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ASSESSMENT AND FORECASTING OF SOCIAL IMPACTS CAUSED BY ENVIRONMENTAL DAMAGE

Environmental damage, below the threshold of adverse health effects, causes interferences both in the individual and social well-being. This is explained on the basis of types of environmental damage, their perception, the related forms of hazards to well-being and social life. The discussion is concluded with an identification of social groups prevalingly exposed to the risks mentioned.

0. Introduction

Usually, politicians are not very enthusiastic about the findings and statements of social scientists. One reason behind this could be that social analyses very often lead to conclusions which--were they translated into political action--would require considerable improvements of the given situation under debate, more improvements than seem to be possible to bring about within a reasonable period of time. The following considerations, written by a social psychologist, will doubtlessly contribute to the unpopularity of social sciences among decisionmakers. Those who follow its argumentation will find themselves talked into forgetting about most hitherto existing standards of environmental quality and plead for the drastic lowering of these standards.

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(1) The Various Types of Environmental Damage

Humans, especially those living in areas of industrial agglomeration, are exposed to many different kinds of environmental pollution.

- The outdoor atmosphere is polluted with a wide variety of noxious substances.
- The air at certain types of work places is polluted with substances related to specific production programs and processes.
- The air in the spaces where people live is polluted with an equally wide range of noxious substances (a condition known as indoor pollution). Some of this pollution is "imported" from outdoors; some of it, which has only recently become the center of attention, emanates from materials used in furnishing and decorating the interiors of rooms (ingredients of interior paints and special adhesives for wood products, carpets, rugs, and the like). Some of the pollution of indoor air stems from household chemicals contained in a wide range of modern detergents.
- Water bodies are contaminated, partly by the residue of household chemicals, partly by industrial waste.
- Farmland is contaminated because of improper or excessive fertilization and, on the whole, through the water cycle (waste water, evaporation, rain), which also picks up airborne pollutants.
- Pollution of the soil means that food is more or less affected, and not only that of plant origin. The food provided by animals is also polluted, first, because animals consume plants and, second, because animal fodder contains pharmaceutical additives for a wide variety of purposes.
- Finally the city dweller is engulfed by noise.

These are only some of the examples of the environmental pollution from which human beings suffer. The sole purpose of this paragraph was to demonstrate how many different varieties of pollution there are.

(2) Phenomenology of Environmental Damage

The particular meaning the various forms of environmental damage have for the quality of human life in terms of well-being and viable social relations depends on the way the damage is perceived by humans. I distinguish between four groups of ways in which human beings come to be aware of environmental pollution.

- Some types of environmental pollution can be perceived directly. That is, some of them can be seen. Nitrogen dioxide, for example, gives the air yellowish tinge. Some types can be smelled. Hydrogen sulfide smells like rotten eggs, for instance. Noise can be heard, vibrations, felt.

- Environmental pollution affects the human organism and in this way can compromise physical well-being, can lead to somatopsychic and somatic diseases.

- Environmental pollution causes damage in the plant and animal world and brings about material damage. Environmental pollution becomes indirectly visible through such damage.

- A layperson can, but does not always, recognize these signs of environmental pollution as such and, if necessary, take steps on his own to avoid or mitigate the damage. But there are types of environmental pollution that the layperson cannot recognize. These include colorless and odorless air pollution like carbon monoxide, noxious substances in the soil and contamination of food. Avoiding or mitigating the resulting damage by private action is possible only if one has the proper information and the necessary awareness. In lieu of that, the environmental authorities issue warnings and, in serious cases, compulsory regulations for action. Ultimately, such warnings and bans amount to the same thing as the environmental pollution that laypersons can perceive and react to themselves--a great many types of psychic and social interference in human life. They undermine our quality of life.

(3) Social Suffering Caused by Environmental Damage

It is no longer questioned that environmental pollution fosters some specific types of diseases, primarily heart and circulatory diseases, respiratory ailments, and certain kinds of cancer. The suspicion has recently grown that a wide variety of unspecific illnesses like allergies are also attributable to environmental pollution. It is assumed that the incidence of such diseases is promoted by an environmentally-related weakening of the human immune system.

Beneath the threshold of what we are used to calling "regular" physical diseases, the increasing incidence of maladies--headaches, eye irritation, irritation of the respiratory tract, fatigue, and general malaise, for example--is being related to environmental pollution.

At this point, the social scientist inevitably defines an "own" group of damages resulting from environmental pollution. Unlike physical diseases, the damages in this group are virtually unknown and their potential ramifications are barely understood. It is the group of social damages resulting from environmental pollution. Instead of a formal definition of "social damages resulting from environmental pollution", some examples will be given below in order to demonstrate what they could look like.

Illness, for example--for environmental or for other reasons--is not just a biological problem. The more serious the case is, the more it involves considerable social and psychic problems such as stigmatization, curtailment and interruption of activities, sometimes the exclusion from the employment system, and social isolation.

Other relatively important environmentally induced social impacts of environmental pollution identified thus far are:

- Negative consequences of impaired well-being
- Interference in the individual's development and way of life
- Greater amounts of private time and money spent to avoid, eliminate, or compensate for damage caused by environmental pollution
- The threat to the individual's livelihood in certain sectors of the economy.

Impaired Well-Being and Negative Consequences

In a study I conducted in 1980 in Berlin, I found a negative correlation between (sulphur dioxide - SO₂) air pollution and the well-being of the surveyed persons (i.e., the higher the level of air pollution, the lower the level of well-being; see figure 1).

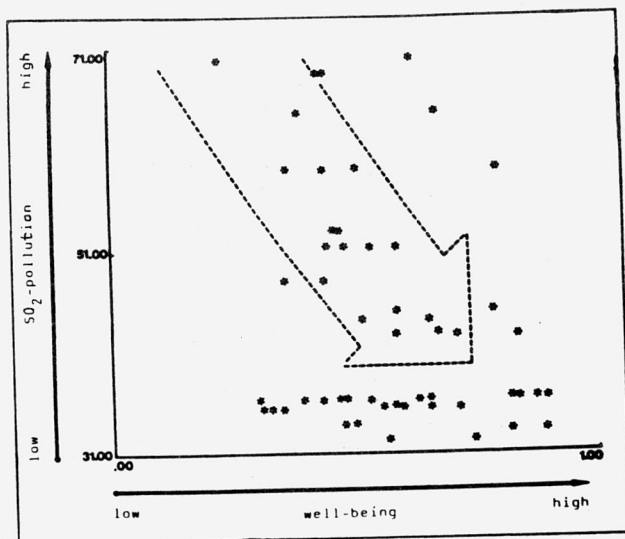
Moreover, the study indicated that people living in areas with high levels of air pollution perceive their entire lives to be more stressful than other people do and that they are also less active in their leisure time (1). All these results are typical omens and symptoms of social contact that is eroding.

fig. 1: Relation Between Air Pollution SO_2 and Well-Being

Scattergram

$r = -.30$
 $r^2 = .09$
 $p = .16$

$N = 52$



The SO_2 and well-being data used are averages of five measurements per person. The well-being data are standardized between 0 (low) and 1 (high). The SO_2 -pollution was measured in the immediate neighbourhood of the test persons. During the time of reference, the pollution varied between 31 and 71 $\mu\text{g SO}_2/\text{m}^3$ on the average.

Without going into methodic details, it should be mentioned that the study surveyed socio-economic factors (by working with a socially homogeneous group of test persons), individual situations and experiences, as well as (other) factors of the urban and natural environment to the farthest possible extent, in order to isolate SO_2 as an explaining variable.

One important point about the above mentioned correlation is that the relationship identified between SO_2 air pollution and well-being comes into effect only beyond SO_2 immissions of 40 g/m^3 on the average. The present SO_2 immission standard in the Federal Republic of Germany is 140 g/m^3 on the average. To meet the well-being criteria, according to this study, it would have to be lowered by two-thirds.

Individual Development and Way of Life

As for the question of interference in the individual's development and way of life, a report on an American study stated that children who live on a street with heavy traffic scored significantly lower on reading and word-discrimination tests than did children who live in quieter areas. Here, too, socio-economic factors could not account for the differences in performance (2).

It is not difficult to imagine what it means when a child does not learn to read and articulate properly. It will have problems in scholastic achievement (at least in the non-mathematical subjects), perhaps later on difficulties in dealing with abstract concepts, eventually a loss in self-confidence; certainly not an optimal basis for a successful private or professional life.

Similar effects might be caused by lead. The theory, albeit still a disputed one, is that lead reduces intelligence. And there are more polluters whose effects point in a similar direction. There is, for example, evidence that the human being's power of concentration, learning ability, and efficiency are impaired not only by noise (above 45 dB), but by carbon monoxide and toluol as well. It is also known that some environmental pollutants like nitrogen oxide, photochemical oxidants, and dioxin contribute directly to the reduction of the human being's psychic stress tolerance.

In addition to such general interference in the individual's development and way of life, environmental pollution also leads to specific restrictions on the freedom of choice. Poor environmental quality and its effects keep one from engaging in outdoor leisure activities. No one can walk in woods that no longer exist. Using one's yard, growing one's own fruits and vegetables, and sending the children to the playground are ill-advised when the ground is contaminated. In the Federal Republic of Germany there have recently been repeated cases in which environmental authorities have issued warnings against pursuing such activities or have prohibited them altogether.

Acute environmental pollution also restricts the freedom of choice where food is concerned. In the Federal Republic of Germany entire

books are now devoted to giving tips on how to avoid pollutants in one's diet.

Other restrictions on the freedom of choice involve the decision on where to live. During, after, and even before the 1950s, for example, the inhabitants of the Bikini Islands (Pacific Ocean) had to move several times because the soil in all directions had been contaminated by atomic bomb tests. Another example: Since it was established that areas with high levels of air pollution have an infant mortality rate noticeably higher than other areas do, West German parents of small children are more frequently considering moving out of such regions.

Even the freedom to plan one's own family can be forfeited because of environmental pollution. The Indian government, after the catastrophe in Bhopal at the end of 1984, when poisonous gas leaked from a Union Carbide plant and killed or injured thousands of people, has advised the women of the region to avoid pregnancy for a seeable future.

It would be difficult to assert that such facts and situations can be harmonized with any concept of the quality of life.

Investment of Private Time and Money

The higher private costs incurred to avoid, eliminate, or compensate for environmental damage is illustrated by the foods on the market that have been specially grown to minimize the pollutants they contain. These foods are more expensive than those handled in the normal manner. The previously mentioned change of residence for environmental reasons does not only mean involuntary uprooting. It also involves time and financial resources that could be invested in another (more pleasant) way.

Changes in nutrition habits and environmentally induced moves are already more or less familiar occurrences. Less familiar is the fact that under unfavourable environmental conditions many routinely used articles wear out more quickly than they otherwise would. Environmental pollution attacks the fibers of textiles, causes leather to become brittle and metal to corrode badly. They are thus more costly to keep in good repair and/or must be replaced earlier.

An extreme case of financial hardship caused by environmental pollution is the threat to the individual's livelihood, a menace that has been growing in certain sectors of the economy dependent on the environment. These include the fishing industry (in cases of intolerable water pollution) and commercial fruit and vegetable farming (in cases of intolerable ground pollution). Tourism in certain areas is also vulnerable to problems induced by environmental pollution. People coming to a certain area in order to spend their holidays in a beautiful forest will stay away after the Waldsterben. Even worse off are mountainous regions which, without the necessary trees, will have to face rockslides.

Clearly, increasing time pressure and financial stress, especially the threat to the individual's occupational existence, are not exactly helpful in cultivating and cementing social relations.

The social impacts of environmental pollution is not a particularly manageable subject. One reason for this is that there are a great many direct and indirect impacts, interrelationships and iterations between various types and levels of effects stemming from environmental pollution. The entire field is one whose individual facets can hardly be fathomed through empirical approaches; it is a complex web in which the difference between cause and effect blurs. Obvious sequences are for example

- physical ailments because of environmental pollution--social isolation, social conflicts and alienation because of environmental pollution--psychosomatic diseases;
- compromise of one's well-being because of environmental pollution--reduced capacity to solve conflicts;
- restrictions on the individuals's development because of environmental pollution--social failure--psychosomatic diseases--somatic illnesses.

This is not to say that environmental pollution is the only reason for social problems, or even the most critical one. On the contrary, in all probability it is more likely that environmental pollution plays a subordinate role in the overall context of social problems. But there is evidence that environmental pollution is the famous straw that broke the camel's back; social problems due to environmental pollution

is the issue that stands at the end of the list after all other every day-problems rooted in the individual's physical and psychic predisposition and in the social setting.

(4) Risk Forecasting and Risk Groups

The factors involved in the potential threat that environmental pollution poses to the quality of life can be inferred from the types of social problems caused by that pollution. In turn, one can gather from those factors which social groups are most likely to be threatened.

Whether--and to which degree--people can become victims of social problems resulting from environmental pollution depends on--

- their physical and psychic constitution;
- their knowledge about environmental pollution and its impacts;
- their knowledge about which types of environmental pollution can be avoided or compensated on a private basis and their willingness to act accordingly (smoking, driving a car, leading a healthy life); and
- the time and financial resources they can invest in avoiding, eliminating, and/or compensating for the impacts of environmental pollution.

Seen in this light, the people most likely to suffer from social problems and the resulting erosion in their quality of life because of environmental pollution are those who--

- have a weak physical and/or psychic constitution; or
- know little about environmental pollution, its impacts, the types of environmental pollution that are avoidable, and the ways to compensate for those that are not avoidable; or
- have little time and/or money to convert their awareness into practice;

or

- finally, the only "insufficiency" vis-a-vis hostile environmental conditions people are free to choose--people who could afford, but are not prepared, to lead their personal lives in a manner sensitive to environmental damages they should avoid and compensate for.

In particular, the people most likely to suffer from social problems and the resulting erosion in their quality of life due to environmental pollution are:

- the very old, the very young, and/or the infirm;
- people with little education and/or information;
- people with little environmental awareness or those in whose lives other problems are more pressing; and
- people with a low level of income and/or a great private or occupational work load.

In other words, this group includes people who are socially underprivileged in the first place. If they live in areas of industrial agglomeration and/or have a highly polluted work place, their chances for enjoying an acceptable quality of life are reduced even further.

The protection of our environment should be so intensive and extensive that such problems no longer play a role.

References

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OCENA I PRZEWIDYWANIE EFEKTÓW SPOŁECZNYCH SPOWODOWANYCH ZANIECZYSZCZENIEM ŚRODOWISKA

Uważa się, że negatywne zmiany w środowisku (poniżej dopuszczalnego progu) prowadzą do obniżenia poziomu życia i dobrobytu jednostek i grup społecznych. Pogląd powyższy został potwierdzony analizą rodzajów szkód oraz ich percepcji i wynikających z nich form zagrożeń dla dobrobytu i życia społecznego. Wyodrębniono i zidentyfikowano grupy społeczne szczególnie narażone na negatywne skutki zanieczyszczenia środowiska.

ОЦЕНКА И ПРЕДВИДЕНИЕ СОЦИАЛЬНЫХ ЭФФЕКТОВ,
ВЫЗВАННЫХ ЗАГРЯЗНЕНИЕМ СРЕДЫ

Обычно считается, что отрицательные изменения в среде (ниже допустимого предела) пригодят к понижению уровня жизни и благосостояния личностей и общественных групп. Это мнение было подтверждено путём анализа видов потерь, а также их перцепций и вытекающих из них форм опасностей для благосостояния и общественной жизни. Выделены и идентифицированы общественные группы, особенно подвергающиеся отрицательным последствиям загрязнения среды.