by citizens. Therefore, the current study investigates opinions about the importance of (1) water pollution (2) underground water, (3) desalinated water, and (4) inadequate wastewater management for samples of college students from BJSQK. The study endeavors to answer the following questions: (a) do respondents believe that water problems are very serious environmental problems? If so, (b) do they believe that water problems are the most serious environmental problems in their countries? Studying college students’ attitudes, opinions, and concerns is very useful. Students are an energetic, better informed, well prepared, and an active segment of society. In addition, students can influence policymaking by educating the public, raising environmental awareness, and leading communities to adopt more effective and efficient policies to mitigate water problems. The history of environmental movements indicates the significant role played by college students to mobilize their communities and to adopt more progressive environmental policies in their countries (Dunlap et al., 1973; Bowman, 1977).

### Methodology

Data set for this study was obtained from the Unit for Community and Environmental Studies at the Social Science Research Center of Mississippi State University. A sample of about 1666 college students was composed of the Environmental Attitudes Survey at the University of Bahrain 1999, King Saud University in Saudi Arabia 1999, Mu’tah University in Jordan 2001, Qatar University 2003, and the University of Kuwait 2005. The sample was drawn from social science, humanities, business, and science classes. Depending on the instructors, students either completed the survey during class time or completed the survey outside of classes and returned it to the instructor. Although the completion rate is not available, it was higher for classes in which class time was used for completing the survey. Students were given the option of completing either an English or Arabic version of the survey (Gill, 1999). To examine levels of concern about water problems, students were given a list of 25 different environmental problems, global and domestic, such as global warming, ozone layer depletion, water related problems, littering, and noise pollution. Respondents were asked to indicate whether a problem is a very serious problem (VSP), a small problem (SP), or not problem at all (NP). Then respondents were asked to indicate which problem is the most serious environmental problem in their countries.

**Table1: Characteristics of the Study Sample (N=1666)**

Variable	Category	Bahrain (N=374)	Jordan (N=412)	Saudi (N=318)	Qatar (N=178)	Kuwait (N=384)
Age	Mean	21.03	20.60	21.41	22.50	21.16
	Median	20.00	20.50	21.00	21.00	20.00
Gender	Male	26.70	34.00	100.00	44.10	16.20
	Female	73.30	66.00	00.00	55.90	83.80
Social Class	Working Class	15.70	20.00	13.20	10.10	8.00
	Middle Class	79.90	75.40	58.80	77.50	85.30
	Upper Class	4.30	4.60	28.00	12.40	6.70
Father Education	Less than high school	44.90	43.00	47.30	51.20	32.00
	High school	22.30	28.40	19.90	21.50	22.00
	College	32.80	28.60	32.80	27.30	46.00
Mother Education	Less than high school	61.30	60.90	84.60	62.00	35.80
	High school	21.70	19.20	10.40	16.40	21.10
	College	17.10	19.90	5.00	21.60	43.10

Table 1 provides general characteristics of the sample. As expected, most respondents are in their early twenties. On the other hand, respondents' gender varies from one country to another. Whereas females make almost 84% of Kuwaitis, all Saudis are males. Nevertheless, approximately 58% of the overall sample are females and 42% are males. Moreover, the majority of the respondents identify themselves with middle class. Although parents' educational levels vary, the majority of them have high school or less education. Finally, levels of concern about water problems are conceptualized in terms of (1) the percentages of respondents who perceive water problems as "very serious" environmental problems, and (2) the percentage of those who consider water problems as "the most serious" environmental problems. The following sections will reveal whether water problems are being viewed as very serious environmental problems and will show the extent to which these problems are being seen as the most serious environmental problems in BJSQK.

### Discussion

In addition to its grave consequences on human and human health, polluted water degrades the quality of fresh water and contaminates surface and underground water resources. As expected, results reveal a common understanding among respondents of the gravity of water pollution. Results also show a near consensus about the significance of water pollution problem. Based on Table 2, 89% of Bahrainis, 84% of Jordanians, 85% of the Saudis, 76% of Qataris, and 83.6% of Kuwaitis view water pollution as a "very serious" problem

**Table 2 Percentage of Respondents Reporting that Water Problem is Very Serious**

	<b>Bahrain (N=374)</b>	<b>Jordan (N=412)</b>	<b>Saudi (N=318)</b>	<b>Qatar (N=178)</b>	<b>Kuwait (N=384)</b>
Water Pollution	89.0	84.1	85.2	76.3	83.6
Underground water	47.3	30.7	100.0	32.4	23.7
Desalinated water	60.4	53.5	96.5	48.6	51.1
Wastewater	43.3	36.9	82.4	45.9	48.9

On the other hand, Saudi consensus over the significance of underground is not very surprising because underground water is the number one source of water in the country. Surprisingly enough, only 23.7% of Kuwaitis, 30.7% of Jordanians, 32% of Qataris, and 47.3% of Bahrainis believe so. Saudi high level of concern about underground water might be due to changes in water discourse and water policy in the country since the 1990s. The Saudi government invested its political, religious, and social assets to address water crises and raise the awareness of water shortage in country. For example, in July 1997, the late King Fahd of Saudi Arabia appeared on television to urge his citizens to save water saying that water conservation is 'a religious and development duty.' (See full text in Allan 2002:169). In addition, Saudi religious leaders, teachers, and the media contributed to the government campaign by highlighting water scarcity and focusing on the value of water conservation. In contrast, respondents from the other four countries indicated a lower level of concern about underground water. Although it is beyond the scope of this study, the discrepancies in respondents' views on underground water require further investigation to find factors, other than the ones discussed above, that might explain these results.

Levels of concern about desalination provide interesting results. Whereas 96.5% of Saudis believe that the availability of desalinated water is a very serious, Bahrainis, Qataris, Kuwaitis, and Jordanians show lower levels of concern. Low levels of concern about desalinated water for Bahrainis, Qataris, Kuwaitis, and Jordanians raise two important points. First, Bahrainis, Qataris, and Kuwaitis reveal more concern about desalinated water than that of underground water which, in fact, is their main source of freshwater supply. Second, Jordanians, where expensive desalinization is neither popular nor viable, appear to be more concerned about desalinated water than underground water which provides Jordan with nearly one fourth of its water needs. In terms of this, respondents are either less informed about desalination, its cost, management, and distribution, or they approach the problem from a global perspective rather than a local or regional one.

Concerns about inadequate wastewater treatment vary considerably across the five countries. Whereas about 82% of Saudis indicates that the problem is very serious, 49% of Kuwaitis, 46% of Qataris, 43% of Bahrainis, and 37% of Jordanians share that view. Cross country difference might be due in part to the type of economy and the size and scope of economic activities within each country. Saudi economy, for example, relies heavily on oil production and petrochemical industries which could magnify wastewater problems. The same rule may apply to Bahraini, Qatari, and Kuwaiti economies although these economies are much smaller than the Saudi one. Jordanian economy, on the other hand, relies on services, food production, and extraction industries. Thus, the degree of harm, real or potential, of wastewater from chemical-related industries might not be very significant. To sum it up, respondents reveal moderate to strong levels of concern about water problems. However, the real test rests on whether they believe that water problems are the most serious environmental problems in their countries.

The following section will examine whether water problems are perceived by respondents as the most serious environmental problems in their countries. As Table 3 shows, water problems were not seen as the most serious environmental problems. With only one exception, levels of concern about water problems do not match the severity and gravity of water problems in the region as reported by Amery & Wolf (200); Allan (2002); Yolls & Gleick (1994); and Powell (1995).

**Table 3** Percentage of Respondents indicating that out of 25 environmental problems, Water Problems are the Most Serious\*

	<b>Bahrain</b> (N=374)	<b>Jordan</b> (N=412)	<b>Saudi</b> (N=318)	<b>Qatar</b> (N=178)	<b>Kuwait</b> (N=384)
Water Pollution	10.3	5.8	2.5	11.3	11.1
Underground water	1.4	0.3	64.8	0.0	0.0
Desalinated water	3.1	1.0	2.2	0.7	3.0
Wastewater	0.0	0.0	0.0	0.7	0.6

\* Since the question gave respondents a long list of environmental issues to choose from, numbers in the table do not add up to 100%.

In a little surprising result, only about 10% of Bahrainis, 6% of Jordanians, 11% of Qataris, 11% of Kuwaitis, and 2.5 of Saudis consider water pollution the most serious environmental problem. Except the Saudis, barely 1.4% of Bahrainis and less than 1% of the Jordanians, Qataris, and Kuwaitis believe that the availability of underground water is the most serious environmental problem. Also, no more than 3% of Bahrainis, 3% of Kuwaitis, 2% of Saudis, 1% of Jordanians, and less 1% of Qataris deem the availability of desalinated water is the most serious environmental problem. Finally, almost none from the five countries consider inadequate wastewater treatment as the most serious environmental problem. Consequently, if water problems are not the most serious environmental problems in BJSQK, what are they then? To answer this question, we turn to Table 4 which provides a summary of the most serious environmental problems as reported by the respondents.

According to Table 4, Ozone layer depletion is considered the most serious environmental. All but the Saudis believe that ozone layer depletion is the most serious environmental problems their countries face. Apparently, the majority of the respondents lack the awareness of the magnitude of the undergoing water problems in BJSQK.

**Table 4: Summary of the Three Most Serious Environmental Problems in BJSQK\***

	<b>Most Serious Problem</b>	<b>Second Most Serious</b>	<b>Third Most Serious</b>
<b>Bahrain</b> (N=374)	Ozone layer depletion (57.7%)	Water pollution (10.3%)	Population growth (7.7%)
<b>Jordan</b> (N=412)	Ozone layer depletion (64.4%)	Global warming (7.9%)	Water pollution (5.8%)
<b>Saudi Arabia</b> (N=318)	Underground water (64.8%)	Global warming (13.5%)	Traffic air pollution (6.9%)
<b>Qatar</b> (N=178)	Ozone layer depletion (55.0%)	Water pollution (11.3%)	Global warming (9.3%)
<b>Kuwait</b> (N=384)	Ozone layer depletion (48.5%)	Water pollution (11.1%)	Global warming (6.3%)

\* Percentages do not add up to 100% because other environmental priorities were listed by respondents but not included in this table

To improve levels of concern about water and raise public awareness about water problems in BJSQK, water-related policies need to be identified and publicly debated. Considering that public participation in BJSQK may take different patterns than those observed in democratic societies, governments in the region may lead while people follow. Governments may need to adopt effective and progressive policies to manage and administer water problems more efficiently. Also, governments may need to adopt public campaigns to teach, inform, and educate citizens about the fact surrounding the status of water in each country. Obviously, behaviors, attitudes, and opinions about water can be shaped by a strong government that is willing to mobilize the necessary resources to raise public awareness about water and modify the way it is managed and consumed. Also, public concern about water can be influenced by public campaigns (e.g., grassroots movements) that are capable of putting enough pressure on governments to make environmentally responsive and environmentally friendly policies. However, without a reliable partnership between the citizens and their governments, water problems will deteriorate and conflicts over water shared water resources will escalate locally and regionally.

## Conclusion

The current paper examined levels of concern about water problems among samples of college students from Bahrain, Jordan, Saudi Arabia, Qatar, and Kuwait. The paper described college students' levels of concern about water pollution, availability of underground water, availability of desalinated water, and inadequacy of wastewater management problems. Also, the study reflected these college students' environmental priorities and how they recognized the saliency of water problems in their countries. Although the majority of respondents agreed that water problems are very serious, only a few considered these problems as the most serious environmental problems in their countries. Contrary to the academic taken-for-granted assumption that domestic environmental issues overshadow global ones, findings revealed the opposite. Respondents were more seriously concerned about global problems like Ozone layer depletion than local environmental problems such as water pollution. Lack of awareness about local water problems warrants further investigation to explain how and why global environmental issues eclipsed local ones. Finally, future studies may need to overcome some of the limitations of this study. For example, the study was limited to college students who might be more educated, informed, active, and younger than the general public. In addition, lack of adequate research resources made it difficult to recruit females in the Saudi sample. Investigating policy linkages and public participation would be necessary to test political models for participation in environmental arenas.

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