The Press and Global Environmental Change: An International Comparison of Elite Newspaper Reporting on the Acid Rain Issue from 1972 to 1992

Edited By

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THE PRESS AND GLOBAL ENVIRONMENTAL CHANGE: AN INTERNATIONAL COMPARISON OF ELITE NEWSPAPER REPORTING ON THE ACID RAIN ISSUE FROM 1972 TO 1992

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CENTER FOR SCIENCE AND INTERNATIONAL AFFAIRS
AND
JOAN SHORENSTEIN BARONE CENTER ON THE PRESS, POLITICS AND PUBLIC POLICY

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Despite this assistance, some errors may remain. The responsibility for these is solely ours.

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THE PRESS AND GLOBAL ENVIRONMENTAL CHANGE: AN INTERNATIONAL COMPARISON OF ELITE NEWSPAPER REPORTING ON THE ACID RAIN ISSUE FROM 1972 TO 1992

Foreword

Almost everyone has an opinion on how the press covers public policy issues. Some people believe that reporters and their editors have a preconceived agenda and focus on those facts and stories that support that agenda, while others believe the press is more benign and has a limited effect in shaping public perceptions. Still others embrace the notion that press coverage reflects the biases and viewpoints of the government or the "establishment."

Environmental issues seem to trigger this debate over the accuracy and fairness of the media. Does the press deliberately exaggerate environmental threats? Are they beholden to one political interest or another? Where do reporters get their information? Why do they decide to pay attention to one aspect of a "story" rather than pursue a different tact? Finally, what factors tend to change a reporter's slant on an environmental issue?

Surprisingly, there has been a paucity of analysis about how the press covers environmental issues. Anecdotal descriptions are the rule, not the exception. Prompted by the vacuum in the scholarly literature and fueled by a generous grant from the IBM Environmental Research Program, scholars at Harvard's John F. Kennedy School decided to explore how the press in six different countries covered the issue of acid rain over a twenty-year period, 1972-1992. Under the direction of Prof. William Clark, teams of researchers were formed in six countries to analyze how one or two elite newspapers in each country selected for attention a subset of events, ideas, and perspectives related to the problem of acid rain and how it diffused these perspectives through society at large. The information obtained from each country was then compared to identify the similarities and differences between the countries.

This paper describes the results of this project. Professor Clark and Nancy Dickson plan to publish a book expanding on these themes which should be available in early 1997.

We at the Kennedy School deeply appreciate the confidence and support provided to us by IBM and particularly by Art Hedge (now retired), and Joe Sarsanski without whom this project would not have been possible.

Henry Lee

THE PRESS AND GLOBAL ENVIRONMENTAL CHANGE: AN INTERNATIONAL COMPARISON OF ELITE NEWSPAPER REPORTING ON THE ACID RAIN ISSUE FROM 1972 TO 1992

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Editor's Introduction

"The Acid Rain Situation in the Netherlands is Unique" headlined a 1990 article printed in the Dutch national newspaper De Volkskrant. Reporting on a government-sponsored study of acidification in the Netherlands, the article alerted the public to the unique role played by Dutch agricultural activities in the acid rain problem as well as the seriously underestimated impacts on the country's forests, groundwater, lakes, agricultural crops, and buildings. Yet by 1992 media interest in acid rain had practically disappeared. "What Ever Happened to Acid Rain?", a question posed in a 1992 article, vividly demonstrates this phenomenon. This chapter examines the seemingly unique features of the Dutch acid rain problem and the role government and interest groups played in placing the issue on the policy agenda. It then reports on a content analysis of press coverage of acid rain from 1972-1992, as well as findings from related research, that have shed new light on the relationship between media coverage and the policy process.

1 INTRODUCTION

Acid rain policy in the Netherlands evolved gradually, with air pollution control legislation in the 1970s directed toward mitigating pollution impacts experienced by residents of the highly industrialized areas of the country. By the early 1980s, Dutch and German media were suggesting a linkage between acid rain and Germany's problem of forest dieback. The argument for stronger environmental policy response was strengthened by the government's 1983 study on the acid rain problem in the Netherlands and a parliamentary motion passed that year urging government action. By 1984, the acid rain policy was formally in place, and over the next decade the government plans would focus variously on the acid rain problem. To support the early policy responses, the Ministry of Environmental Affairs conducted public education campaigns the mid-1980s. Press coverage reached a high, peak volume at this time but would gradually decline as attention turned towards the emerging global problems such as ozone depletion and climate change.

In 1990 research shed new light on the acid rain problem. Not only were acid deposition levels higher than previously estimated but also the contribution from emission sources was different than earlier estimates had suggested. Surprisingly, ammonia emissions from the country's highly intensified livestock farming were the major pollution source, while the emissions from transport and industrial activities were lower than expected. In 1990 ammonia accounted for nearly half of the acid deposition on soil surfaces in the Netherlands, followed by sulfur dioxide (30 percent) and nitrogen oxide (22 percent). About 45 percent of all acid deposition in the Netherlands originated from foreign-based emission sources; of this total, the United Kingdom and Ireland together accounted for 15 percent, Germany for 11 percent, Belgium for 7 percent, France for 6 percent and Eastern Europe for 1 percent. Domestic sources were responsible for more than half of the acid deposition in the Netherlands, agriculture leading the group with 32 percent, transport with 10 percent, refineries and electricity plants with 4 percent, industry with 3 percent and households with 2 percent. In contrast, the Netherlands exported nearly three quarters of its acid-causing emissions, aggravating the acidification problems mainly in neighboring Germany and the former Czechoslovakia (Heij & Schneider 1990).

2 CONTEXT

2.1 The Political System

The Netherlands is one of the world's most densely populated countries. A member of the European Union (EU), the country is bordered by Germany on the east, by Belgium on the south and by the North Sea on the west and the north. Formally, the Netherlands is a constitutional, hereditary monarchy. Constitutionally, the country is a parliamentary democracy with a multiparty political system. The Head of State is not responsible politically for government policy; responsibility rests with the cabinet ministers. The legislative branch is composed jointly of the government and the two-chambered States General, the latter serving the citizenry through proportional representation. Executive power, in principle, is vested in the King; in practice, the government ministers exercise this power. The judicial branch is composed of (politically) independent judges, who are appointed for life by the Head of State.

Dutch politics changed markedly after World War Two, as traditional concepts of societal segmentation and secularization were abandoned in favor of more democracy and public involvement in the policy process. Indeed, the old politics of reconciliation and depoliticized action were steadily supplanted by a trend toward politicized and polarized activity. The principle of openness and transparency for the constituency underpinned all political activity, and the public was able to closely monitor government action and to respond quickly. These developments gave impetus to an increasingly larger number of extraordinary parliamentary actions that occurred during 1972-1992. Both center-right and center-left coalitions of political parties served in government.

2.2 Environmental Policy and Acid Rain

Environmental policy in the Netherlands is attuned to that of the governments of the other EU member states. Yet Dutch environmental policy responses often go beyond those in place or envisaged in other countries. The Netherlands' standpoint is understandable. Because of its high population density and large scale of industrialization, the country is not only a major polluter but also a direct recipient of pollution impacts at a noticeably faster rate than most other countries.

Historically, the Netherlands has actively participated in, and at times initiated, deliberation on international environmental policy and research. Dutch support for international action on the acid rain issue is exemplary. More than once, the then Minister of Environmental Affairs stressed the importance of international policy on acid rain. He was aware of the potential of the Netherlands to act as a role-model by establishing national emission standards for sulfur dioxide, nitrogen oxide, and ammonia.[2] Given the country's success in domestically controlling several environmental problems, Dutch politicians have influenced international deliberations on a number of environmental issues.

Acid rain policy emerged gradually, beginning with the 1896 Nuisance Act to reduce air pollution (Van der Straaten 1990). After World War Two as industrialization accelerated in the western part of the Netherlands and residents soon experienced the pollution impacts, Parliament enacted the 1972 Bill on Air Pollution. Pressure from environmental advocates to tackle air pollution influenced both public opinion and parliamentary decisionmaking. At that time environment policy centered on limiting the human health risks associated with air pollution. The Bill obligated the government to report every five years on the air pollution problem and solution strategies. Generally speaking, these reports, prepared under the auspices of the Minister of Environmental Affairs, did not define policy responses but rather provided broad statements about policy priorities. Policy implementation would require separate legislation.

Subsequently, the government established a five-year planning process to control air pollution. The first Indicative Five-Year "Program Air" (1976-1980) dealt with the risks of acid rain on the health of humans, plants, animals and natural resources.[3] Among other things, the Program attempted for the first time, albeit unsuccessfully, to estimate ammonia emissions caused by the country's highly intensified livestock farming. The second Indicative Five-Year "Program Air" (1981-1985) mentioned the linkage between air pollution reduction goal achievement and environmental policy responses.[4] Standards would be set for both emissions and air quality. Fossil fuel combustion was identified as the major cause of acid rain, implying the need for energy policy response to help reduce air pollution. In 1983, a motion introduced in the States General by De Boois (representing the social democratic opposition party) strongly urged the government to implement a program for controlling acidification in the Netherlands. The motion was carried almost immediately.

The third Indicative "Program Air" (1984-1988) concentrated on air and soil acidification.[5] A maximum permissible level (a so-called "critical load") of soil acidification was established; the concept of an acid equivalent was introduced to bring all acidic substances under one denominator. The Program specified a maximum permissible level of 1800 acid equivalent; at that time, the overall acid deposition level in the Netherlands was estimated at 5800 acid equivalent. The Program thus underscored the need to reduce soil acidification levels by a factor of three to four.

The year 1984 marked the formal initiation of the Dutch anti-acidification policy, with the government formal report to the States General on the acidification problem.[6] Among other things, the 1984 acidification report estimated the (then) current and projected (1985 and 1990) emissions of sulfur and nitrogen oxides and ammonia as well as their potential impacts. Cost estimates were made of acid rain-related damages to agriculture, nature, the cultural heritage and utility goods that would be incurred if there was no change in policy direction. As for policy responses, the acidification report proposed measures for reducing emissions from both transport activities (e.g., catalytic converters for automobiles and speed limits on highways) and from agricultural activities although no concrete proposals were made for reducing ammonia emissions. It is noteworthy that the fourth Indicative Five-Year "Program Air" (1985-1989) devoted considerable attention to the international nature of the acidification problem.[7] In this period it became clear that acidification is a transboundary problem, requiring solutions on an international level. Emission reduction factors were increased to 3.5 for sulfur dioxide, 1.5 for nitrogen oxide, and 2 for ammonia.

The integration of environmental policy response began in 1985 when the Ministry of Environmental Affairs issued the Indicative Five-Year "Program Environment" (1986-1990).[8] Dutch environmental policy, as defined then, would examine problems from the twofold perspective of emission sources and their impacts. Source-oriented policy would make target groups responsible for the environmental damage based on the principle that the polluter must pay. As for the polluters, namely, refineries, electricity generating plants, agriculture and transport, the government would support their remedial actions through subsidies, incentives and communication strategies. The Environmental Ministry remained stanched its view that a policy change was needed to avoid more costly damages. Looking to 1990 and even further to 2000, it predicted that the emission reduction goals set forth in the previous Program Air (1985-1989) would not be achieved under the current policy direction. Significantly, measures to reduce animal manure emissions were a mute point in this Program. For transport activities, policy responses included promoting the wide-scale use of public transport, car-pooling and increasing costs for private car use.

The subsequent Indicative Five-Year "Program Environment" (1987-1991) described the decline of Dutch forests and suggested measures to help address this problem.[9] It referred to new research findings on the seriousness of the acidification problems in certain areas of the country and the

concurrent need to reduce ammonia emissions in the year 2000 by 70 percent relative to the 1980 level. Given the inability of environmental policy so far to tackle acidification problems related to increased activities of industry, transport and agriculture, it was concluded that the desired emission reduction goals would not be met. Thus in spring 1989, the government presented its first "National Environmental Policy Plan", which offered explicit policy options for reducing acidification.[10] This was soon augmented by the National Environmental Policy Plan "Plus". As 1992 drew to a close, the 2nd National Plan was in preparation and a strengthening of acid rain controls seemed inevitable.[11]

2.3 Government, Interest Groups and the Policy Agenda

Historically two competing groups have characterized the debate on acid rain in the Netherlands. One pole has comprised the Ministry of Environmental Affairs, environmental advocates and scientists; at the other pole, the Ministries of Agriculture and of Transport held a common position together with their related interest groups. The terms of the debate have been largely defined by both the prevailing scientific state of the art and the perceived need for certain actions or for "no-action" as the proper policy response.

2.3.1 Government Actors

In 1984, the then Minister of Environmental Affairs, representing the conservative party in power, having witnessed the forest decline in Germany, became convinced that the acid rain issue had to be put on the political agenda. The Minister's stance was impressive. At that time the government had a center-right leaning and was not inclined to advance policy responses that could hurt its supporters (i.e., industry, agriculture, transport and other target groups). Likewise, the opposition party did not support these policy responses. For example, a fraction of the conservative political party in the second chamber of the States General openly opposed the policy of its own Minister. Members of conservative party finally convinced this party fraction to act on behalf of the environment and to cease criticizing the Minister and support his efforts.

To help gather support from the public and the legislative branch, in 1985 the Ministry of Environmental Affairs began a series of public education campaigns on acid rain. These campaigns, together with their high volume of press coverage, succeeded in gathering the desired support for policy response. External factors also helped, as Dutch politicians could not ignore the vast publicity given in Germany and in the Netherlands to the forest dieback problem in Germany. Later, the Dutch Institute for Public Opinion Research (NIPO) evaluated the campaign effectiveness; while it successfully introduced the rubric "acid rain" into the vocabulary of 98 percent of the Dutch people, many people were led to hold somewhat biased opinions about industry and transport emissions as the primary cause of acid rain, rather than agricultural activities or fossil-fuel power generation.[12]

For the Ministry of Transport, the controversial issues were the level of contribution of transport activities to the acid rain problem and precise actions needed to control automobile emissions. In the early stages of debate the Ministry of Agriculture, which represents agricultural economic interests, opposed decreasing the number of livestock. Gradually more information was forthcoming about the effects of intensified agriculture on acidification and the problems caused by large amounts of livestock and their ammonia emissions. In 1990 the Ministry of Agriculture acknowledged the need for more effective policy responses. Still, these policy responses were implemented slowly.

The Ministry of Agriculture and the Ministry of Traffic formulated policy for their own area. A somewhat unique feature of the Dutch political system has been the so-called policy unity whereby a proposed policy represents consensus of the concerned ministries. For the Dutch acid rain policy key

initiatives included the "Plan to Reduce Ammonia Emissions" issued by the Ministry of Agriculture in 1990.[13] the Program "Third Phase Manure and Ammonia Policy" issued by the Ministry of Agriculture in 1993;[14] and the "Structural Plan for Transportation II" issued by Ministry of Transportation in 1990.[15]

The Forestry Commission was created in 1899 to maintain the well-being of State forests; later its responsibilities were expanded to include all Dutch forests, nature reserves, and the like. In 1982 the Commission became part of the Ministry of Agriculture and in 1983 the Commission began its now customary annual reporting on Dutch forests. For example, the Commission's findings for 1984-1994 showed that on average one half of Dutch forest was less than vital. As knowledge increased about the impacts of agriculture activities on the Dutch acid rain problem, the Forestry Commission increasingly opposed the reserved policy of the Ministry of Agriculture of which it was part.[16]

2.3.2 Scientific, Environmental and Other Actor Groups

Since the end of the 1980s, scientific research on acid rain in the Netherlands was coordinated by the State Institute for Public Health and Environmental Hygiene. Several environmental organizations in the Netherlands were actively engaged with the acid rain issue, deploying publicity tools and lobbying techniques to influence the political process. For example, the organization "Nature and Environment" periodically issued research findings, policy priority statements and critiques of government bodies, industrial polluters and other target groups. Similarly, "Environmental Defense" and "Greenpeace" (operating locally and internationally) gained media headlines with their actions aimed at convincing government and the public to endorse their position. An automobile lobbying group comprised mainly of importers and vendors worked to influence government policy in support of its position on the anti-acidification policy.

The Agricultural Authority also influenced the policy debate on reducing manure emissions. Created in 1954 under public law, the Authority is supervised formally by the government and holds authority over farmers, horticulturists and their employees. In practice, the Authority represents the interests of these groups.

2.4 Newspapers In the Netherlands

Six major national newspapers and at least one newspaper in each region serve readers throughout the country. All of the major national newspapers are headquartered in the western region of the Netherlands. In 1989, for example, the daily editions of the national and the regional newspapers had a combined circulation of 1.9 million and 2.6 million respectively; by 1993, circulation nationally had risen to 2.0 million while that of the regional papers declined slightly to 2.5 million. Among national newspapers, *De Volkskrant* is third with a daily circulation of 350,000, outranked by *De Telegraaf* and the *Algemeen Dagblad*.

Research in the 1980s found that the public considered newspapers an important and reliable information source, despite the extensive deployment of other media, particularly television (NOS 1982). In 1993, some 89 percent of all newspaper sales were subscription based, with newsstands and kiosks accounting for the rest of the distribution. Because of their wide circulation Dutch newspapers broadly disseminate information. This also serves to strengthen their market position. By our own observation, we know that most politicians read *De Volkskrant* daily, a morning newspaper with a large national distribution. For the average person in the Netherlands, newspaper reading is a daily ritual, and most people spend on average one half hour daily reading at least one newspaper.

During the study period, the country witnessed a process of newspaper concentration. Responding to growing pressure on their revenues from television and radio advertisements, several newspaper companies merged their operations. From 1946 to 1989, the number of privately owned newspaper companies plummeted from 81 to 20, while the total number of newspapers declined from 124 to 82. Of these 82 newspapers, only 45 have their own staff; the other 37 newspapers serve as regional editions of the national newspapers. In 1988, the top four newspaper companies owned 60 percent of the market. By 1992 most regions had only one newspaper, the result of both the trend towards press concentration and social and economic considerations (Bakker 1993).

Prior to 1960 the Dutch press was either religiously or politically oriented, with most social movements arising from either political or secular considerations. Indeed, by the end of the 19th century, so-called "persuasive newspapers" prevailed, their goal being to foster the organization and commitment of the rank and file of their specific ideological group. Beside common news, these newspapers published articles on political, social and cultural events within their own movement. The 1960s saw a gradual but steady decline in newspaper commitment to a social movement, such as labor unions or a specific political party. Similar strides toward autonomy took place within newspaper companies, as editorial staff became more independent and proactive in editorial matters. In 1977, contractually newspaper journalists and editors assumed full responsibility for their newspapers' content while newspaper companies were entrusted with commercial activities.

Although all Dutch newspapers offer a variety of reports, newspapers are distinguishable by the type of information published. One group consists of the popular, general interest newspapers which emphasize human interest stories, amusement (e.g., cinema, cartoons) sporting events, and practical information (e.g., weather reports). The second group, the so-called "quality" newspapers, offer readers more policy-oriented information on, say, social and political issues, organizations and their key actors.

Previous research conducted by several researchers of the Department of Psychology has yielded further insights on the environmental reporting by Dutch newspapers. The first study, from 1977 to 1984 that was sponsored by the Ministry of Environmental Affairs (see Wiegman et al. 1989), analyzed articles on environmental hazards and risks, for example, by hazardous industrial complexes, raw material mining and processing, transport of hazardous industrial products, dangerous or toxic chemicals, radioactive materials, wastes from industrial material production, and certain chemical use. Also selected for study were articles on the risks, mitigation efforts and impacts of other industrial activities that lead to the pollution of soils, air and water, and chemical wastes. Four newspapers were selected for this analysis: *De Volkskrant*; the national newspaper *De Telegraaf* (a conservative popular newspaper); and two regional newspapers from areas with specific environmental risks. A second study by the same research group, sponsored by the University of Twente, continued the content analysis, focusing exclusively on the environmental reporting in 1989 in only *De Volkskrant* and *De Telegraaf* (see Gutteling & Caljé 1993).

Several major findings emerged from this related research that have salience here. For the years 1977-1984, 4318 articles were selected from the four newspapers. From the sampling method applied, it was estimated that this total represents some 50 percent of all the articles published on environmental risks in these Dutch newspapers. The four newspapers differed significantly in terms of the amount of coverage. *De Volkskrant* published the largest number of articles on environmental risks in this period (n=1496). Comparatively speaking, *De Volkskrant* published three times as many articles and five times as many printed lines as *De Telegraaf*. The numbers for the two regional newspapers fell between those for *De Volkskrant* and *De Telegraaf*. In 1989, *De Volkskrant* published 729 articles on environmental risks, and *De Telegraaf* 380 (based on 100 percent sampling). Mainly

negative effects of environmental risks were emphasized in the environmental reporting during those times. Indeed, some 90 percent of the selected articles focused on pollution causes, risks and incidents. Articles dealing with possible solutions and control of environmental risks were printed infrequently. Generally, during 1977-1984 there was more press coverage of pollution issues (mainly soil pollution) while articles on incidents involving damage or victimization of people decreased. Throughout the period, attention to risks generally remained constant. However, throughout this period and also in 1989 the emphasis shifted from the risks posed by hazardous industrial complexes to the risks posed of soil pollution in residential areas.

2.5 The Selected Newspaper: *De Volkskrant*

De Volkskrant was selected for study because of its strong emphasis on environmental issues (as compared to other Dutch newspapers, see previous paragraphs), its highly educated national readership, its prominence on the national newspaper circuit (the third largest circulation) and its influence on the policy agenda. *De Volkskrant* was founded as a newspaper serving the explicit interests of the Roman Catholic population in the Netherlands. After 1960, Dutch newspapers were no longer divided along political and secular lines and could address broader public issues. In 1965 *De Volkskrant*, which was then owned by a catholic labor movement, deleted its subtitle "Catholic Newspaper for the Netherlands". Dramatic changes followed, and *De Volkskrant* emerged as a liberal, left-of center newspaper. As the first national Dutch newspaper on 2 October 1975 *De Volkskrant* adopted editorial bylaws, among other things comprising a declaration of identity of the newspaper (see Hemels 1981). The declaration of identity of *De Volkskrant* is as follows: *De Volkskrant* is a national daily newspaper, which has the objective of informing the readers as fair and versatile as possible. *De Volkskrant* did arise from the catholic labor movement. Among other things for that reason, *De Volkskrant* wants to be progressive and mainly plead for those oppressed and whose right are violated. *De Volkskrant* is independent is its opinions. In particular *De Volkskrant* aims to stimulate developments which are promising a more humane society.

From 1966 to 1971, *De Volkskrant*'s editor of the foreign affairs section also wrote scientific articles; in 1971 he concentrated on scientific topics. During this period technological developments in armaments and the Club of Rome's global study (see, e.g., Meadows et al. 1972) were popular topics. In 1977, *De Volkskrant* launched a half-page weekly column on scientific issues, expanding this in 1981 to a full section entitled "Science and Society" that appeared in the Saturday edition. (In 1988, this section was renamed "science".) Since then, two editors and a team of regular science reporters have written articles covering up to four pages per edition (Heuvelman & Van der Staak 1992). Then, environmental and medical reporters regularly contributed articles to the section as *De Volkskrant* did not have an environmental section or column. In 1985, a reporter was assigned to cover all issues related to the environment and nature. By 1989, this staff consisted of two such assigned reporters who wrote articles for both the Saturday Science section and the general news coverage of the environment and nature, giving equal time to both types of coverage. Other reporters wrote articles on acid rain for the general news coverage, for example, as part of their work as a foreign correspondent or as contributing writer for the science section. Basically, *De Volkskrant*'s editorial policy then was to treat all issues competitively and objectively. During the study period, in all twenty two reporters wrote articles on acid rain, of which ten were foreign correspondents and five were reporters for the science section.

According to the environmental journalist interviewed, the process of news selection, researching and writing of articles on environmental issues closely resembles that for articles of general news coverage. One approach is for the journalist or his/her editorial staff to initiate the process, prompted by news obtained from foreign media, wire services, or clipping services. More information is

gathered on the subject, or example, by seeking out other sources. In deciding whether to write an article, the journalist and/or the editorial staff obviously consider potential reader interest in such an article and, say, whether the newspaper would be willing to assume the watchdog role which publication of certain articles normally engenders. Alternatively, individuals or organizations contact a newspaper journalist and/or the editorial staff. Government officials and environmental advocates have tended to prefer this approach. Two possible publication routes normally would be available: the issue would be slotted for coverage in the daily edition of the newspaper, competing for placement with other news items; or the newspaper's editor(s) would decide to assign the issue feature status in the Saturday science section.

A profile of the readership of *De Volkskrant* appears in Table 1. Five groups were defined according to the professional or educational status of the family head, ranging from economically well-suited, through the middle class and ending with the group of uneducated and unemployed individuals. More than two thirds of *De Volkskrant*'s readers were categorized as middle and upper class (Kaiser 1990). The research also established a relationship between socio-economic grouping and interest in specific topics. For example, environmental and scientific issues were of great interest to those in the higher socio-economic groups, while they had much less appeal to lower class groups.

3 ANALYSIS OF PRESS COVERAGE OF ACID RAIN

3.1 Methodology

The archives of *De Volkskrant* were used for article selection. Files were made available on acid rain, covering 1982 - 1992. For the period before 1982, use was made of the files on air pollution, energy and environmental conferences. The articles were copied and coded according to the Research Protocol. Data were entered in the project's Notebook database. Since this method did not systematically provide information on article placement, no analysis was made of this point. The selected data were compared with those from two related studies of environmental issues carried out by the authors for the period 1977-1984 and for 1989. (See Section 2.4.) Although the sampling procedures for the related research and for the present study of acid rain are different, a similar pattern of article distribution could be observed. Thus, it was concluded that the archives of *De Volkskrant* were a reliable basis for the content analysis.

Information on the nine individuals interviewed appears in Table 2: the interviews helped to clarify the role of the actors in the acid rain press coverage and the impact this coverage had on environmental policy in the Netherlands. Each individual was interviewed in his/her working environment according to the project 's interview protocol. Interviews were taped, and averaged one hour.

3.2 Issues In Perspective

All told, 299 articles were selected and processed. Most of the articles (73 percent) appeared as news stories; only 15 percent were features which typically dealt less with events than with the actual story and presented the journalist's opinion. Only 5 percent of the articles reflected interviews and 3 percent were so-called letters to the editor. Most (88 percent) of the articles were written or edited by the staff of *De Volkskrant*; only a small percentage (9 percent) were picked up directly from (inter)national wire services. A very small group (3 percent) of articles came from other sources (mostly environmental advocates), mainly as letters to the editor.

3.2.1 Timing

The first appearance of an article on the subject of acid rain was in 1976, although the rubric "acid rain" was not used until 1978. Referring to the situation in Scandinavia, this 1978 article cautioned about future problems of acid rain. As Figure 1 illustrates, the highest volume of press coverage occurred during the mid-1980s. Indeed, during the early and mid-1980s, the issue of forest dieback in Germany had received considerable media attention in Germany as well as in the Netherlands. Peak coverage (the first) occurred in 1984 (71 articles), at the time of the Dutch government's announcement of its Acidification Report and, de facto, the official start of the implementation of its acid rain policy. (See Section 2.2) A second, less pronounced peak in press coverage occurred in 1988. Some 50 percent of the articles then reflected media interest in acidification from the perspective of the newly defined link between acidification and animal manure emissions. After 1988, media interest in acid rain waned partly because of the expanding interest in the global issues of the greenhouse effect and ozone depletion. "*Whatever Happened to Acid Rain?*", the title of an article *De Volkskrant* printed in 1992, poignantly conveyed this dramatic decline of press interest in acid rain (*Volkskrant* 28 March 1992). In the article several reasons for this decline in interest were mentioned. It was stated that the climate issue scientifically would be more interesting than the acidification issue. A second argument was that the level of public involvement in the acidification issue seemed to have declined in recent years. And thirdly the first effects of governmental acidification policy became apparent; the levels of emitted sulfur dioxide had been reduced significantly in the last years of the 1980s.

For the previously performed content analyses, the aim was also to understand how *De Volkskrant* and the other newspapers treated air pollution related issues (acid rain, ozone depletion, the greenhouse effect). The data of these studies showed that of these air pollution issues acid rain was by far the dominant topic during 1977-1984 (Gutteling and Caljé 1993). The situation in 1989 is reversed, as the issue of the greenhouse effect attracts the most attention (some 10 percent), followed by ozone depletion (3 percent) and acid raid (some 2 percent). Most of the articles on ozone depletion and the greenhouse effect focus on the pollution aspects of the problem, and only occasionally mention the risks for (human) health. However, it is noteworthy that the selection procedures for this related research excluded animal manure and agricultural issues.

Declining public interest in the acid rain issue over this period can be also be observed in the findings of a government sponsored study of public interest in some 50 issues, which is performed yearly since 1984 (NSS/Marktonderzoek). Whereas in 1984-1985 the highest interest ranking is shared among the issues of the environment, acid rain and public safety, interest in acid rain peaks in 1989 (at 45 percent) and declines thereafter. The previous content analysis research also showed that the year 1989 witnessed a significant increase in number of printed lines devoted to environmental risks in both *De Volkskrant* and *De Telegraaf* (see Gutteling & Caljé 1993). This suggests that interest of the news media in environmental issues grew strongly from 1985 to 1989. The government sponsored survey data suggest, however, that this declining interest in acid rain was due to its displacement by other environmental concerns, rather than a decrease in overall attention to the environment. Indeed, environmental issues in general receive increasing attention throughout the survey period, and by 1992 have emerged as the single topic most engaging the highest proportion of the population (59 percent).[17]

During the project interviews, explanations were given for this phenomenon. One view was that press coverage of an environmental issue follows a lifecycle that corresponds with that of the policy process (Winsemius 1985). During the stage of initial policy formulation vast amounts of often controversial data are available and the scientific and political debate is generally stimulating and

hence newsworthy. During the next stage of policy implementation, there is generally (less newsworthy) scientific and political consensus. For several interviewees, the Dutch anti-acidification policy was now in the policy implementation phase as opposed to the policy formulation stage for global environmental issues such as ozone depletion.

Still other interviewees suggested that the period of arrival of the new Minister of Environmental Affairs in 1989[18] signalled a new policy emphasis on global climate issues. As a result, there were fewer research grants and opportunities for researchers to report findings on the causes-effects of acid rain. Yet other interviewees strongly challenged this reasoning, arguing that the global issue of the greenhouse effect had been on the policy agenda and enjoyed press popularity long before the new Minister of Environmental Affairs had taken up his post. The data of the press analysis on global air pollution issues by Gutteling and Caljé (1993) seem to support this last claim.

3.2.2 Framing

To understand how the issue of acid rain was framed by the press, three keyword groups were selected that reflected popular portrayals of the problem of acid rain in the Netherlands: "sulfur dioxide/natural gas/coal", "forests", "intensive cattle breeding/manure". The keyword selection was based on the account of Dutch acid rain policy developments presented earlier in Section 2.2. The analysis of these keywords for the entire study period shows that both "sulfur dioxide/natural gas/coal" and "forests" were mentioned in about a quarter of the articles (i.e., 71/299 for each) while "intensive cattle breeding/manure" appeared rather less often (39 articles). As illustrated in Figure 2, however, the dominance of these frames changes through time. The early discussion of acid rain in the framework of sulfur dioxide/natural gas/coal is related to Dutch policy emphasis on energy conservation starting in the 1970s. Rigorous efforts were made to conserve natural gas, which was not only the country's only indigenous natural energy resource but also its most widely used energy source. Coal increasingly substituted for natural gas in energy supply, particularly for electricity generation. The oil crises of the 1970s accelerated this shift. In a 1976 article the Council for Advice on Environmental Planning expressed concern about the increasing air pollution implied by this shift from natural gas to coal. It cautioned against escalating emissions of sulfur dioxide and the potential environmental consequences. Yet it would not be until 1984 that the Dutch government reported on acidification and set in motion its anti-acidification policy (see Section 2.2).

As to framing of the acid rain issue in terms of forest dieback, the highest volume of coverage appeared around the mid- to late 1980s, with the topic of forest related damages gradually losing most (but not all) of its media appeal by the end of the study period. This can be attributed largely to the linkage of policy formulation in Germany and the Netherlands and their mutual support during international discussions of the issue. Indeed, both the Netherlands and Germany pioneered in formulating anti-acidification policy in the mid-1980s. In the interview with the (then) Minister of Environmental Affairs, he described Dutch policy as "Germany plus three months"; his goal was to introduce policy measures in the Netherlands shortly after they had been executed in Germany. The public education campaigns conducted by the Ministry of Environmental Affairs during the mid-1980s also underscored the linkage between acid rain and forest dieback.

The acid rain-manure emissions framing was noticeable during the early 1980s but became particular strong later in that decade. During 1972-1992 the size of the Dutch livestock grew significantly: however, unlike Dutch meat, eggs, and dairy products, animal manure was not exported, so that large surplus accumulated.[19] By the mid-1980s, even the press began to view this situation with alarm. By the end of the 1980s and the early 1990s, ammonia emissions from manure were considered the prime cause of acidification in the Netherlands. Peak press coverage of this topic occurred around 1987-1988.

A more detailed examination of the "framing" question was carried out by analyzing a wider range of causes, impacts, and options mentioned in the articles of the period.

Figure 3 illustrates how the articles treated the causes of acid rain. Electricity generation was mentioned most frequently (54 percent) as a possible cause, followed by automotive transport (31 percent); and intensive cattle breeding (32 percent). Significantly, by the end of study period intensive livestock breeding (coded as other causes in the figure) was referred to as the main cause for acid rain in the Netherlands. Other causes (e.g., household and other combustion, industrial processes) together account for only a small percentage and natural causes of acid rain damage for even less. As can be seen in figure 3, the relative interest in electricity generation declined during the research period, while the interest for livestock-related issues increased. This finding is in agreement with figure 2.

References to acidification impacts on forests appeared in the selected articles only after 1982/1983. (See Figure 4.) Forests were identified as impacted ecosystem in 43 percent of the articles, followed by other ecosystems such as Scandinavian and Canadian lakes and Dutch fens (14 percent). Risks to human health posed by acid rain were mentioned infrequently (5 percent), mostly at the end of the 1970s. All together, the secondary impacts (e.g., decline in quality supplies of groundwater and drinking water, erosion, avalanches, economic damage) were rarely mentioned (6 percent) and some 9 percent of the articles referred to impacts on historical buildings and monuments.

In contrast, the results for options were less pronounced. As Figure 5 shows, emission reduction technologies for power plants were mentioned in 24 percentage of the articles, while emission reduction technologies for automobiles were cited in 11 percent. Some 15 percent of the articles referred to other technologies to reduce pollution at the source such as fuel switching and the use of renewable energies. Very few articles mentioned technologies for mitigating acidification at the impact level (3 percent), which is not surprising considering the relatively low priority the Dutch policy attributes to impact measures. Domestic regulations for emission standards for power plants and automobiles were mentioned in 16 percent. International regulations were mentioned in 12 percent. For perspective, in some of the articles it was stated that politicians sometimes used international regulations as a non-option for dealing with acid rain at the national level, the argument being that once international regulations existed no action would be needed at the national level. Other regulatory activities or lawsuits were mentioned in 14 percent of the articles. Behavioral change as an option in the acid rain debate was seldom mentioned (5 percent) slightly less than half of these linked to the Ministry of Environmental Affairs's education campaigns in the mid-1980s.

Then too, during the late 1970s and early 1980s, environmental advocates in the Netherlands worked hard to put acidification and air pollution on the policy agenda. Initial efforts concentrated on persuading polluters (e.g., electricity plants, refineries) to employ desulfurization techniques for combustion gases whenever company permits came up for renewal. However, the environmentalists were unsuccessful in convincing the Council of State, the highest Dutch institution for administrative law, to alter these permits partly because at that time the impact of acidification was not yet fully appreciated. The issue of forest dieback in Germany developed throughout the 1980s, which would help to attract attention to the efforts of environmental advocates in the Netherlands to combat acidification problems.

As for the general scope of the articles, some 80 percent of the articles have a domestic scope. Thirty-two percent of these articles mentioned the transboundary aspects, and international aspects were mentioned in 14 percent (see Figure 6). Coverage of acid rain in other countries (7 percent of the articles) shows slight peaks in 1983 and 1986. Most of these articles dealt with forest dieback in Germany or the acid rain debate involving Canada and the United States.

3.2.3 Slant

A proactive stance was expressed in 74 percent of the articles. Another 20 percent adopted a neutral stance while 6 percent called for no action (see Figure 7). Among the reasons for the no-action position were that the solutions were too costly, scientific uncertainty, and acid rain was a non-problem.

Most articles showed no bias with regard to the main actor groups (i.e., environmentalist, government and industry). (See Figure 8.) These results are not astonishing given *De Volkskrant*'s editorial policy to report the news as objectively and comprehensively as possible and to exploit all information sources on both sides of the debate. However, as the data suggest *De Volkskrant*'s historical link with labor and its subsequent editorial bylaws may have been at the root of what seems to be a modest reporting bias against government and industry since 1981. A possible explanation is that several environmental organizations as well as the State Institute for Public Health and Environmental Hygiene openly criticized the Dutch anti-acidification policy for its weakness in protecting the environment.

3.2.4 Sources

Government actors were the dominant source quoted directly or indirectly in the articles on acid rain (in 48 percent of the total number of articles analyzed), followed by environmental organizations (27 percent) and scientists (24 percent). Figure 9 contains the timeline for sources. From these actor groups, the former Minister on Environmental Affairs (1983-1986) is the most frequently quoted actor (23 counts); other representatives of the Ministry of Environmental Affairs were also often cited (different persons, in total 28 counts). The general manager of the Forestry Commission was quoted 5 times in the articles; the acid rain specialist of the environmental organization "'Nature and the Environment" in 13 articles, and the biologist who first pointed to the impact of ammonia on forests in 5 articles. Several actors from the emitter industries were quoted in 45 times (15 percent of the articles), although no one individual was cited more than twice; the members of the Dutch Parliament accounted for 13 percent. In contrast, impacted industries and spokesmen from international organizations were rarely quoted.

The findings on the dominance of the government actors is not surprising. For one thing, the Ministry of Environmental Affairs' communication strategy contained elements of both press and public education policy. During the Ministry's first acid rain campaign in 1985, to achieve the broadest possible dissemination of information all media outlets were exploited including the special feature sections of quality papers like *De Volkskrant*, general interest magazines, and television. Furthermore, the Ministry served as a point of information for those who needed more information on environmental issues. Moreover, in the Netherlands the government is the prime initiator and sponsor of scientific research on acid rain.

Several interviewees indicated that in general the journalists encountered during the acid rain debate seemingly had no preferences for persons or types of sources. Sources were used frequently to verify information. The sources themselves stated that they were relatively satisfied with the press' accessibility. Practically none of the interviewees reported that his/her organization was excluded from the publicity activities. For example, the scientist remarked somewhat critically the time consuming activities needed to respond to the media attention. He also reported several unfortunate experiences with journalists, mainly due to the activities of the State Institute for Public Health and Environmental Hygiene that coordinates acidification research in the Netherlands and also coordinates the information about the research that is presented to the press. The scientist that was interviewed stated that this monopolization occasionally lead to leaving out the names and affiliations of the

researchers in the field. For these reasons he stated that nowadays he has a reserved and reactive press policy.

Another explanation for the frequency of quotes of many key actors is that many of the organizations cited employ press conferences or press reports to make contact with the press, usually in cooperation with specialized public relations or communications departments. For example, the environmentalists organize a monthly press conference, which draws the attention of a large number of journalists. During the acid rain debate, starting in 1984 these press conferences were used to issue a list of the ten most polluting companies in the Netherlands; the electricity plants and refineries were normally high on this listing. The list was especially effective in generating news and in pressing policy makers to act. These press events also provided opportunities to criticize weaknesses in the government's acid rain policy. Regular meetings with the press also fostered understanding between the environmentalists and the environmental journalists and communication channels. Other interest organizations, such as the Forestry Commission and the Agricultural Authority, only organized press meetings or distributed press reports relating to specific situations.

4 CONCLUSION

The project study of acid rain coverage in the Netherlands during 1972-1992 has shed new light on the relationship between the media and the policy process. From the content analysis of articles over this period and the interviews with some of the key actors involved, several conclusions have been reached along with possible explanations on the dynamics of the relationship between the media and public policy process.

From the interviews, there is some anecdotal evidence that the media directly influenced policy. For example, the researcher received a research grant for an acidification study within some weeks after an alarming press article appeared on acid rain, while normally the approval of a governmental research takes 6 months to one year. Numerous actors indicated that both the formulation of the motion De Boois in 1983 which urged government action on acid rain, and its relatively quick passage in the States General, could be attributed directly to the alarming press coverage of that time. Finally, the education campaigns of the Ministry of Environmental Affairs in the mid-1980s and the associated high press coverage, we assumed created the political and societal basis to implement stronger anti-acidification measures.

On the other hand, one could also argue that press interest normally follows policy developments. In line with the so-called 'agenda journalism' the press typically pays close attention to issues under discussion in the second chamber of the States General. Furthermore, politicians and government officials are cited frequently because of the policy measures taken or not taken.

However, for this study, as for any other, anecdotal evidence must be treated cautiously, as this does not permit cause-effect conclusions. For that reason, it is justifiable to conclude that there are indications that the press coverage of acid rain and the policy process have influenced each other. However, it is not clear whether there is more influence on the policy process from the media than vice versa. Additional research will have to shed more light on this question.

The project analysis showed that the press coverage of the acid rain issue grew steadily during the 1970s and early 1980s, peaked around 1984/1985 and decreased. Although the Netherlands unlike Germany, where forest dieback framed the acid rain debate, has few forests the issue of forest dieback was and still is an important issue in the acidification coverage in the Dutch press. A

temporary second peak in 1988 was largely attributed to the seemingly unique feature of ammonia-manure emissions and acid rain in the Netherlands. This feature was especially newsworthy because of the Netherlands' dense population and intensified livestock breeding. Even today these agricultural emissions continue to generate media interest, albeit a small volume. Nevertheless, by the end of the 1980s and early 1990s press coverage was clearly focused on several global environmental issues, such as ozone depletion and climate change.

As to why the press coverage was timed and framed in this manner, the project suggests three reasons, some of which were hinted at by the interviewees. One view is that the press coverage of an environmental issue follows a lifecycle that corresponds with that of the policy process (Winsemius 1985). During the stage of initial policy formulation vast amounts of often controversial data are available and the scientific and political debate is generally stimulating and hence newsworthy. During the next stage of policy implementation, there is generally (less newsworthy) scientific and political consensus, unless the policy fails or an associated crisis occurs. For the case of acid rain, the scientific and environmental controversy did not land the issue straightforwardly on the policy agenda. During the early 1980s the then Minister of the Environment was convinced of the seriousness of the problem and had committed the Ministry to effective policy response. As policy was being formulated (around the mid-1980s), the Ministry mounted a public education campaign that had strong appeal and ultimately provided the social and political support needed for moving from policy formulation to implementation. As policy responses began to be implemented (mid-1980s to 1992) scientific and policy controversies were essentially resolved (except perhaps the controversy about the ammonia issue) and the press became noticeably less interested in acid rain. Press attention may have shifted towards several global issues (e.g., ozone depletion and climate change) because these issues were in the policy formulation stage in their lifecycle and hence had all of the newsworthy features mentioned above.

A second explanation for the press' new-found interest in these global environmental issues during the late 1980s was hinted at by some of the interviewees. They argued that the new interest in global issues was linked to the new policy emphasis of the (new) Minister of the Environment. The assumption is that a (social democratic) politician would want to identify himself with a new issue, as a way of distancing himself from his (conservative) predecessors and enhancing his image. In the case of acid rain, this political change came about in 1989 and may have resulted in the noticeable decrease in funding for acidification research and, accordingly, decrease in the number of scientific reports on study findings that normally would be newsworthy. Other interviewees, however, argued that the policy interest in global issues was already at a high level under former cabinets. Unfortunately, our study did not provide us with data to back this second assumption, e.g., because we did not collect data on amounts of government funding on acidification or global climate research. Additional research is required here.

A third possibility is that the change in the level of press coverage of environmental issues is a relatively autonomous process and inherent to the functioning of the press. Conceivably, a journalist's interest in an issue builds as new and especially controversial information becomes available and lessens as information becomes sparse and less stimulating. Both the complexity of the issue and journalists' perception of its severity may play a decisive role. After almost 20 years of acid rain coverage, a decline of journalistic interest would be understandable. But if we look at the acidification issue in the Netherlands, we see a complex environmental issue involving numerous actors and organizations. All of the interviewed persons representing the most important actor groups indicated that acidification in the Netherlands is of serious concern because of the disruption of the soil's mineral balance and possible irreversible damage and the long term effects. Given these characteristics, it would appear that the acid rain issue should still be on the press agenda and stay

there for a long time. However, what we found was that the amount of acid rain coverage has clearly declined over the past years, although the controversy on the agricultural issue is far from solved. So, the development of the acid rain issue in the Netherlands and its subsequent coverage seem to contradict our third assumption. Of interest to future research is whether the process of rise and fall of journalistic interest really is an autonomous process, or is interacting with the emergence of new environmental threats such as the depletion of the ozone layer and the greenhouse effect.

Indeed, future research should concentrate on examining these three hypotheses particularly in the light of the complexity and severity of the acid rain issue in the Netherlands in relation to the other environmental issues.

Table 1:
Readership profile of the selected newspaper *De Volkskrant* (Kaiser 1990).

	De Volkskrant readership	Dutch Public in general
Class A: highest level of economically well placed people (e.g., managers, physicians, industry executives)	14.4%	5.8%
Class B1: the upper middle class (e.g., higher government officials, functionaries)	23.1%	11.8%
Class B2: the lower middle class	30.0%	29.0%
Class C: the lower class (small tradesmen, skilled laborers)	27.8%	43.9%
Class D: the lowest class of uneducated, unemployed or retired people)	4.6%	9.6%

Table 2:
Profile of actors interviewed for the project study of the press coverage of acid rain in the Netherlands

Type of organization	Interview with
Newspaper	A journalist with *De Volkskrant* journalist assigned since 1985 to cover issues on Environment and Nature, and author of numerous articles on acidification.
Politician	The former Minister of Environmental Affairs (from 1983 to 1986) and the most frequently cited individual in *De Volkskrant*'s coverage of acid rain; he also helped to integrate environmental policy and launched the first public education campaign on acid rain in the Netherlands.
Government	Current Head of the Department of Acidification at the Ministry of Environmental Affairs; A public relations functionary dealing with policy at the Ministry of Environmental affairs; A press liaison officer at the Ministry of Environmental Affairs.
Forestry Commission	The former General Manager of the Forestry Commission from 1983 to 1988 during which time the Commission initiated reporting on the health of Dutch forests.
Agricultural Authority	A policy functionary on the issue of acidification with the Agricultural Authority.
Environmentalists	A physicist actively engaged in the acid rain debate on behalf of the environmentalists and the second most frequently cited individual in the acid rain coverage in *De Volkskrant*.
Academic	A biologist working in academia who first pointed to the impact of ammonia emissions on acidification in the Netherlands; also the most frequently cited researcher in *De Volkskrant*.

Figure 1. Frequency of articles on "acid rain" in *De Volkskrant* scaled as a proportion of the number of articles in the year of maximum citations (1984 = 71 articles), 1972-1992. The files of *De Volkskrant* were searched with the descriptor 'acid rain' for the period 1982-1992. For the period 1972-1981 we used descriptors 'air pollution', 'energy', and 'environmental conferences'.

FIGURE 1

NEWSPAPER ATTENTION -- "ACID RAIN" -- NETHERLANDS

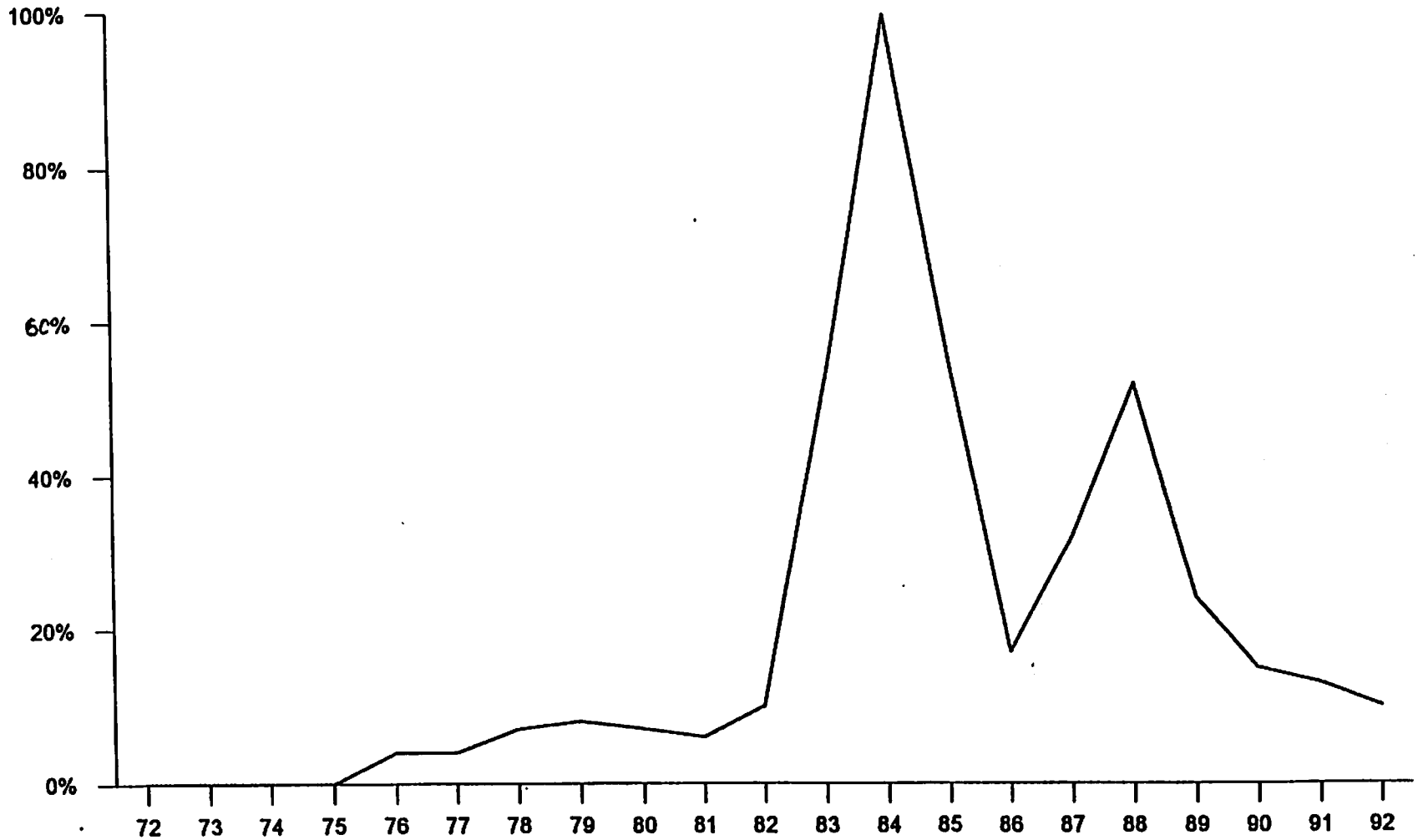


Figure 2. Percentage of articles per year on "acid rain" in *De Volkskrant* which focus on three major topics in the Dutch acidification debate: sulfur dioxide (1975-1992), the forest dieback (1982-1992), and the enormous amounts of animal manure causing ammonia releases (1983-1992).

FIGURE 2

MAJOR TOPICS IN PRESS COVERAGE -- "ACID RAIN" -- NETHERLANDS

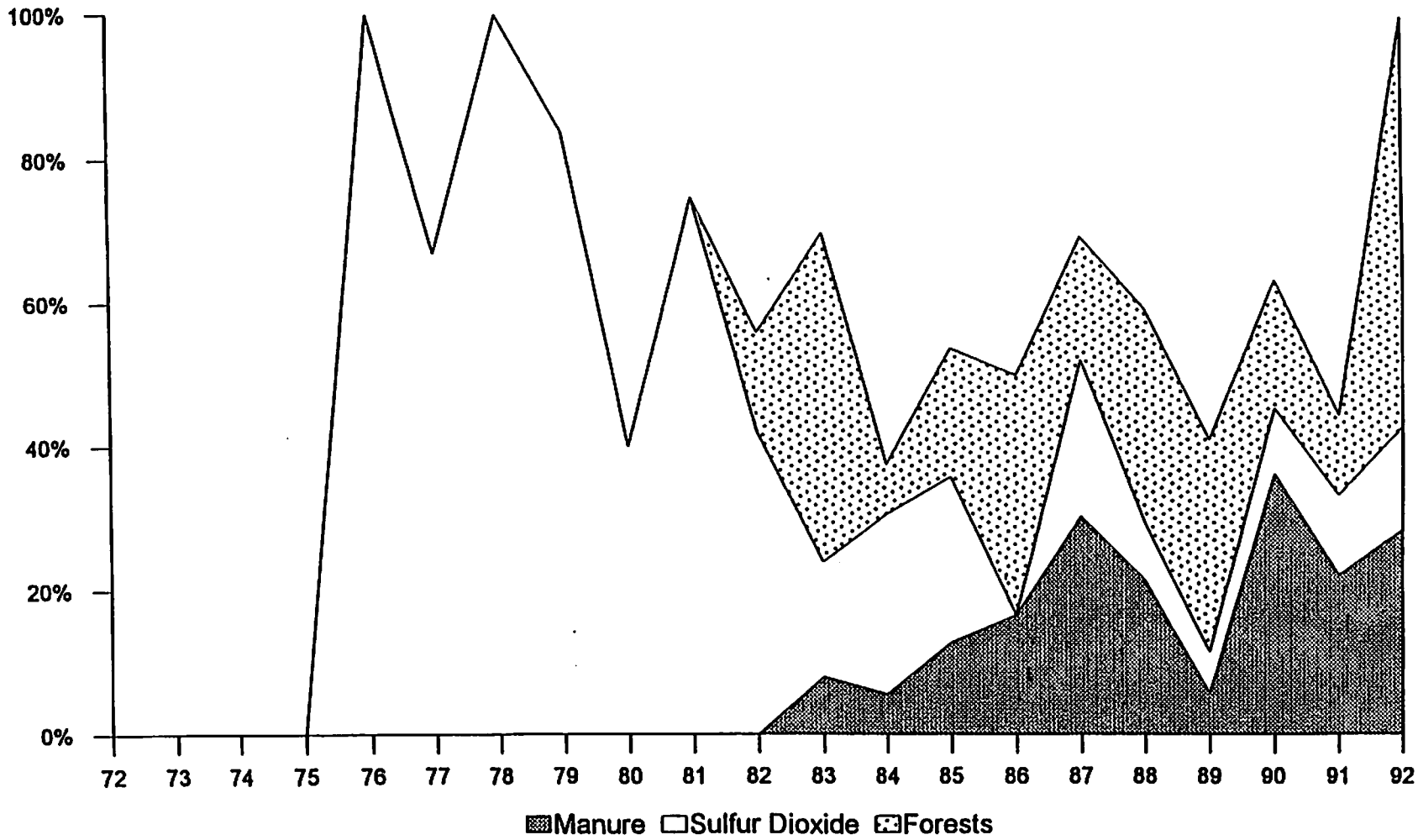


Figure 3. Percentage of all causes of "acid rain" mentioned in *De Volkskrant* articles in a given year belonging to each category, 1980-1992. Each article may have more than one cause coded. In the category 'other' articles were coded focusing on the relation between large-scale livestock breeding and ammonia deposition through animal manure.

FIGURE 3

CAUSES --"ACID RAIN"-- NETHERLANDS

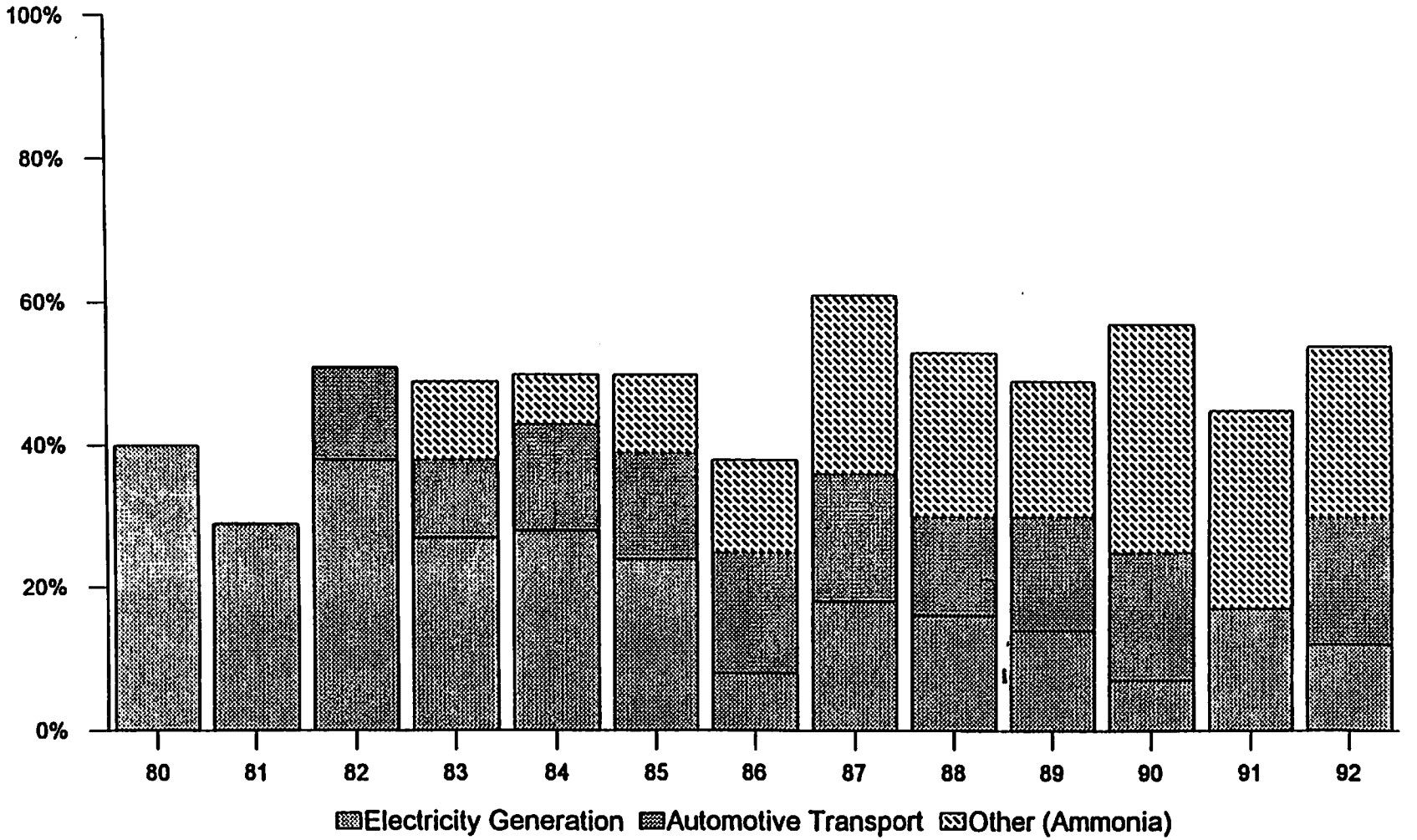


Figure 4. Percentage of all primary impacts of "acid rain" mentioned in *De Volkskrant* articles in a given year belonging to each category, 1980-1992. Each article may have more than one primary impact coded.

FIGURE 4

PRIMARY IMPACTS --"ACID RAIN" -- NETHERLANDS

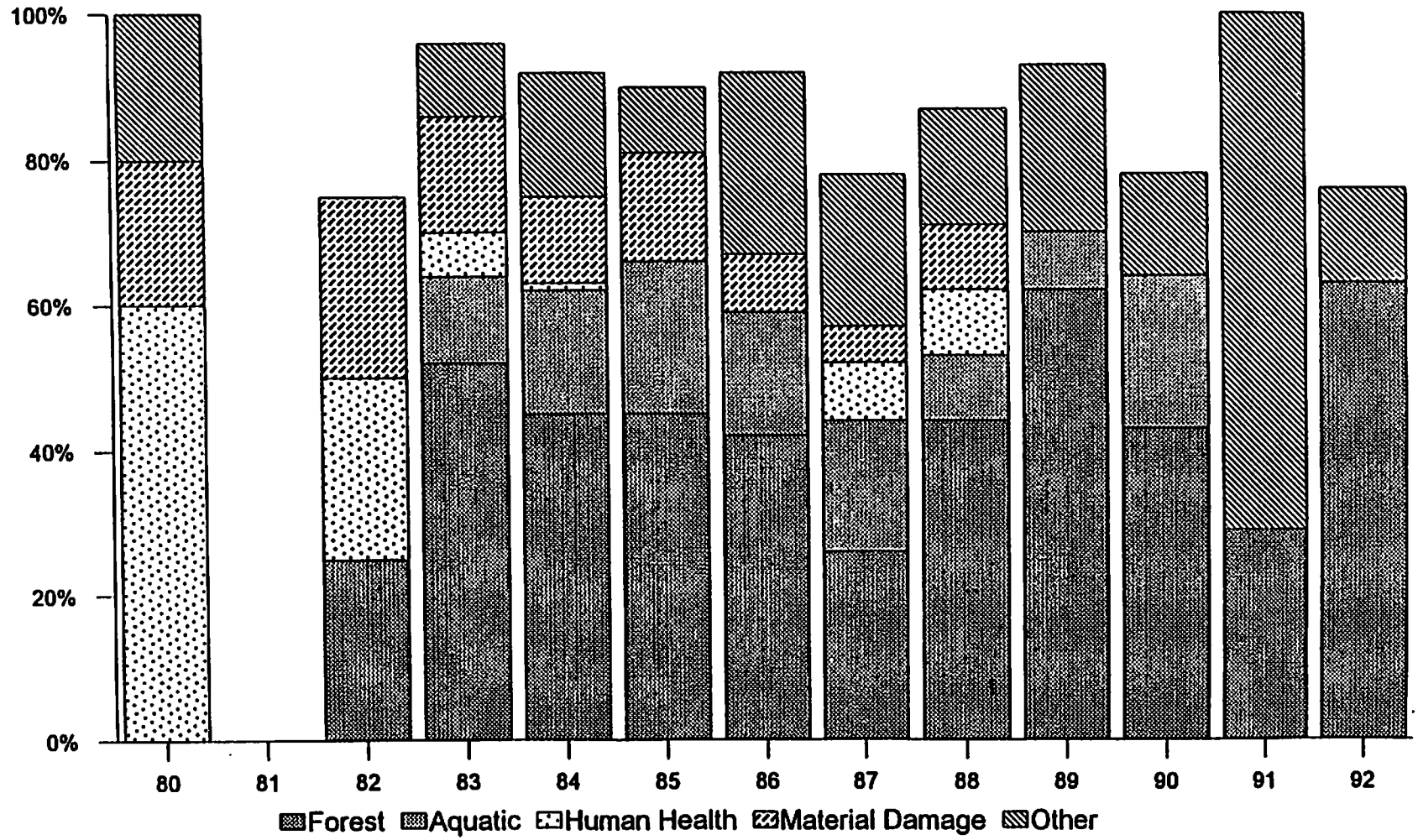


Figure 5. Percentage of all options to manage "acid rain" mentioned in *De Volkskrant* articles in a given year belonging to each category, 1980-1992. Each article may have more than one of the following options coded: "technology-emissions" includes technologies such as those that reduce emissions in power plants and autos, fuel switching, and renewable energies. "Technologies-impacts" are technologies designed to mitigate impacts such as liming, fertilizing, or breeding resistant species. "Rules-domestic" include emissions standards for power plants or autos, and lawsuits. "Rules-international" includes international or bilateral regulations or agreements. "Incentives" could include financial incentives and education.

FIGURE 5

OPTIONS -- "ACID RAIN" -- NETHERLANDS

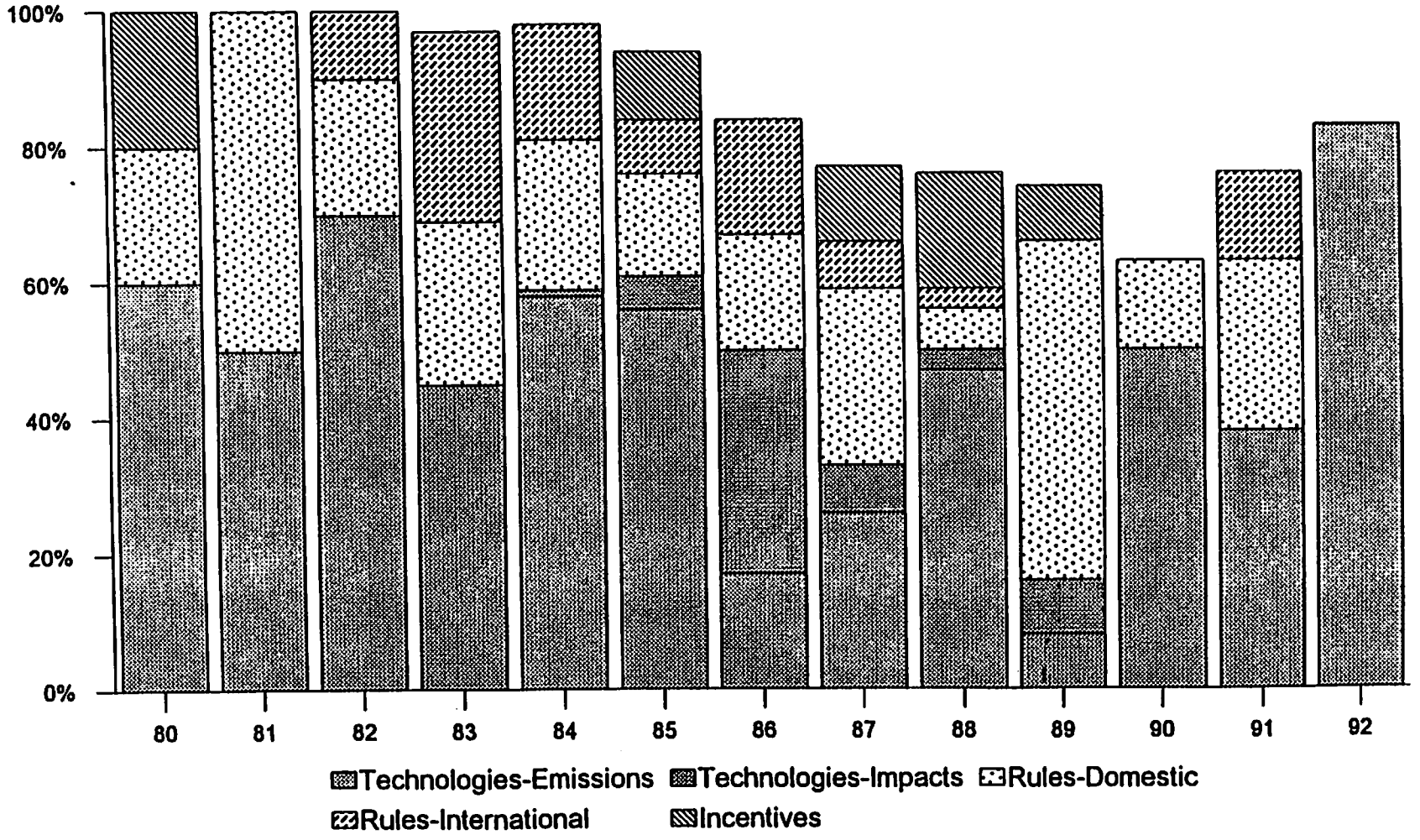


Figure 6. Percentage of *De Volkskrant* articles in a given year belonging to each category, 1980-1992. Each article was assigned to only one of the following categories: purely a "domestic" scope; "domestic and transboundary" includes those articles that mention transboundary aspects but have a domestic focus; and "non-domestic" includes articles that have a transboundary aspect as the main focus or cover another country's problems.

FIGURE 6

GEOGRAPHIC FOCUS --"ACID RAIN" -- NETHERLANDS

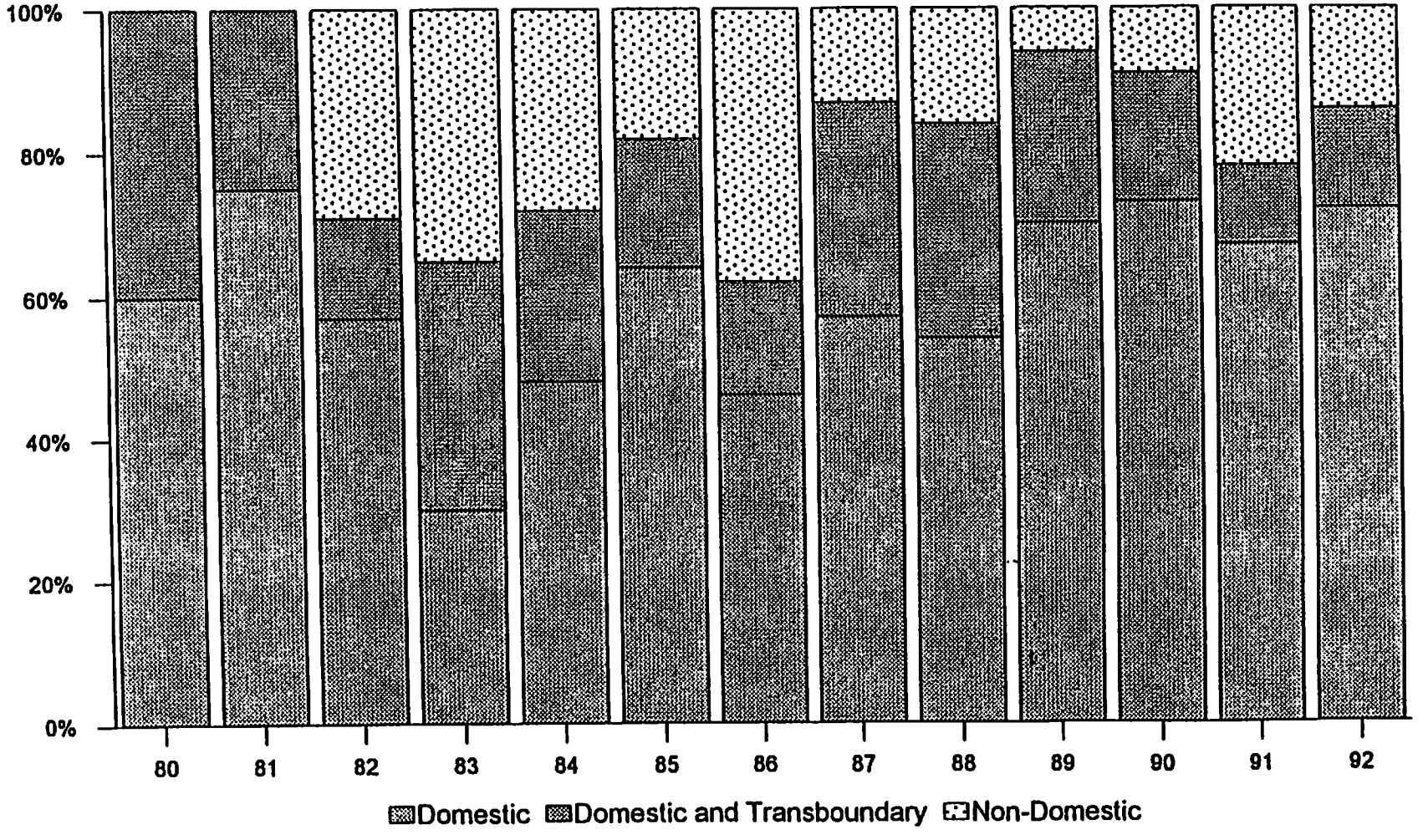


Figure 7. Percentage of *De Volkskrant* articles on "acid rain" in a given year that were either for action or against action, 1980-1992. The percentage of articles coded as neutral is not shown. Each article was assigned to only one category.

FIGURE 7

ACTION BIAS -- "ACID RAIN" -- NETHERLANDS

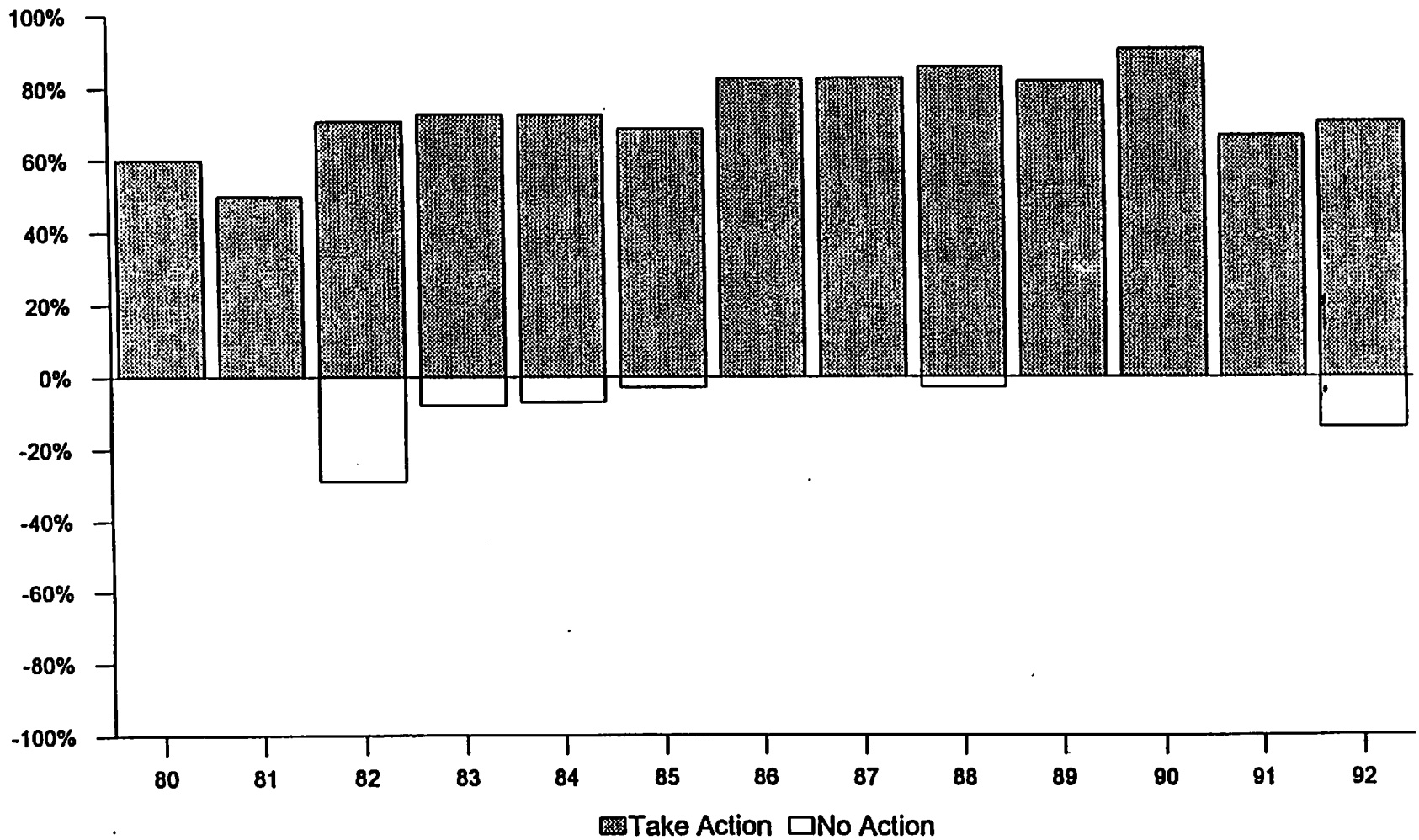


Figure 8. Percentage of *De Volkskrant* articles in a given year that showed bias towards particular actors, 1980-1992. Positive bias portrayed an actor in a positive light; negative bias in a negative light. The percentage of articles coded as showing no bias is not shown here. Each article was assigned to only two categories, one indicating positive bias and, second negative bias.

FIGURE 8

ACTOR BIAS -- "ACID RAIN" -- NETHERLANDS

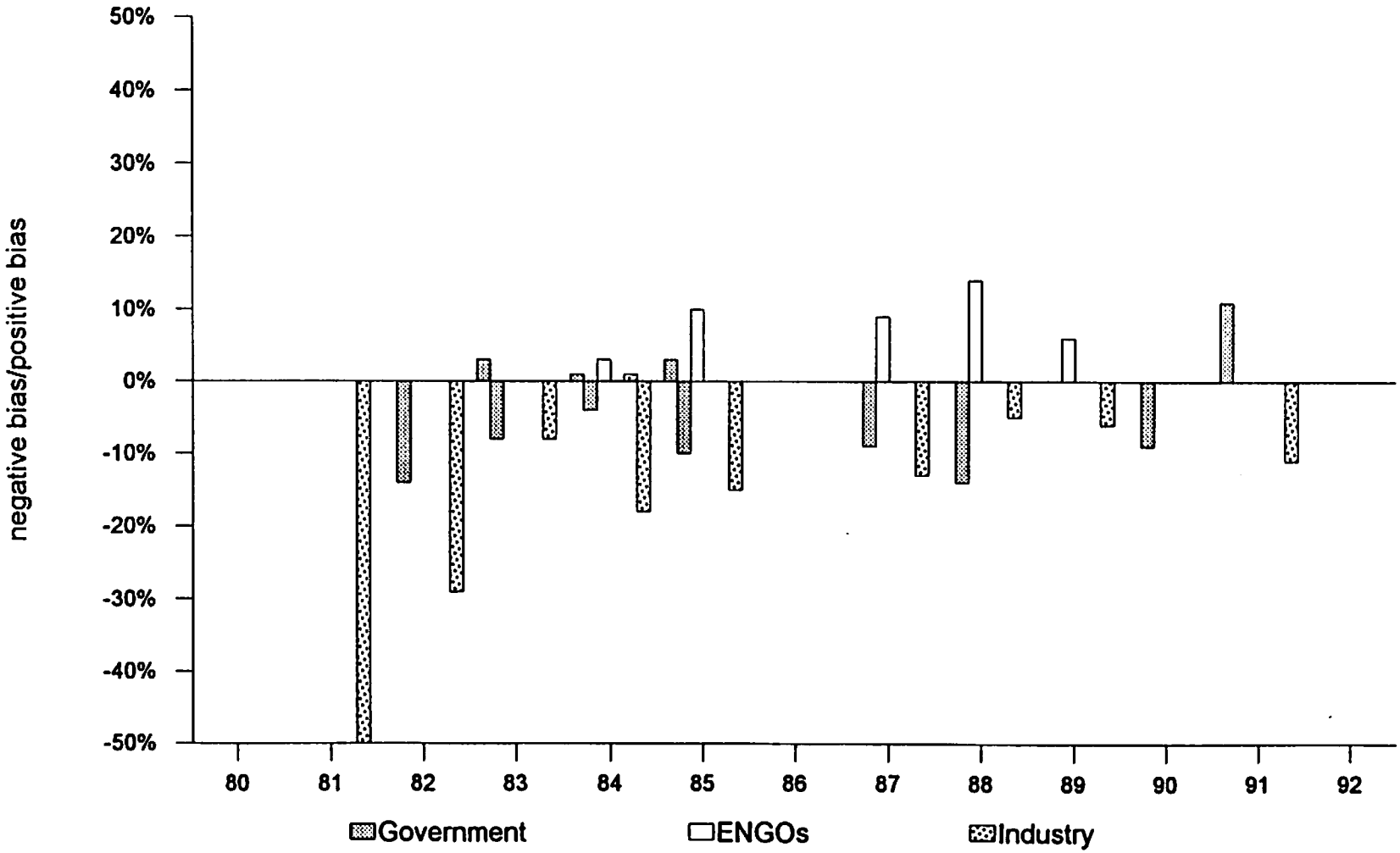
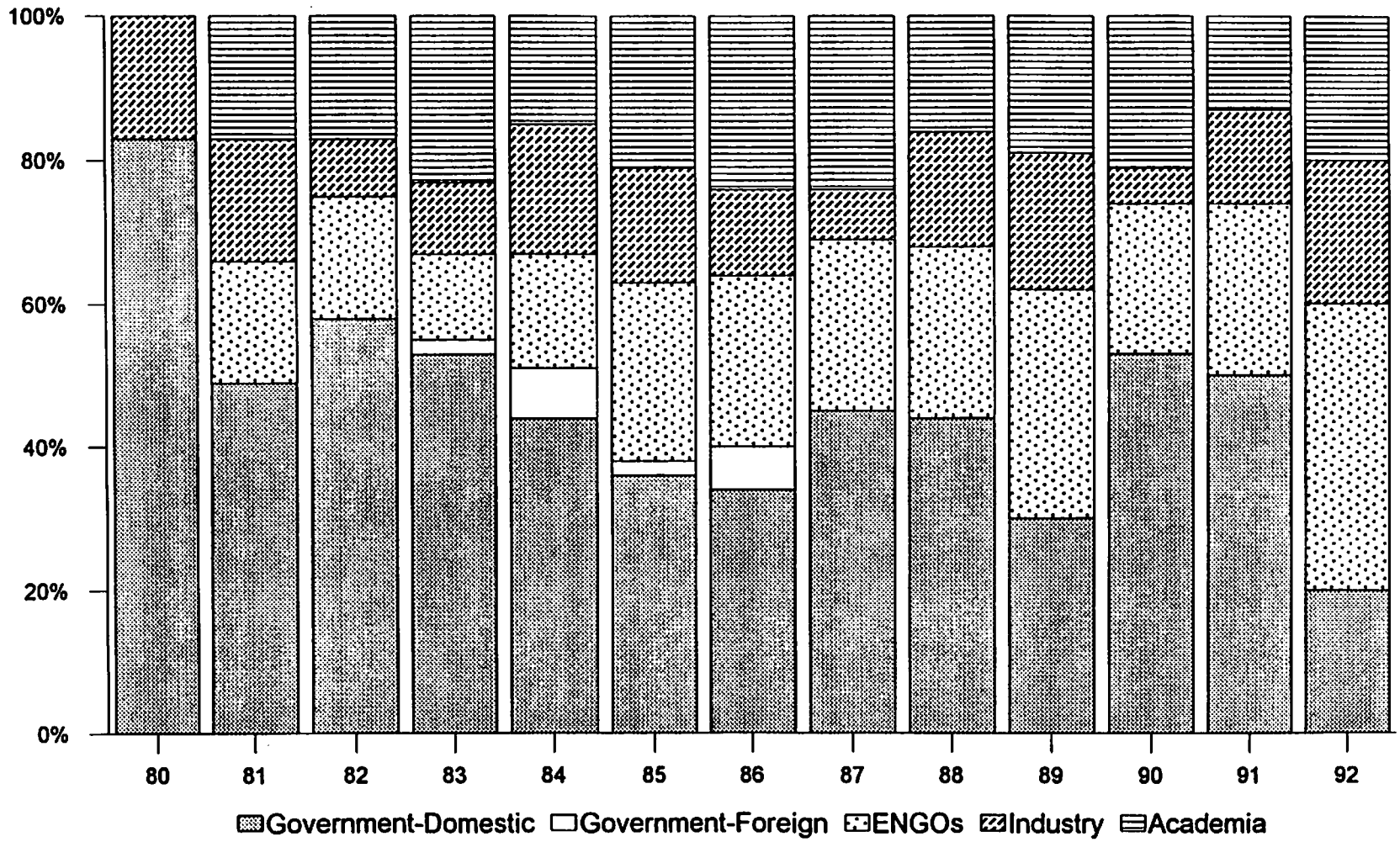


Figure 9. Percentage of news sources that dominated the framing and shaping of "acid rain" articles in *De Volkskrant*, 1980-1992. Each article may have more than one source category coded. "Government-domestic" includes executive, legislative, and judiciary actors. The "government-foreign" category includes European Community and European parliament actors. "ENGO" includes environmental non-governmental organizations and environmentalists. "Industry" includes emitter and impacted industries.

FIGURE 9

NEWS SOURCES -- "ACID RAIN" -- NETHERLANDS



Endnotes

1. Jan Gutteling, University of Twente, Netherlands; Mirjam Galetzka, University of Twente, Netherlands; Oene Wiegman, University of Twente, Netherlands.

2. See e.g., *De Volkskrant* 22 February 1983, 21 September 1983, 15 May 1984.

3. Ministerie van Volksgezondheid en Milieuhygiene. Indicatief Meerjarenplan Lucht (1976-1980), vergaderjaar 1976-77, nr. 14314, nrs. 1-3.

4. Ministerie van Volksgezondheid en Milieuhygiene. Indicatief Meerjarenplan Lucht 1981-1985, vergaderjaar 1982-83, nr. 17600, Hoofdstuk XVII, nr 7.

5. Ministerie van Volkshuisvesting, Ruimtelijke Ordening en Miliubeheer. Indicatief Meerjaren-programma Lucht 1984-88. Vergaderjaar 1983-84, Nr. 18100 hoofdstuk XI, nr. 7.

6. Ministerie van Volkshuisvesting, Ruimtelijke Ordening en Miliubeheer. De problematiek van de verzuring. Vergaderjaar 1983-84, Nr. 18225, nr. 1-2.

7. Ministerie van Volkshuisvesting, Ruimtelijke Ordening en Miliubeheer. Indicatief Meerjarenprogramma Lucht 1985-90. Vergaderjaar 1984-85, Nr. 18605, nr. 1-2 en 8.

8. Ministerie van Volkshuisvesting, Ruimtelijke Ordening en Miliubeheer. Indicatief Meer-jarenprogramma Milieubeheer 1986-90. Vergaderjaar 1985-86, Nr. 19204, nr. 1 en 2.

9. Ministerie van Volkshuisvesting, Ruimtelijke Ordening en Miliubeheer. Indicatief Meer-jarenprogramma Milieubeheer 1987-91. Vergaderjaar 1986-87, Nr. 19707, nr. 1-2.

10. Ministerie van Volkshuisvesting, Ruimtelijke Ordening en Miliubeheer. Nationaal Milieubeleidsplan. Vergaderjaar 1988-89, Nr. 21137, nr. 1-2.

11. In 1993, the second National Environmental Policy plan appeared, in which emission reduction goals were set; the goal was to reduce sulfur dioxide emissions by 60 percent in 1994 and emissions of ammonia, sulfur dioxide and nitrogen oxide by 90 percent in 2010. This plan proposed even stronger policy responses. There was an elaboration of existing policy, with more emphasis on reducing emissions at the source and less on mitigating acidification effects. Coherent policy measures would continue to be directed at the target groups (e.g., industry, electricity generating plants, refineries, agriculture, transport and consumers) and government support would continue through communication campaigns, subsidies and other incentives. From the technology perspective, reductions in sulfur dioxide emissions would be pursued through desulfurization energy-saving strategies and the development and use of more cost-effective clean engines for transport were considered viable means for reducing nitrogen oxide emissions. As of 1 January 1993 in the Netherlands all new automobiles would have to be equipped with a three-way catalytic converter. Reductions in ammonia emissions were expected through restrictions on both the amount of animal manure stored and the amount farmers could spread on pastures; excesses would be dealt with through measures such as manure processing plants. Furthermore, regulations were now in place both for the storage and the land transport of manure, and all storage and handling facilities had to be registered.

12. *Volkskrant* (13 April 1985). Het scheve beeld na de campagne (the biased perception after the campaign).

13. Ministerie van Landbouw, Visserij en Natuurbeheer (1990). Plan van aanpak Beperking ammoniak-emission van de landbouw.

14. Ministerie van Landbouw, Visserij en Natuurbeheer (1993). Notitie derde fase mest- en ammoniakbeleid.

15. Ministerie van Verkeer en Waterstaat (1990). Structuurschema Verkeer en Vervoer II.

16. Less than 10 percent of the Netherlands is covered with forests. The Dutch forests are relatively young, 60 percent is younger than 100 years, only 13 percent is older than 200 years. In the second part of the 19th century there was a large-scale plantation of forests, mainly for wood production purposes. Since the 1950s the recreational function of the forests became more important.

17. A year later, in 1993, environment was edged out by the issue of public safety (56 percent as opposed to 55 percent for the environment and only 34 percent for acid rain).

18. The environmentalist and the scientist referred here to the arrival of Minister of Environmental Affairs Alders, who was representing the social democrats in the center-left cabinet Lubbers III. Between Winsemius (representing the conservative party in the center-right cabinet Lubbers I) and Alders, Nijpels was Minister of Environmental Affairs (representing the conservative party) in the center-right cabinet Lubbers II.

19. In the Netherlands between 1970 and 1990 the number of pigs increased from 2.6 million to 8.5 million, and the number of chicken from 47.9 million to 74.2 million. The number of cows (dairy cows and fattening calves) remained constant at 2.5 million. (Source: Central Census Bureau [1993]. Environmental statistics of the Netherlands.)

References

Bakker, P. 1993. Pers concentratie in Nederland 1986-1994 (Press concentration in the Netherlands 1986-1994). *Massacommunicatie* 21 (4): 308-317.

Gutteling, J.M., and J.F. Caljé. 1993. De invloed van van het milieu in het nieuws: mondiale risico's en risico's dichter bij huis (The influence of environmental issues in the media: global risks and risks near home). *Milieu* 8 (1): 14-19.

Heij, G.J. and T. Schneider, eds. 1990. *Eindrapport tweede fase Additioneel programma verzuringsonderzoek* (Dutch priority programme on acidification). Rapport 200-09, Bilthoven, the Netherlands: State Institute for Public Health and Environmental Hygiene.

Hemels, J. 1981. *De emancipatie van een dagblad. Geschiedenis van De Volkskrant* (Emancipation of a newspaper. History of *De Volkskrant*). Baarn, Ambo.

Heuvelman, A., and J. van der Staak. 1992. Wetenschap en technologie in de journalistiek (Science and technology in journalism). In *Communicatie over wetenschap en techniek* (Communication about science and technology), ed. A. Heuvelman and J. van der Staak. Houten, the Netherlands: Bohn, Stafleu en Van Loghum.

Kaiser, A. 1990. Een wereld van papier. Werkwijze en uiterlijk van de Nederlandse krant (A world of paper. Working-method and appearance of the Dutch newspaper). In *Media in Nederland* (Media in the Netherlands), J. Bardoel and J. Bierhoff (red.), 111-132. Groningen: Wolters-Noordhoff.

Meadows, D.H. et al. 1972. *The limits to growth*. New York: Universe Books.

NOS, afdeling Kijk en Luisteronderzoek (Netherlands Broadcasting Foundation). 1982. *Evaluatieonderzoek radio kleuring* (Evaluation research radio). Hilversum.

Straaten, Jan van der. 1990. *Zure regen: economische theorie en het Nederlandse beleid* (Acid rain: Economic theory and the Dutch policy). Tilburg, the Netherlands: dissertation.

Wiegman, O., J.M. Gutteling, H. Boer, and R.J. Houwen. 1989. Newspaper coverage of technological and environmental hazards and the reactions of readers. *Journalism Quarterly* 66 (winter): 844-852, 863.

Winsemius, P. 1985. Communicatie en overheidsbeleid (Communication and government policy). In *Actuele vraagstukken van de overheidsvoorlichting* (Current issues in governmental communication), J. Katus and L.C. Beets (Red.). Muiderberg: Coutinho.