



Research Report

Barbara Anderson, Marie Wentzel,
John Romani, Heston Phillips

Exploring Environmental
Consciousness in South Africa

Report 10-709
June 2010

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Barbara A. Anderson
Ronald Freedman Collegiate Professor of Sociology and Population Studies
University of Michigan

Marie Wentzel
Chief Researcher, Human Sciences Research Council
Pretoria, South Africa

John H. Romani
Professor Emeritus of Public Health Administration
Faculty Associate, Program in the Environment
University of Michigan

Heston Phillips
Monitoring and Evaluation Advisor, UNAIDS South Africa Country Office
Pretoria, South Africa

Population Studies Center Research Report 10-709

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Acknowledgements: We wish to acknowledge the assistance and helpful comments from Paul Mohai and Raymond DeYoung, University of Michigan School of Natural Resources; Mosidi S. Nhlapo, Statistics South Africa; Peter Kok, formerly of the Human Sciences Research Council; Barry Rabe, Gerald R. Ford School of Public Policy, University of Michigan; and Howard Kimeldorf, Alford Young and Karyn Lacy, Department of Sociology, University of Michigan.

Support was provided by Statistics South Africa, Human Sciences Research Council, and by National Institute of Child Health and Human Development Grant HD41028 to the Population Studies Center, University of Michigan.

A version of this paper is forthcoming in *Africa Focus*, Pretoria: Human Sciences Research Council.

ABSTRACT

This paper explores the relationships between perceptions, behaviors and awareness regarding four environmental conditions in South Africa: water pollution, land degradation, air pollution and littering. Data from the 2004 General Household Survey are used. First, the extent to which these perceptions, behaviors and levels of awareness correspond to those found in other parts of the world is assessed. Secondly, the importance of race and ethnicity and of socioeconomic status in differences and similarities in environmental perceptions, behaviors and awareness are analysed. African households are much more likely to perceive environmental problems than non-African households, but non-African households are more likely to take action in response to environmental problems and to be aware of environmental initiatives. Logistic regression analyses reveal that the particular circumstances of households are important in response to environmental issues. For example, households with access to land for agriculture are more likely to perceive land degradation as a problem than are households without access to land for agriculture. Education of household head is rarely important for perception of environmental problems, but education is usually important for whether the household takes action in response to an environmental problem and for awareness of environmental initiatives.

INTRODUCTION

The late 20th and early 21st centuries witnessed the emergence of the environment as an important political and social issue. (Berglund 2006, Dunlap, Gallup and Gallup 1993; Ebero and Vining 2001; Inglehart, 1995; Rohrschneider 1988; Jacobs 2002; Schellas and Pfeffer 2005) Rising concerns about environmental pollution and global warming led governments and civil society alike to expand efforts to increase public awareness of water, air and ground pollution and the means for alleviating these conditions. How views regarding environmental conditions are developed, the relationship of these views to behaviors regarding these circumstances and the relative influence of living conditions, social status and other factors in forming these attitudes and resultant behaviors are important questions in social science. The broader public understanding of these matters is also an essential ingredient for informed responses to climate change and related environmental concerns.

South Africa offers a special context in which to look at these questions and their implications for both social science and environmental policy. The constitutional provision that South African citizens are entitled to an environment that is “not harmful to their health and well-being” is a central factor (Constitution of South Africa, Chap. 2, Sec., 24 Republic of South Africa 1996). Inclusion of this item in the bill of rights, coupled with the broad range of environmental protection legislation and corresponding administrative actions taken by post-apartheid governments is evidence that this provision is viewed seriously (DEAT 2004; DWAF 2005; Peart and Kogi 2001; Republic of South Africa 1998). Further, these actions have created the potential not only for a greater public awareness of environmental matters and a higher level of expectations for environmental, but also for a situation in which governmental performance in this area might be subject more critically scrutinised (Heyns and Brand 2004).

ISSUES

The role of socio-economic status and individual characteristics in the development of perceptions about the environment and actions taken to cope with environmental pollution have been studied by social scientists for several years (Van Liere and Dunlap 1980; Rohrschneider 1988; Dunlap and Scarce 1991; Hunter, Strife and Twine 2009; Jacobs 2002; White and Hunter 2009). One body of work gave rise to the position that the concern about the environment and its protection were more likely to found in developed societies where populations enjoyed higher socio-economic status (Franzen 2003; Inglehart 1995) Other studies challenged this position, arguing that awareness of environment pollution as well as a willingness to take action to mitigate these conditions is also found in developing societies (Anderson, et al. 2007; Dunlap, Gallup and Gallup 1993; Goksen et al. 2002; Jacobs 2002; Dunlap and York 2008; White and Hunter 2009) A common element in findings from these studies is that socio-economic factors

have a differential influence depending upon both individual circumstances and the particular questions of environmental concern that are being explored. Moreover, the strength of the relationship between any given factor, or set of factors, may also vary according to the particular situation of the population concerned.

Our finding in an earlier study of perceptions about water pollution in South Africa that “those most directly affected by water pollution were also most likely to see it as a problem” bears this out (Anderson et al. 2007). White and Hunter (2009) concluded in their study of Ghanians’ attitudes about environmental matters that: “...residents of less-wealthy nations also often prioritize environmental issues” (White and Hunter 2009: 980). Gosken and his colleagues (2002) reported the capacity to differentiate among environmental issues in their study in Turkey of the effects of the geographical proximity of an environmental problem on environmental attitudes and a willingness to pay to deal with that condition. Hunter and her associates (2009, 20) noted in their study of environmental perceptions of rural South Africans that among people and communities around the world “there may actually be more commonality than differences with regard to social and environmental concerns”.

An additional factor, and one which has special relevance to South Africa, is that of race and ethnicity. Conventional wisdom has been that concern with the environment is largely a “white” issue (Mohai and Bryant 1998). They also observed that while there appeared to be racial differences when the issue was about environmental conditions in neighborhoods, these distinctions “rather than representing a race effect based on cultural conditionings, [they] appear to be related to the greater likelihood of African-Americans living in poorer environmental conditions than to whites” (Mohai and Bryant 1998, 500). They further argue that the differences between Whites and Afro-Americans regarding some environmental questions are not necessarily a part of what divides Afro-Americans and Whites in the United States (Mohai and Bryant 1998). This view is consistent with other studies in which local environmental conditions were seen as an important contributor to attitudes about environmental matters (Blake, Guppy and Urmetzer 1997; Blake 2001; Parker and McDonough 1999).

However, variations in perceptions about environmental matters between ethnic groups have been found to persist even when demographic factors such as age, education, gender, residence and family size were held constant (Johnson, Bowker and Cordell 2004). On a scale designed to measure the degree to which one held pro-environment beliefs, the scores for Afro-Americans and foreign born Latinos were consistently lower than those for Whites. Scores for Asians were similar to those of the Whites, while US born Latinos had scores placing them in an intermediate position. A similar pattern was found on four measures of environmental behavior, including recycling.

This paper explores the relationships between perceptions, behaviors and public awareness regarding four environmental conditions in South Africa: water pollution, land degradation, air pollution and littering/refuse disposal. The purpose of this analysis is to assess the extent to which the perceptions, behaviors and levels of awareness among South African households correspond to those found in other parts of the world. Given the emphasis placed on environmental concerns since 1994, one would anticipate a high degree of environmental consciousness among South Africans. Secondly, the presence of distinct population groups allows for an examination of the influence of race and ethnicity on differences and similarities in environmental perceptions and behaviors. The question is not simply one of aggregate differences between the populations, but the degree to which such differences are the product of the particular circumstances experienced by the different racial and ethnic populations. Thirdly is the role played by specific environmental conditions in explaining similarities and differences in environmental perceptions, behaviors and awareness.

DATA

Data used for these analyses are from the 2004 General Household Survey conducted by Statistics South Africa. The 2004 survey was the third in a series of annual household surveys initiated in 2002 as a replacement for the October Household Survey conducted by Statistics South Africa from 1993 through 1999. The 2004 Survey was a stratified random sample which included 26,214 households, of which 19,950 (76%) were African households and 6,264 (24%) were non-African households.

The second survey in this new series - the 2003 survey - contained a limited number of questions about household involvement in recycling activities and in the disposal of household waste. The 2004 instrument contained most of the items from the 2003 survey as well as a number of new questions regarding environmental problems. These additional items dealt with four specific conditions of environmental contamination: water pollution, land degradation, air pollution and littering (Table 1). For land degradation and air pollution, questions were only asked to determine if these conditions were seen as community problems. For water pollution and littering, however, additional information was sought regarding behaviors to address these particular concerns and the level of awareness of specific initiatives that had been developed to deal with these matters (Table 1).

An additional matter concerning the data is who answered the questions used in the analysis. The 2004 General Household Survey had a "person" section and a "household" section. The items that we analysed were all in the "household" section. The 2004 Survey does not indicate which household member answered these questions. The interviewer instructions only stated that it was to be a "responsible adult". The education of the head of household is a relevant characteristic of the household, but we do not know whether the actual respondent was male or female or his or her age.

Table 1. General Household Survey 2004 items relating to perceptions, behaviors and awareness in various environmental areas

	Water Pollution	Land Degradation	Air Pollution	Littering/Waste Removal
Perception of a Community Problem	Which of the following environmental problems do you experience in your community?			
	Water pollution	Land degradation/over utilization of natural resources	Outdoor/indoor air pollution	Waste removal/littering
Behaviors to Address the Problem	<p>Do household members treat the water used for drinking?</p> <p>Do household members treat the water used for food preparation?</p>			<p>During the past 12 months have you or any member of your household:</p> <p>a) Facilitated recycling of glass?</p> <p>b) Taken cans to a collect-a-can recycling point for recycling?</p> <p>c) Taken plastic to a recycling facility for recycling?</p> <p>d) Made compost out of kitchen waste?</p> <p>In the past 12 months have you or any member of your household separated:</p> <p>a) Paper from rubbish so it could be collected?</p> <p>b) Plastic from rubbish so that it could be collected?</p>
Awareness of Initiatives Related to the Problem	Are you aware of the following initiatives in South Africa?			
	Work for Water (clearing of alien vegetation)			<p>Collect a Can (aluminum cans containing beverages/cool drinks for cash)</p> <p>Green cages (cages provided for plastic bag deposits)</p>

As in all surveys, the 2004 General Household Survey was not totally representative of the South African population. To correct for this condition the data in all of the tables with numerical results as well as in the figures are weighted. When the results are shown for all households, the weights from the survey are scaled so that the weighted total number of households equals the total number of households in the survey. When results are shown for African households alone, the weights are scaled to make the weighted number of African households equal to the number of African households in the survey. Similarly, when results are shown for non-African households alone, the weights are scaled to make the weighted number of non-African households equal the number of non-African households in the survey. This is the weighting procedure employed for the results in all of the statistical tables.

Table 2 provides a description of the explanatory variables used. Two matters concerning the independent variables selected need to be noted. The first concerns the very different distribution of characteristics of African and non-African households that are shown in Table 3. It was difficult to find a set of independent variables that was equally appropriate for the analysis of both African and non-African households. The selected independent variables work well for the analysis of all households and of African households. If, however, the main purpose of the analysis were the examination of non-African households, a somewhat different set of independent variables might have been used.

Second it is necessary to point out that certain of the independent variables -- the quality of drinking water, type of sanitation, nature of housing and availability of refuse collection - are used in two different ways. Each of these items, when taken together with a number of other items, constitutes a package of indicators that can also be used to define the level of living of a household. Each is also employed separately as an independent variable that could be related to the perception that a particular environmental condition is viewed as a community problem. The two ways in which these variables can be applied require that a clear distinction be made each time the variable is used in a given part of the analysis.

Table 2. Description of explanatory variables used

Urban	Urban/non-urban classification based on 1996 South Africa Census 1=Yes, is an urban place, 0=No, is not an urban place
Flush/Chemical Toilet	Flush/chemical toilet includes flush toilet connected to a public sewage system, whether in dwelling, on site or off site, slush toilet connected to a septic tank whether in dwelling, on site or off site, or chemical toilet whether on site or off site 1=Yes, uses a flush or chemical toilet, 0=No, does not use a flush or chemical toilet
Clean Water	The household's main source of water for drinking and food preparation. Clean water includes piped(tap) water in dwelling, piped tap) water on site or in yard, neighbor's tap, public tap, or water from a water carrier/tanker 1=Yes, has clean water, 0=No, does not have clean water
Formal Housing	Formal housing includes dwelling/house or brick structure on a separate stand or yard or on farm, flat or apartment in a block of flats, town/cluster/semi-detached, or unit in a retirement village 1=Yes, lives in formal housing, 2=No does not live in formal housing
HH Head 5+ Yrs Education	Education of household head 1=Yes, household head has 5 or more years of education, 0=No, household head does not have 5 or more years of education
HH Head Bachelor Degree+	Household head has a bachelor degree, bachelor degree and diploma. honors degree, or higher degree (Masters, Doctorate) 1=Yes, household head has bachelor degree or higher degree, 0=No, household head does not have bachelor degree or higher degree
Access to Land for Agriculture	Whether the household has access to land that is, or could be, used for agricultural purposes 1=Yes, has access to land for agriculture, 0=No, does not have access to land for agriculture
Rubbish Collected At Least Weekly	Rubbish collected at least weekly includes rubbish removed by local authority at least once a week and rubbish removed by community members at least once a week 1=Yes, rubbish collected at least weekly, 0=No, rubbish not collected at least weekly
African Household	Population group of household head 1=Yes, household head is African/Black, 0=No, household head is not African/Black

Table 3. Percent of households with various characteristics

	All Households	African Households	non-African Households
Urban	59%	50%	88%
Flush/Chemical Toilet	57%	46%	95%
Clean Water	86%	82%	98%
Formal Housing	67%	59%	94%
HH Head 5+ Yrs Education	75%	70%	93%
HH Head Bachelor Degree+	5%	2%	13%
Access to Land for Agriculture	14%	17%	5%
Rubbish Collected at Least Weekly	56%	46%	.88%
African Household	77%	---	---

As noted above, Table 3 shows the percent of all households, African households and non-African households with particular characteristics. Non-African households are made up of households occupied by members of the White, Coloured and Asian populations. There were 2886 Coloured, 604 Asian and 2950 White households in the survey. Readily evident from this table are the differences between African and non-African households. It can be seen that non-African households are far more likely than African households to have access to clean water, good sanitation, formal housing, heads of households with higher levels of educational attainment and frequent refuse collection. The only characteristic in which the percent of African households exceeds that of non-African households is access to land for agricultural purposes. Reflected here is the pattern of living conditions that existed in the period prior to 1994 and which continues in South Africa to the present.

ANALYSIS

Perceptions of a Specific Environmental Condition as a Community Problem

The perception that a given environmental condition is a community problem and the household circumstances associated with that perception is the first question examined. Table 4 presents the percentages of all households, African households and non-African households who perceive specific environmental conditions as community problems. Three things stand out from these data. First is the small percentage of all households that view any of these conditions as a community problem. Only littering was seen as a community problem by more than 20% of all households. These levels of concern with environmental pollution differ from those reported in other studies where a much higher percentage of respondents identified environmental pollution as an important issue (Holl, Daily and Ehrlich 1995; White and Hunter 2009).

Second were the differences in the identification of the four environmental conditions as community problems. Water pollution was seen as a problem by the lowest percent of all households, followed, in ascending order, by land degradation, air pollution, and littering. The same pattern of perceptions held for African households. However, the views of non-African households were slightly different. For these households, land degradation was seen as less of a community problem than water pollution. In none of these cases, however, did more than ¼ of households perceive a particular condition of environmental pollution as a community problem.

Third were the differences in views between African and non-African households regarding these particular environmental conditions as community problems. African households were three times as likely as non-African households to see water pollution and land degradation as community problems. Air pollution and littering were twice as likely to be seen as problems by African households as by non-African households.

Perception of Water Pollution as a Community Problem. Table 5 presents the results of a logistic regression analysis of the influence of the explanatory variables on the perception of water pollution as a community problem. For all households, as well as for African households, if the household considered water pollution, was urban, lacked a flush or chemical toilet, did not have clean water, or did not reside in formal housing. For non-African households, only the type of housing and the educational level of the head of household were significantly related to the perception of water pollution as an issue. Neither the location of the household nor access to clean water was statistically significant.

The substantial differences in the position of the urban and rural populations in South Africa with reference to water quality and type of sanitation can be seen in Figures 1 and 2. The distribution of all rural households by sanitation and drinking water quality is shown in Figure 1 and the distribution of all urban households with respect to sanitation and drinking water quality is presented in Figure 2. Only 15% of all rural households had access to both clean water and a flush or chemical toilet compared to slightly less than 32% of rural households which lacked both clean water and a flush or chemical toilet. A contrasting picture is found for urban households where 85% of them had both clean water and a flush or chemical toilet, while less than 1% both lacked clean water and did not have a flush or chemical toilet.

Table 4. Percent of all households, African households and non-African households with perceptions, behaviours and awareness in various environmental areas

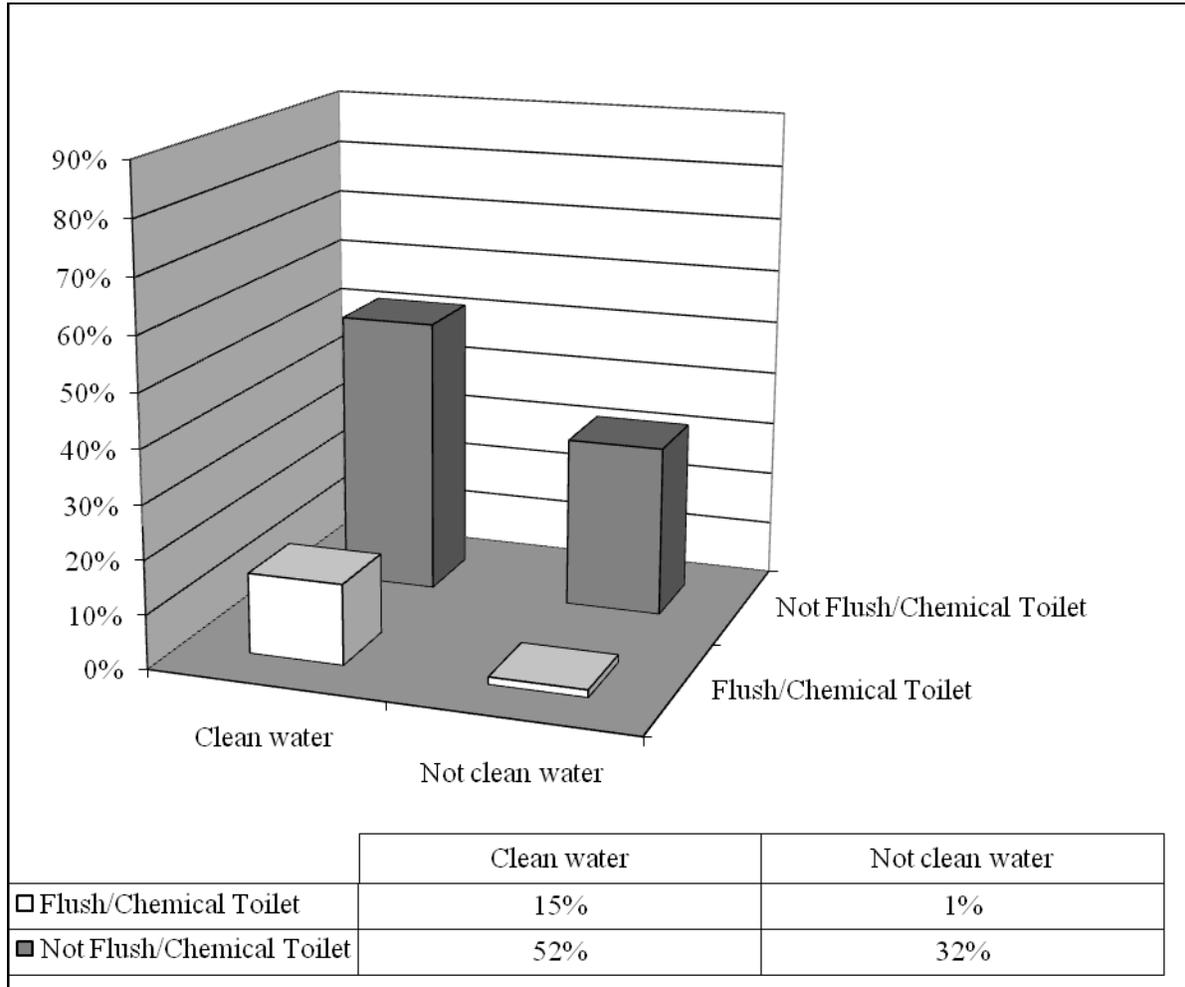
	Water Pollution			Land Degradation			Air Pollution			Littering						
		All	African	non-African		All	African	non-African		All	African	non-African				
Perceived as a Community Problem	Water Pollution	10.8%	13.0%	3.9%	Land Degradation	11.7%	14.3%	3.4%	Air Pollution	15.1%	17.2%	8.3%	Littering	21.5%	24.1%	12.9%
Behaviors	Treat Drinking Water Sometimes or Always	5.8%	5.8%	6.0%								Did Any Recycling Behavior Listed in Table 1	6.5%	4.1%	14.5%	
	Treat Water for Food Sometimes or Always	5.0%	5.1%	4.8%												
Awareness of Initiatives	Working for Water	12.0%	7.0%	28.1%								Collect-a-Can	62.7%	59.5%	73.2%	
					Green Cages	19.0%	14.0%	35.6%								

Table 5. Logistic regression results for perceptions of environmental problems

	All Households				African Households				non-African Households			
	(1) Water Pollution a Problem	(2) Land Degradation a Problem	(3) Air Pollution a Problem	(4) Littering a Problem	(5) Water Pollution a Problem	(6) Land Degradation a Problem	(7) Air Pollution a Problem	(8) Littering a Problem	(9) Water Pollution a Problem	(10) Land Degradation a Problem	(11) Air Pollution a Problem	(12) Littering a Problem
Urban (0=No, 1=Yes)	<u>.639</u> (.000)	<u>-.270</u> (.000)	<u>.662</u> (.000)	<u>1.120</u> (.000)	<u>.653</u> (.000)	<u>-.252</u> (.000)	<u>.657</u> (.000)	<u>1.115</u> (.000)	.429 (.077)	-.242 (.269)	<u>.710</u> (.001)	<u>1.201</u> (.000)
Flush/Chemical Toilet (0=No, 1=Yes)	<u>-.333</u> (.000)	<u>-.961</u> (.000)	<u>-.173</u> (.001)	<u>-.440</u> (.000)	<u>-.333</u> (.000)	<u>-.995</u> (.000)	<u>-.159</u> (.004)	<u>-.387</u> (.000)	-.400 (.184)	-.375 (.209)	-.244 (.310)	<u>-.885</u> (.000)
Clean Water (0=No, 1=Yes)	<u>-1.087</u> (.000)	<u>-.246</u> (.000)	<u>.122</u> (.04)	<u>.308</u> (.000)	<u>-1.111</u> (.000)	<u>-.237</u> (.000)	<u>.135</u> (.022)	<u>.306</u> (.000)	-.117 (.821)	<u>-1.063</u> (.001)	-.387 (.284)	.175 (.617)
Formal Housing (0=No, 1=Yes)	<u>-.565</u> (.000)	-.011 (.794)	<u>-.252</u> (.000)	<u>-.190</u> (.000)	<u>-.560</u> (.000)	-.016 (.713)	<u>-.245</u> (.000)	<u>-.178</u> (.000)	<u>-.635</u> (.003)	.039 (.896)	<u>-.378</u> (.025)	<u>-.342</u> (.016)
HH Head 5+ Yrs Education (0=No, 1=Yes)	.057 (.371)	.082 (.064)	<u>.141</u> (.001)	<u>.143</u> (.000)	.079 (.108)	.086 (.057)	<u>.152</u> (.001)	<u>.193</u> (.000)	<u>-.469</u> (.045)	-.272 (.285)	-.080 (.676)	<u>-.570</u> (.000)
Access to Land for Agriculture (0=No, 1=Yes)	---	<u>.175</u> (.001)	---	---	---	<u>.153</u> (.005)	---	---	---	<u>.730</u> (.006)	---	---
Rubbish Collected at Least Weekly (0=No, 1=Yes)	---	---	<u>-.391</u> (.000)	<u>-.704</u> (.000)	---	---	<u>-.408</u> (.000)	<u>-.766</u> (.000)	---	---	-.206 (.316)	.245 (.157)
African Household (0=No, 1=Yes)	<u>.945</u> (.000)	<u>.838</u> (.000)	<u>.778</u> (.000)	<u>.677</u> (.000)	---	---	---	---	---	---	---	---
Constant	-1.940 (.000)	-2.078 (.000)	-2.597 (.000)	-2.144 (.000)	-1.001 (.000)	-1.238 (.000)	1.740 (.000)	-1.499 (.000)	-2.088 (.000)	-1.617 (.000)	-1.814 (.000)	-1.275 (.000)
X ²	1119.480 (.000)	1601.772 (.000)	549.166 (.000)	1065.449 (.000)	697.953 (.000)	895.106 (.000)	210.782 (.000)	628.659 (.000)	19.292 (.002)	38.480 (.000)	20.696 (.000)	92.744 (.000)
d.f.	6	7	7	7	5	6	6	6	5	6	6	6
N	26214	26214	26214	26214	19950	19950	19950	19950	6264	6264	6264	6264

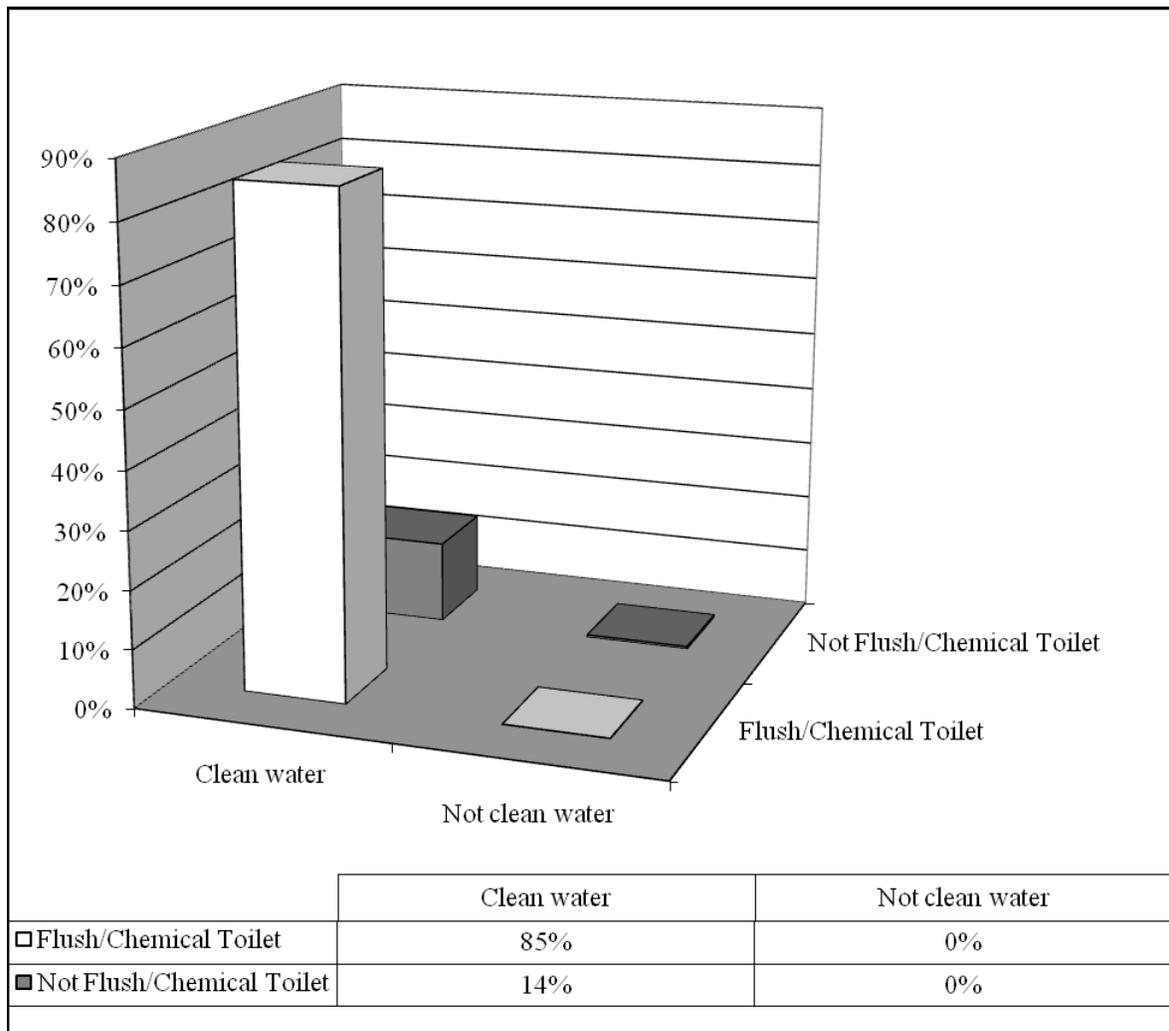
p values in parenthesis. Coefficients underlined if $p < .05$ --- indicates that the variable was not included in the given analysis.

Figure 1. Distribution of all rural households by sanitation and water quality



Three observations can be made concerning the nature of South African households which in 2004 viewed water pollution as a community problem. First, lower socioeconomic status (SES) households (lack of a flush toilet, unclean water, resident in informal housing) were much more likely to see water pollution as a community issue than those households living in better circumstances. This was true both for all households and for African households. Non-African households living in informal housing tended to see water pollution as a community problem. While the lack of flush or chemical toilets and unsafe water supply were not statistically significant in the logistic regression analysis for the non-African households, both were negative and the sanitation variable was strongly negative. This underscores the importance of specific living conditions in leading to the perception by households that water pollution is a serious community problem.

Figure 2. Distribution of all urban households by sanitation and water quality



While it would be easy to argue that race is an important factor in explaining perceptions of water pollution as a problem, this is too simple an explanation. The appearance that race plays a strong role derives almost wholly from the situation portrayed in Table 3. It is clear from those data that non-Africans, on the whole, enjoy higher SES living conditions than do Africans. This condition, coupled with the relationships among the various independent variables and the perceptions of water pollution as a community concern, lead, in our judgment, to argue that SES is a significant factor in explaining differences among households in whether water pollution perceived as a community problem.

Second is the fact that a household was headed by an African meant that it was more likely see water pollution as a community issue than was one headed by a non-African. Given the marked differences in levels of living seen in Table 3, this pattern reinforces the first observation that low SES households were more likely to identify water pollution as a

community problem than households with higher SES. It also confirms the continuing and persistent influence of the historical circumstances under which the majority African population in South Africa has lived.

Third is the inconsistent influence the educational level of the head of household has on the perception of water pollution as a community concern. It was noted that some other studies found that environmental concerns were more likely to be associated with higher levels of educational attainment (Inglehart 1995; White and Hunter 2009). This was clearly not the case among South African households in 2004. The educational attainment of the head of household was not a significant factor for all households and African households, and had a negative influence in non-African households (Table 5). Thus, we found that a household head did not need substantial education to exhibit concern about water pollution.

Perception of Land Degradation as a Community Problem. A second environmental condition about which respondents in the 2004 General Household Survey were asked was land degradation. Slightly less than 12% of all households said that land degradation was a community problem – 14% among African households and 3% among non-African households (Table 4). Perhaps more important is that the percentages of all households and African households which saw land degradation as a problem were only marginally higher than the percentages which perceived water pollution as a community issue.

The results of the logistic regression analysis of factors related to the perception of land degradation as a community problem are presented in Table 5. In this analysis, whether the household had access to land for agriculture is included as an explanatory variable. Neither the type of housing nor the education of the head of household was statistically significant for any of the three groups. Also, for each group, if the household did not have clean water and if the household had access to land for agriculture, it was more likely to perceive land degradation as a community problem.

Again three observations can be noted from this limited analysis of factors explaining the perception of land degradation as a community problem. First is the importance of access to land for agriculture in influencing whether a household views land degradation as a community problem. We do not know if the household actually used the land for this purpose or received any income from this use of the land. However, generally households with access to land for agriculture would have had more exposure to agricultural land use and more opportunity to observe the effects of land degradation than households without access to land for agriculture. Having access to land for agriculture tends to make a household more sensitive to the negative effects of land degradation. The particular situation of the household and the particular area of environmental concern matter. This finding is counter to the view that high SES is always important for environmental concern.

The importance of an African as head of household is a second matter to note. As in the case of water pollution, such households were more likely to view land degradation as an issue than were non-African households (Table 5, Column 2).

Perhaps more striking is the importance of the quality of the water available to the household in the view that land degradation was a community problem. For all categories of households the lack of a clean source of water was statistically significant in explaining the perception that land degradation was a community problem. This differs from the situation regarding perceptions of water pollution as a community issue where the source of water supply for non-African households was not statistically significant (Table 5, Columns 2, 6, 10). Thus, the source of the household's water supply for this group of households had a stronger influence on the view of land degradation as a community concern than it had in the case of water pollution.

Perception of Air Pollution as a Community Problem. The third environmental issue respondents to the 2004 General Household Survey were asked about was air pollution. As with the land degradation item, it was only asked whether air pollution was seen as a community problem. First is that the percentages for all three groups which viewed this condition as a community problem were higher than the percentage which saw either water pollution or land degradation as an community problem (Table 4). While African households viewed poor air quality as slightly more important than either of these other two conditions, the proportion of African households with this perception was twice that of non-African households with this perception and more than twice the percentage of non-African households which stated that either water pollution or land degradation was a community problem.

For this analysis, access to land for agriculture was not seen as relevant and was not included in the analysis. However, whether rubbish was collected at least weekly was included in the analysis. As might be expected, urban location is an important predictor of perception of air pollution as a community problem. This contrasts with what is found when the other independent variables are examined. All households and African households which lacked flush or chemical toilets, had clean water, lived in informal housing, whose head had 5 or more years of education and whose rubbish was collected less frequently than once a week were more likely to perceive air pollution as a community problem. None of these variables, except for the type of housing, were statistically significant for non-African households. Further, if a household was African it was also more likely to see air pollution as a community problem.

There is, however, a counter-factual element which needs to be noted. African households, only 50% of which are urban, were more than twice as likely to view air pollution as a community problem than were non-African households, 85% of which are urban. What may be the case here is that it is the overall quality of the circumstances in which African households find themselves which leads to a more dismal perception of environmental conditions than might

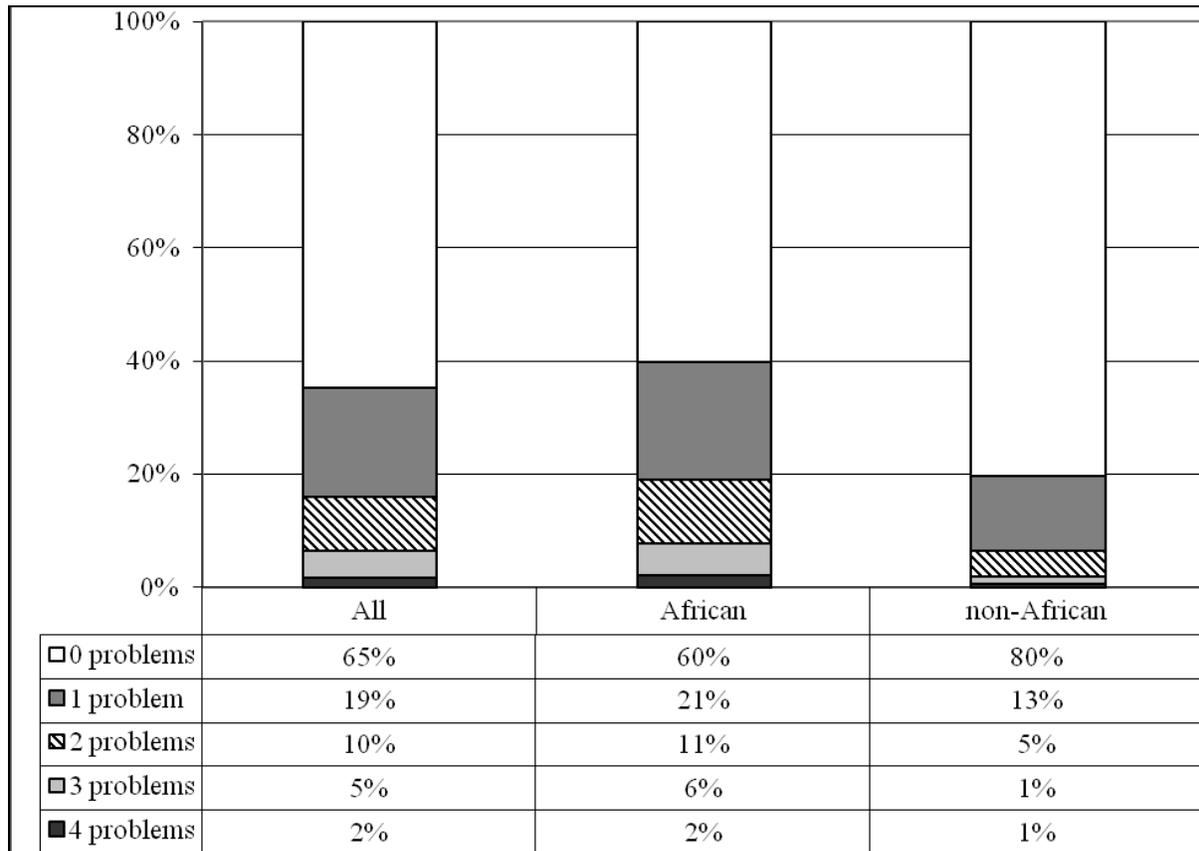
be expected, especially given the significance of urban location of a household as a predictor of the perception of air pollution as a community problem. This finding supports, in some respects, the observations made by Mohai and Bryant (1998) that were cited earlier.

Perception of Littering as a Community Problem. Littering was the fourth environmental condition about which respondents to the 2004 General Household Survey were asked. More than twice the percentage of all households perceived littering as a community problem as viewed water pollution as a community problem. This was also true in comparison to the problem of land degradation (Table 4). Moreover, the 21.5% of all households saw littering as a problem, which exceeded by more than 5% the percent which viewed air pollution as a community problem. Littering was also seen as a community problem by a higher percentage of both African and non-African households than any of the other three environmental conditions. While the reasons for these differences are not immediately evident, one can reasonably hypothesize that littering is more readily observable than the other environmental conditions about which information was sought.

Urban households whose head had more the five years of education, which lacked a flush or chemical toilet, had access to clean water, lived in informal housing and whose rubbish was collected less frequently than once a week were more likely to view littering as an issue than those households without these characteristics (Table 5, Column 4). African households with these same conditions were also more likely to see littering as a problem than other African households (Table 5, Column 8). Among non-African households, however, littering was seen as a problem when the household was urban, lacked a flush or chemical toilet, lived in informal housing and whose head had 5 or less years of education. Neither access to clean water, nor the frequency of rubbish collection was statistically significant (Table 5, Column 12). Recalling Figure 2, almost all urban households had clean water, but 14% of urban households had clean water but did not have a flush or chemical toilet.

Number of Environmental Problems Perceived. Since only one third of the households surveyed reported perceiving any environmental pollution, one might think that the similarities in the relationship between perceptions and household characteristics across different environmental problems are a function of some households reporting multiple problems. That this is not the case can be seen in Figure 3. Of the nearly 35% of all households which reported at least one specific environmental condition as a community problem, less than half identified more than one condition. Of the close to 40% of African households which reported conditions of environmental pollution, less than half of them – 19% - identified more than one problem. Only a third of the non-African households reported seeing more than one area of environmental pollution.

Figure 3. Percent distribution of household by number of environmental problems perceived: All households, African households and non-African households



When one examines the characteristics of households which reported the presence of environmental problems using a multiple regression analysis several things stand out. It is clear from the results presented in Table 6 that the perception of a condition of environmental pollution was much more likely to be held by households which had characteristics low SES: lack of clean drinking water, lack of a flush or chemical toilet, resident in informal housing, rubbish collected less than once weekly and headed by an individual with less than 5 years of education. With the exception of the last of these variables, this relationship was true whether the household reported one or two problems. Also relevant is the relationship between living in informal housing and having unclean water and reporting least three types of environmental pollution. Further is the association of an urban location of the household with the perception by the household of at least one or two problems.

Table 6. Multiple regression results for analysis of factors related to the number of environmental problems perceived: All households

Number of Problems Perceived	Any problems perceived		At least 1 problem perceived		At least 2 problems perceived		At least 3 problems perceived	
	Coefficient	Sig.	Coefficient	Sig.	Coefficient	Sig.	Coefficient	Sig.
Urban	.374	.000	.246	.000	.179	.000	.001	.984
Clean Water	-.087	.000	-.071	.000	-.075	.000	-.079	.018
Flush/Chemical Toilet	-.200	.000	-.106	.014	-.077	.019	-.027	.375
Formal Housing	-.131	.000	-.153	.000	-.133	.014	-.078	.001
HH Head 5+ Years Education	.067	.000	.048	.025	-.005	.843	.022	.385
Access to Land for Agriculture	.067	.010	.093	.001	.100	.002	.042	.199
Rubbish Collected at Least Weekly	-.280	.000	-.168	.000	-.099	.002	.057	.073
African Household	.274	.000	.168	.000	.052	.174	-.001	.978
Constant	.538	.000	1.634	.000	2.551	.000	3.335	.000
R ²	.059		.035		.032		.014	
F	206.229		41.131		17.165		3.845	
Significance of F	.000		.000		.000		.000	
n	26213		9196		4200		1657	

Household Behaviors taken in Response to Perceived Environmental Pollution

The 2004 General Household Survey contained concerning actions taken by households to mitigate the perceived effects of some types of environmental contamination. One set dealt with the treatment of water by households and another focused on household participation in recycling. There were no questions asked about household behaviors concerning land degradation or air pollution.

Water Treatment. Water was treated by less than 6% of any of the three groups of households for any purpose (Table 4). More important, however, is whether households which engaged in these behaviors had different characteristics from those which did not. We explored these relationships using a logistic regression, the results of which are shown in Table 7.

Households were more likely to treat water for drinking if they perceived water pollution as a community problem, lacked access to clean water, did not have a flush or chemical toilet or if their head had 5 or more years of education (Table 7, Column 1). For these households which were also classified as having formal housing, water also tended to be treated in food preparation (Table 7, Column 2). African households which saw water pollution as an issue were more likely to treat water for both purposes if they lacked clean water, a flush or chemical toilet, and if their head had 5 or more years of education (Table 7, Columns 4 and 5). Neither the type of housing nor urban location had any significant relationship to whether African households treated water.

Drinking water tended to be treated in non-African households only if the household viewed water pollution as a problem, lacked a clean source of water or if the head had 5 or more years of education. Among those households which perceived water pollution as a problem, treatment of water for cooking tended to be done if there was an unsafe water supply or if the household resided in informal housing.

Household Participation in Recycling. Only 6.5% of all households reported that they participated in at least one of the recycling activities about which they were asked (Table 4). The relationships between household characteristics and involvement in recycling presented below employs a different educational level of the head of household variable than used earlier. The distinction here is made between households which are headed by an individual with a bachelor's degree or more and those whose head does not have this level of education (Table 2). This was done because this was the lowest level of educational attainment which made a difference in whether an African household recycled.

While the percentage of the non-African households which perceived littering as a community problem was nearly half that of the African households, the percentage of non-African households involved in recycling was nearly three times that of African households. Recycling was more likely among African households which had access to clean water, formal housing, lacked a flush or chemical toilet, whose head had a bachelors degree or higher or who saw littering as a community problem (Table 7). These same characteristics, except for access to clean water, held as significant reasons for engagement in recycling by non-African households. The frequency of rubbish collection was not predictive of recycling by any of the household categories.

Table 7. Logistic regression results related to water pollution and littering behaviors

	All Households			African Households			non-African Households		
	(1) Treat Drinking Water	(2) Treat Water for Food Preparation	(3) Engaged in Recycling Activities	(4) Treat Drinking Water	(5) Treat Water for Food Preparation	(6) Engaged in Recycling Activities	(7) Treat Drinking Water	(8) Treat Water for Food Preparation	(9) Engaged in Recycling Activities
Urban (0=No, 1=Yes)	-.114 (.191)	-.001 (.989)	.099 (.310)	-.095 (.341)	.026 (.805)	.162 (.173)	-.090 (.619)	.001 (.996)	-.055 (.746)
Flush/Chemical Toilet (0=No, 1=Yes)	<u>-.270</u> (.003)	<u>-.236</u> (.013)	<u>-.144</u> (.114)	<u>-.348</u> (.000)	<u>-.306</u> (.003)	<u>-.276</u> (.010)	.447 (.162)	.404 (.216)	<u>1.222</u> (.000)
Clean Water (0=No, 1=Yes)	<u>-1.311</u> (.000)	<u>-1.269</u> (.000)	<u>.295</u> (.009)	<u>-1.279</u> (.000)	<u>-1.221</u> (.000)	<u>.362</u> (.002)	<u>-2.017</u> (.000)	<u>-2.025</u> (.000)	-.230 (.535)
Formal Housing (0=No, 1=Yes)	.122 (.052)	<u>.157</u> (.019)	<u>.224</u> (.001)	.101 (.121)	.120 (.081)	<u>.169</u> (.028)	.201 (.417)	<u>.671</u> (.042)	<u>.638</u> (.002)
HH Head 5+ Yrs Education (0=No, 1=Yes)	<u>.299</u> (.000)	<u>.262</u> (.000)	---	<u>.255</u> (.000)	<u>.244</u> (.001)	---	<u>.915</u> (.002)	.456 (.113)	---
HH Head Bachelor Degree+ (0=No, 1=Yes)	---	---	<u>.982</u> (.000)	---	---	<u>.716</u> (.001)	---	---	<u>1.001</u> (.000)
Rubbish Collected at Least Weekly (0=No, 1=Yes)	---	---	.049 (.626)	---	---	.011 (.929)	---	---	.259 (.149)
Water Pollution a Problem (0=No, 1=Yes)	<u>.858</u> (.000)	<u>.667</u> (.000)	---	<u>.691</u> (.000)	<u>.604</u> (.000)	---	<u>1.922</u> (.000)	<u>1.202</u> (.000)	---
Littering a Problem (0=No, 1=Yes)	---	---	<u>.617</u> (.000)	---	---	<u>.673</u> (.000)	---	---	<u>.528</u> (.000)
African Household (0=No, 1=Yes)	<u>-.597</u> (.000)	<u>-.384</u> (.000)	<u>-1.224</u> (.000)	---	---	---	---	---	---
Constant	-1.565 (.000)	-1.944 (.000)	-2.540 (.000)	-2.081 (.000)	-2.297 (.000)	-3.752 (.000)	-2.363 (.000)	-2.552 (.000)	-3.791 (.000)
X ²	757.547 (.000)	506.985 (.000)	970.490 (.000)	654.754 (.000)	452.841 (.000)	119.451 (.000)	160.063 (.000)	72.273 (.000)	200.709 (.000)
d.f.	7	7	8	6	6	7	6	6	7
N	26185	26214	26214	19932	19950	19950	6264	6264	6264

Awareness of Environmental Programme Initiatives

Respondents to the 2004 General Household Survey were asked if they were aware of three specific programmes involved in efforts to improve environmental conditions (Table 1). Awareness of these endeavors varied considerably (Table 4). Among the three programmes, Working for Water was not only the least known, but the percentage of African households with knowledge of the programme was roughly one-fourth that of non-African households. The percentage of African households aware of the other two activities – Collect-A-Can and Green Cages – was also much less than among non-African households.

More salient are relationships between household characteristics and awareness of these three efforts. Table 8 sets forth the results of a logistic regression analysis in which the relationship between the explanatory variables (Table 2) and awareness of these three programmes is examined. The Collect-A-Can and Green Cages initiatives were more likely to be known in each of the three household groups if the household was urban, had a flush toilet, enjoyed formal housing or if the head had five or more years of education (Table 8). For African households, as well as for all households, access to clean water was also significant. Less than weekly trash collection was predictive of awareness of the Green Cages programme for both African and all households, but not for non-African households. Further, neither the type of water available nor the frequency of trash collection was significant in determining the awareness among non-African households of these two initiatives.

Knowledge of Working for Water - developed by the Department of Water Affairs and Forestry and the Department of Social Development to remove alien vegetation from South African waterways and provide work for rural Africans – was more likely for African households and for all households if they resided in formal housing, the head had more than five years of education, if there was safe sanitation or if there was clean water. Urban location was not a significant explanatory factor for any of the household categories, while the lack of clean water was important in determining awareness of this activity among non-African households. Moreover, if the household was African it was less likely to be aware of the endeavor.

This lack of knowledge about the Working for Water programme is in sharp contrast to the proportion of all households – 62% - who were aware of Collect-A-Can (Table 4). Not only were nearly three-quarters of the non-African households aware of this activity, but close to 60% of African households knew about it. There was also a much higher level of awareness of the Green Cages endeavor than of the Working for Water activity. The corresponding figures were 36% of non-African households and 14% of African households. These considerations clearly indicate that the efforts made to publicise the programme had not produced any substantial level of awareness of this endeavor within the African community which was a special target of this initiative.

Table 8. Logistic regression results for awareness of initiatives related to water pollution and littering

	All Households			African Households			non-African Households		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Aware of Work for Water Initiative	Aware of Collect-a- Can	Aware of Green Cages	Aware of Work for Water Initiative	Aware of Collect-a- Can	Aware of Green Cages	Aware of Work for Water Initiative	Aware of Collect-a- Can	Aware of Green Cages
Urban (0=No, 1=Yes)	-.112 (.069)	<u>.559</u> (.000)	<u>.324</u> (.000)	-.048 (.553)	<u>.522</u> (.000)	<u>.335</u> (.000)	-.164 (.084)	<u>.734</u> (.000)	<u>.297</u> (.017)
Flush/Chemical Toilet (0=No, 1=Yes)	<u>.342</u> (.000)	<u>.264</u> (.000)	<u>.425</u> (.000)	<u>.204</u> (.011)	<u>.212</u> (.000)	<u>.327</u> (.000)	<u>1.314</u> (.000)	<u>1.090</u> (.000)	<u>1.385</u> (.000)
Clean Water (0=No, 1=Yes)	<u>.325</u> (.001)	<u>.497</u> (.000)	<u>.420</u> (.000)	<u>.453</u> (.000)	<u>.547</u> (.000)	<u>.504</u> (.000)	<u>-.505</u> (.049)	-.404 (.106)	-.369 (.153)
Formal Housing (0=No, 1=Yes)	<u>.680</u> (.000)	<u>.436</u> (.000)	<u>.347</u> (.000)	<u>.714</u> (.000)	<u>.440</u> (.000)	<u>.316</u> (.000)	<u>.477</u> (.001)	<u>.258</u> (.031)	<u>.545</u> (.000)
HH Head 5+ Years Education (0=No, 1=Yes)	<u>.466</u> (.000)	<u>.471</u> (.000)	<u>.498</u> (.000)	<u>.353</u> (.000)	<u>.414</u> (.000)	<u>.428</u> (.000)	<u>.875</u> (.000)	<u>1.020</u> (.000)	<u>.858</u> (.000)
Rubbish Collected at Least Weekly (0=No, 1=Yes)	---	-.020 (.684)	<u>-.192</u> (.002)	---	.011 (.832)	<u>-.141</u> (.049)	---	-.087 (.492)	-.231 (.063)
African Household (0=No, 1=Yes)	<u>-1.206</u> (.000)	.072 (.058)	<u>-.755</u> (.000)	---	---	---	---	---	---
Constant	-2.572 (.000)	-1.039 (.000)	-2.328 (.000)	-3.788 (.000)	-.946 (.000)	-3.062 (.000)	-2.852 (.000)	-1.363 (.000)	-2.958 (.000)
X ²	2048.289 (.000)	2492.662 (.000)	1955.484 (.000)	273.827 (.000)	1840.018 (.000)	541.707 (.000)	126.284 (.000)	354.308 (.000)	177.444 (.000)
d.f.	8	7	7	5	6	6	5	6	6
N	26214	26174	26173	19920	19923	19925	6264	6251	6248

Unlike Working for Water, Collect-A-Can and Green Cages are non-governmental entities created by private companies: BMW in the case of Green Cages and Mittal Steel in the case of Collect-A-Can (Plastic Federation of South Africa 2006; Collect-A-Can 2006). Both have partnerships with a variety of other groups, including schools, foundations and local governments. The two organizations, however, differ in some important respects which may partially account for the large differences in public awareness of their work.

First is their age. Collect-A-Can was created in 1993 and established some 5 years later. Second is their mode of operation. Collect-A-Can pays individuals and recycling businesses to collect cans and deliver them to an extensive number of locations both in South Africa and other countries in Southern Africa. Green Cages uses a somewhat smaller set of collection points and, as of this date, has not provided a set of financial incentives for people deposit plastic bags at these collection centres. Further is that none of the South Africans involved in this research had heard of Green Cages prior to the beginning of this project. The greater public awareness of Collect-A-Can appears to a function of its use of financial incentives and its extensive network of collection points.

CONCLUSIONS

The consistent relationship between specific household characteristics and the perception that a given environmental condition is a community problem is a first observation arising from this analysis. Urban households - both African and non-African - were more likely than rural households to view littering and air pollution as community problems. A common condition among all household categories leading to the view of water pollution, air pollution and littering as problems was if the household resided in informal housing (Table 5). A clean water supply and whether a household had access to land for agriculture were significant factors in the perception of land degradation as a community problem (Table 5).

This general observation is further supported by the results of the logistic regression analysis of factors associated with the number of environmental problems reported by all households (Table 6). While these similarities mask, to some degree, the differences among the groups of households, they support the argument that specific living conditions play an important role in determining whether a given South African household will define a particular environmental condition as a community problem. They also provide additional evidence concerning the importance of particular circumstances in influencing views of the environment. (Inglehart 1998; Mohai and Bryant 1998; White and Hunter 2009).

A related finding concerns African households. These households were more likely to view specific environmental conditions as community problems than non-African households (Table 5, Column 1, 2, 3, 4), regardless of the particular environmental condition examined.

There is less commonality in the behavior of South African households in response to a given environmental condition. A logistic regression analysis of factors associated with these responses shows that the only common factors across all household categories concerning with the treatment of water were the view of water pollution as a community problem and the lack of clean water (Table 6). Education of household head was also important for all situations except for whether non-African households treated water for food preparation. Household participation in recycling was related to the education of the head of household, the perception of littering as a problem and the residing in formal housing.

Perhaps more striking are the differences between African and non-African households in their awareness of environmental initiatives. These are most obvious regarding the Working for Water Programme. African households were considerably less likely to be aware of the programme than non-African households (Table 4). While there were similarities in the variables associated with the awareness of the programme between the two sets of households, the most important observation was the extremely low level of awareness in African households. This is evidenced by the negative coefficient of -1.206 for whether a household was African in the logistic regression analysis.

This pattern of differences between African and non-African households also obtained in their respective levels of awareness of the Collect-A-Can and Green Cages initiatives. While there was greater awareness of these programmes among both African and non-African households, the proportion of African households aware of these activities was substantially lower than that of non-African households (Table 4). In this case, as with Working for Water, awareness of these efforts was largely confined in both the African and non-African households to those with relatively high SES (Table 8). In addition, the strong negative coefficient for the African household variable for awareness of Green Cages and a very small positive, but not significant, coefficient regarding Collect-A-Can provide additional evidence supporting this finding (Table 8).

These observations suggest that there is the need to examine further the degree to which awareness of environmental initiatives is a function not simply of the extent to which it has been publicised, but also of other factors. Among these is whether the issue or activity involved is seen as having a direct and immediate relationship to a concern of the target audience. This is particularly relevant for Working for Water one of whose purposes is the provision of employment opportunities for poor rural Africans who have not been able to find work. While there is both the need to clear alien vegetation from South African waterways and employment for rural Africans, what is not immediately obvious is how this activity directly relates to the need for greater access to clean water and safe sanitation.

A second factor regards economic incentives. The Collect-A-Can programme is far better known than either of the other two initiatives. It used an entrepreneurial model as a basis

for its organization more than did Green Cages. While our data do not allow testing the influence of economic incentives on awareness of the programme, we think that the strong economic incentives have contributed to the greater awareness of this activity.

The general lack of awareness of environmental initiatives among African households contrasts with the observation that these households were much more likely than non-African households to perceive problems related to environmental pollution. A simple explanation would be to attribute this to race. Another explanation is that these perceptions are a function of the historic position of Africans in South Africa. The standard of living among Africans is still generally lower than that of non-Africans. More than 80% of non-African households are urban; over 90% have access to clean water and flush or chemical toilets; reside in formal housing and their household heads have 5 or more years of education (Table 3). Less than half of African households have a flush or chemical toilet; only slight more than half live in formal housing and have trash collection at least weekly (Table 3). The lack of clean water in the case of rural African households and the absence of flush or chemical toilet facilities for urban African households were clearly important in their perception that water pollution was a community problem (Figures 1 and 2).

Not clear, however, is whether the environmental perceptions, behaviors and awareness of African households will immediately change as more of these households acquire higher SES. That this is a possibility as the living conditions for Africans approach those of the non-Africans is seen when one examines the responses concerning awareness of the Working for Water Programme. Non-African households were four times more likely to be aware of this programme than African households (28.1% versus 7%). This suggests that there is an association between greater awareness of environmental concerns and higher SES. White and Hunter (2009) had a similar finding in Ghana.

To test this proposition further we looked at African and non-African households in which there was the simultaneously clean water, a flush or chemical toilet, formal housing and the head had five or more years of education. Table 9 shows that the percentage of non-African households with these characteristics that were aware of Working for Water was nearly three times (30% to 11%) that of African households with similar living conditions. However African households with these good living conditions were nearly twice as likely as all African households to be aware of the initiative (7%). Further, 84% of all non-African households, but only 26% of African households enjoy the living conditions described above.

Table 9. Percent of African households and non-African households aware of the Working for Water initiative among those households which simultaneously have clean drinking water, a flush or chemical toilet, a household head with five or more years of education and who live in formal housing

African Households	11%
non-African Households	30%

It was not possible to make the comparison shown in Table 9 for households which lack all of the characteristics considered in that table. While 6% of African households live in these conditions, only .1% (8 households in the survey) of non-African households live in these circumstances.

Three conclusions can be drawn from this discussion. Most important is that even when one controls for the simultaneous presence of particular household conditions, as was done in this case, the proportion of non-African households aware of this particular programme was still nearly much higher than among African households. Thus the probability of an immediate and large shift in awareness of environmental initiatives resulting from changes in living standards is low. But secondly, the direction of change towards a similarity in viewpoints between the non-African and African households which have comparable living conditions offers some support for the notion that socio-economic conditions are an important influence in framing awareness of environmental programmes.

Third is the issue of similarities and differences in environmental consciousness between the developed and developing worlds. White and Hunter (2009) have argued that differences in levels of environmental consciousness among groups in a developing society are not simply a function of the level of development. Rather that the differences are the product of some of the same kinds of influences that have been advanced to explain these differences in population groups in the developed world, i.e., standards of living, cultural patterns and the like. What may be characterized as a higher standard of living in places like the central coastal region of Ghana or among the African population in South Africa are likely to be representative of relatively low SES in the more developed world. This could lead observers to suggest that particular attitudes concerning environmental issues are reflective of a low SES. What may be more important, however, is the relative position of particular groups within a given society.

It was suggested at the outset that the special conditions in South Africa would lead one to predict that there would be a higher level of awareness of environmental matters among South Africans than found elsewhere in the world. This assertion is challenged by this analysis. Only slightly more than 10% of all households identified water pollution as a community problem (Table 4). In just one case did more than a fifth of the households surveyed report a particular condition – littering - as a community problem. Slightly less than 20% of all households

reported a problem of environmental pollution and less than 2% indicated the presence of four conditions (Figure 3).

This suggests that environmental matters are not a high priority for the South African public. In this respect, South Africans appear to have views similar to those elsewhere where, as reported in several other studies, environmental concerns are generally not seen as among the most important issues facing a particular society (Bloom 1995; Dunlap and Scarce 1991; Dunlap, Gallup and Gallup 1993; Van Liere and Dunlap 1980).

A cautionary note, however, needs to be entered. What has been reported in the literature concerning the importance given environmental matters by the public has generally called upon respondents to rank environmental problems in relation to other issues confronting the country. This was not the case in 2004 General Household Survey. Thus, from the data at hand, it is not possible to know conclusively that South Africans see environmental matters as less important than other issues they consider.

This examination of perceptions, behaviors and awareness of environmental issues in South Africa provides a limited insight into the underlying factors associated with environmental consciousness in that society. The linkage between lack of clean water and flush or chemical toilets and the perception of water pollution as a community problem is clear. Also important is the influence of socio-economic status as measured by specific indicators such as education, access to clean water, formal housing, and safe sanitation on the perception of environmental problems and in evoking behaviors such as treatment of water for drinking and cooking and participation in recycling. Awareness of environmental protection activities is also strongly associated with SES. While there does not seem to be a high level of awareness about environmental concerns among South Africans, it is not clear how South Africans perceive environmental matters in contrast to other problems facing them. The presence of the HIV/AIDS epidemic, high unemployment, a high crime rate, continuing poverty for many rural Africans and growing inequality are potential reasons for the small percentage of households perceiving environmental pollution as community problems.

Not dealt with directly in this discussion of environmental understanding is the effect that the discussions about climate change will have on perceptions about environmental conditions and behaviors related to this emerging area of environmental concern. The recently issued report of the Intergovernmental Panel on Climate Change poses a number of new questions to which governments will be asked to respond (IPCC 2007). The effectiveness of these responses will, as in the past, require a both a greater awareness of the specific environmental conditions which need addressing as well as how community and individual behaviors can affect these conditions. The analysis presented here suggests the need for additional and more focused examination of how to stimulate greater public awareness of both the underlying causes of environmental degradation and the governmental and community measures best suited to mitigating these conditions. It through such efforts that the vision contained in the South African constitution can be made real along with ensuring greater equity for all segments of the South African population.

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