

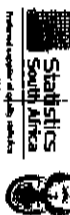
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# Exploring Environmental Perceptions, Behaviors and Awareness: Water and Water Pollution in South Africa

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## Problem

Understanding the factors related to environmental perceptions and behaviors and awareness of environmental stresses is important for both policy makers and social scientists. But there is limited consensus about the reasons for differences and similarities among ethnic and socio-economic groups in their environmentally-related attitudes and behaviors and in their awareness of environmental problems. Specifically we look at factors related to the perception of water pollution as a community problem, whether the household treats drinking water sometimes or always and whether household members are aware of the Work for Water Initiative, a program to employ the poor, mainly rural Africans, to clear watersheds of alien vegetation.

## Hypotheses

**Hypothesis:** Based on Maslow's hierarchy of needs, Ingelhart (1995) maintains that concern with the environment is a post-materialist view. According to this, people are only concerned about the environment after basic needs, such as for food and shelter, have been satisfied. This perspective suggests that those with higher socioeconomic status (SES), such as having higher educational attainment and those with a higher standard of living will be more concerned about the environment than those who struggle to satisfy their basic needs.

**Alternative Hypothesis:** March (1971) and Hobin (1976) found that those who live in worse environmental conditions and who have relatively low SES are more likely to be concerned with the environment.

## Data

Data from the 2004 South Africa General Household Survey are analyzed. This is a national survey with 19,950 households headed by an African and 6,264 households headed by a non-African. Non-African households comprise 22% of South African households. Among non-African households, 55% are White, 33% are Coloured and 12% are Asian. All of the groups of non-African households are much more similar to each other than to African households (Table 1).

TABLE 1

Characteristics of Population Groups in South Africa and of non-African Households as a Whole: 2004			
	% Urban	% with Clean Drinking Water	% with a Flush Toilet
African	50%	82%	60%
White	40%	98%	90%
Coloured	15%	82%	81%
Asian	4%	100%	13%
Weighted Average of non-African groups	41%	90%	81%

## Univariate Analysis

Members of African households are much more likely than members of non-African households to perceive water pollution as a problem.

- There is no difference between African and non-African households in the tendency to seek drinking water.
- Members of non-African households are much more aware than members of non-African households of the Work for Water Initiative (Table 2).

TABLE 2  
Percent of All Households, African Households and non-African Households with Water-Related Perceptions, Behaviors and Awareness

	All Households	African Households	non-African Households
Water Pollution Perceived as a Problem	18.5%	13.8%	23.7%
Treat Drinking Water	5.3%	5.8%	4.7%
Aware of Work for Water Initiative	12.9%	7.0%	26.1%

## Multivariate Analysis

Results from a logistic regression analysis appear in Table 3.

**Perception of Water Pollution as a Problem:** Members of African households and members of households with lower SES (urban water, no flush or chemical toilet, not living in formal housing) are more likely to perceive water pollution as a problem. Education of the household head is not important for this perception.

**Treatment of Drinking Water:** Perception that water pollution is a problem, having urban water and having a household head with 5+ years of education all contribute to a household treating drinking water. African households are less likely than members of non-African households to treat drinking water.

**Awareness of Work for Water Initiative:** Members of households with a flush or chemical toilet, in formal housing and with a household head who has 5+ years of education are more likely to be aware of the Work for Water Initiative. Members of African households are much less likely to be aware of the initiative than members of non-African households.

TABLE 3  
Logistic Regression of Factors Related to Perception of Water Pollution as a Problem, Treatment of Drinking Water, and Awareness of Work for Water Initiative

	African Households			non-African Households		
	Water Pollution Perceived as a Problem	Treat Drinking Water	Aware of Work for Water Initiative	Water Pollution Perceived as a Problem	Treat Drinking Water	Aware of Work for Water Initiative
Urban	.432	-.114	-.112	.652	-.064	-.061
Formal Housing	-.212	-.218	-.232	-.402	-.247	-.232
Household Head with 5+ Years of Education	-.282	-.211	-.211	-.317	-.242	-.229
Household Head with 1-4 Years of Education	.257	.222	.222	.201	.222	.222
Household Head with 0 Years of Education	.257	.222	.222	.201	.222	.222
African Household	.432	-.114	-.112	.652	-.064	-.061
White	-.212	-.218	-.232	-.402	-.247	-.232
Coloured	-.212	-.218	-.232	-.402	-.247	-.232
Asian	.257	.222	.222	.201	.222	.222
Constant	1.918	1.918	1.918	1.918	1.918	1.918
N	19,950	19,950	19,950	6,264	6,264	6,264

## Conclusions

Perception of Water Pollution as a Problem

- Those more likely to be adversely affected by water pollution - Africans, those with urban drinking water, and those with otherwise poor living conditions - are more likely to perceive water pollution as a community problem.
- These results contradict Ingelhart's expectations. They indicate that concern with the environment is not only a post-materialist concern.

Treatment of Drinking Water

- Perception of water pollution as a problem and living in poor environmental conditions are important in the decision to treat drinking water. These results somewhat contradict Ingelhart's view.
- In the presence of poor environmental conditions, having a relatively well-educated household head is important in the decision to treat drinking water; the result supports Ingelhart's expectations.
- Education could increase the household's efficacy in dealing with a variety of problems. It could enable the household to focus its energies on action to counter the effects of water pollution.

Awareness of Work for Water Initiative

- Having relatively high SES plays a strong role in whether household members are aware of the Work for Water Initiative. The result is consistent with Ingelhart's expectations. Awareness of the initiative is virtually restricted to those who have already satisfied their basic needs.
- Possibly the connection between clearing watersheds of alien vegetation and combating water pollution is not obvious for many people as appreciate Africans, who were a target of this initiative, are much less likely than non-Africans to be aware of it.

Awareness of Work for Water Initiative Among Relatively High SES Households

In Table 4, we look at the percent of African and of non-African households who are aware of the Work for Water Initiative, restricting attention to relatively high SES households - those that simultaneously have clean water, have a flush or chemical toilet, and whose household head has five or more years of education and who live in formal housing.

Even when households have a relatively high standard of living, members of non-African households are almost 3 times more likely to be aware of this initiative than members of African households.

TABLE 4

Percent of African and non-African Households Aware of the Work for Water Initiative, Among Those Households which Simultaneously Have Clean Water, a Flush or Chemical Toilet, a Household Head with Five or More Years of Education, and Live in Formal Housing	
African Households	non-African Households
31%	31%

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## Urban Residence and Education of Head of Household in the Analysis of Perception of Water Pollution as a Community Problem Among African Households

The finding for Africans in Table 3 in the logit regression analysis that urban residence is *positively* related to perception of water pollution as a problem is puzzling. In a difference of means test (Table 5), urban residence is *significantly negatively* related to perceiving water pollution as a community problem.

**Table 5. Results of Difference of Means Tests for Factors Related to Perception of Water Pollution as a Community Problem, African Households, 2004**

	Yes	No	Sig.
Urban	.124	<b>.136</b>	.015
Flush or Chemical Toilet	.105	<b>.151</b>	.000
Clean Water	.106	<b>.239</b>	.000
Formal Housing	.096	<b>.178</b>	.000
Household Head 5+ Yrs Education	.127	<b>.137</b>	.036

The entries show the proportion of households with the given characteristic who perceive water pollution as a community problem. For example, 15.1% of households without a flush or chemical toilet perceive water pollution as a community problem. The significance column shows the p value for the difference of means between the two categories (Yes and No) for each variable. The higher value is underlined and bolded if  $p < .05$ .

Urban Africans have a substantially higher standard of living than rural Africans (Table 6). Urban Africans are more likely than rural Africans to have a flush or chemical toilet, to have clean drinking water and to live in formal housing.

**Table 6. Percent of African Households with Various Facilities by Urban/Rural Residence 2004**

	Urban	Rural
% with Flush or Chemical Toilet	79%	12%
% with Clean Water	99%	65%
% in Formal Housing	64%	53%

Table 7 shows why the relation between urban residence and perception of water pollution as a community problem is different in the univariate difference of means test (Table 5) than in the multivariate logistic regression analysis (in Table 3). Although by itself urban residence is negatively related to perceiving water pollution as a problem, Table 7 shows that in a multivariate analysis urban residence is *positively* related to perceiving water pollution as a problem, because urban residents within a given category of type of sanitation are more likely to perceive water pollution as a problem than are rural residents within the same sanitation category.

**Table 7. Percent of African Households who Perceive Water Pollution as a Community Problem by Urban/Rural Residence and by Whether the Household has a Flush or Chemical Toilet, 2004**

	Urban	Rural
Household Has a Flush or Chemical Toilet	11%	8%
Household Does not Have a Flush or Chemical Toilet	18%	14%

Also note that although in the multivariate analysis (Table 3), education of head of household is *not significantly related* to whether African households perceive water pollution as a problem, in the univariate analysis in Table 5, education of head of household is significantly *negatively* related to perception of water pollution as a community problem. The significance of education of head of household disappears in the multivariate analysis in Table 3 because of the relation of education of head of household to other household characteristics, such as type of sanitation and whether the household has clean drinking water, that are more strongly related to perception of water pollution as a community problem.