

Rural Senegalese Perceptions of Environmental Quality*

Keith M. Moore¹
Soukèye Thiongane²

ABSTRACT. Differences in environmental perspectives between advanced industrial and developing country nationals has both practical and policy implications for the transfer of environmentally sound technologies. This paper characterizes rural Senegalese environmental perspectives in the context of competing environmental paradigms and of their historical development. Methodological issues concerning the adaptation of items from the "Health of the Planet Survey" (HOPS) questionnaire (Dunlap, Gallup, and Gallup, 1993) to rural Senegal are discussed and qualitative survey results presented. Based on a stratified national sample of rural Senegalese men and women, a quantitative analysis addresses the priority concerns of rural Senegalese men and women and how they perceive the trade off between environmental protection and economic development. The paper concludes that attempts to draw valid conclusions concerning comparisons between the environmental perspectives of the publics of advanced industrial and low income developing countries must take local conditions, their historical dynamics and cultural expressions into account.

1. Introduction

Improved environmental quality is a priority issue among advanced industrialized country nationals. In contrast, developing country nationals are seen as primarily concerned with increasing economic growth. This assumed difference in perspectives has both practical and policy implications for the transfer of environmentally safe technologies. As

a contribution to the understanding of these differences, this paper characterizes rural Senegalese perspectives on environmental issues within a comparative framework. It is argued that public concerns over environmental quality are a consequence of environmental conditions and the socio-economic and cultural contexts in which they have been experienced. Attempts to draw valid conclusions concerning comparisons between the environmental perspectives of the publics in advanced industrial countries and in low income developing countries must take these conditions, their historical dynamics and cultural expressions into account.

2. Theoretical discussion

Comparative analyses of international perspectives on the environment have a relatively short history. For the most part, this work has been largely one-sided, focusing entirely on the advanced industrial countries (Dunlap, 1994). Many studies have linked the rise of environmental concerns to the emergence of "post-materialist values" and the rise of the "new environmental paradigm" associated with advanced industrial development and the welfare state which has allowed these publics the freedom to be more concerned about quality of life issues. Within this perspective, environmental quality has been perceived as a "luxury good" unlikely to be seriously considered by the publics of less developed countries. This worldview has been explained as a paradigm shift from materialist to post-materialist value orientations (Inglehart, 1977, 1990; Kidd and Lee, 1997).

Environmental concerns have been seen as intimately related to the growth of post-materialist values and often used to indicate such per-

* This paper was prepared with support from USAID Cooperative Agreement No. 685-0305-A-00-4211-00. A previous version of this paper was presented at the Annual Meeting of the Rural Sociological Society, August 1997, Toronto, Ontario, Canada.

¹ Assistant Program Director
Office of International Research and Development (OIRD)
Virginia Polytechnic Institute and State University (Virginia Tech)

² Sociologist
Senagrosol-Consult
Dakar, Senegal



spectives. It is hypothesized that lower levels of development in developing countries engender more materialist value orientations as those nationals must be most concerned about issues of mere survival. Recall that over twenty-five years ago, it was on the basis of a lack of modern materialist values that Inkeles and Smith (1974) distinguished developing from developed country nationals. The current debate, however, has been over the extent to which environmental concerns are linked to post-materialist values (Brechtin and Kempton, 1994; Kidd and Lee, 1997). Interpretation of the environmental perspectives of developing country nationals has been central to this debate.

Until the "Health of the Planet Survey" (HOPS: Dunlap, Gallup and Gallup, 1993), little was known about the general public's environmental perceptions outside of North America, Europe and Japan. The HOPS began to fill the information gap by providing cross-national data from geographically dispersed nations with different economic levels in a single standardized survey. The hypothesis driving the HOPS was that concern about environmental quality is limited primarily to residents of wealthy, industrialized nations. Residents of the poorer, non-industrialized nations are too preoccupied with economic and physical survival to be concerned about environmental problems. The HOPS was able to document that there are not major differences between levels of environmental concern between citizens of rich and poor nations. In fact, citizens of poor nations appear to be more concerned (Adeola, 1998). For those living in developing nations, high levels of concern over environmental quality did not come as a surprise. Locally, environmental conditions in many of these countries are directly experienced as poor and deteriorating rapidly.

In a re-study of the HOPS data set for Nigeria (the sole African country included in that study), Adeola (1996) confirmed that environmentalism and environmental concern do exist in Nigeria, although the driving force behind these perspectives is unlikely to be the same as in the advanced industrial countries. Noting a degree of ethnocentrism in the survey, he further argues that the HOPS does not provide a basis on which to assess traditionally existing environmental paradigms.

He concludes that there is a need to incorporate indigenous knowledge systems in the study of environmentalism in non-Western societies.

The question of how environmental knowledge is produced was addressed by Buttel and Taylor (1992). They stressed the scientific nature of environmental knowledge production and how environmental discourse has been homogenized and shaped within a developed country context. To consider the social construction of environmental knowledge raises the issue of what is "nature"? Most American environmentalists see the normative state of nature as one in which human technologies have not interfered (Bird, 1997). Environmental problems, then, arise from the imposition of those technologies on the basis of a reductionist science. This socially constructed perspective rests on the negotiation of experiences and moral interpretations shared by those interested in environmental problems in the developed countries.

Environmentalism in developing countries is not directly dependent on these historical factors which have shaped the developed countries transition to post-industrial society. Developing country nationals' environmental knowledge and perspectives are socially constructed within the context of their own political economies often based on pre-industrial technologies, despite a language of discourse which may be imposed through the imperialism of western science. Environmental problems are defined in terms of what is perceived as most significant in their lives and as interpreted by their culturally defined moral principles.

Some environmental issues may be global in their origin and impact. Nevertheless, many environmental changes are locally generated and experienced. To understand the dynamics of environmental perspectives in developing countries, therefore, requires recognizing both the locally based social construction of environmentalism as well as the tendency for global constructions of environmental knowledge to dominate the local in national discourse. What is negotiated in a particular society is an empirical question which must be addressed as such and not assumed to be the same as the negotiated perspectives of another society.

3. The evolution of environmental discourse in Senegal

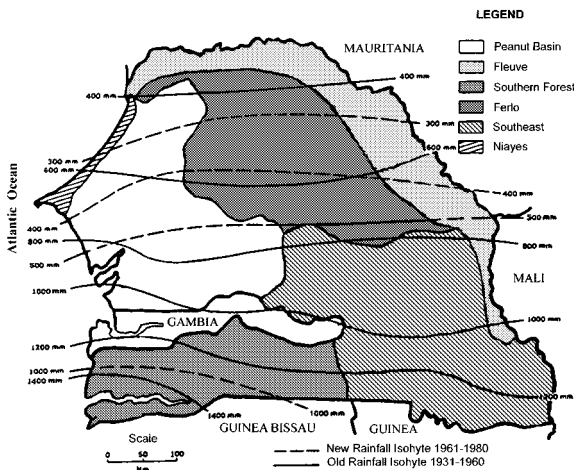
When the issue of the environment is raised in Senegal one first thinks of the climate change which has produced increasingly severe droughts in the Sahel. Map 1 shows the decreasing level of rainfall over the course of the 20th century as the dominating factor shaping environmental experience. Environmental problems in the Sahel have not been posed in terms of technological hazards or industrial pollution. The real issues have evolved around the degradation (deforestation and erosion) of the Sahel's eco-systems which are increasingly being called upon to serve the multiple needs of an expanding economy and growing population. Monocropping of peanuts and cotton for export has led to significant soil degradation. Deforestation for crop production and to produce charcoal for urban cooking fuel has reduced Senegal's forest cover at a rate of 1.2% per year (Ribot, 1995).

This dimension of environmental problems has constituted a major concern in Senegal since the severe multi-year drought and oil crisis of the 1970s. At that time, the majority of researchers and development agents who investigated these issues considered developing countries as completely preoccupied with the problems of survival. Environmental problems would be resolved only through investments in more productive technolo-

gies from the industrialized countries. Traditional beliefs and practices of the rural populations (such as preservation of sacred forests and multi-year fallowing) were ignored or forgotten.

By the 1980s, dependence on the transfer of improved technologies was found to be insufficient. An increasing sense of the necessity for self-reliance led to a change in perceptions. Environmental questions began to be understood in terms of environmental protection. The preservation and conservation of nature and natural resources constituted the core principles of this new perspective. A rational and sustainable management of natural resources in Senegal began to be recognized as an achievable goal. The driving force for this revised developmentalist vision conceived of natural resources as capital to be managed properly for growth and prosperity. The central issue, as expressed in the National Environmental Action Plan (CONSERE, 1997), is how to incorporate natural resource and environmental dimensions into a strategy for the economic and social development of the country.

With a succession of environmental catastrophes in the 1990s, the perception of environmental issues as linked solely to natural resources has shifted. The key wake-up call was the escape of ammonia from the SONACOS factory which killed over 200 people. With an increasing rural exodus (43% of Senegal's population is urban), a new set of environmental problems are now being recognized. Problems of contaminated food and potable water, the management of household wastes and sewage, industrial pollution, and the management of toxic wastes are increasingly seen as the principle issues of concern to the urban population. Meanwhile the population of rural Senegal is still confronted with threats to their natural resources through deforestation, soil degradation and periodic drought.



Map 1. Senegal's agro-ecological zones (from Faye and Bingen, 1989, p. 4).

4. Environmental survey research in Senegal

Studies of natural resource management (NRM) knowledge, attitudes and practices (KAP) among rural Senegalese have been routinely conducted in the context of United States Agency for International Development (USAID) program activities since the end of the 1980s. The first such study (Livingston, 1988; 1990) was developed in

the context of the Senegalese Reforestation Project (SRP) to provide a broadly based monitoring system for project interventions. Subsequently, USAID/Senegal developed its own KAP Survey "to measure and evaluate the impact of its development strategy for Senegal" (Kite, Keita, and Thiam, 1993). Both of these studies were conceived with the objective of monitoring changes over time in environmental attitudes and behaviors. The SRP/KAP Studies were conducted in 1989, 1991 and 1994. The USAID/Senegal KAP Surveys were administered in 1992 and 1994.

The first USAID/KAP Survey found that Senegal's agricultural system was overextended and leading to rapid environmental degradation. Continued efforts would be needed to ensure that NRM was an integral part of Senegalese farming practices. While some in the population were aware of "improved" NRM practices, few actually applied them in their own fields. Management for short-term gain predominated, but the costs of inputs reduced the application of modern farming practices. Overall, rural incomes were declining.

The final report of the 1994 USAID/Senegal KAP Survey (Senagrosol-Consult and Ingesahel, 1995) provided a continued base to monitor NRM KAP across Senegal. Knowledge of NRM practices was found to have increased from levels in the previous study, although the application of those techniques was still low. The application of "improved" practices was linked to the involvement of particular populations in development projects and to the specific constraints posed by the local environment.

The Senegal Reforestation Project KAP Studies were focused on reforestation issues where trees were seen as the key to increasing soil fertility. The initial study in 1989 (Livingston, 1988; 1990) provided the basis for improving the design of project interventions as well as monitoring change in reforestation knowledge, attitudes and practices. Timberlake, (1992) and Moore, (1994) continued monitoring these conditions identifying successes and constraints in project implementation. Increased awareness of reforestation practices was noted with the evolution of the SRP KAP surveys. Knowledge concerning the specifics for applying particular practices, however, was more limited. Nevertheless, interest in learning more was found to be generally rising.

Differences in knowledge between men and women were noted. Men were found to be more knowledgeable about the soil fertility benefits of trees. When sufficient numbers of women were included in the sample in the last survey (Moore, 1994), it was possible to demonstrate that knowledge levels were linked to activities specific to each gender. It was also found that differences in attitudes and practices were frequently linked to agro-ecological and/or ethnic differences between regions.

5. Data and method

The sample

The population sampled in this current study is composed of household heads and their "leading" wives.¹ Each of these population segments provide a different natural resource management perspective. The design of the sample framework involved a two-stage procedure. In the first stage, the rural population was stratified according to six eco-geographical zones (see Map 1). Within these zones, villages were arranged by size of population within administrative units, assuring broadly based representativeness of the stratified sampling base. Villages were then drawn systematically. In the second stage, households, clustered at the village level, were selected systematically from lists prepared in consultation with village heads.

The field work for the survey took place during June and July 1996. Interviews were conducted with household heads and their "leading" wives from five randomly selected households in each village (Senagrosol-Consult, 1996a). Completed questionnaires are available for 790 of the 800 targeted households. Not all household heads and leading wives were available to be interviewed. Completed pairs of questionnaires are available for 694 households; completed individual questionnaires are available for 765 women and 725 men. Sample attrition was most pronounced in two zones (the Fleuve, and to a lesser extent in the Peanut Basin), where men routinely migrate and emigrate for extended periods (Senagrosol-Consult, 1996b).

6. Informal surveys for questionnaire design

Although the HOPS provides an important reference point for comparative analyses, two methodological issues are raised. First, the sample of nations surveyed is strongly skewed toward the advanced industrial nations. Low income nations were poorly represented (6 of 24). Nigeria was the only African country included. This is particularly important to the assessment of differing environmental perspectives due to the low technological level experienced by the predominantly rural populations of these countries. Second, such a standardized set of survey items assumes homogeneity of meaning concerning the concepts involved. Based on survey items developed and tested in advanced industrial countries, the survey instrument is strongly biased toward advanced industrial country perceptions and formulations of what constitutes the “environment.”²

The study design, consequently, involved an initial informal survey to prepare formal survey items and instruments and to aid in the interpretation of the data collected. This assured both development of valid and reliable questionnaire items and a qualitative understanding of how the rural Senegalese perceive and practice natural resource management. A multidisciplinary team accompanied survey supervisors to discuss NRM issues with local authorities, extension agents, village heads, and men and women villagers throughout Senegal. These guided discussions clarified a wide range of issues relevant to NRM in rural Senegal with important implications for questionnaire design and survey management.

As these informal surveys began, it was realized that several of our questions were poorly formulated with respect to general understandings in the rural areas. These questions matured as the survey proceeded and mechanisms identified to elicit the types of information sought. The process allowed survey supervisors to shape the development of the survey tools, making the questions they were to ask meaningful to themselves, as well as to respondents.

During and after the informal survey, the final version of the survey instruments were drafted. Questionnaire development was an inclusive process, involving items from the previous USAID/KAP and SRP/KAP surveys, as well as the HOPS,

all of which focused the informal survey. Items from the previous KAP surveys, for the most part, were easily adapted and understood by the survey team and the target population. However, the developed country biases and irrelevancy of many items in the HOPS quickly became apparent. While components of some items were kept intact, many items suffered major adaptations in order to become applicable and meaningful to the surveyed population. The central issue addressed in these discussions revolved around the meaning of the concept “environment” which was presumed to be the core concept for each of the reference surveys.

7. Interpretive findings: key concepts of environment and natural resources

It should be noted that the words “environment” and “natural resources” come to the rural Senegalese from the exterior. Even when translated into the languages of the five major ethnic groups, these concepts still lack the connotations associated with them in French. In translation, these terms are easily confused and seen to refer to some vague heterogeneous concept. During the informal surveys, it was necessary to go beyond the simple translation of terms and explore the meanings which the rural Senegalese attributed to the objects of these concepts.

Within the various ethnic languages, the concepts of “environment” and “natural resources” can be distinguished. The concept of environment is often associated with the phrase *that which God [Allah] has given*. In contrast, natural resources refer to *those parts of the [environment] which are used in making a livelihood*. This socially negotiated construction of the concept “environment,” then distinguishes between humans’ non-domination of the environment and their attempt to use a part of it, “natural resources” for their livelihoods.

The following helps to illustrate this conceptual perspective. The air is part of the environment, it is not, however, considered a natural resource because it is not consciously used. Rural Senegalese recognize differences in air quality (particularly during dust storms), but see them as a part of the environment which is not amenable to control for one’s own ends. The idea of being

able to control or manipulate the object in question is central to this conception of natural resources. Soil erosion happens during environmental events such as rain storms or heavy winds. These events are not perceived as manageable. For practical purposes, manageability may be either a function of relevant know-how or of perceived feasibility with limited livelihood choices. At times, the two may be intertwined, and community factors may also be involved. In any case, it is the perception of what is manageable that counts. The environment is not open to human manipulation, it is simply God-given. Consequently, environmental problems in Senegal are experienced by the population with a great deal of fatalism. Policies for the management of environmental problems have rarely been followed when established. On the other hand, a multitude of customary rules and conventions to maintain sustainable use of natural resources have been common.

Rural Senegalese manage their natural resources to assure their livelihoods. In fact, natural resources are largely described in terms of their contribution to that end. Forests, plateaus, rivers, flood plains, rangelands, etc. each provide a range of opportunities to conduct agriculture, fishing, hunting, mining, grazing livestock, and collecting forest products. Soil and water are distinguished as separate elements, but are meaningful only in the context of their use for a specific end. This can be seen in the description of the plateaus as areas for the growing of millet, of flood plains as the areas for rice production, and of the forests for grazing, hunting, and the collection of naturally occurring products. In addition, islands, the ocean, rivers and forests, with their assorted flora and fauna, provide opportunities for employment in the growing tourist industry of some areas.

Drought is a major problem. The population in all zones understands that the condition of the natural resources on which livelihoods depend is controlled by their access to water – its quality (salinity, potability), proximity, and amount. For example, drought has led to lower water tables and river flows which contribute to the salinization of littoral regions, most specifically the rice beds. This has turned some communities inland to seek out new lands. Consequently, previously idle plateau lands have come under cultivation. In

several villages, agricultural production and consumption have been modified as rice production of women declines and millet production of men expands. Women have increasingly turned to market gardening, shifting the division of labor between men and women.

8. Formal survey results

Priority concerns

In order to better understand the values and reasoning which shape the rural Senegalese environmental world view, respondents were asked about the seriousness of a wide range of current social problems. The perceived seriousness of these problems in their communities have been ranked to produce a set of priority concerns. Respondents were asked to evaluate each of 20 items on a four-point scale from “very serious” (1) to “not serious” (4). Table 1 presents the average scores and rankings for the perceived seriousness of the most important problems within the six eco-geographic zones. For completeness, the top five rankings for men and women in each zone have been included.

The first thing which stands out in this table is the relatively high level of consistency in these rankings. Out of some 20 items for men and women in the six zones, only 11 were ranked in the top 5 across all categories. The lack of agricultural inputs and equipment is viewed as the top priority by men across nearly all zones. Women, although it often falls in the top five of their rankings, are more concerned about the standard of living.

Concerns about the seriousness of drought as a major problem rank highly among only women in the Niayes and the Southern Forest Zone. More important to both men and women is the lack of rural infrastructure and means of communication. These two problems constitute a second major priority area. Concern over the lack of infrastructure is felt across the country, and this is especially targeted with respect to communications in the Ferlo, Niayes and Peanut Basin. For women, this is largely expressed in their concern over health conditions, particularly in the Southern Forest and South East Zones. Un- and underemployment are most seriously felt by both men and

Table 1
Average scores and rankings (in parentheses) for rural men and women of priority problems for each eco-geographic zone

Level of Seriousness of:	Fleuve	Ferlo	Niayes	Peanut Basin	Southern Forest	South East
Lack of agricultural inputs						
Men	1.54 (2)	1.6 2(1)	1.81 (2)	1.40 (1)	1.94 (2)	2.05 (3)
Women*	1.74 (3)	2.01 (5)	2.68 (-)	2.05 (2)	2.05 (-)	2.43 (3)
Lack of agricultural equipment						
Men	1.53 (1)	1.71 (2)	1.88 (3)	1.78 (3)	1.99 (4)	1.88 (1)
Lack of infrastructure						
Men	1.73 (4)	1.74 (3)	2.06 (4)	1.84 (4)	2.14 (5)	1.96 (2)
Women	1.93 (5)	1.68 (2)	2.52 (4)	2.12 (3)	1.85 (3)	2.32 (2)
Standard of living/devaluation						
Men	1.87 (5)	1.95 (-)	1.80 (1)	1.69 (2)	1.89 (1)	2.08 (4)
Women	1.33 (1)	1.59 (1)	2.12 (3)	1.78 (1)	1.68 (2)	1.91 (1)
Un- and under employment						
Men	1.63 (3)	1.83 (4)	2.53 (-)	2.43 (-)	2.37 (-)	2.56 (-)
Women	1.37 (2)	1.85 (3)	2.82 (-)	2.26 (-)	1.87 (5)	3.14 (-)
Lack means of communication						
Men	2.39 (-)	1.94 (5)	2.16 (5)	1.96 (5)	2.53 (-)	2.57 (-)
Women	2.20 (-)	1.87 (4)	2.55 (5)	2.14 (4)	2.47 (-)	2.52 (-)
Drought						
Men	2.59 (-)	2.43 (-)	2.22 (-)	2.22 (-)	1.95 (3)	2.29 (-)
Women	2.20 (-)	2.41 (-)	2.09 (2)	2.85 (-)	1.59 (1)	2.80 (-)
Health problems						
Men	2.28 (-)	2.19 (-)	2.81 (-)	2.21 (-)	2.29 (-)	2.19 (5)
Women	2.22 (-)	2.22 (-)	2.96 (-)	2.44 (-)	1.85 (3)	2.48 (4)
Environmental problems						
Men	2.70 (-)	2.34 (-)	2.70 (-)	2.44 (-)	2.58 (-)	3.01 (-)
Women	2.38 (-)	2.26 (-)	2.75 (-)	2.18 (5)	2.19 (-)	2.54 (-)
Availability of firewood						
Women*	1.86 (4)	2.36 (-)	1.93 (1)	2.22 (-)	3.02 (-)	3.59 (-)
Lack of education						
Men	2.83 (-)	2.39 (-)	2.91 (-)	2.80 (-)	2.97 (-)	2.54 (-)
Women	2.66 (-)	2.19 (-)	3.29 (-)	2.37 (-)	2.48 (-)	2.49 (5)

Note: 1 = very serious, 2 = serious, 3 = somewhat serious, 4 = not serious.

* The agricultural inputs and equipment items were combined into one item for women and an item on the availability of firewood was added for women as a replacement.

women in the Fleuve and Ferlo where the search for alternative livelihoods has been actively pursued through emigration.

The prioritization of generic environmental problems only attained a top five ranking by women in the Peanut Basin. Overall, however, women are concerned about the availability of firewood which is their top priority in the Niayes. Education was ranked in the top five only once, in the South East.

It should be noted in interpreting this table that the environment, and drought for that matter, are relatively diffuse concepts which in themselves are not perceived as manageable. While

environmental quality and drought are current topics of discourse, they are not perceived as the most serious problems. Rather, they set the context in which problems exist. Notably missing from this list are: global warming; loss of ozone; poor air; contaminated soil; inadequate sewage; and too much noise. These latter items, although relevant to developed country and urban dwellers, were not considered critical to the discourse over social problems in rural Senegal and were therefore dropped from the questionnaires. Priority problems, for men particularly, appear to be those for which something specific can be done to address the problem. They reflect both what it is

believed to be manageable as much as what is desired. The general feeling is that once they have (locally unavailable) agricultural inputs, they will be better able to manage problems associated with vegetation, soil and water which are the key components of their natural resource system.

In comparison with citizens of the countries in the HOPS (see Figure 1), rural Senegalese men and women express very low levels of environmental concern. This is despite the fact that the measure for rural Senegalese used in this comparison referred to problems in their local communities where it has been shown that environmental issues are most strongly felt (Dunlap, 1994). This would appear to confirm the post-materialist thesis. However, the rural Senegalese are very distant from the influence of this dominant dis-

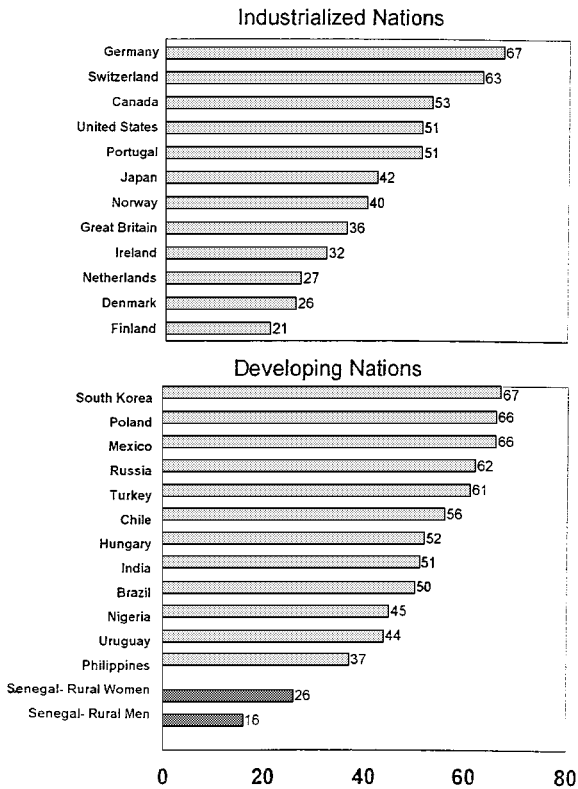
course. Let us investigate further within the rural Senegalese frame of reference.

9. Economic development vs. environmental protection

All respondents were also asked whether they were most in agreement with either “protecting the environment should be given priority at the risk of slowing economic growth” or “economic growth should be given priority even if the environment suffers.” Although forcing this trade off was initially considered inappropriate by the Senegalese researchers, it was accepted to test the hypothesis concerning respondent priorities. Table 2 shows that rural men (34.3 percent) were less likely to choose protecting the environment and most likely to favor economic growth than their wives (46.5 percent). However, despite instructions not to offer the alternative of both equally, both men and women respondents volunteered this response over a third of the time. The sense of this finding is that rural Senegalese discourse does not support this either/or trade off since one without the other is not sustainable.

In comparison with respondents to the HOPS, these rural Senegalese respondents ranked among the four least frequent countries to choose protecting the environment over economic growth (see Figure 2). These rural men and women confirm the belief that developing country nationals are less likely to favor protecting the environment than their developed country counterparts as framed by the developed country discourse.

To further explore this finding, factor analysis was conducted on the seriousness of social problems discussed above. Two factors were selected

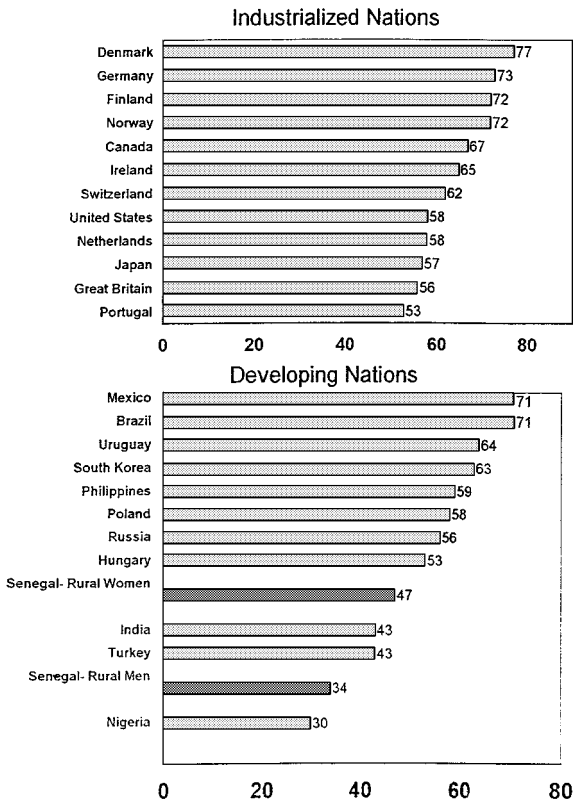


Sources: R.E. Dunlap, G.H. Gallup, and A.M. Gallup, Health of the Planet Survey, 1993; and Senagrosol, Rapport descriptif, 1996.

Figure 1. Percentages of respondents who say environmental problems are a “very serious” issue in their nation (community in rural Senegal).

Table 2
Percent of rural senegalese men and women according to their preference for protecting the environment or promoting economic growth

	Men	Women
Protect the environment at the expense of economic growth	34.3	46.5
Give equal priority	35.1	37.5
Promote economic growth to the detriment of the environment	30.7	16.0
Total	100.0	100.0



Sources:
 R.E. Dunlap, G.H. Gallup, and A.M. Gallup, *Health of the Planet Survey*, 1993;
 and Senagrosol, *Rapport descriptif*, 1996.

Figure 2. Percentages of respondents who choose protecting the environment over economic growth.

for the following analyses to aid in the interpretation of the trade off findings (for a discussion of factor analyses methods used see Moore and Thiongane, 1996). The first factor represents the highest priority problem identified by Senegalese rural men and was composed of the three items lack of agricultural inputs, equipment, and infrastructure for the intensification of agricultural development. The corresponding factor for rural women included only two items: the combined inputs and equipment, and the infrastructure item. The hypothesis being tested is that those most concerned about intensifying agricultural development would be most likely to choose economic growth over environmental protection.

The second factor highlighted concerns over environmental degradation and was based on the three items: environmental problems, lack of pas-

ture land and soil degradation. The hypothesis in this instance is that those most concerned about environmental degradation would be most likely to choose environmental protection over economic growth.

Table 3 presents the findings for levels of concern about agricultural intensification (lower values indicate higher levels of concern). For rural men there is no statistically significant difference in concern over agricultural development by response to the trade off between the environment or the economy. However, men appear to register more concern when they also are most likely to protect the environment. Rural women, on the other hand, register a significant difference in levels of concern over agricultural intensification. They confirm the hypothesis that the minority of rural women who would choose to promote economic growth at the expense of the environment are those most concerned about agricultural development.

In contrast with the gender differences found for agricultural intensification, both men and women present a similar pattern of concern over environmental degradation according to their choice between the environment and the economy (Table 4). Those most concerned about environmental degradation are the most likely to choose promoting the economy at the expense of the environment. This is statistically significant

Table 3
 Mean levels of concern about agricultural intensification according to economic or environmental priorities: Senegalese rural men and women

Choice between the economy and the environment	Agricultural intensification		
	Mean	Standard deviation	Cases
Protect the environment			
Men	5.03	1.91	241
Women ^a	4.21	1.35	314
Give equal priority			
Men	5.36	1.74	246
Women ^a	3.94	1.38	253
Promote economic growth			
Men	5.25	1.54	217
Women ^a	3.75	1.22	106

^a F for significant difference in means was 5.68, significant at the .0036 level.

Table 4
Mean levels of concern over environmental degradation
according to economic or environmental priorities:
Senegalese rural men and women

Choice between the economy and the environment	Environmental degradation		
	Mean	Standard Deviation	Cases
Protect the environment			
Men ^a	7.99	2.09	235
Women	7.74	2.15	312
Give equal priority			
Men ^a	8.40	1.89	237
Women	7.76	2.13	246
Promote economic growth			
Men ^a	7.67	1.89	212
Women	7.24	1.91	104

^a F for significant difference in means was 7.69, significant at the .0005 level.

for rural men. Not only is our hypothesis not confirmed, but within developed country discourse, this finding may be considered counterintuitive. These findings suggest the possibility of a positive relationship between economic growth and environmental protection within rural Senegalese discourse.

Concern over environmental degradation translates into strong desires to promote economic growth for both rural men and women. These responses can be interpreted in the sense that this rural population seeks to manipulate to its advantage that which it believes it can control. The economy is seen as tangible, something which can be managed, and consequently, the means through which concerns over less controllable environmental degradation can be addressed.

10. Discussion

This paper has presented an initial glimpse of the complexity involved in the comparative study of environmental perspectives. The social construction of these perspectives requires an in-depth understanding of the cultures and the political economic dynamics which shape the environmental conditions in which discourse is developed. As can be seen, the negotiation of these different perspectives through survey research at the cross-national level provides the opportunity for the scientific and developed country perspectives

to dominate. However, it does not negate the actual experiences and understandings of those in the rest of the world; it simply ignores them.

For a truly scientific understanding of environmental public opinion throughout the world, more research on the construction of environmental perspectives needs to be done. Cross-national attitudinal research is not simply the translation of a questionnaire from one language to another. To the extent that the cultural and experiential basis of the two languages differ, then a qualitative analysis will be required to determine how meaningful comparisons can be established. For a multi-national survey that compares shared meanings across many societies, substantial preliminary work must be done.

By investigating the environmental perspectives of rural Senegalese, we have tried to provide a point of reference for future comparative research. Further, we have tried to make a limited contribution to the current theoretical debates surrounding the linkage between environmental concerns and post-materialist values. It may very well be that "environmentalism" has a distinct post-materialist meaning among certain classes or social categories in the United States and Western Europe, and potentially, among developing country elites. However, to the extent that the environment is indeed global and experienced across classes, other perspectives need to be taken into account.

The environment and the natural resource base which it includes are an essential component of rural Senegalese culture and life-styles. We have shown that, indeed, the rural Senegalese are highly concerned about their environment, but that this concern is not expressed, nor does it involve the same meanings, as found in the developed countries. The implication for the transfer of environmentally sound technologies is that they must be linked to immediate and observable improvements in economic conditions.

While the Senegalese discourse over the environment has shifted during the last few decades to include new urban and industrial issues, over 50 percent of the population is still dependent on direct relations with their "natural" environment, as a producer of meanings and identities, as well as physical sustenance. Nearly half the world's population still shares this type of direct environ-

mental experience. For a scientific understanding of environmental perspectives to be truly comparative on an international scale, it will need to come to terms with the distinctive perspectives of the world's poor rural populations.

Notes

1. "Leading" wife refers to the dominant wife in households where the male household head has more than one.
2. In addition, Adeola (1996; following Kuechler, 1987) notes that the very idea of conducting cross-national surveys in countries with limited freedom of speech may be problematic in itself. Furthermore, the surveying of predominantly rural populations is problematic, both logistically (time consuming and expensive) and methodologically (formally surveying of illiterate populations unaccustomed to western norms of survey research).

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