



## Conference Proceedings: An Agenda for Black Universities and Colleges in the XXI Century

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LAND DEGRADATION AND THE AMERICAN SOCIETY

"An Agenda for Black Universities and Colleges in the Twenty First Century"

by

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**Introduction:** In this presentation, an overall view on environmental problems will be presented. More specifically, I shall highlight the interaction of the degradation of one environmental medium, land, and society. This is not because of time frame, but because I am not an expert on all of the other environmental media and issues. In fact, no one is.

We are all aware that every household in our communities generate waste. In reality, almost every household in America. Industries, in their manufacturing processes, generate waste. What we sometimes don't stop to think about is what effects these wastes have on our environment. This and other factors of land degradation will be discussed in this presentation. The discussion will focus on all culprits of land degradation including nature. Needless to say, man is also a culprit.

The other question we should be asking ourselves but sometimes fail to do so is "where do these wastes, that we as a society generate, end?" Do they end up in our back yard or someone else backyard. I shall provide data to show that black communities get disproportionately affected. Is this a concern to blacks? I think it is.

The problem is a complex one. The many facets of the problem include technological, sociological, economical, political, and the list goes on. I do not bring answers to all these problems. I however, bring some suggestions on how we as a minority group should wake up and begin to see the inevitable tasks ahead of us not just from the stand point of solving the health and environmental effects of environmental degradation, but the huge economic benefits that can be reaped by getting on the band wagon of environmental protection.

Defining Environmental Problems: Environmental problems in eastern USA (specifically EPA Region III) can be described with respect to:

1. Sources of pollution (eg. USTs, automobiles);
2. Pollutants (eg. PCBs, pesticides, lead);
3. Media (eg. land, ground water, air);
4. Geographic region (eg. Chesapeake Bay, DC); and
5. Other factors.

On a national or global scale, one may include issues such as global warming and ozone depletion.

From the factors above, one can develop a list of potential problem areas in our region and may include:

1. Hazardous substances at Superfund sites;  
(Superfund is a fund generated by Congress for the cleanup of the nation's worst hazardous waste sites)
2. Management of hazardous waste at RCRA facilities;  
(RCRA is the Resource Conservation, and Recovery Act -the "cradle to grave" regulation of wastes generated by industries)
3. Solid waste (such as household wastes) management;
4. Underground storage tank releases; (eg. gasoline stations)
5. Ground water contamination from farming;
5. POTW discharges to surface water and air;  
(POTW is Publically Owned Treatment Works such as the treatment system that collects water from the Potomac R., treats it and supply household and industries in the Washington DC Metro area)
6. NPS discharges to surface water and air;  
(NPS means Non Point Source such as lead released into the atmosphere by cars and finally get washed into rivers eg. Anacostia during rainstorms. The brown color of the Anacostia is mainly due to surface erosion of loose soil such as in construction to the river)
7. Industrial PS discharges to surface water and air;  
(PS is Point Source deals with discharges by industries through a permit to surface waters)
8. Radon radiation - indoor;
9. Radiation other than radon;
10. Indoor air pollutants other than radon;
11. Hazardous/Toxic air pollution;
12. Acid deposition;

13. Physical modification of aquatic habitats;
14. Physical modification of environmentally sensitive terrestrial habitats; and
15. Operation and maintenance of water supply facilities.

This list could go on and on.

**Definitions:** Before we proceed with the discussion on land degradation, it is pertinent to first of all provide some definitions.

**Land:** This is the solid surface of the earth

**Concept of Land:** Land is a phenomenon that embraces the following components of a specific area of the earth's surface and the resulting effects on their use. These include the:

1. atmosphere;
2. hydrology;
3. soil and its underlying geology; and the
4. plants above, on, and below the soil.

**Land with respect to use:** With respect to land use, land can be a:

1. production unit;
2. consumer good or commodity;
3. source of recreation & pleasure;
4. property; and
5. capital.

**Degradation:** Degradation involves changes in the properties of land with resultant impairment of the original use of that land and/or its associated media (water, air).

## **Mechanisms of Degradation - Natural Factors**

### **1. Weathering**

Rocks --> Minerals ----> Soils ----> Chemicals

### **2. Erosion**

- (a) Wind erosion
- (b) Erosion by water

### **3. Salinity**

- (a) Surface evaporation --> high concentrated salts on surface of soil

affects: soil properties & plant growth; ground water supplies; surface water.

- (b) Salt encroachment - may affect coastal water supplies

High tide --> salt encroachment --> high salinity or  
reversal of  
g.w. gradients

affects: soil properties & plant growth; ground water supplies.

**Mechanisms of Degradation - Human Factors** Let me now summarize the various methods man has used (and continue to use) to degrade our land resources.

I must caution here that given that I am not a toxicologist, I cannot speak to the health effects of these practices except to say that contaminants could be released to the environment as a result of such practices. Should anyone be interested, EPA has classified these chemicals (for which data is available) based on their carcinogenicity. For more information, you can contact your local environmental agency or EPA for a copy of the classification.

In talking about land degradation, it is recognized that there is a need for society to provide not just the basic necessities of life to its citizens, but to continuously improve the quality of life by improving its productivity in the market place. The irony is that the wastes generated in these processes could mean poor quality of life through poor health and poor economies.

Next, the several mechanisms of land degradation will be summarized with their potential to release contaminants to the environment.

## **1. Industrial**

(a) Above and underground chemical storage tanks

- \* Leaks in system (tanks, pipes, etc.) with age
- \* Removal --> tank rupture

(b) Spills (various chemicals)

(c) Illegal dumping

(d) Impoundments (pits, lagoons, etc.)

- \* Lack of liners
- \* Porous soils

(e) Wells

- \* Recharge wells (infiltration cells)
  - Discharge to gw
  - Solids separation

- \* Well construction effects

- \* Disposal wells

- \* Injection wells

- Liquid wastes

(f) Construction ----> Surface Erosion

- \* Effects on Anacostia & other rivers

## **2. Landfill Operations**

(a) Solid wastes landfills \*

Western USA

(b) Hazardous wastes landfills

- \* Some solid waste lfls ----> h.w.

## **3. Air Emissions**

(a) Automobiles

- \* Pb, and other heavy metals

- Deposited on soil (b) Industrial Emissions

- \* SO<sub>2</sub>, NO<sub>2</sub>, CO<sub>2</sub>, --> Acid Rain (H<sub>2</sub>SO<sub>4</sub>, HNO<sub>3</sub>, etc.)

- CO<sub>2</sub>+ effect (global warming)

## **4. Agricultural**

(a) Crop Production with:

- \* Nutrient and pesticide application on soil;

- \* Waste application on land

V  
Ground water & surface water contamination

- (b) Feedlot operations --> g.w. & s.w. contamination
- (c) Irrigation return flows --> gw & sw contamination

### **5. Deforestation**

- (a) Erosion
- (b) Increased soil acidity (nutrients leached but not replenished, etc.)  
Heavy metals leached to g.w.  
with decreased crop production
- (c) Increased CO<sub>2</sub> effect

### **6. Septic Systems**

- \* Waste filtration
- \* Failed systems possible
- \* Increased bacterial and other contaminants

### **7. Radioactive Waste Deposits**

Land will be contaminated for period based on contaminants half-life.

### **8. Coal Mining**

Derelict land

### **9. Lawn fertilization**

Effects of nutrient and pesticide application

**Taking Care of the Problem:** The ideal thing to do when a problem occurs is to fix it. Sometimes it works and other times it doesn't. The same applies in the remediation of environmentally degraded land.

Laws have been enacted at the Federal, State, and Local levels and implemented by agencies such as EPA to fix the problem. Sometimes the law is aimed at preventing the problem.

For land degradation that is identified to pose imminent and substantial threat to human life, an attempt to remove the threat is usually made followed by attempts to study and remediate any potential health and environmental effects that may remain. Remediation of these sites and other toxic sites not requiring any removal action starts with some investigation followed by the implementation of a chosen remedy to clean up the degraded land and its associated media.

**Balancing Economic Growth and Environmental Protection:** Removal and/or remediation of the deleterious effects of land degradation is an expensive business. It is frequently cheaper to prevent the problem than to remove and/or remediate it. However, one cannot avoid the fact that industrial societies generate waste.

As alluded to earlier on, the balance between economic growth and environmental protection is a difficult task and the side the pendulum shifts depends on who you talk to. For a mother that loses a child due to cancer tumor growth resulting from that child ingesting say soil with a cancer causing chemical, no economic benefit from dumping the chemical on the soil may be good enough for her. However, to a business man, a risk of only 1 person (out of a million people) dying from exposure to the same chemical may be an acceptable risk. This the balance that people who write the law have to weigh. Regulators like us run into these problems also. Similarly, the choice is difficult for governments who have to choose between pressing issues like drugs and environmental protection. The answer to this problem is going to depend on a site specific basis. This brings in the issue of "prioritization". Prioritization however requires a thorough understanding of the various problems at hand. For minority groups, education coupled with greater interest and commitment by all individuals of each community is going to be needed. The next segment of my talk will highlight why this commitment is necessary especially for the black communities in this country.

## **Hazardous Waste Citing Correlated with Race and Socio-Economic Status:**

Much has been said that man's effects on land. To understand the urgent need for blacks to begin to wrestle with environmental issues, it is necessary to examine how blacks are affected by land degradation. Since health effects may be correlated to environmental exposure, let us now look at few studies that have attempted to correlate citing of hazardous wastes and the racial and economic status of the communities that surround these sites.

### **1. United Church of Christ Report:**

'Toxic Wastes and race in the United States'.

#### Report Conclusions

\* Communities with the greatest number of hazardous waste facilities have highest composition of racial and ethnic residents

\* 3 out of every 5 Black and Hispanic Americans lived in communities with uncontrolled hazardous waste sites

\* 3 out of every 6 Asian/Pacific Islanders and Native Americans live in communities with uncontrolled hazardous waste sites

### **2. U.S. Census Bureau Report**

The report looks at black representation in metropolitan areas with the greatest number of toxic waste sites.

#### Conclusions

\* Percent blacks living in metropolitan areas with the greatest number of toxic waste sites is greater than the national average black population.

### **3. 1983 General Accounting Office Report**

\* Examined 4 HW landfills in 3 SE states:

Alabama

S. Carolina

N. Carolina

#### Conclusions

\* Majority of the people close to the landfills are black

- \* Black population in surround census areas close to the landfills has lower mean income than the mean income for all races combined
- \* Black population represents the majority of those below the poverty level

## **Suggestions for Immediate Action:**

### **1. Role of Educational Institutions**

- i. Offer comprehensive environmental programs at the
  - High School level; and
  - College and university levels
- ii. Educational programs should cover the:
  - Technical;
  - Legal;
  - Economic; and
  - Social aspects of environmental protection.
- iii. Seek grants for research efforts in areas such as:
  - Risk characterization;
  - Health effects of chemicals; and
  - Innovative technologies for remediating contaminated sites.
- iv. Offer Environmental Clinics for citizens

For those students who may be contemplating on choosing careers, I challenge you to this exciting field. For others who may have decided on some career they are not sure about, it is not to late to give the environment a try.

When I decided to pursue a Doctorate degree in Soil Science, it was my intention to specialize in a discipline that is as versatile as possible. I choose the field of Soil Physics with research in flow of solutes in soils thinking then that if I could not secure a job in the agriculture sector, I may do so in the environmental field. Together with my extensive background in Geology, I have never been in the environmental field for seven years now and have never been in need of a job.

### **2. Minority Industries**

- i. Begin to attract environmental professionals;

## REFERENCES

1 The DC Water Resources Research Center, FY 90 Annual Final Report. DC WRRC Report No. 88. DC Water Resources Research Center, Washington, DC USA.

2 Field, R.J.,1989. Black Natural Resources Managers: Why, Where and How. Presentation to the Southern Association of Fish and Wildlife Agencies Annual Conference, St-Louis, Missouri, USA.

3 The National Association of Equal Opportunity in Higher Education (NAFEO), 1989. An Inventory of the Capabilities of the Historically Black Colleges and Universities and other Minority Institutions (HBCUS/MIs), Washington, DC, USA.

4 Watt, M.H. August 1983. Views on US Water Research and Technology Transfer. DC WRRC Report No. 53. DC Water Resources Research Center, Washington, DC, USA.

ii. Start bidding for environmental projects at both national and international levels;

iii. Make provisions for R&D especially in areas of innovative technologies called for in the cleanup of uncontrolled toxic sites;

### 3. Politicians

i. Make environmental protection a priority issue of discussion not only during the campaign trail, but also during legislative deliberations;

ii. Work with citizen task force on community environmental issues; and

iii. Visit neighborhoods as often as possible to observe environmental conditions.

### 4. Citizen Participation

i. Attend public meetings on environmental issues

ii. Call on your environmental regulatory agency on environmental issues you may have questions on;

iii. Follow as much as possible changes on environmental laws that may affect you

iv. Be aware of your legal rights, eg. method decided by EPA to cleanup a hazardous waste site listed in the NPL (National Priorities List) in your community should be presented to the citizens of your community for comments

**Conclusions:** In closing, I want to reiterate that much interest has been raised during the past decade, and deservedly so, on both the current and future status of our nation's environmental quality. The challenge to solve the nation's environmental problems is a responsibility of every sector of the community. Consequently it is a responsibility of every black and other minorities in this country. This challenge should therefore be that of Black Universities and Colleges also. Educated blacks in the 20th Century are going to be needed in environmental fields to make well informed decisions on environmental issues affecting their communities.

The education of blacks in the field of the environment alone doesn't guarantee that the problems of environmental degradation in our neighborhoods, and indeed in the nation, will be solved immediately. Blacks would need to also get involved in community affairs, and in political activism. Those blacks who are already educated in the field would need to share that knowledge to others at a very early stage. In essence, one of the biggest issue that is going to face us in this century, as a minority group, is how to maintain a clean environment in our neighborhoods and we need to start thinking of solutions to this issue immediately. If money is a reason to embark on a career, then it is certainly the field to be in, and the opportunities keep growing as the demand for environmental professionals grows.

