

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

Edited By

William C. Clark and Nancy M. Dickson

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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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William C. Clark and Nancy M. Dickson

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

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**THE PRESS AND GLOBAL ENVIRONMENTAL CHANGE:
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Project Directors:

William C. Clark and Nancy M. Dickson

Production Editor:

Nora O'Neil

Text Editor:

Jeanne Anderer

Contributors:

Amy Blitz
William C. Clark
Nancy M. Dickson
Renate Ell
Adam Fenech
Mirjam Galetzka
Jan Gutteling
Éva Hizsnyik
Michael Keating
Akiko Kôda
Don Munton
Roderick Scheer
Miranda Schreurs
Ferenc Toth
Patricia Welch
Oene Wiegman

Further information on the project can be obtained from William C. Clark, Center for Science and International Affairs, Kennedy School of Government, Harvard University, 79 John F. Kennedy Street, Cambridge, MA 02138 USA. Tel (617)495-3981; Fax (617) 495-8963; email clark@ksgrsch.harvard.edu.

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

William C. Clark and Nancy M. Dickson
Center for Science and International Affairs
John F. Kennedy School of Government
Harvard University
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**THE PRESS AND GLOBAL ENVIRONMENTAL CHANGE:
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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

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Miranda A. Schreurs, Patricia Welch, and Akiko Kôda¹

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Editor's Introduction

This chapter explores environmental reporting in Japan as it related to acid rain from 1972 to 1992. The study both answered and raised questions about the role of the media in relation to international environmental politics, in general, and acid rain, in particular. What sources did Japanese journalists rely on for their information on acid rain? Should the media be portrayed as an agenda setter or as a tool of other societal actors? How did the media treat changing scientific understanding of the causes and consequences of acid rain? To what extent was acid rain an environmental issue as opposed to an international policy issue? Finally, how and why did Japanese coverage of acid rain differ from that reported for other countries in this book?

1 INTRODUCTION

This chapter presents the findings of a content analysis of the *Asahi Shimbun's* coverage of acid rain from 1972 to 1992. The picture obtained from this analysis presents a somewhat different view of the media's role in environmental reporting than do many other accounts which have likened the Japanese media to a powerful watchdog in the environmental field (Pharr and Badaracco 1986; Reich and Huddle, 1975; Ishi, Okajima, and Hara, 1992).² Whereas most of these accounts portray the media in the early 1970s as an agenda setter, the results of this study call for a more nuanced understanding of the changing role of the media in environmental reporting.

As an island nation Japan is relatively protected from most transboundary environmental problems. While domestic environmental issues received much media, political, and social attention, particularly in the early 1970s, it was not until the late 1980s that interest broadened to include regional and global environmental issues. Until the mid-1980s, concern with acid rain in Japan was largely confined to a specialized community of scientists. Already in the early 1970s, Japanese scientists who are among the world's leading experts in the study of tropospheric air pollution began to conduct studies on the mechanisms causing acid rain, acid mist, and acid snow throughout Japan. They were concerned not only with acid rain near industrial plants but with its regional dispersion.³ By the mid-1970s, Japanese scientists were conducting research on air pollutant levels in distant Japanese islands and with the impact of wind patterns on the dispersion of acid rain causing pollutants (e.g., Kito et al. 1976). They were also interested in the effects of acid rain on human health, plants, and various materials. It was not until the early 1980s, however, with the support of the Environment Agency and the Meteorology Agency that Japanese scientists first began to study long-range transboundary acid rain. These early efforts focused on the effects of the transport of soil dust from the Asian continent on the atmosphere over Japan. Later studies were made of acid rain in various regions of China and the potential for emissions from power plants to reach Japan (e.g., Tanaka et al. 1983). Scientists have found that acid rain is affecting forests and lakes in various areas of Japan (e.g., Tamaki 1991).

The public's understanding of acid rain has also changed with time. Initially, in the early 1970s the public viewed acid rain much like other local air pollution problems that could cause various health damages. With fears running high about pollution diseases in a country that had suffered many fatalities from mercury and cadmium poisoning and severe air pollution, on several occasions highly acidic rainfall sent hundreds of people to clinics seeking medical care. The Environment Agency reported that between 1973 and 1975 in the Kanto region and in 1981 in Gunma there was a total of 30,000 complaints about eye and skin irritation from acidic rainfall registered with local governments (Environment Agency of Japan 1983: 192). As a result in 1981 the Environment Agency compiled information on the mechanisms by which acid rain forms and the eye irritating components of acidic

rainfall. The investigation pointed to a combination of acidic substances, formaldehyde, formic acid and hydrogen peroxide as the probable causes of eye and skin irritation. In 1982 the Environment Agency established a Committee on Acid Rain Countermeasures in the Air Quality Bureau to survey existing scientific information on acid rain and to prepare plans for future surveys and research. The Water Quality Bureau also began to collate data on the acidification of lakes in Japan at this time. A new Committee on Acid Rain Countermeasures was established in July 1983 to launch a five-year research program on the extent of acid rainfall in Japan and its effects on ecosystems. The Committee issued its first report in August 1989. The average pH level of precipitation in Japan between 1984 and 1987 was in the range of 4.4 to 5.5. Of the 133 lakes that were monitored most had pH levels of around 7. The report concluded that Japan's ecosystems are not currently affected by acid rainfall but that if rainfall maintains its current acidic level there could be a long-term impact on soil, water, plants, and animals are unclear (Environment Agency of Japan b 1989). A second report issued in 1992 found average pH levels of between 4.3 and 5.3 and concluded that it was important to continue to closely monitor acid rainfall and its impact on ecosystems (Environment Agency of Japan c 1990).

As part of its global environmental budget, the Environment Agency has initiated a monitoring network throughout Asia. Furthermore, in high level negotiations, Japanese officials have discussed controlling acid rain emissions with their Chinese counterparts and the Ministry of International Trade and Industry has established technology transfer programs to help China reduce emissions (Sentaku 1992: 36). Citizens' groups are also monitoring pH levels throughout the country to provide a check on government reports. Citizens' groups have challenged several government reports that have concluded that acid rain is still not a real problem in Japan.

Media reporting on acid rain is largely based on government and foreign sources with a greater reliance on non-governmental organizations beginning in the late 1980s. Reporting on acid rain can be divided into three distinct phases. During the first phase, in the early 1970s, acid rain was portrayed as a health threat that could cause damage to the eyes and the skin. The media pointed to emissions of sulfur dioxide and nitrogen oxides from Japanese industries as the cause of the acid rainfall. There were only a few articles on acid rain at this time, however, and by the end of the decade the acid rain issue had fallen almost completely from the newspaper's pages. The second phase began in the early 1980s when a few articles discussed acid rain in Europe and North America. The coverage focused on Europe's widespread ecosystem destruction from acid rain and on developments in North America, including the passage of the 1990 United States Clean Air Act and acid rain related disputes between Canada and North America. Acid rain was treated as an overseas problem. By the middle of the 1980s, however, the first reports appeared about possible damage to Japanese forests and water bodies from emissions from China's expanding industries.

2 CONTEXT

2.1 The Japanese Print Media

Japan has five national newspapers. A unique feature of Japanese newspapers is that they run both morning and afternoon editions. The *Yomiuri Shimbun* with a combined circulation for its morning and evening editions in 1990 of 14.5 million is the world's largest circulating commercial newspaper. The other national newspapers are the *Asahi Shimbun* (12.9 million), the *Mainichi Shimbun* (6.3 million), the *Nihon Keizai Shimbun* (4.5 million), and the *Sankei Shimbun* (3.2 million). The circulation rate of Japanese newspapers is extremely high. While there are ten times as many newspapers in the U.S. as compared to Japan, Japanese newspapers have twice the circulation rate of

those in the U.S. The circulation rate in 1987 was 579 papers per 1000 people. Given this wide distribution, it can be assumed that the print media exerts a strong influence on society (Feldman 1993).

The most influential national newspapers are the *Asahi Shimbun*, the *Nihon Keizai Shimbun*, and the *Yomiuri Shimbun*, each of which has a somewhat different slant. The *Asahi Shimbun*, which is the most left leaning of the three, was selected for this content analysis. Its closest counterpart in the U.S. is the *New York Times*. The *Yomiuri Shimbun*, in contrast, is conservative in orientation and targets a broad audience. The paper tends to be relatively pro-government and includes more human interest stories than do either the *Asahi Shimbun* or the *Nihon Keizai Shimbun*. The *Nihon Keizai Shimbun* is the nation's most influential business newspaper, equivalent in orientation to the *Wall Street Journal*.

The differences among these newspapers should not be over-emphasized. As former Ambassador to Japan Edwin O. Reischauer noted, "Japanese newspapers are surprisingly uniform in format and content" (Reischauer 1988: 220). In their analysis of environmental news coverage in Japan around the time of the United Nations Conference on Environment and Development (UNCED), four Japanese scholars remarked on the high similarity of data reported by the *Asahi Shimbun* and *Yomiuri Shimbun* (Mikami et al. 1994: 15).

The regulatory structure of the Japanese media took shape during the Allied Occupation of Japan. Under the 1947 Constitution, freedom of the press is guaranteed. To help ensure this freedom, the Allied Occupation forces saw to it that share holding in the media by any single share holder would be capped at 10 percent of total shares. As a consequence, in comparison with the United States and many European countries, non-media firms have little direct control of the media. In fact, shares in Japan's national newspapers are all held internally although as Westney (1995) argues, this structure has not prevented the development of other kinds of close relations among the mass media, industrialists, and government officials.

It is generally recognized that the Japanese press is strongly influenced by its organizational form (Feldman 1993: 67-79; Reischauer 1988: 220). Each of the major newspapers assigns many of its reporters to particular beats generally for one to three years. Reporters from different newspapers that are assigned to the same beat form formal associations known as press clubs or "kisha clubs" in Japanese. Press clubs are formed around each of Japan's ministries and agencies, law courts, political parties, major economic organizations, and leading politicians. Government agencies allocate office space to the press club covering their activities. Until recently, reporters working for the foreign press were barred from the clubs. Now all clubs are open to foreign correspondents. The clubs are managed by the Japan Newspaper Publishers and Editors Association and The National Association of Commercial Broadcasters in Japan. Although over 100 companies belong to these associations, the clubs are dominated by representatives of 15 major news media companies, including the five national newspapers, three regional newspapers, five television networks, and two news agencies (Kyodo News Service and Jiji Press). Typically, one or two representatives of each of these companies are assigned to the environmental press club.

The environmental press club has an office within the Environment Agency. For the Agency, the club is opportune for disseminating information to the general public and providing an outlet for Agency efforts to influence media coverage of environmental issues. For the reporters, the club is useful for gathering information, receiving briefings, raising questions for clarification, and writing articles. The club also serves as an informal social group within which reporters can establish friendships and a common outlook on problems. In addition to be assigned to cover developments

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within the Agency, reporters belonging to the environment press club are expected to follow activities within the Environment Committees in the Diet, to talk with members of environmental groups and industry, and to travel to problem areas. While no members of press clubs sit on bureaucratic advisory boards ("shingikai"), their editors may be represented along with members from industry, labor, the bureaucracy and academia. In 1986, representatives of the mass media sat on 55 percent of all shingikai (Schwarz 1991).

The existence of these press clubs is often cited as the main reason for the lack of diversity in the Japanese press (Mori 1976; Reischauer 1988; Feldman 1993; Pharr 1995). Press clubs are criticized for encouraging reporters to rely for information on the politicians and bureaucrats to whom they are assigned (Mori 1976). As an *Asahi Shimbun* reporter in the environment press club pointed out, however, they are not the only journalists to write articles on the environment.⁴ Many of the articles analyzed for this study were written by Japanese foreign correspondents. In fact, Japan has the highest number of foreign correspondents of any nation in Washington, D.C., and New York. These reporters are generally in a better position to gather information on new understandings of environmental problems that are developing abroad.

2.2 The Media and Environmental Policy

During the 1960s and early 1970s, public opinion increasingly favored stronger environmental protection measures. Reacting to mounting public pressure, Japan's ruling Liberal Democratic Party was forced to strengthen Japan's environmental laws. The process began with the passage of the 1967 Basic Law on Environmental Pollution Control. This law was greatly strengthened in December 1970 with the passage of fourteen environment bills and amendments in a special Diet session. In 1971, the Environment Agency was established. By the mid-1970s, Japan was among the nations with the most progressive environmental laws.

Given the strong environmental sentiment in society at this time, Japanese environmental journalists enjoyed a period of unprecedented support and visibility. Ironically, by the late 1970s, the situation had changed dramatically. So successful was Japan in implementing various pollution countermeasures established in the early 1970s that a few years later public interest in the environment began to wane. Newspaper editors gave less and less space over to environmental issues. It is with this as context that one must understand developments in Japanese coverage of acid rain.

2.3 The Selected Newspaper: *The Asahi Shimbun*

The *Asahi Shimbun* was selected for this content analysis because of its influential role within society and its image as a somewhat left leaning newspaper amenable to environmental reporting. The *Asahi Shimbun* was founded in 1879 and has covered environmental issues for over a century. In the early 1960s, reporting on pollution became a regular feature of the newspaper as smog related problems became severe and governmental pollution research teams were established. At this time, the newspaper indexed pollution ("kôgai") as a subheading under the medical and hygiene section of the culture section, reflecting the general tendency in society to consider pollution as a health related matter. As pollution problems became increasingly severe, environmental reporting surged. As a result, in 1971 the newspaper altered its indexing style making pollution ("kôgai") its own major subheading under the society section.

Besides reporting on smog, noise pollution and related research, around the mid-1960s, the *Asahi Shimbun* started reporting on pollution victims, including victims of mercury poisoning, cadmium

poisoning (*itai-itai*), and severe air pollution in the Yokkaichi area. Young reporters sympathetic to the environmental movements that were sprouting up throughout Japan became increasingly critical of the government's failure to adequately respond to pollution problems. By the late 1960s, the *Asahi Shimbun* was playing an important role in breaking news stories about pollution problems and raising public awareness of the links between pollution and human health risks. After a photochemical smog incident in July 1970 in which students at a high school collapsed and had to be rushed to hospitals, the newspaper company decided to establish a pollution reporters' team (Reich 1984: 155). The team was in operation for one-and-a-half years and may account in part for the sudden steep rise in pollution reporting in 1970 (see Figure 1). From 1969 to 1970 articles on pollution appearing in *Asahi Shimbun* jumped from under 300 to over 1600 articles per year and remained high for the next several years (Schreurs 1995). The team's formation also symbolized the larger shift occurring in society and in environmental politics (Reich 1984: 155).

3 CONTENT ANALYSIS

3.1 Methodology

The content analysis of the *Asahi Shimbun* covered a total of 292 articles on acid rain printed in the *Asahi Shimbun* between 1973 and 1992. For 1985-1992, articles were identified using a keyword search on the *Asahi Shimbun*'s data base. The keyword "sansei u" (acid rain) was used to identify the 409 articles that contain this term. Of these, 250 articles were identified as being primarily or somewhat related to acid rain and were summarized into English and coded. For the years 1972-1984, the newspaper's monthly indexes ("shukku satsuban") were searched; under the headings "kôgai" (pollution) and "kankyô hozen" (environmental protection) an additional 42 articles were identified and coded.

Informal interviews about acid rain reporting and environmental reporting more generally were conducted with four reporters from *Asahi Shimbun*, one from *Mainichi Shimbun*, and one from Kyôdo News Service. These included journalists working in the early 1970s as well as those covering environmental issues today. Additionally, this paper draws on over two hundred primarily informal interviews or discussions conducted on environmental policy making in Japan with Japanese politicians, academics, environmental bureaucrats, scientists, ENGO and citizens' groups representatives, and industry representatives conducted between 1991-1994.

3.2 Timing

Press coverage of acid rain in Japan over 1972-1992 can be divided into three distinct phases: an initial stage from roughly 1973 to 1977 when acid rain was portrayed as a human health threat; a second stage 1981 to 1984 when acid rain was presented as a problem for Western Europe and North America; and a third phase from the mid-1980s to the early 1990s when acid rain was recognized both as a problem and an opportunity for Japan (see Figure 2). Of the total number of articles that were coded, 65 percent appeared in the four years from 1989 to 1992. The first report on acid rain occurred in the summer of 1973 in conjunction with reports of health damage from acid rain. There was a total of twenty articles on acid rain from 1973 to 1977 most of which dealt with the health impacts of acid rain. This was followed by three years when no articles on acid rain appeared in the *Asahi Shimbun*. A second phase of reporting began in 1981 with articles reporting acid rain discussions in international meetings. In this phase acid rain was portrayed as an overseas problem threatening European and North American forests and lakes. The third phase began in the mid-1980s with growing concern about the possibility of acid rain in Japan and a sharp rise in the number of

articles beginning in 1989. As of 1992, it was unclear whether or not reporting on acid rain had peaked or was still rising.

To put the sharp rise in reporting on acid rain into its broader context, a content analysis of the media conducted by a group of Japanese academics in the weeks leading up to the United Nations Conference on Environment and Development (UNCED) found that only about 3 percent of environmental news stories emphasized acid rain, compared with between 15 percent and 50 percent for global warming or between 3 percent and 26.5 percent for wildlife preservation, depending on the weeks analyzed (Mikami et al. 1994:15).

3.3 Framing

The issue of acid rain first broke on the Japanese print media scene, or at least in the *Asahi Shimbun*, on June 30, 1973 with reports of acidic rain clouds in the areas around Shimizu City and in Shizuoka. In these locations there were numerous reports of injuries (mainly eye irritation) leading local health offices to conduct studies to determine the pH level of clouds. Smokestack emissions from factories were labeled as the cause of the acid rain. Speculation followed that pollutants, at least in the case of the Shizuoka incident, had traveled from industrial areas in Tokyo to Shizuoka since there were no factories in the vicinity which emitted sulfur oxides (*Asahi Shimbun* 30 June 1973: 23). Over the next few years there were several similar reports. One described a case where hundreds had been injured by acid rain. "On the afternoon of the fourth (of July), residents of Kanagawa and Chiba prefectures and Tokyo reported to their prefectural or district environmental offices that their eyes hurt from the misty rain. By 2:00 p.m., the number of victims had risen to 201. On the fourth, it was also discovered that over 4,000 residents of Tochigi, Gunma, and Saitama prefectures had suffered similar damage. The Tokyo District Pollution Office believes the cause to be SO_x and NO_x emissions from factory smoke stacks and automobiles that 'melt' in the rain and form 'acid rain.'" (*Asahi Shimbun* 5 July 1974: 19).

Of the 17 articles on acid rain appearing in the *Asahi Shimbun* between 1973 and 1975, 11 discussed injuries to the eyes from acid rain. The rest discussed the pH levels observed in various areas, the weather patterns occurring in connection with highly acidic rain, or the efforts of local health offices, scientists, and others to introduce countermeasures and warning systems to alert residents of potential acid rain danger.

The concern with the impact of acid rain on human health reflected the dominant pollution related concerns of the day. Yet this handful of articles on acid rain injuries was small compared to the hundreds of articles on pollution-related health problems appearing in the press in the early 1970s. The *Asahi Shimbun's* readers were being deluged with an average of two to three articles per day on pollution.

The frightening incidents of Minamata and Niigata mercury poisoning, *itai-itai* disease from cadmium poisoning, severe asthma in various urban areas, and PCB contamination of Kanemi cooking oil shaped the nation's perception of pollution as a serious threat to human health. Injury from acid rain was a minor issue among these far more serious pollution problems. Interestingly, some experts speculated that some of the reports of eye damage from acid rain could be attributed to "mass psychogenic systemic illness" rather than to the poor ambient air quality (Kasuga 1989:108).

In the mid- to late 1970s, media interest in the environment plummeted and acid rain disappeared as an issue altogether. In part, this was because in the course of the 1970s, Japan went from being one of the most polluted countries in the world to being among the most effective in controlling many air

pollution and other environmental problems. In Japan the prevailing view was that the worst of the pollution problems had been cleaned up and that the quality of the environment had taken a turn for the better. Reflecting a new perception overseas of Japan's environmental protection efforts, a 1977 article discussed requests to Japan by the European Community, France, West Germany, Canada, Yugoslavia, Czechoslovakia, and Poland to establish environmental cooperation agreements. The article reported that these countries wished to learn from Japan's success in applying advanced pollution control technology and in establishing and meeting strict sulfur dioxide emission regulations. The article suggested that Europe's biggest headache was the SO_x emissions from factories in Germany and the United Kingdom and the resulting acid deposition which was killing fish in Scandinavian lakes (*Asahi Shimbun* 22 May 1977: 2).

After a three-year period in which no articles on the acid rain issue appeared, the *Asahi Shimbun* again began to report on acid rain in reference to the fifth Japan-United States Environment Conference convened in Washington, D.C. in November 1981 (*Asahi Shimbun* 8 October 1981: 3 and 10 November 1981). This parallels the emergence of interest in acid rain within the Japanese Environment Agency. In conjunction with the 1982 tenth year anniversary of the United Nations Conference on the Human Environment in Stockholm, bureaucratic interest in global environmental problems began to emerge. Global warming, chlorofluorocarbons and their link to stratospheric ozone depletion, and acid rain were mentioned for the first time in the Environment Agency's annual White Paper on the Quality of the Environment in Japan (Environment Agency of Japan 1981: 32-38 and 1982: 210-211).⁵

In this second phase, there was a change both in the geographic focus of reporting and in the assessment of impacts. In the period from 1973 to 1977 all but two articles dealt with acid rain as a domestic problem. In comparison, from 1981 to 1993 over half of the coded articles treated acid rain as a foreign problem (see Figure 3). In terms of impacts, whereas 58 percent of the articles printed before 1980 referred to acid rain as a health problem, between 1981 and 1992 only 9 percent held this view. Increasingly, the perception of acid rain was that it was a European and North American problem affecting ecological systems. In this period, several articles referred to the problems of sulfur emissions from European factories and coal-based electricity generation plants and their damage to aquatic systems in Scandinavia and to forest ecosystems in Germany (*Asahi Shimbun* 24 November 1983: 1). One of the eight articles on acid rain in 1983 was written by four *Asahi Shimbun* reporters doing a special series on the environment overseas. They provided a first-hand report on forest dieback in central European areas near the former Czechoslovakia, together with a bleak photo of dead trees. The polluters were identified as petrochemical factories in northern Czechoslovakia and German electricity generating plants (*Asahi Shimbun* 30 June 1983: 1). Indeed, electricity generating plants topped the list of causes for acid rain followed by automobiles (see Figure 4). Articles on the US-Canada acid rain issue also appeared in the early 1980s. In 1983, *Asahi Shimbun* gave front page treatment to a National Academy of Science report on acid rain, which pointed at sulfur emissions from US-based electricity plants as the probably cause of acid rain damage to forests and lakes in Canada and the United States (*Asahi Shimbun* 30 June 1983:1).

In the 1980s, articles in the *Asahi Shimbun* portrayed a range of potential impacts from acid rain (see Figure 5). These included possible damage to ecosystems, and in particular damage to forests (20 percent of the articles) and to lakes and fish (10 percent). By the end of the 1980s, potential impacts on material resources also joined the list. For example, articles described how acid rain "ate away at marble statues" in Italy (*Asahi Shimbun* 29 June 1989: 4), how it "blackened the cathedral in Koeln" (*Asahi Shimbun* 22 May 1989: 11) and how it had created major problems for the ancient ruins in Greece (*Asahi Shimbun* 17 May 1991: 3). One report also discussed damage to historical monuments in Japan and the new research effort under way to monitor damage to the statue of the Great Buddha at Kamakura (*Asahi Shimbun* 28 October 1992:29).

The first article mentioning possible acid rain damage in Japan from Chinese emissions appeared in 1985, soon after the peak coverage of acid rain problems in Europe and North America. It is clear that parallels were being drawn between the situation in Europe and North America and what might be happening in Northeast Asia. The article began by stating that 70 percent or more of Sweden's acid rain could be traced to pollutants from Great Britain and West Germany. It cautioned that Japan could no longer ignore acid rain in view of China's rapid industrialization. In five to ten years, the article suggested, acid rain could begin reaching Japan causing air and water pollution. Interestingly, the report referred to an informal meeting in Japan in February 1984 during which United States Environment Protection Agency Director Ruckelshaus raised the issue of long range transport of acid rain in the Asian area. Ruckelshaus suggested that China's reliance on high sulfur coal for fueling its rapid industrialization ultimately would increase transboundary emissions of sulfur dioxide and as a result in the future Japan could suffer from acid rain. It also mentioned that a French scientist had warned that acid rain damage in Japan from emissions in China could spread quickly due to Japan's warm climate (*Asahi Shimbun* 19 January 1985: 4).

The idea that Japan too might be adversely affected by the long range transport of acid rain shifted the focus of media coverage. Eight of the seventeen articles on acid rain appearing in 1985 in the *Asahi Shimbun* made mention of acid rain in China and the potential for its long range transport to Japan. One article warned that 85 percent of China's rainfall is acidic and that, despite China's insistence that the impact on Japan was negligible, sulfur dioxide emissions could transcend national borders, traveling distances of as much as one thousand miles (*Asahi Shimbun* 10 May 1985:1).

The Chinese language uses an imaginative set of characters to describe acid rain. Literally, they mean "the devil in the sky" (*Asahi Shimbun* 12 July 1985: 14). By 1985, there were reports of forest damage in Japan caused by this devil. In the fall of 1986, the Environment Agency and the Ministry of Agriculture, Forests, and Fisheries produced a report announcing that cedar trees in the northwestern Kantô Plain, near Tokyo, were dying from acid rain (*Asahi Shimbun* 3 October 1986: 22). A few months later, the Environment Agency announced the results of its five-year research program into acid rain that found high pH levels throughout the country. While the findings linked the problem to emissions from within Japan, the report also suggested that sulfur emissions from China could be a concern. The report noted, for instance, that Shimane Prefecture, which has no major industry, suffered from acid rain. The Meteorology Agency of Japan suggested that the high sulfur content of rain in the region was caused by sulfur transported from the Asian continent, much in the same way that sand particles reached Japan after sand storms in the Gobi desert (*Asahi Shimbun* 3 December 1986: 3).

From the perspective of the volume of press coverage of acid rain it is clear that the media did not consider acid rain to be a newsworthy issue. From 1973 to 1988 there were only 10 first page articles on acid rain and all of these appeared between 1983 and 1986. In 1987 and 1988, there were respectively only thirteen and fifteen articles that mentioned acid rain. Among these, none commanded a front page and several contained no more than two to five sentences on the subject. The *Asahi Shimbun* was not giving the issue much attention, but neither were other groups in Japan. Scientific research was being done but the findings remained largely confined to the scientific community. The Environment Agency and the Meteorology Agency conducted research on acid rain, but they produced few reports. Some informally organized Japanese environmental groups continued to press the government for action on air pollution issues, much as they had in the early to mid- 1970s, but acid rain was not their primary concern. Rather, they were intent on getting the government to improve its treatment of pollution victims and to reduce nitrogen oxide emissions from transportation, which they saw as a threat to those living or working near busy roads. Japan's politicians expressed almost no interest in global atmospheric pollution issues during this entire period.

In 1989, however, the picture changed and acid rain along with global climate change and stratospheric ozone depletion suddenly became major news issues. Media coverage of acid rain jumped. That year 84 articles mentioned acid rain as opposed to 23 in 1988. The change in media coverage was clearly tied to rising public and political attention to global environmental issues in Japan. A 1989 poll conducted by the Environment Agency's Pollution Research Center found that 87 percent of respondents considered global warming to be among the most serious environmental problems; 57 percent responded it was acid rain (*Asahi Shimbun* 3 October 1989: 6). From this point on, the media covered acid rain as one of many environmental issues threatening the planet.

This new societal and political emphasis on global environmental issues was symbolic of a commitment Japan's political leaders made in the late 1980s to strengthen Japan's role in resolve global-scale problems. As one aspect of this broader commitment, Japanese government and industry began devoting considerable resources for enhancing understanding of both the scientific state of the art and the policy options for combating acid rain. In a public relations effort, the Ministry of Foreign Affairs prepared an English language report for presentation at the 1992 United Nations Conference on the Environment and Development (UNCED) entitled "What Japan is Doing in the Environmental Area." The report described Japanese measures for combating acid rain, illustrating Japanese assistance to developing countries in reducing their acid rain causing pollutants (*Asahi Shimbun* 4 May 1992:2).

A frequently proposed policy option was to conduct scientific research into various aspects of the acid rain problem (see Figure 6). Over the course of the 1980s, the *Asahi* suggested a growing interest among scientists and ministries in assessing the impact of acid rain on Japanese soil, forests, and lakes. At this time, the media also started to report that steps were being taken to help China expand its research capabilities for monitoring and assessing the impacts of acid rain. In 1987, for instance, researchers from Japan and China began joint research on monitoring acid rain, studying the mechanisms of acid rain, and considering policy options (*Asahi Shimbun* 9 April 1987: 3). Interestingly, this occurred despite that fact that China was critical of accusations that it caused acid rain problems in Japan. The *Asahi* reported that an English-language edition of the *Beijing Weekly* argued that the winds in China were not strong in the area where acid rain was the most severe and thus, China could not be responsible for acid rain in Japan (*Asahi Shimbun* 27 September 1990: 22).

A widely endorsed option was technology transfer. In 41 articles printed from 1985 to 1992 flue gas desulfurization and denitrification technologies were discussed as options for dealing with acid rain. Initially, reporting focused largely on European requests for Japanese flue gas desulfurization technology. Contracts for the sale of this technology were signed with several West European countries after the Chernobyl nuclear accident prompted several of these countries to abandon plans for new nuclear power plants and to look to coal for generating electricity. They sought Japan's technological know-how in controlling sulfur dioxide emissions. Some consideration was also given to means to reduce emissions linked to acid rain from the transport sector. Over 7 percent of the articles that appeared in the press in or after 1985 addressed technology options related to the transport sector.

A salient finding is Japan's emerging interest in linking pollution control technology to Japan's overseas development aid programs. One of the earliest articles to suggest this tie between technology transfer and acid rain abatement was a June 1985 letter to the editor by Chûô University Professor Ando, an environmental scientist who served as an environmental consultant overseas. He urged Japan to take a leadership role in addressing air pollution overseas and use this to make a contribution to the world. He argued, however, that it would be necessary to develop more inexpensive technology. Although Japanese flue gas desulfurization and denitrification technology is

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the most advanced in the world, it is too expensive for many countries to install (*Asahi Shimbun* 4 June 1985).

A few years later, the *Asahi* reported that MITI was actively involved in projects for the transfer of relatively low cost desulfurization equipment to the developing world. In 1989, the newspaper announced that Japan planned to cooperate with Indonesia in developing low cost desulfurization technology as part of Japan's overseas development aid. Similar reports appeared on discussions with Thailand (*Asahi Shimbun* 7 March 1991:1) and China as part of the Ministry's Green Aid Plan, a plan to assist developing nations in environmental pollution control technology (*Asahi Shimbun* 15 April 1992:1).

Most controversial of the policy options that were considered was the nuclear option. An article that reported on the controversy surrounding the nuclear option during the United Nations Extraordinary Environment Committee (Brundtland Commission), which met in Tokyo in 1987, for instance, raised the question of whether nuclear energy is destructive to the environment or is a better option than oil or coal that were known to harm forests through acid rain (*Asahi Shimbun* 23 February 1987: 15).

In his analysis of environmental reporting in Japan in the late 1970s, Reich (1984: 162) found that within the *Asahi Shimbun* there was a division among sections, some supporting and others opposed to nuclear energy, but that there was an editorial bias that was guardedly in favor of nuclear energy. This may explain why some articles concerned with both acid rain and nuclear energy discussed it as a reasonable policy option while others discussed it as a threat to the environment. In 1988, for instance, when the Nuclear Power Safety Committee issued a white paper that positively appraised the safety of nuclear energy, the *Asahi Shimbun* ran an article noting that according to a survey it had conducted, 56 percent of respondents felt nuclear energy was dangerous (*Asahi Shimbun* 24 October 1988: 5). A year later, it ran an article showing that while there was a growing anti-nuclear movement after the Chernobyl nuclear accident, another movement is promoting the use of nuclear power by stressing that it can help to cope with global warming and acid rain (*Asahi Shimbun* 15 April 1989: 15).

4 SLANT

Over 86 percent of the articles called for action to address the acid rain problem while the remaining 14 percent were neutral (see Figure 7). The articles are for the most part free of bias. The majority consider acid rain as an issue on which action must be taken, but there are no strong biases either for or against particular actor groups in how they approach acid rain (see Figure 8). Less than 4 percent of the articles, for instance, showed a bias against ENGOs or government and less than 2 percent showed a bias against industry. There is a slightly stronger bias toward some actors. In 16 percent of the articles, for instance, a bias in favor of ENGOs was found.

5 SOURCES

One way to establish an idea of how the media shapes a community's response to a particular social issue is to isolate the key sources, individuals or groups most often quoted in the context of a particular social issue. Throughout the twenty-year study period, the Japanese media relied heavily on executive level sources, including the Environment Agency, the Meteorology Agency, the Prime Minister's Office and the United States government (see Figure 9). For all articles where it was possible to determine key source actors, there was a total of 143 that relied on executive level

sources. The Environment Agency could be identified as a source actor in 32 instances. A number of other ministries were cited as well -- including the Ministry of Transportation and the Ministry of International Trade and Industry, as well as the governments and environment agencies of foreign countries, including the United States and South Korea. There were at least 10 references to a United States administration, 6 of which referred to the Reagan White House and 4 of which referred to the Bush administration. The United States administration was cited primarily in reference to the passage of the Clean Air Act (1989), the resolution of environmental problems between Canada and the United States (1984), and—not least—environmental degradation related to the Gulf War (1991). In addition, there were 38 academic sources, 32 environmental ENGO sources, and 21 international sources. Few references were made to emitter industries (14), impacted industries (2) or the EC (3).

Clearly, the Japanese media relied overwhelmingly on executive level sources. This bias toward executive level sources was particularly true in the first years of coverage. From 1973 until 1981, there was a total of 19 executive level sources, as opposed to 1 academic and 2 international sources. During this period, a large number of sources for the acid rain issue were regional health offices throughout Japan. Already in the prewar period but particularly after the 1960s, national and regional health offices were established to track environmental pollution and related health damages. These sources were relied on for information on on-going experiments to determine the extent of acid rain in Japan, as well research on countermeasures.

One of the most interesting developments over time was the enhanced importance of ENGOs as news sources. As noted above, for the entire period analyzed, there were 32 ENGO sources cited. Interestingly, 28 of the ENGO sources were cited in 1989, 1990, and 1991. Reflecting this new interest in ENGOs in November 1989, the *Asahi Shimbun* sponsored an international symposium on "The Role of Citizen Action in Protecting the Global Environment" (*Asahi Shimbun* 11 November 1989: 4). These articles described the role citizens groups were playing in framing the acid rain debate. One noted that an independent survey by the All-Japan Alliance of Pollution Victims, representing 39 groups, found high levels of acid rain in industrial areas and in urban centers in Japan. In presenting their data to the Environment Agency, the Alliance challenged the perspective that acid rain was a global environmental problem caused by problems in distant places. They argued that local emissions were the problem (*Asahi Shimbun* 27 September 1990: 22). At least four articles covered the "the Citizens' Bank Eco Research" project, a nationwide campaign of citizens -- groups of housewives, recycling groups, organic food groups and others -- that worked together to gather data on the pH level of water in their areas (*Asahi Shimbun* 25 November 1990: 31).

6 CONCLUSION

Media coverage of acid rain in Japan over the twenty years between the United Nations Conference on the Human Environment in Stockholm Sweden in 1972 and the United Nations Conference on the Environment and Development in Rio de Janeiro in 1992 tells a fascinating story. The treatment of acid rain as a problem has gone through major transitions. Reflective of the dominant health related concerns of environmental reporting in the early 1970s, acid rain was portrayed as a serious problem because of the damage it could do to the eyes and skin. A decade later, after a period of no interest in acid rain, the media again picked up the issue, but this time, it was not a problem for the health of Japanese, but rather a problem for the forests and lakes of Europe and the United States. It was seen as a problem in Scandinavia, the Black Forest of Western Germany, and in northeastern Canada. It took several years before the idea took hold that Japan too might be affected by the long range transport of acid rain.

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When parallels began to be drawn between the situations in Europe and North America with the situation in Asia, the media started to focus its attention on the environmental implications for Japan of rapid industrialization in China. Acid rain was seen as a real threat. The media reported numerous instances of acid rainfall in Japan and began to run articles describing damage to Japanese forests and cultural objects. Many of the articles linked damage, real or potential, in Japan to China's "devil in the sky." Despite continued uncertainty about the causal linkage and Chinese denials that they are the cause of Japan's problem, the issue gained prominence in the Japanese media.

Interestingly, acid rain was also portrayed as an opportunity for Japanese industry. In the 1970s, in reaction to severe domestic air pollution problems, Japanese industries developed sophisticated desulfurization and denitrification technology. First, in the late 1970s, European countries suffering from acid rain turned to Japan because of its expertise in reducing air pollution. Then in the latter half of the 1980s, Japan began to consider incorporating acid rain abatement into its overseas development aid programs. This was something that was both positive for the environment and for Japan's international image. In the early 1990s, acid rain continued to receive considerable media coverage. While acid rain is still a minor issue compared with some other environmental issues, it is likely to remain an item in the Japanese press in the years to come.

The analysis of acid rain media coverage is also revealing with respect to the role of the media in setting the environmental policy agenda. The low level of media coverage of acid rain from 1973 to 1988 suggests that the media did not play an agenda setting role in getting acid rain onto the social or political agenda. In the early 1970s, acid rain was only a minor issue compared with the thousands of articles on the environment appearing in the press. The media may have played an important role at this time in increasing public awareness of environmental issues in general, but it was not trying to get acid rain per say onto the political agenda. In the late 1970s as the salience of environmental issues declined and environmental policy making became more routinized, reporters relied increasingly on the Environment Agency for their leads. Acid rain was essentially a non-issue for the press because it was a non-issue for the government. This did not change until the *Asahi Shimbun's* overseas reporters picked up on the flood of newspaper coverage of acid rain in the United States, Canada, and Western Europe in the early 1980s. Even throughout most of the 1980s, however, the acid rain issue was a minor one in the newspaper.

The Japanese media did not show a strong interest in acid rain until 1989 and this was linked to a more general change in environmental politics that occurred at that time. As global warming and stratospheric ozone depletion rose to the political agenda, acid rain was pulled along as one of a series on environmental issues threatening the planet.

Once on the political agenda, acid rain gained the media's attention and provided a setting for various actors in society to voice their opinions about policy options. Some suggested that the problem was too uncertain scientifically and required more research. Others suggested that the nuclear option would solve acid rain problems. Others countered this arguing that nuclear energy had its own problems. Most suggested that Japan must do something to aid developing countries, and particularly China, in dealing with air pollution problems. Unlike prior environmental problems in Japan, acid rain was not a particularly controversial one. In large part, this was because it was not Japanese industries but overseas industries that were seen as the problem; Japanese industries have been portrayed as the supplier of potential solutions to the acid rain problem. Finally, the attention given to environmental groups in acid rain news coverage in the late 1980s suggests that ENGOs in Japan are gaining greater visibility.

Figure 1. This count is based on articles appearing under pollution or environmental subject headings in the *Asahi Shimbun's* monthly index ("shukku satsuban"). For the 1964 to 1970 period the count represents articles listed under the subheading "kôgai" or "pollution" in the medical and hygiene subsection of the culture section of the *Asahi Shimbun* monthly index. In 1970 indexing styles changed. Thus, for 1971 to 1992, the count represents environmental articles appearing under the subheading "kôgai" in the society section of the newspaper plus environmental articles listed under the subsection "development and environmental protection" of the culture section. In addition, environmental articles in the general and international sections of the world section of the index were counted for the years 1970 to 1993. Articles are identified by the section of the newspaper index in which they were located. Actual coverage of the environment is somewhat higher than suggested by this count.

FIGURE 1
FREQUENCY OF ENVIRONMENTAL ARTICLES APPEARING IN THE ASAHI SHIMBUN

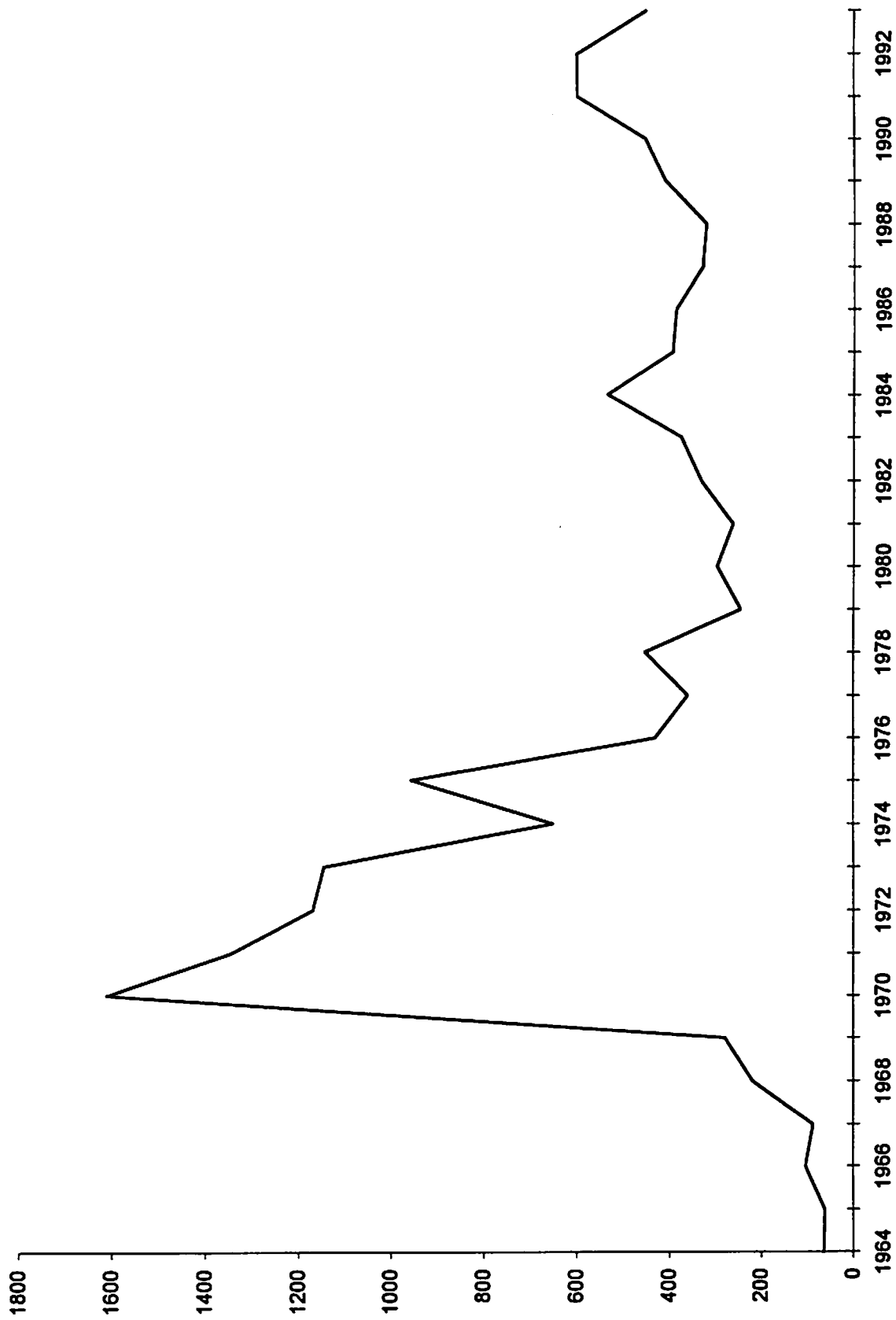


Figure 2. Frequency of articles on acid rain in the *Asahi Shimbun* scaled as a proportion of the number of articles in the year of maximum citations (1992 = 100 articles), 1972-1992. The *Asahi Shimbun's* computer index, which covers the period 1985-1992, was searched using the keyword, "sansei u." For 1972-1984, the *Asahi Shimbun's shuku satsuban* monthly index was manually searched for articles on acid rain. 409 articles were identified by the computer search. Of these, 250 were identified as being primarily or somewhat related to acid rain and were summarized into English and coded. All of the articles (42) found manually were coded.

FIGURE 2
NEWSPAPER ATTENTION -- "ACID RAIN" -- JAPAN

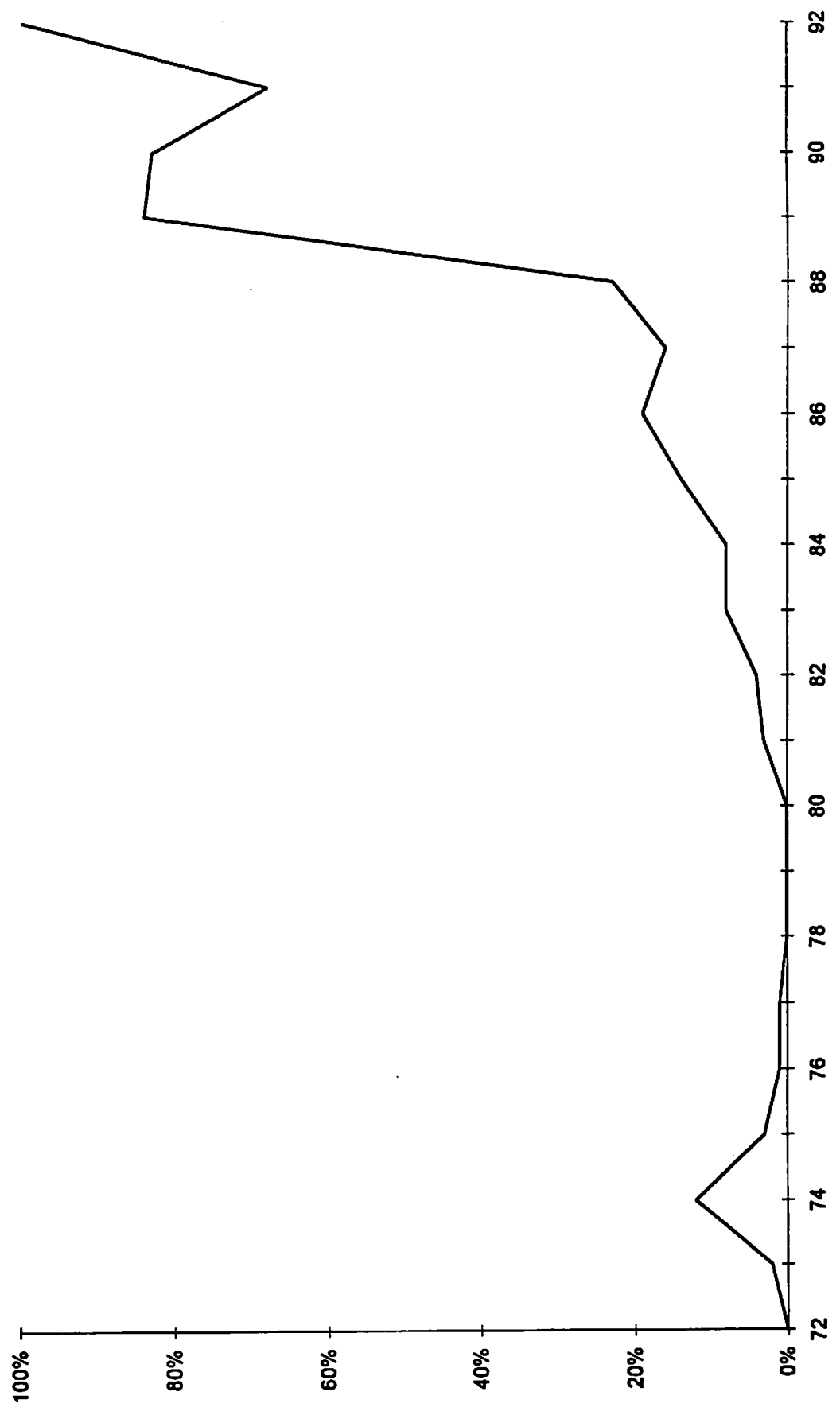


Figure 3. Percentage of *Asahi Shimbun* articles in a given year belonging to each category, 1980-1992. Each article was assigned to only one of the following categories: purely a "domestic" scope; "domestic and transboundary" includes those articles that have the transboundary aspect as the main focus or cover another country's problems.

FIGURE 3
GEOGRAPHIC FOCUS -- "ACID RAIN" -- JAPAN

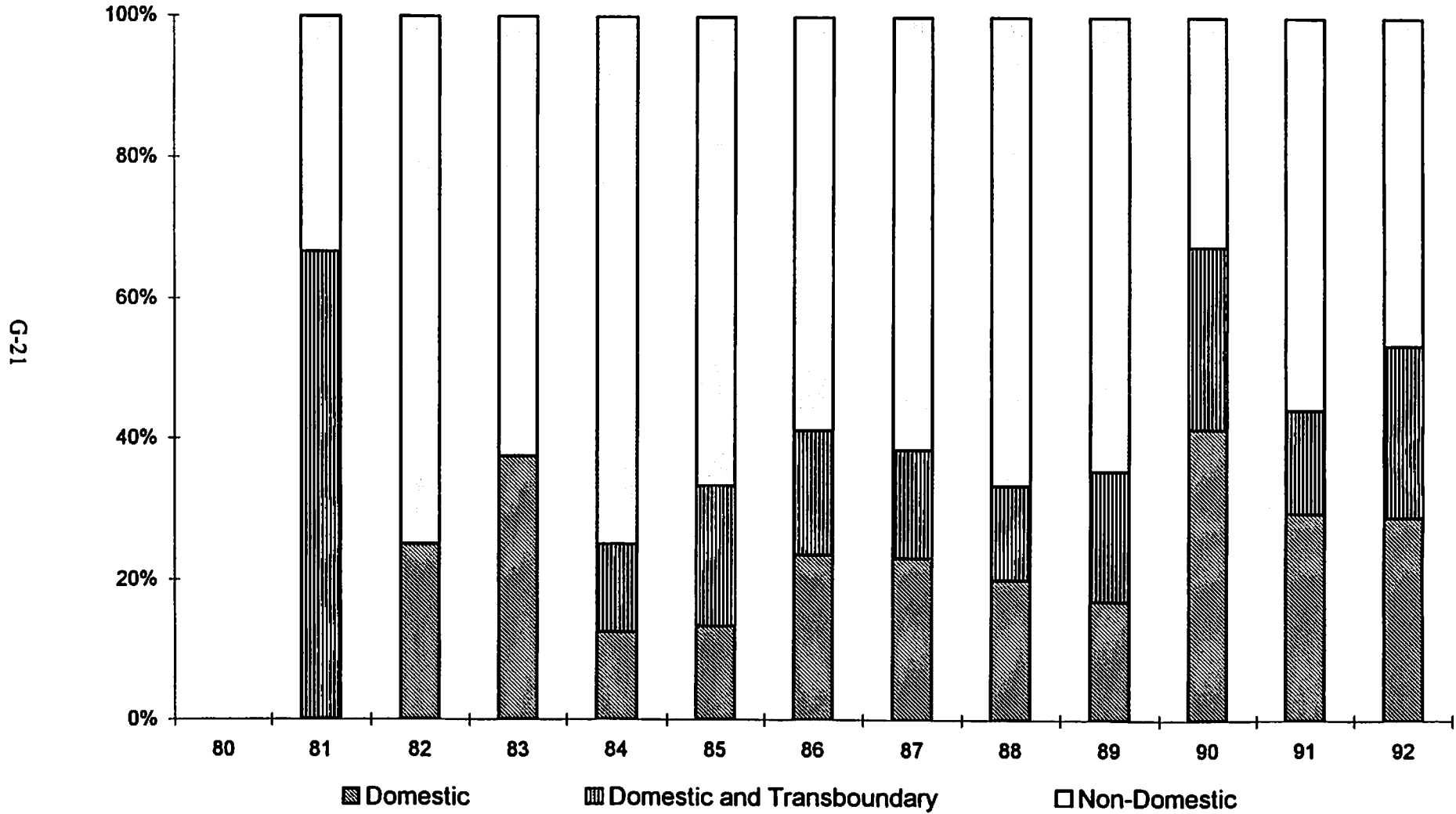


Figure 4. Percentage of all causes of "acid rain" mentioned in *Asahi Shimbun* articles in a given year belonging to each category, 1980-1992. Each article may have more than one cause coded.

FIGURE 4
CAUSES -- "ACID RAIN" -- JAPAN

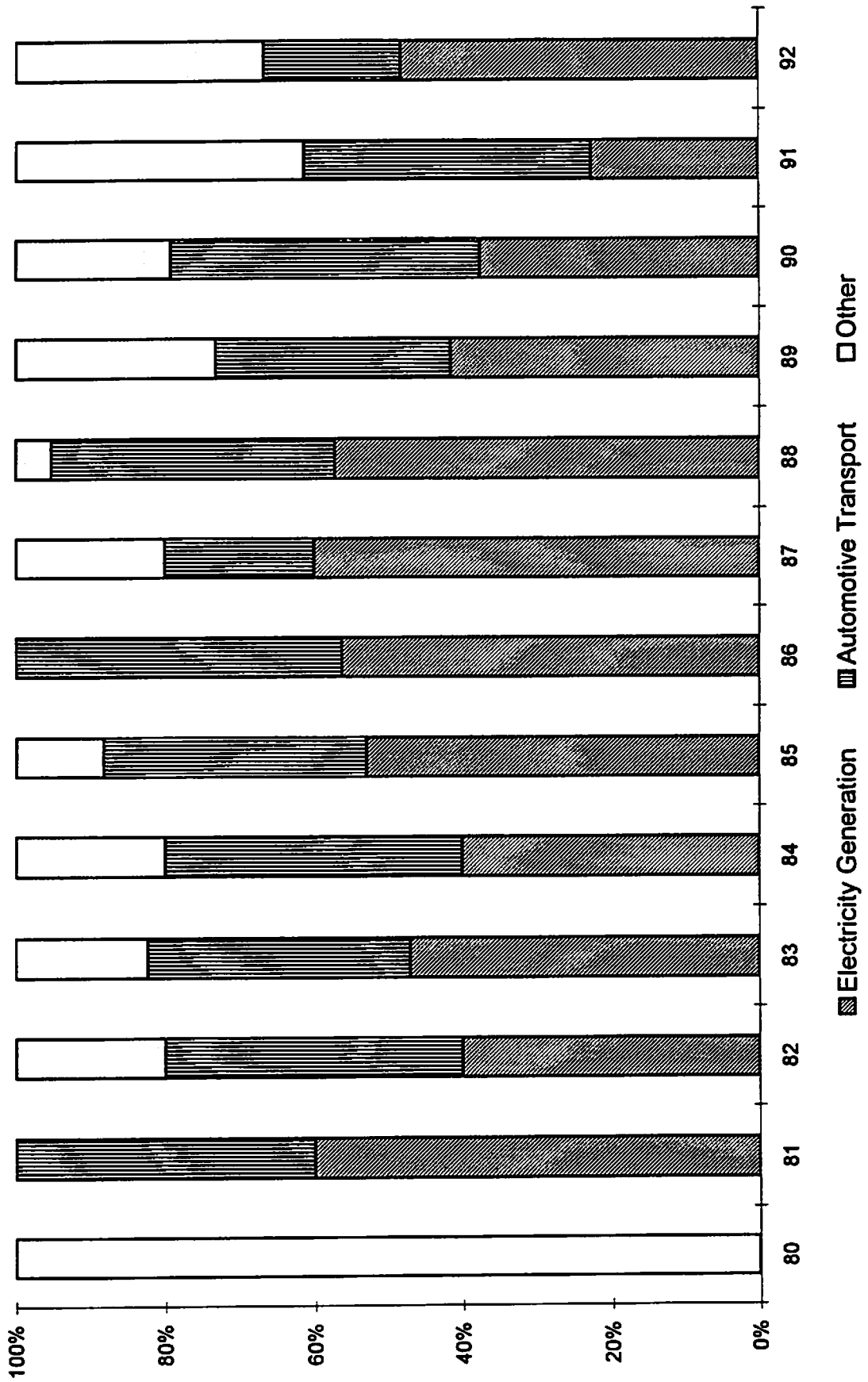


Figure 5. Percentage of all primary impacts of "acid rain" mentioned in *Asahi Shimbun* articles in a given year belonging to each category, 1980-1992. Each article may have had more than one primary impact coded. Generic secondary effects, e.g., economic damage, are not included unless they are posed in terms of one of the listed primary impacts, e.g., the economic impact on forests is generally coded under forest impacts.

FIGURE 5
PRIMARY IMPACTS -- "ACID RAIN" -- JAPAN

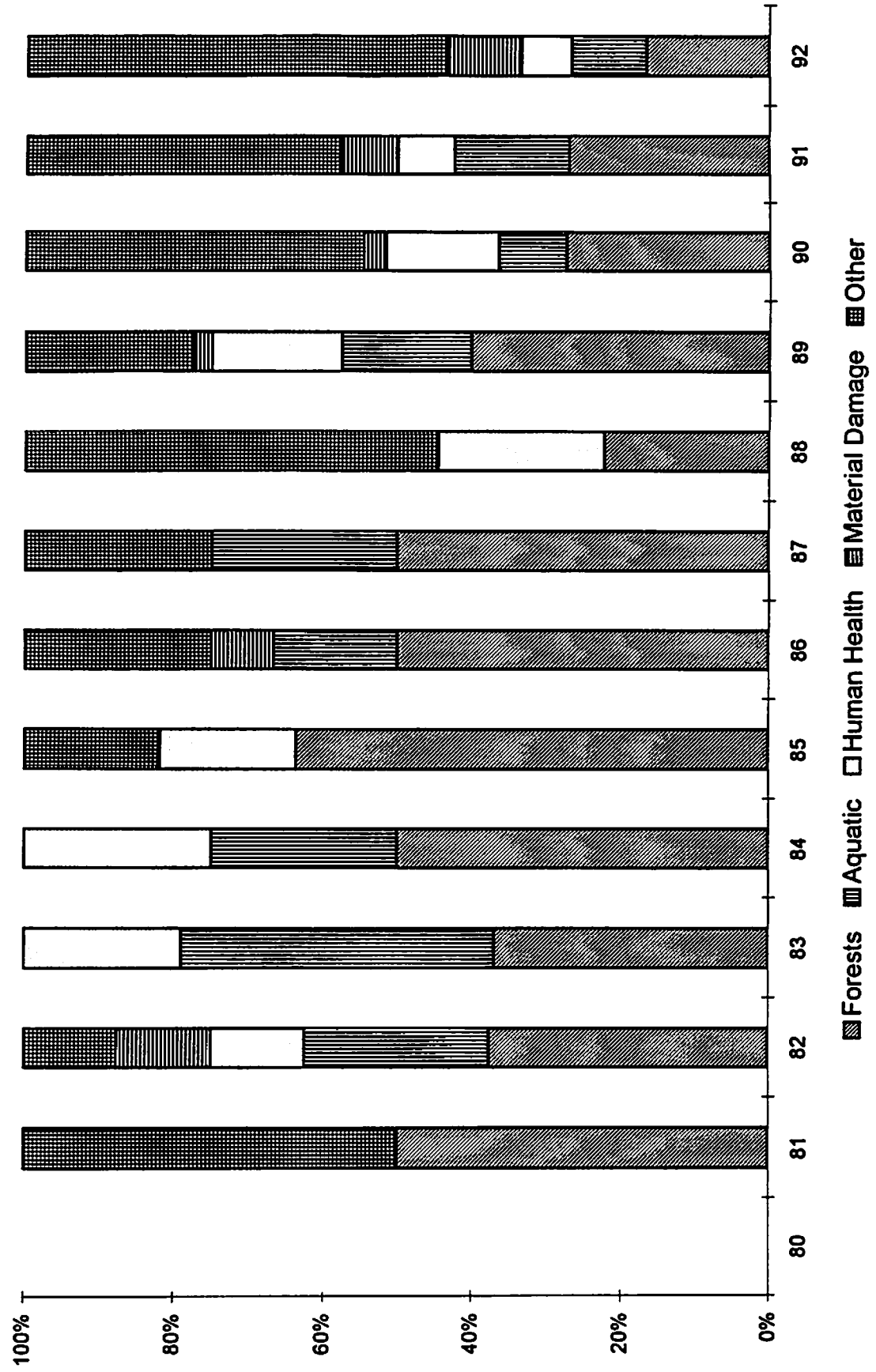


Figure 6. Percentage of all options to manage "acid rain" mentioned in *Asahi Shimbun* articles in a given year belonging to each category, 1980-1992. Each article may have had more than one of the following option categories coded: "technology - emissions" includes technologies such as those that reduce 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 6
 OPTIONS -- "ACID RAIN" -- JAPAN

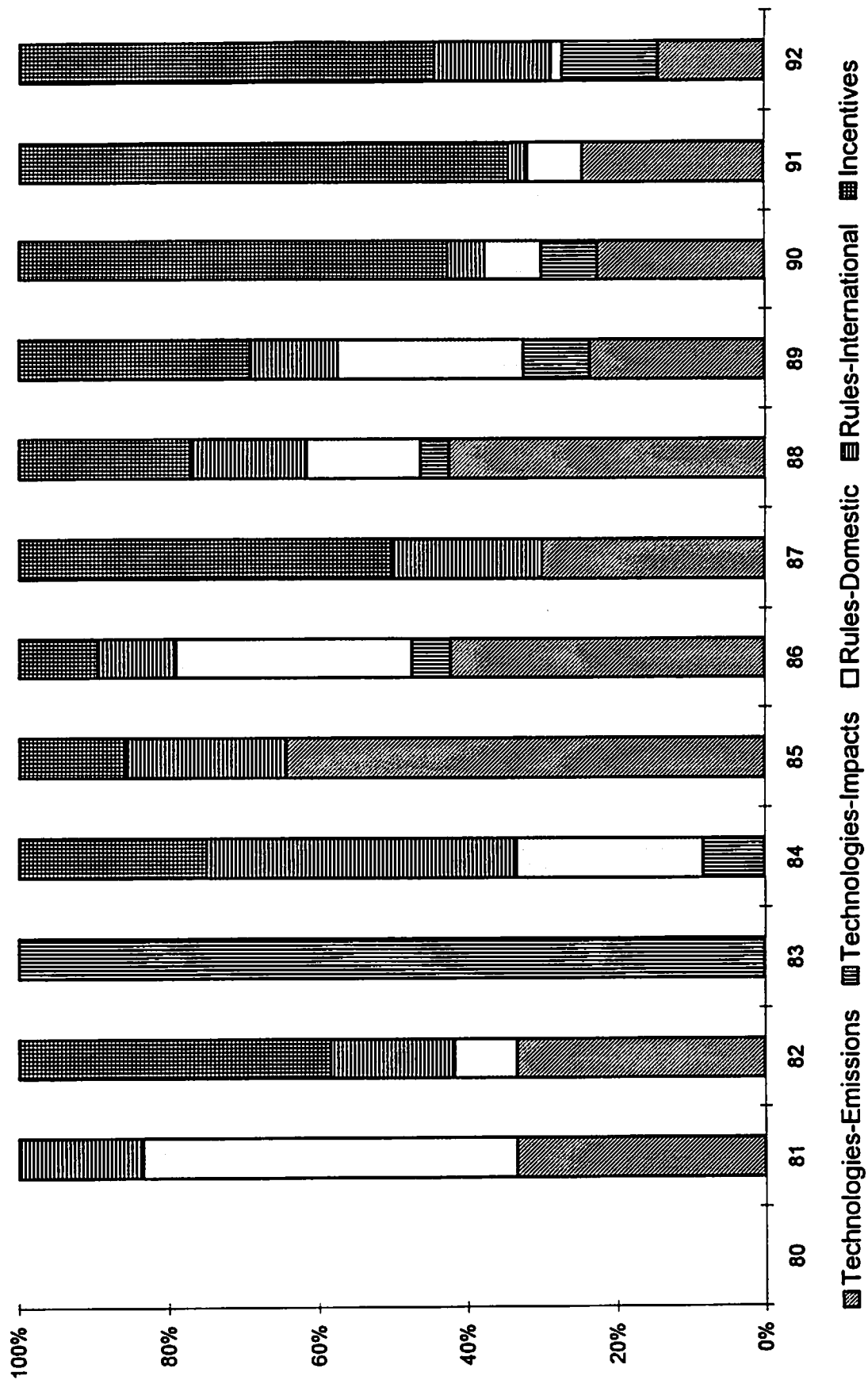


Figure 7. Percentage of *Asahi Shimbun* articles on "acid rain" in a given year that were either for action or against action, 1980-1992. The percentage of articles coded as neutral is not shown. Each article was assigned to only one category.

FIGURE 7
ACTION BIAS -- "ACID RAIN" -- JAPAN

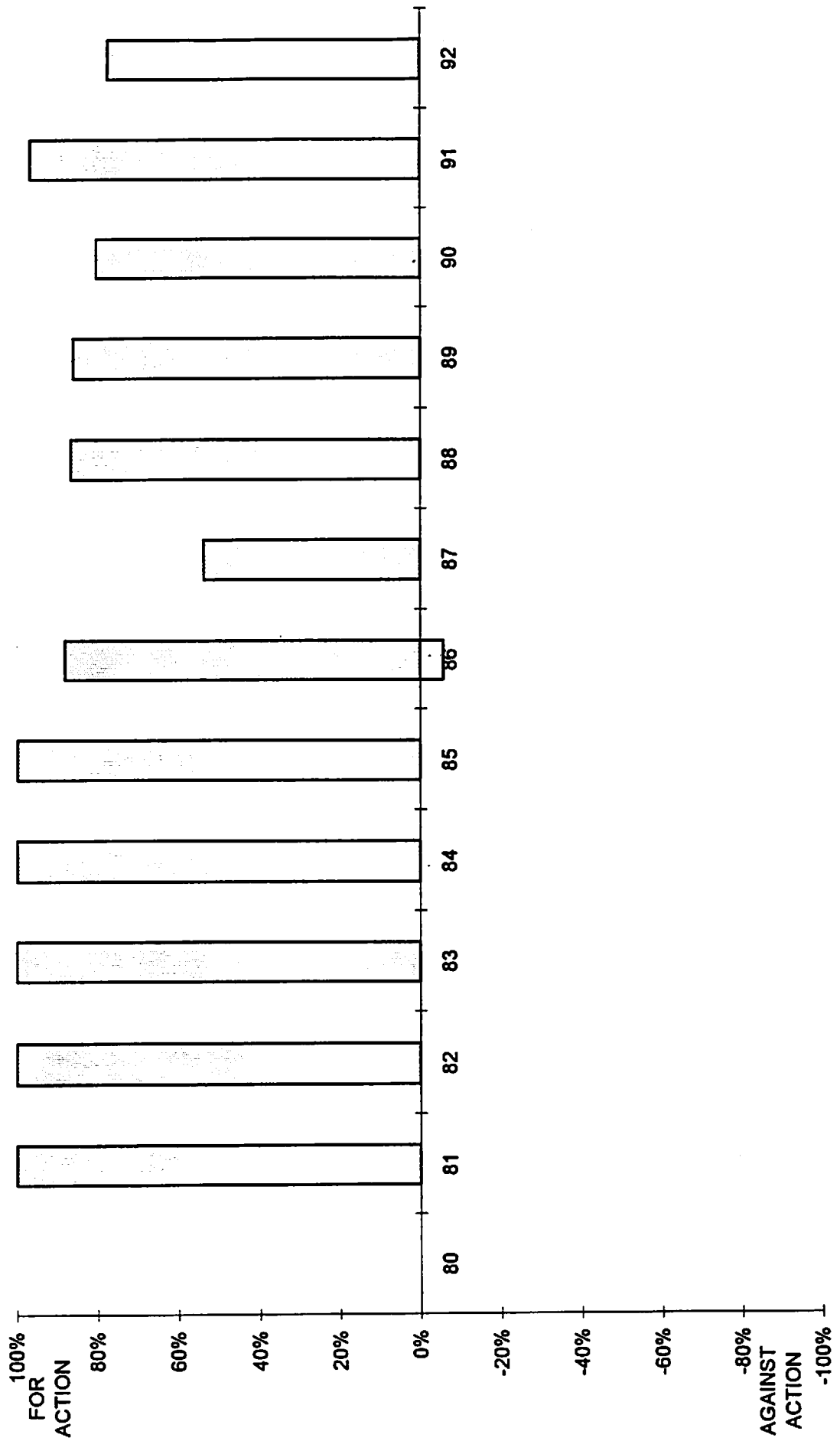


Figure 8. Percentage of *Asahi Shimbun* articles in a given year that showed bias toward particular actors, 1980-1992. Positive bias portrayed an actor in a positive light; negative bias in a negative light. The percentage of articles coded as showing no bias is not shown here. Each article was assigned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

FIGURE 8
 ACTOR BIAS -- "ACID RAIN" -- JAPAN

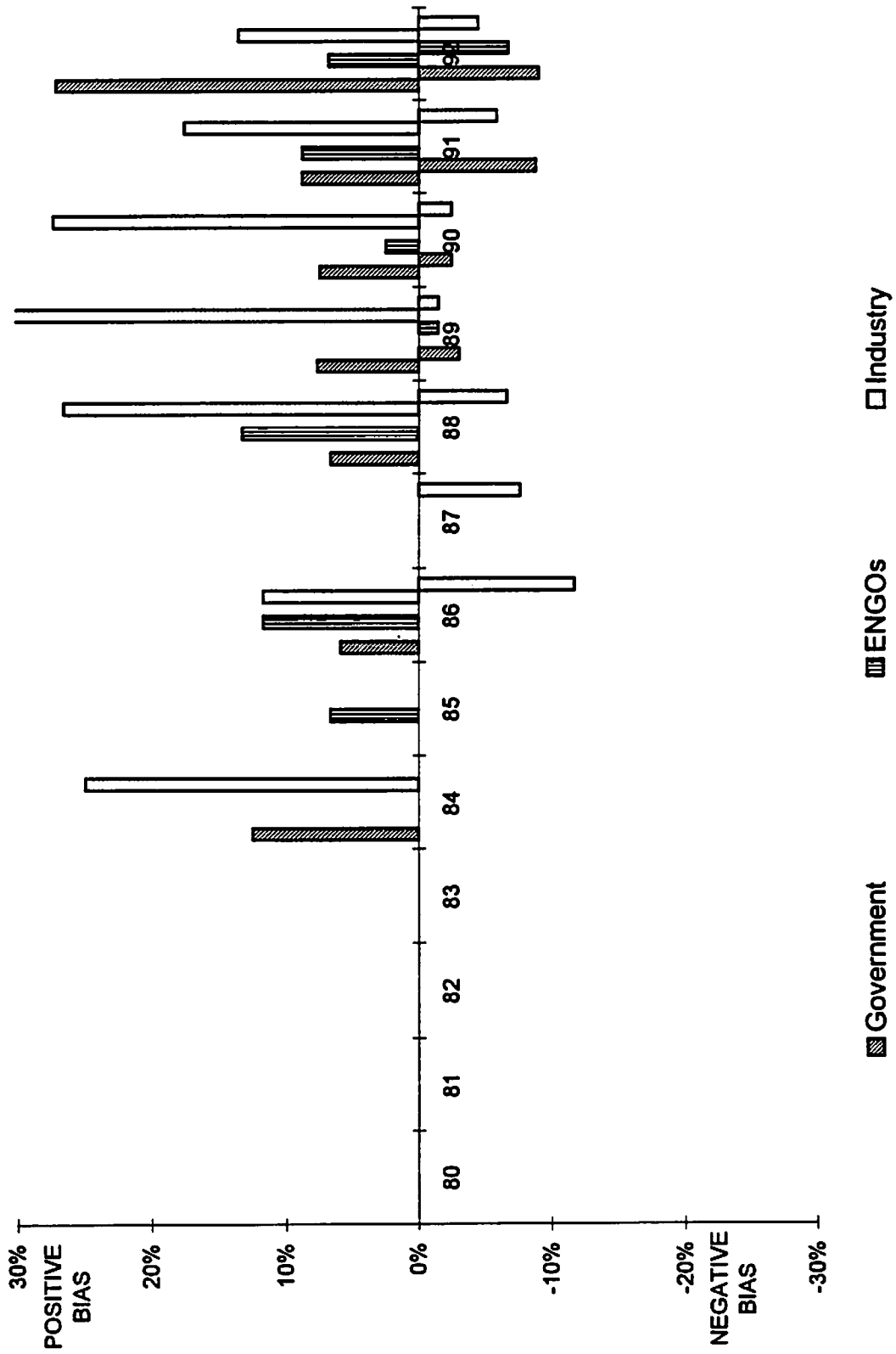
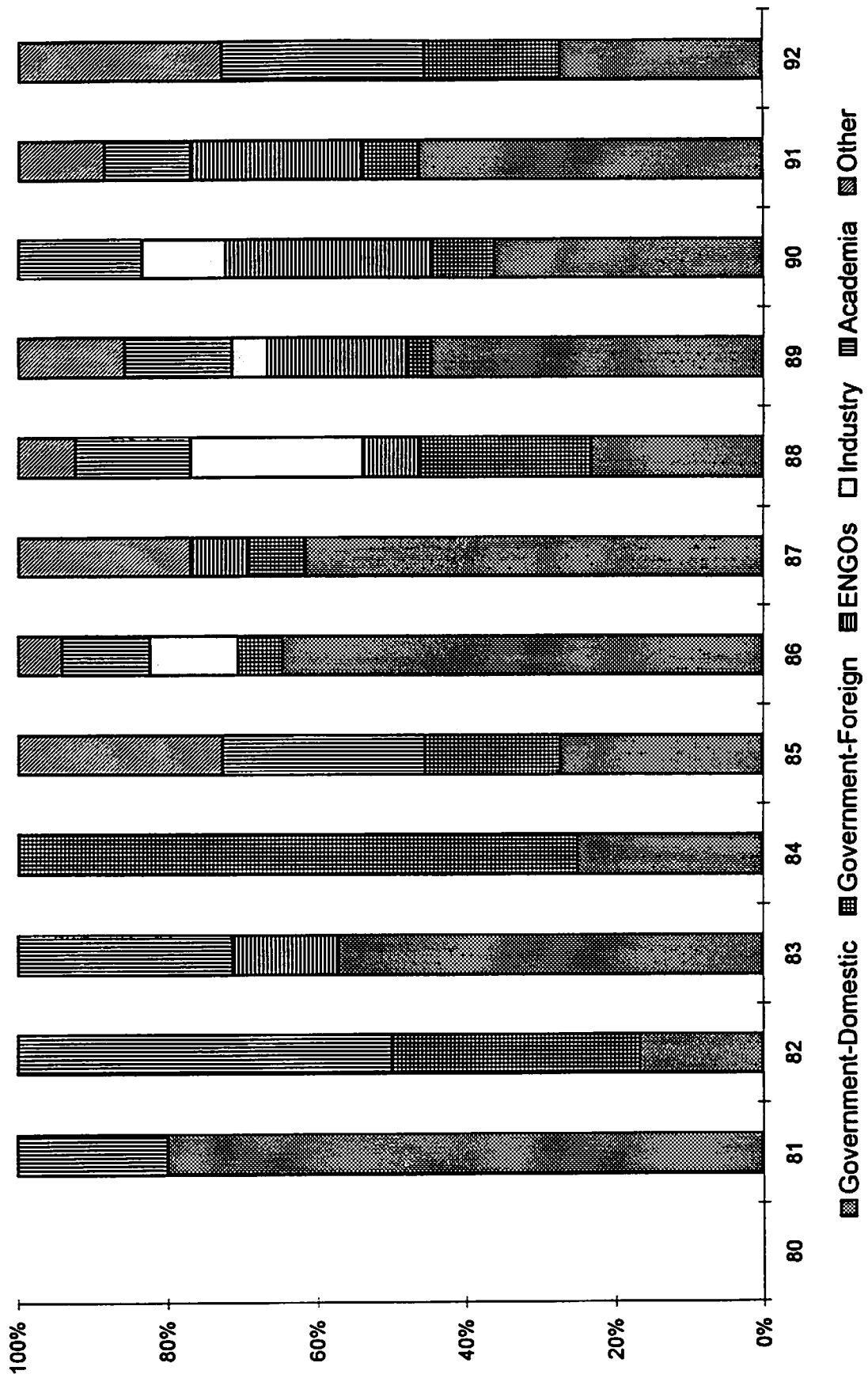


Figure 9. Percentage of news sources that dominated the framing and shaping of "acid rain" articles in the *Asahi Shimbun*, 1980-1992. Each article may have more than one source category coded. "Government-domestic" includes executive, legislative, and judiciary actors. The "government-foreign" category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

FIGURE 9
NEWS SOURCES -- "ACID RAIN" -- JAPAN



Endnotes

1. Miranda Schreurs, University of Maryland, USA; Patricia Welch, University of Michigan, USA; Akiko Koda, Keio University, Japan.
2. Groth (1995) presents a somewhat different view of the media in an analysis of the perceptions of the media held by leaders of a citizens' movement that emerged in opposition to plans for a new bullet train route. The leaders felt that the media often failed to perform an adequate watchdog role over the national ministries and public corporations. Consequently, the leaders themselves had to perform a "watchdog" role over the media.
3. For early examples of this type of research, see the Proceedings of the Thirteenth and Fourteenth Annual Conferences of the Japan Society of Air Pollution.
4. Telephone interview with an *Asahi Shimbun* reporter, August 1994.
5. The earliest references to stratospheric ozone depletion and global climate change are in the 1981 white paper. The earliest reference to acid rain is in the 1982 white paper.

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