## Government Environmental Regulations and Income Distribution:

# Where You Stand Depends on Where You Sit

BY K. R. TEFERTILLER

A disturbing disparity between upper-income and lower-income groups has evolved in the United States during the past several years. The U.S. is becoming a nation of "haves" and "have-nots." While the number of people in poverty in the United States remains high, the Internal Revenue Service's income statistics reveal that 206,000 individuals reported adjusted gross incomes of $1 million or more for 1999, more than three times the number in 1995. A recent study by the Center on Budget and Policy Priorities (CBPP) found the rich-poor income gap is national in scope, and widened in 44 states during the past decade.

The CBPP recommended that state and federal lawmakers address income inequity through a wide range of programs (such as training programs, tax reform, and direct income transfer). Although government programs may achieve a reduction in the income gap over time, in a competitive economy like that of the United States, a gap of some magnitude will likely remain.

A considerable part of this income disparity must be attributed to differences in skills and educational opportunities. However, might governmental policies also contribute to the widening gap? Sometimes these policies are hidden, or at least not readily transparent to the average citizen. This article includes a conceptual analysis of the tendency of government regulations (in this case, environmental regulations) to intensify income distribution inequities.

### Environmental or Economic Racism?

While disparate impact of economic regulation on the poor is accepted as canon in some circles, the issue of adverse impact of environmental regulations on the poor has only emerged in the past few years. A recent example of this phenomenon is the small town of Convent, Louisiana (Payne, 1997). Recently, the Environmental Protection Agency (EPA) stopped plastics manufacturer Shintech from building a plant in the predominantly African-American southern Louisiana town.

According to the Louisiana Department of Environmental Quality, charged by the EPA to regulate state industry, Shintech's plans satisfy the state's strict emissions standards. Despite the state's approval, EPA sided with Greenpeace and its allies, who were determined to stop the plan by invoking President Clinton's 1994 executive order on environmental injustice. The order states, "It is essential that minority and low-income communities not be disproportionately subjected to environmental hazards." It could be interpreted as follows: "All people must consume the same level of environmental quality under all conditions, including income differences among groups of people."

This is a classic case of higher-income members of a community, with the assistance of out-of-town environmental groups, attempting to set higher environmental quality standards than those demanded by low-income members and those set by the relevant state regulatory body. Some low-income stakeholders, far from considering Shintech's plans an injustice, saw it as an opportunity to increase the number of relatively high-paying jobs in the community. A poll of the local NAACP chapter found that 73 percent of the people living near the proposed plant site favored approval of the plant being located there. Nevertheless, EPA cited the location for environmental racism, ignoring the opinions of all the local

African-American officials who had voted in favor of the plant. Also, one could argue that the state of Louisiana had already practiced economic affirmative action by declaring the area a state enterprise zone.

EPA did not invoke the executive order to stop the plant, as favored by Greenpeace, but instead called for further research. If further research includes analysis of the different levels of environmental quality demanded by people of different income levels, EPA may find that the economic issue becomes an important consideration

## Those Who Have Shall Get, Those Who Don't Shall Pay

The income distribution side of environmental quality externalities is a real issue in a world in which inequality and poverty are high-priority social problems. A better understanding of the impact of environmental quality policies on those with different levels of income is needed to design adequate policies and to obtain the necessary support for their adoption. Based on empirical evidence as well as common sense, it is possible to argue that the demand for environmental services increases as income rises. This leads us to expect higher-income citizens to have a greater demand than poor citizens for such items as clean air. The problem is a classic case of consumers considering two goods, with one being the consumption of environmental quality and the second being the consumption of all other goods.

A consumer preference (indifference) map can be used to show how the demand for environmental quality varies with income. A single indifference curve in such a map shows the various combinations of goods and services that provide the consumer

with the same level of satisfaction. In other words, the consumer is indifferent to, or equally satisfied by, any combination of goods and services shown by points on a given curve. An application of the indifference curve approach measures the rate at which

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consumers will substitute one good (environmental quality) for other goods as previously described.

Two indifference curves (I and II), shown in Figure 1, represent two levels of consumption of environmental quality and of all other goods. These curves represent combinations of environmental quality and other goods along either curve I or curve II. Curve I and budget limitation AA represent the situation of a typical "rich" individual, while curve II and budget limitation BB represent a typical "poor" individual. These relationships are explained more fully in the sidebar on p. 19.

Assuming a given set of costs for environmental quality and other goods, points a and b represent the optimal combination of environmental quality and other goods on curves I and II, respectively. The optimal amount of environmental quality con-

sumed by lower-income citizens is $qb$ while the optimal level of environmental quality consumed by higher-income citizens is $qa$. This higher income level leads to an increase in the desired level of environmental quality from $qb$ to $qa$.

Environmental quality is often location-specific. For example, a landfill may generate nauseating odors that can adversely affect the quality of life for those living within a short distance or immediately downwind from the facility, while other residents within the same municipality or county may not be affected. However, the model used here assumes that environmental quality is a public good available to all persons on equal terms.

Since environmental quality is a public good, the community must agree upon some level of quality. If local elected officials make the decision, it may be considered the level preferred by the simple majority that elected them. The likely outcome is a compromise in which the chosen level of environmental quality may be lower than that desired by upper-income citizens, and higher than that desired by lower-income citizens. This compromise is illustrated by q* in Figure 2.

In reality, the selected level will likely be even higher than q*. Upper-income citizens, preferring a higher level than q*, are likely to have more direct access to elected officials and better-financed lobbying efforts, giving them more influence on political decisions. As illustrated by this model, higher-income citizens tend to place a higher dollar value on benefits from improved environmental quality than do lower-income citizens.

Figure 2 shows that the value of an additional unit of environmental quality at quantity $q*$ is higher for the "haves" than it is for the "have-nots."

**Figure 1.** Curves I and II represent various combinations of environmental quality and other goods consumers purchase according to income and preference. Curve I shows combinations of "Other Goods" and "Environmental Quality" that provide the same quantity of satisfaction to relatively high-income consumers. According to the indifference curves, the higher-income consumers will prefer higher levels of environmental quality than will the relatively low-income consumers whose preferences are shown by Curve II.
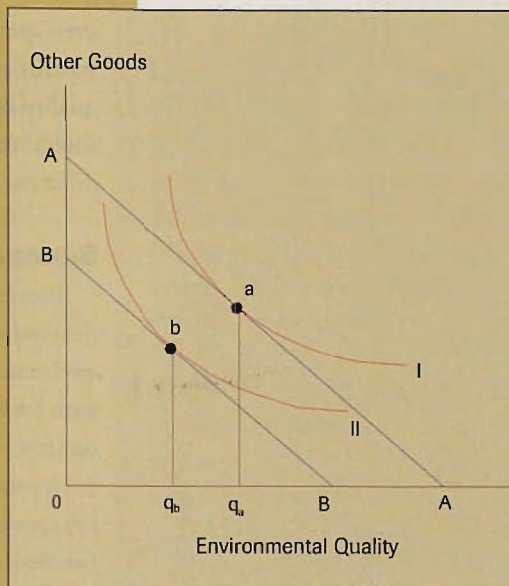


Since most environmental programs have strong elements of "publicness," individuals with lower incomes may be required to accept higher levels of environmental quality than they would otherwise seek. In fact, they might be forced to accept this level of environmental quality over other goods, such as jobs, that they might actually prefer. Based on this model, we can expect programs for environmental quality improvement to be pro-rich in their distributive impacts unless specific redistributive measures are written into environmental policy.

Figure 2 shows that lower-income citizens are required to consume more environmental quality than they prefer to consume because the public policy decision requires them to consume level $q^*$ of environmental quality instead of level $qb$. This analysis can be extended to measure the income compensation needed to offset the negative impact to low-income citizens. Because of the requirement to consume $q^*$ of environmental quality, the lower-income group, which is limited by BB, is no longer able to reach curve II. Instead, they are required to consume at point d, which is located on a lower indifference curve (III). Point d is a

non-optimal combination of products, given the budget limitation BB and curve III. Citizens required to consume at level $q^*$ would need compensation valued at $cd$ to offset the negative impact of being forced to consume at point $d$ on curve III instead of point $b$ on curve II. The amount $cd$ is the minimum compensation required to repay low-income citizens for the negative impact of the regulation.

## Environmental Program Costs: Who Really Pays?

In the public good model discussed above, the cost per unit of environmental quality is assumed to be the same for rich and poor alike. In reality, however, it is unlikely that the cost of environmental quality will be the same for both income groups.

It is possible to categorize costs such as these as either "transitional" or "continuing" costs. Transitional costs are the costs associated with the process of adjusting to a new level of environmental quality. Continuing costs are the annual costs required to maintain the new level of quality.

The transitional costs of environmental programs vary greatly among industry type, location, and methods

used to implement the program. A newly adopted environmental program may curtail or stop the operations of some industries; hence, one impact of a new program may be the loss of jobs. It is possible to compensate people who have lost their jobs; however, it is difficult to do so on a timely basis.

It is also difficult to generalize on such a broad topic. Significant evidence supports the contention that job losses resulting from new environmental programs often fall heaviest on low-income citizens, in part because professional/managerial personnel tend to have greater occupational and geographic mobility than lower-income employees have.

The continuing costs needed to maintain a given level of environmental quality are complex and are related to the prices of goods and services. Few studies deal with the distribution of these costs across income levels. Gianessi and Peskin (1980) analyzed the distribution of the costs of the Clean Air Act and found that the costs constituted a larger percentage of incomes of lower-income groups than of higher-income groups. Robison (1985) examined the distribution of the costs of industrial pollution abatement. This study found the incidence to be quite regressive over a wide range of income levels. Cost was 0.76 percent of income for the lowest-income group and 0.16 percent for the highest-income group.

The adverse impact of government regulations on lower-income citizens also prevails in some industries. For example, there is a wide disparity in net income among U.S. farmers. Government regulations often have a negative economic impact on all farmers because farming is a low-return industry and because it is difficult in the short run to pass on regulation costs to

Figure 2. When lower-income consumers are required to consume the amount of environmental quality represented by q*, they must consume a commensurately lower quantity of all other goods. This pushes them from Indifference Curve II to Indifference Curve III, effectively lowering their overall level of living.
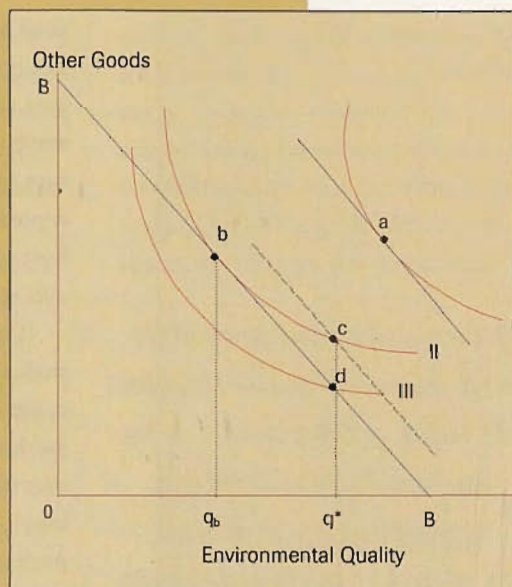
consumers (Tefertiller, Jauregui and Olexa, 1997).

Furthermore, government regulations probably have a greater negative impact on small farms than on medium-sized and large farms. This is due largely to limited capital and time, along with difficulty in interpreting regulations. The small individual farmer is often the owner, manager, and a major source of labor on the farm. The increasing number of small part-time farmers find similar difficulties dealing with government regulations. The disparate negative impact of regulation on small farmers appears to be in direct conflict with the USDA's long tradition of supporting policies and programs that benefit the small and medium-sized family farmer.

## Tightrope Act: Choosing Between Competing Priorities

The primary purpose of government environmental programs is to direct resource use to achieve desired levels of "environmental quality." There are two extreme views on the issue of adverse impacts on low-income citizens:

(1) Programs should seek to promote efficiency in resource utilization regardless of the implications for income distribution. Other agencies should deal with the problem of adverse impacts on people with low income.

(2) The elimination of poverty should be a higher priority than environmental protection.

A problem with position (1) is that the past performance of direct compensation suggests that the undesirable impact of environmental programs for a low-income group is not likely to be offset by government programs. A limitation of position (2) is that postponement of corrective measures of environmental quality may involve vital matters of public health. Since neither of these extreme positions are acceptable, a more balanced approach to this problem is essential.

In order to better understand the issue of adverse impact of environmental regulations, the term environmental quality should be further defined and classified. If environmental quality involves vital matters of public health and perhaps ultimately of survival, most people would agree that distribution issues should be secondary. However, much of what is labeled environmental quality may be aesthetic, or

even speculative and without sound scientific foundation. Environmental quality initiatives of this latter type should consider economic impacts on different income levels.

## Summary and Conclusions

People with higher incomes tend to demand a relatively large amount of environmental services, while people with lower incomes are inclined to desire a relatively large amount of non-environmental services – especially if job creation is involved. When environmental quality is treated as a public good, there is a tendency for the standard to be set higher than the standard preferred by people with low incomes and lower than the standard preferred by people with high incomes. The illustration provided here suggests that compensation may be needed to offset the negative impact of the proposed regulation on low-income citizens. The amount of compensation required depends on the magnitude of the impact. Two empirical studies found the cost of environmental regulations to be regressive over a wide range of income levels. The results of this study suggest that the government's role in making and implementing environmental policy intensifies the income gap between rich and poor. Unless special measures are used to offset the negative impact on the poor, government regulations may widen the income gap.

The number of environmental regulations in the United States is expected to increase at all levels of government in the future. At the same time, poverty is expected to remain a national problem. Hence, there is a real need for comprehensive empirical studies to measure the impact of environmental regulations on a wide range of low-income groups.

## For More Information

Center on Budget and Policy Priorities. *Pulling Apart: A State-by-State Analysis of Income Trends.* 820 First Street, N.E., Suite 510, Washington, DC 20002.

Gianessi, Leonard P., and Henry M. Peskin. "The Distribution of the Costs of Federal Water Pollution Control Policy." *Land Economics* 56 (February 1980): 85–102.

Internal Revenue Service. *Income Statistics.* Washington, DC, 1996.

Payne, Henry. "Environmental Justice Kills Jobs for the Poor." *Wall Street Journal,* (16 September 1997).

*Economic Report of the President.* Washington, DC: Government Printing Office, 1997.

Robison, H. David. "Who Pays for Industrial Pollution Abatement?" *Review of Economics and Statistics* 67 (November 1985): 702–6.

Tefertiller, Ken, Carlos Jauregui, and Michael T. Olexa. "Impact of the Regulatory Environment Facing Florida Dairy Farmers." Economic Information Report 97-2, Food and Resource Economics Department, University of Florida, June 1997.

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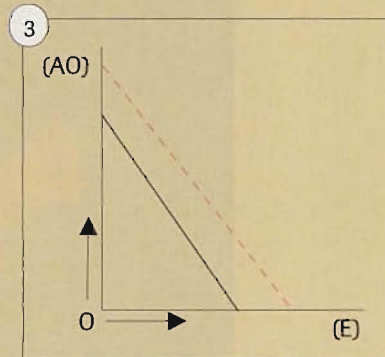# Don't be indifferent to indifference

1. Consider a blank graph showing environmental benefits (E) on the horizontal axis and all other goods (AO) on the vertical axis. Moving away from the origin (O) indicates an increase in the quantity of either (AO) or (E). Moving to point (X) in the body of the graph indicates a combination of (AO) and (E).
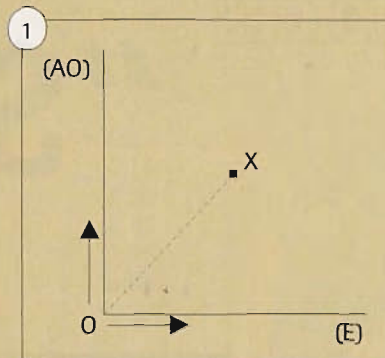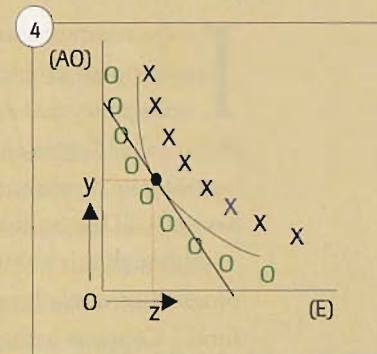
2. The two hypothetical sets of points — Xs and Os — show combinations of environmental benefits and other goods that will provide the same amounts of satisfaction. Since the Xs are farther from the origin than the Os, the curve connecting the Xs indicates a higher level of satisfaction (enjoyment) then the curve connecting the Os. A purchaser is *indifferent* to which combination of AO and E is purchased as long as he or she stays on either the O curve or the X curve since each point along the curve yields the same amount of total satisfaction. Hence the term "indifference curve."
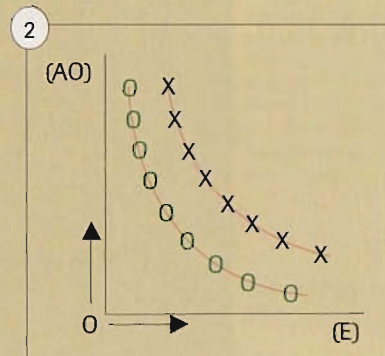
3. The solid "budget line" reflects the price relationship between (AO) and (E) as well as showing, at either end, the total amount of (AO) that can be purchased if all available money is spent on "other goods," or the total amount of (E) that can be purchased if all available money is spent for this purpose. If more money becomes available for purchasing combinations of (AO) and (E), or the price of both drops, the budget line moves to the right (and becomes the dashed line).

4. An individual (or group, or entire society) maximizes its level of satisfaction by selecting the combination of (AO) and (E) shown by the point where the budget line touches the highest possible "indifference curve." This is shown by the heavy dot on the curve between the Xs and the Os. This purchaser will select a combination that includes OY of (AO) and OZ of (E). Selecting combinations from the curve of Os is foolish because more satisfaction can be gained from reaching a point on the solid curve. Any point on the curve of Xs would be superior, but the purchaser has insufficient funds to reach it.