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## AN INSTITUTIONAL ANALYSIS OF ENVIRONMENTAL POLLUTION DISPUTES IN TAIWAN: CASES OF “SELF-RELIEF”

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During the late 1980s and early 1990s in Taiwan, people’s protests against environmental pollution often took the form of “self-relief,” meaning that they attempted to fight polluters using their own resources, without relying on legal or administrative procedures. Why did such an extreme form of dispute become so widespread? What institutional changes did these movements bring about? These questions are analyzed using the analytical framework of “law and economics.” Our research shows that self-relief functioned to a certain extent as a means of realizing quick compensation for victims, and for reflecting the opinions of local people concerning development projects; in addition, it served to promote the formulation of law and administrative systems. However, as it was based on direct negotiations between the parties concerned, the outcome of each dispute only reflected the transient balance of forces, and the experience gained in negotiations was not accumulated as a social norm.

### I. INTRODUCTION

**I**N the latter half of the 1980s, serious and frequent environmental disputes began to occur in Taiwan. Public protest against emissions of pollutants or against development projects which might cause serious pollution often took the form of “self-relief” (*zili-jiuji*) movements, in which people attempted to fight the problems using their own resources.<sup>1</sup> In antipollution self-relief movements, victims (or potential victims) frequently negotiated directly with the enterprises responsible for pollution, and very few attempts were made to solve the problems through legal procedures. Self-relief actions by victims involved face-to-face confrontations and sometimes physical force. The use of force by victims’ groups in such cases sometimes caused halts in operations of the polluting factories.

These self-relief movements have included a wide variety of collective protests by citizens against administrative authorities or business enterprises. All social movements were banned in Taiwan under martial law, and even after martial law

<sup>1</sup> “Self-relief” (self-help) is a legal term, but in this paper we will not use it strictly according to legal terminology.

was lifted in 1987, self-relief movements were still considered illegal in some respects. Most cases of self-relief against environmental pollution, especially during the process of democratization, were unorganized, spontaneous actions by local people against polluters or development projects. In this paper, we will focus on the antipollution self-relief carried out under such unorganized people's actions. We believe that these local, unorganized self-relief actions should be distinguished from social movements carried out by urban intellectuals (Terao 2002, pp. 266–68).

We will begin with the question of why an extreme form of settling disputes, i.e., through the self-relief movement, spread so widely in Taiwan in the 1980s. We will analyze this question using the analytical framework of “law and economics.” Our conclusions are that the cost of this form of collective protest was decreasing along with democratization, and that at the same time the Kuomintang (KMT)'s developmental dictatorship had produced an “institutional vacuum” of alternatives such as legal or administrative ways to solve environmental problems at a lower cost. However, the self-relief measures did not guarantee a fair and efficient solution. We will cite two problems of self-relief movements: opportunistic behaviors by both victims and pollutant enterprises, and solutions through power games.

The second question is what institutional changes the self-relief movements have brought since the late 1980s. If a legal and/or administrative system for pollution prevention and dispute solution were developed and operated at a lower social cost, it would inevitably replace the solution of resorting to the use of force. We also analyze the impacts of democratization on environmental movements, including self-relief. In actuality, self-relief movements undoubtedly induced the expansion of environmental administration systems, the formulation of environmental laws and ordinances, and a rapid increase in investments in pollution prevention by the public and private enterprises. These institutional adjustments are likely one reason why protests on environmental issues became somewhat milder in the 1990s than in the 1980s. In addition, the changes in the protest movements can also be attributed to their own transformation of strategies, as one recent study emphasizes.

In Section II, we will briefly outline the political situation in Taiwan before the development of democratization in the 1980s, and explain the preconditions for the eruption of popular discontent concerning environmental pollution in the form of self-relief movements. In Section III, we will outline how the antipollution movements emerged in the course of Taiwan's gradual political democratization in the early 1980s to the lifting of martial law in 1987. We will then focus on some typical examples of protest movements by local people after 1987 against pollution caused by public enterprises. In Section IV, we will attempt to provide an analysis of our first question. Using the framework of “law and economics” or “economic analysis of law,” we will demonstrate the problems of self-relief movements as well as the institutional reasons why they prevailed in Taiwan despite their defects. In Section V, we will examine our second question. We will look at institutional development

and the change in the protest movements, and then examine the relation between them. The final section provides a summary and the implications of Taiwan's experiences.

## II. "DEVELOPMENTAL DICTATORSHIP" AND THE BACKGROUND TO DEMOCRATIZATION

The KMT maintained a dictatorship in Taiwan after moving there from mainland China. Under the regime, Taiwan achieved phenomenal economic growth. However, environmental pollution worsened in tandem with rapid industrialization. Despite this fact, the regime refused to allow people to organize movements to protest against and negotiate with private big business and administrative authorities.

Taiwan's dictatorship was an authoritarian regime featuring a one-party system in which the KMT was integrated with the government. Under this system, the KMT government, though advocating "liberalism," enforced martial law and relentlessly suppressed the freedom of speech, assembly, and association. It severely restricted people's participation in politics. The KMT dictatorship also implanted a sense of defeatism in the minds of local Taiwanese people through "white terror," meaning constant surveillance of political activities and threats.

In the mid-1970s, anti-KMT politicians began to openly challenge the authoritarian regime. General elections were held once every two or three years, and the KMT government allowed people to elect a small portion of representatives. These elections offered anti-KMT politicians a limited but very precious opportunity to express their opinions. Whenever the authorities were suspected of irregularities or plots aimed at defeating anti-KMT politicians in elections, political disturbances occurred. The Chungli incident of 1977 was one such popular revolt.

When the United States established diplomatic relations with the People's Republic of China in 1979 and severed formal relations with Taiwan, the legitimacy of the KMT government was thrown into serious crisis. In place of formal diplomatic ties, the United States enacted the Taiwan Relations Act, and maintained its political and military influence over the island. At the same time, it placed stronger pressure than before on Taiwan to democratize and respect human rights.

The political crisis that resulted from the change in Taiwan's relations with the United States stimulated domestic demands for democratization. Despite the clampdown known as the Militao (Kaohsiung) incident of 1979–80, anti-KMT politicians continued to expand their influence. Wakabayashi (1992) characterizes the situation in Taiwan in this period as follows: "in a series of internal and external political crises, a 'gap of freedom' began to open up in Taiwan's authoritarian system" (my translation) (p. 212).

### III. THE EXPANSION OF SELF-RELIEF MOVEMENTS

#### A. *The Rapid Expansion of Self-Relief Movements in the 1980s*

Until the end of the 1970s, protests against the authoritarian regime were confined to anti-KMT forces in local assemblies. However, collective protest actions by nonpermanent organizations outside of the antiestablishment forces began to be organized in the early 1980s. The antipollution movements are considered examples of such collective protest movements.

Wu (1990) calls such collective actions “social protests,” and classifies the actions that occurred in 1983–88 as shown on the Table I. Social protests here can be considered to substantially overlap with self-relief movements.

The table illustrates first, a remarkable increase of social protests even before the lifting of martial law in 1987. According to Wakabayashi (1992), the “gap of freedom” that was opened up by anti-KMT forces in the development of democratization from the authoritarian system was a “kind of common property created in the space of social disputes” (pp. 198, 228) and was not monopolized by anti-KMT

TABLE I  
NUMBER OF “SOCIAL PROTESTS” BY TYPE, 1983–88

Type	1983	1984	1985	1986	1987	1988	Total
Livelihood <sup>a</sup>	89	89	114	116	293	407	1,108
Environment	37	62	39	98	146	200	582
Labor	27	40	85	40	69	296	557
Farmers	3	0	3	2	24	51	83
Antigovernment <sup>b</sup>	1	5	7	60	119	136	328
Pan-political <sup>c</sup>	6	6	18	12	34	29	105
Others <sup>d</sup>	10	2	8	9	49	53	131
Total	173	204	274	337	734	1,172	2,894

Source: Wu (1990, p. 57).

<sup>a</sup> Represents self-relief actions against the expropriation of land for the construction of public facilities, and street vendors’ protests against policing.

<sup>b</sup> Represents street demonstrations by anti-KMT organizations and the opposition party (Democratic Progressive Party, DPP), as well as protests against the opposition (mainly the DPP) by right-wing forces (thirty-one cases in total).

<sup>c</sup> Represents any political protest other than “antigovernment,” for example, conflicts among local political factions over local political power and resources, and disputes within professional organizations over personnel affairs and organizational arrangements.

<sup>d</sup> Represents movements and actions by groups and organizations which could not be categorized into other types, for example, the New Testament Church Protest (protest against government by a religious group), student movements, veteran mainlanders’ home-visiting movements, women’s movements, indigenous peoples’ human rights movements, consumers’ movements, etc.

forces. These protests in turn widened the gap of freedom, which anti-KMT forces utilized in reviving mass political protests and street demonstrations.

Second, according to the table, the increase in the number of protests was substantially accelerated after 1987, when martial law was lifted. The widening gap of freedom contributed to this acceleration.

Third, the table shows that movements against pollution and in favor of environmental protection held a significant position among the social protests. This indicates that environmental problems were one of the most important contradictions that Taiwan's developmental dictatorship produced and could not solve effectively at that time.

### B. *The Expanded Gap of Freedom and Environmental Protection Movements*

Some statesmen and scholars characterize the turning point in Taiwan's environmental protection movement as the lifting of martial law in 1987.<sup>2</sup> However, anti-pollution movements did not suddenly spring up in various parts of Taiwan after the lifting of martial law. Even while martial law was still in place, antipollution movements had developed in various parts of Taiwan, and some were organized movements.

The first popular movements against pollution occurred in 1981. In July of that year, 116 farmers in Huatan-hsiang, Changhua County filed a lawsuit against eight brick-baking factories, demanding compensation for long-term damage to their rice crops caused by smoke. The farmers won the lawsuit, and received NT\$1.48 million in compensation. However, civil lawsuits, as in this case, did not become the major way for solving pollution disputes in Taiwan hereafter.

In 1983, people living near an amino acid factory in Linyuan, Kaohsiung County, used force to block the factory in protest against foul odors and polluted water. As a result of this movement, the factory was forced to shut down and move to another location. This is considered the first antipollution self-relief movement in Taiwan (Terao 1993, p. 179).

The Sankuang Agricultural Chemical incident, which occurred in Tali-hsiang, Taichung County, in 1982–86, signaled a turning point in Taiwan's antipollution

<sup>2</sup> One example is Hsieh Chang-ting, a leading statesman of the Democratic Progressive Party who has participated in some environmental movements since the 1980s. His understanding (Hsieh 1992) was that before 1987, such movements were led by intellectuals and lacked grassroots support. Without any long-term perspective, they were localized, accidental, and passive antipollution movements. A change began to be seen in the political situation in the latter half of an overall change in the democratization movement, environmental protection movements began to spread to the grassroots and develop into islandwide movements. After 1987, as mass movements were "liberalized," middle-class people, women, farmers, workers, students, and people from all walks of life began to participate in such movements, which were thus no longer passive self-relief movements, as they developed into positive environmental protection movements with a long-term perspective. It was after the lifting of martial law in 1987 that powerful antipollution movements promoting environmental protection and with widespread influence began to develop in Taiwan.

movements, in that it was organized. Since 1967, Sankuang Agricultural Chemical had operated a factory in Ninhua village, Tali-hsiang, manufacturing agricultural chemicals, including insecticides, herbicides, germicides, and other chemicals. People in the vicinity of the factory protested against its emission of irritating gases and discharge of toxic water. In 1985, the residents discovered a buried water discharge pipe and launched a protest. In response, the Department of Environmental Protection (predecessor of the Environmental Protection Administration of the Executive Yuan, central government) ordered the factory to close. The factory management resisted, but was compelled to promise that the factory's operations would be suspended by July 1986, a year and a half after the order. In 1986, during this dispute, the Taichung County Pollution Prevention Association was established as Taiwan's first legal private antipollution, environmental protection organization.<sup>3</sup> The Sankuang Agricultural Chemical incident is seen as having made a strong impact on the development of antipollution organizations and environmental protection movements in various parts of Taiwan (Hsiao et al. 1998; Terao 1993).

In 1985, Du Pont announced a project to construct a titanium dioxide plant in an industrial estate in Changhua County. Although the plan had been approved by the Ministry of Economic Affairs, it was suspended and finally canceled in March 1987 due to an opposition movement launched by people in Lukang, where the industrial estate was located. It was Taiwan's biggest-ever foreign direct investment project at the time, representing an investment of U.S.\$160 million. The Ministry of Economic Affairs approved the project only thirteen days after the application was filed, making it obvious that no proper environmental impact assessment (EIA) was carried out. The movement against Du Pont's plan represented a turning point in that for the first time, an antipollution environmental protection movement had a significant impact on Taiwanese society (Reardon-Anderson 1992).

Under the martial law regime, people had to be prepared to pay great costs and make large sacrifices when launching antipollution movements. It can be said that these initial efforts paved the way for the upsurge in such movements after martial law was lifted.

### C. *The Lifting of Martial Law and Antipollution Self-Relief*

After the lifting of martial law in 1987, there was a major increase in cases in which protesters resorted to physical force when pressing enterprises to cut back on

<sup>3</sup> Until the late 1980s, when the government relaxed its strict control over private social organizations, people could not establish any formal social organizations without its permission. Even if the purposes were nonpolitical, the government did not allow private social activities that were not controlled by the KMT. It was especially cautious about network type organizations, which could mobilize resources at a islandwide level (Terao 2002). According to Chang et al. (1992, pp. 89–91, 135–37), about 75 per cent of antipollution and antidevelopment self-relief activities were conducted collectively, relying on informal social relations such as cooperation among local-community people or relatives.

TABLE II  
NUMBER OF "ENVIRONMENT"-RELATED COLLECTIVE ACTIONS BY OBJECTIVES, 1983-88

Objective	1983	1984	1985	1986	1987	1988	Total
Anti-construction plan (by public enterprises)	2	1	3	16	43	19	84
Anti-construction plan (by private enterprises)	1	8	1	17	9	19	55
Antipollution	19	12	21	51	59	95	257
Anti-garbage dump	16	38	12	11	33	35	145
Conservation and policy <sup>a</sup>	0	0	0	0	1	10	11
Anti-nuclear power	0	0	0	0	2	9	11
Others	0	0	0	0	0	7	7
Total	38	59	37	95	147	194	570

Source: Chang et al. (1992, p. 81).

<sup>a</sup> Indicates numbers of protest movements related to nature and ecology conservation and movements seeking proper environmental policies and legislations.

or suspend their operations, and demanding large sums of money in compensation. In many cases the targets of the protests were public enterprises, because they monopolized many sectors of the heavy and chemical industries that tended to be the causes of pollution. The Chinese Petroleum Corporation (CPC), which was the largest public enterprise and which monopolized oil refineries and petrochemical materials, was most often attacked. In this subsection, we will focus on two pollution-related disputes involving CPC.<sup>4</sup>

### 1. *Taiwan's Fifth Naphtha Cracking Plant*

As shown in Table II, protests against construction plans increased drastically. Of plans that were subjected to protests by local people, plans by public enterprises made up more than half. The movement against CPC's plan to construct Taiwan's Fifth Naphtha Cracking Plant was typical of the disputes that occurred prior to the implementation of industrial projects in Taiwan. The background to this opposition movement was popular discontent with pollution due to the lack of proper pollution prevention measures by existing oil refinery plants. Oil and gas leakages were everyday occurrences at Kaohsiung oil refinery, where the Fifth Naphtha Cracking Plant was planned to be constructed, and people in the neighboring area had suffered for many years from air pollution and noise, as well as oil seeping into their well water.

In July 1986, CPC made public its plan to construct Fifth Naphtha Cracking Plant, with an annual production capacity of 400,000 tons of ethylene, in the compound of its Kaohsiung oil refinery. The plan was made to cope with the obsolescence of Taiwan's first and second ethylene plants in the compound. The original

<sup>4</sup> For the details of each pollution dispute, see EPA (1994, 2000a, various issues).



plan called for completion in 1992. At the end of 1986, however, people living in the area around the compound launched a movement to oppose the construction of the fifth plant. Their pent-up indignation erupted after the lifting of martial law, and they continued to block the main gate of the refinery with barricades for about two years until the autumn of 1990.

On May 6, 1990, a referendum was conducted in the Houchin district near the refinery, to ask the residents whether or not they approved of the construction of the proposed plant. Of the 7,616 persons who cast their ballots, 59.1 per cent (4,499 persons) expressed opposition to its construction, while 38.1 per cent (2,900 persons) approved starting negotiations with CPC. Between 1987, when the opposition movement started, and the time of the referendum, CPC had donated about NT\$4 billion to the Houchin district for the construction of public facilities, and the Ministry of Economic Affairs of Executive Yuan and CPC had established a compensation fund of about NT\$1 billion.

In September 1990, the Ministry of Economic Affairs gave CPC permission to go ahead with the construction without regard for the opposition by people in the neighboring area and the opposition Democratic Progressive Party (DPP). It took four years for the plan to be implemented after the initial announcement. Operations at the First Naphtha Cracking Plant, which was constructed in 1968 and had become superannuated, causing damage to people in the area due to its pollution, were suspended immediately after work began on the fifth plant. The fifth plant is a large-scale project, requiring a total investment of NT\$15.3 billion. A sum of NT\$2.4 billion, accounting for about 16 per cent of the total construction cost, is being earmarked for measures against environmental pollution. It was also decided that NT\$1.5 billion should be transferred to a fund established by the local authorities to provide compensation to local residents (Terao 1993, pp. 158–61).

This forcible launching of construction work was due to the tight supply-demand situation of petrochemical materials and the central government's desire for large-scale investments, which were expected to stimulate domestic demand. At the same time, the government believed it necessary to solve the problem of the construction of the plant, in order, first, to encourage the privately owned Formosa Plastic group to abandon its plan to move into mainland China by building petrochemical plant there, and second, to promote the construction of Taiwan's first private naphtha cracking plant by the group (the Sixth Naphtha Cracking Plant) inside Taiwan. Politically, Premier Hau Pei-tsun, who had been the Chief of the General Staff and had just taken office in May 1990, took a less tolerant stance toward social movements compared to his predecessor. For social movements, including environmental movements, the two years of Hau's cabinet were a reactionary period (Ho 2000, chap. 5).

## 2. *The Linyuan incident*

The Linyuan incident is a representative ex-post-facto movement aiming at gain-

ing compensation for pollution caused by an accident. It was a very successful one from the standpoint of the local people concerned, considering the large amount of money paid in compensation, and also because the local residents received exemptions from responsibility for the illegal acts they committed.

The incident began with an accident that occurred in September 1988, at the Linyuan petrochemical complex in Kaohsiung County, centered on the Linyuan plant of CPC. Heavy rain caused contaminated water to leak from the reservoir tank at the water treatment plant. The direct cause of the incident was the reservoir tank's insufficient capacity to handle wastewater. Residents and eel farmers in seven villages near the complex started a self-relief movement in October demanding NT\$2.4 billion in compensation. On October 11, some of the residents forced their way into the plant and demanded that it suspend its operations. The plant was forced to shut down in the early morning of October 13. Negotiations started between the residents and the central government's Ministry of Economic Affairs with the mediation of the member of the Legislative Yuan (parliament) elected from the district, and the negotiations were brought to a successful conclusion on October 15. The eighteen enterprises operating in the complex agreed to pay a total of NT\$1,305 million in compensation. This amount was the highest ever for such a case. This movement was epoch making in that: (1) victimized residents resorted to physical force to halt the plant's operations; (2) the enterprises paid compensation to individual victims; and (3) the agreement expressly stated that residents would not be held legally responsible for their acts.

The Linyuan experience, together with the movement against the construction of the Fifth Naphtha Cracking Plant, symbolized the rapid progress of antipollution movements after the lifting of martial law (Terao 1993, pp. 161–62; EPA various issues).

#### IV. AN ECONOMIC ANALYSIS OF ENVIRONMENTAL POLLUTION DISPUTES

##### A. *Economics of Environmental Pollution Disputes*

Before analyzing self-relief movements in Taiwan, we will present an analytical framework for environmental disputes using "law and economics." In the first place, the main cause of environmental problems is the fact that there is no incentive on the part of private enterprises operating under market mechanisms to bear the costs of utilizing environmental resources (renewable natural resources such as air and water). In this case, an excessive amount of environmental resources are used, and the damage caused by pollution cannot be compensated at all. In microeconomics, this inefficiency of resource allocation is called "market failure" due to (negative) "externality."

Environmental pollution can be reduced by government interventions, such as

indirect regulation through a pollution tax, or direct regulation on emissions through a “command and control” approach. But, government interventions are not always effective, and do not always achieve efficient resource allocation. According to Coase (1960), if there is no transaction cost in a market transaction, inefficiency in the allocation of resources due to externality, as in the case of environmental pollution, should be removed through voluntary negotiations between the parties concerned (victims and victimizers in the case of environmental pollution). In the framework presented by Coase, if the victims of environmental pollution can compensate the polluter for economic losses, they will ask the polluter to reduce emissions of pollutants by, for example, reducing production activities or through the introduction of pollution prevention equipment. The resulting resource allocation of the negotiations should be efficient. In the real world, positive transaction costs arise from the necessity to organize many victims, demonstrate a cause-and-effect relationship between pollution and damages, etc., and sometimes it exceeds the gains from mutual negotiations between parties concerned. Thus, in such cases, voluntary negotiation cannot be realized.

By specifying the ownership of a resource which has scarcity value, transaction costs can be reduced, since an individual economic agent who wants to use it does not need to negotiate with others who also want to utilize the resource, but only needs to negotiate with its owner. The owner allows the individual economic agent offering the best terms to use the resource. To ensure that scarce resources are utilized effectively through the functioning of decentralized market mechanisms in a world with transaction costs, the specification of ownership can be effective. However, in many cases it is difficult to specify the ownership of environmental resources such as air and water.

In addition to such difficulties, the asymmetrical nature and uncertainty of information make it difficult to solve the problem of “externality” through voluntary negotiations. In many cases, where victims have less information-gathering ability than the pollution-causing enterprise, solving a dispute through fair and voluntary negotiations is not possible. In particular, victims are at a disadvantage in gathering information on and acquiring technological knowledge about the actual production process in the factory concerned, compared with the pollution-causing enterprises. Furthermore, polluters themselves normally do not have complete information concerning the damage they are causing to the environment. Uncertainty due to natural phenomena such as meteorological conditions and difficulty in making predictions due to incomplete information are always factors in negotiations concerning environmental disputes. Those factors make it difficult to show a cause-and-effect relationship of pollution problems. This incompleteness and uncertainty of information tends to lead both victims and victimizers to resort to opportunistic actions. Also, the transaction costs become very large in cases where the effects of the utilization of the environment are widespread and a large number of victims need to be orga-

nized to negotiate with a pollution-causing enterprise. Liabilities on polluters and/or government regulations on pollution emission could also reduce pollution. But, in many developing countries, the effectiveness of such instruments is questionable.

The self-relief movements involved in environmental disputes in Taiwan represent cases of “voluntary negotiations between the parties concerned.” In cases of negotiations in the real world, there is asymmetry, incompleteness and uncertainty of information. The transaction costs are thus high, so it is difficult to rearrange the misallocation of resources.

In order to reduce social losses in such situations, the following means are suggested: (1) instituting an ownership structure that will help smooth negotiations; (2) reducing negotiation and transaction costs sufficiently to allow victims to start negotiations, and achieving a socially efficient allocation of environmental resources through proper negotiations; and (3) minimizing the incompleteness and uncertainty of information in negotiations in order to reduce the inclination of the parties concerned to resort to opportunistic behaviors.

Providing an appropriate legal system can simplify procedures and reduce transaction costs in negotiations concerning the utilization of environmental resources. For instance, liability rules can provide comparable results to ownership institution. Also, if the principle of solving disputes in court using legal precedents is presented in advance, the parties concerned can skip negotiations on the method for solving their dispute and begin concrete negotiations over compensation from the outset. Mediation by administrative authorities in disputes can also reduce transaction costs in negotiations and uncertainty of information, by presenting scientific data, which could be local “public goods,” to the parties concerned, and by filling the gap between victims’ and victimizers’ information-gathering capabilities.<sup>5</sup>

<sup>5</sup> In Japan, there were cases where local government, representing the interests of local residents who did not have sufficient information-gathering capability, concluded agreements with enterprises on pollution prevention while acting as the representative of a local population with its backing. Those are called “Pollution Prevention Agreements.” It is possible to interpret such cases as efforts by local governments and their technical staff to overcome the asymmetrical nature of information and minimize the gap in bargaining power between enterprises and local people in order to lower transaction costs. When there is a need for a neutral organization of some kind to mediate between the parties concerned, local governments appear to have an advantage over the central government, in that they can better gather information on the nature of local environmental problems and possible countermeasures. It is more efficient from the standpoint of cost, as well, to establish a decentralized system under which local governments can respond to local problems, than for the central government to respond on the basis of information gathered locally. In many cases, environmental pollution is localized, and it is only after the pollution has spread and large-scale disputes have erupted that the central government comes to know about it. In places where environmental administrative systems are not yet well developed and there are limits to administrative capacity in this respect, it takes a great deal of time and money for the central government to gather relevant information (Terao 1994). In Taiwan, a system of pollution prevention agreements between local governments and enterprises was promoted by the EPA, but only one example has been realized so far, between the Ilan county government and a cement factory (EPA 2000a, pp. 187–96).

## B. *Analysis of Self-Relief in Taiwan*

How can the pollution disputes that occurred so frequently from the early 1980s in Taiwan be interpreted within the framework of “law and economics” presented by Coase? Why did environmental movements come to prevail in the 1980s, taking the form of self-relief featuring direct negotiation between polluters and victims despite its high cost? This question can be divided into two parts: (1) why did so many disputes take place in the 1980s? and (2) why did victims choose the high cost method to protest against pollution?

### 1. *The reasons for the frequent occurrence of environmental disputes in the 1980s*

There was a long period in Taiwan after World War II in which the ownership of environmental resources did not come into question. The amount of pollution was low, and it is supposed that only rarely were people especially aware of the ownership of the pollution-free natural and living environment. As the economy developed rapidly and incomes rose sharply, people’s preferences on the living environment and natural resources changed drastically. It was only when people became clearly aware of the pollution of environmental resources, against the background of the rapid expansion of economic activities, that they came to be interested in the ownership of environmental resources and their right to live in an pollution-free environment.

Government regulations on emissions could have improved environmental quality, but were neither strict nor effective at that time. While the central government had neither any awareness or concern over individual local pollution problems, the local governments did not have sufficient capacities to control pollution. For example, most local governments did not have independent sections concentrating on the pollution problems, they had few specialists with scientific knowledge, and they had only limited budgets.

It is believed that under the KMT’s developmental dictatorship regime, the transaction costs incurred in protesting against pollution and negotiating with enterprises, administrative and jurisprudential authorities were prohibitively high. A ban on social movements under the developmental dictatorship regime step by step began to weaken in the mid-1980s. As the transaction costs for direct negotiations fell gradually due to this process, it was expected that gains (or reductions of losses caused by pollution) through negotiations would exceed the transaction costs, and an incentive would be created for victimized people to assert their ownership of (or right to utilize) environmental resources and start negotiations, even at the cost of taking risks under the developmental dictatorship regime. Transaction costs for direct negotiations on the part of victims fell sharply after the lifting of martial law, and self-relief movements mushroomed in various parts of Taiwan.<sup>6</sup>

<sup>6</sup> We need to consider the “free rider problem” in Mancur Olson’s “collective action” argument. The

## 2. *The selection of strategy induced by "the institutional vacuum"*

Even after the lifting of martial law, direct negotiations with polluting enterprises using physical force continued to be illegal in many respects. The result was that transaction costs were still higher than if the disputes had been resolved through appropriate systems, whether legal, administrative, or other. However, the developmental dictatorship regime was structurally deficient in terms of its capacity to address local problems such as environmental pollution, and an institutional vacuum remained in place for some time during the democratic transition. People facing serious environmental pollution problems felt that the only possible course open to them was direct negotiations with polluters.

According to a study by Hsiao et al. (1988), out of 108 cases of antipollution self-relief activities which occurred from 1982 to 1988, protesters made petitions to administrative authorities (local governments) in some form or another in 69 cases, instituted lawsuits in 20, and demanded negotiations with the attendance of administrative authorities in 28. Protesters did not initially resort to direct negotiations with polluters or organizations promoting development projects, but in many cases decided that they had no alternative when they realized that the administrative measures they had attempted to utilize were totally dysfunctional.

In the period of the authoritarian regime, the Legislative Yuan (parliament), administration of justice, mass media, and local governments did not function as social channels for solving pollution disputes. A majority of the members of parliament, most of whom were members of the KMT, had held their seats since its arrival in Taiwan without election. Judicial independence was not maintained, and people fighting pollution did not place trust in the fairness of the courts. In particular, in disputes with administrative authorities and public enterprises, they did not place any trust in legal procedures. Looking at the various kinds of disputes in Taiwan, the percentage of pollution disputes that have been solved in court is very low. The government and the KMT controlled the mass media. Local governments were able to exercise only limited powers and were financially weak. At the same time, there was no formal administrative mediation system for solving pollution disputes.

Although this situation started to improve with democratization, the institutional vacuum basically remained in place during its early stage. At the same time, since democratization substantially decreased the costs of collective protests in the form of self-relief, these types of movements prevailed.

## 3. *Problems of disputes resolution through self-relief movements*

Self-relief did not turn out to be the best way to efficiently resolve environmental

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first successful collective action reduces the transaction costs for latecomers to protest collectively against power. Some scholars called them "political entrepreneurs." See Olson (1965), Wakabayashi (1992), Tang and Tang (1997), and Cheng and Schive (1997).

disputes. First, the possibility of direct negotiations provided by the expanded “gap of freedom” led people to resort to opportunistic behaviors in the absence of sufficient information, resulting in an inefficient allocation of resources and a large loss in terms of social welfare. The case described below, involving metal scrap recovery, illustrates the opportunistic behavior of protesters. Second, self-relief movements often became involved in power games against the firms. For this reason, when the government started to take a stern attitude against environmental movements, they became unable to win their expected compensation.

(1) Metal scrap recovery

Waste nonferrous-metal recovery is a labor-intensive industry aimed at extracting useful metals (copper, gold, etc.), mainly from imported metal scrap, such as disposed home electric appliances, electric cables, and computers. Most firms operating in this industry are small sized. These firms have been the source of many cases of water and soil pollution with heavy metals and dioxin.

One incident in which oysters grown in aquaculture farms were contaminated with copper, causing their color to become greenish, occurred in January 1986 in oyster farms near the estuary of the Er-ren-hsi River in Kaohsiung County. About 450 hectares of oyster farms were affected, and oyster farmers were obliged to burn the contaminated oysters and the lattices used for hanging oysters in the seawater. Initially, the source of the pollutant could not be identified. Oyster farmers decided that the Hsingta power plant, operated by Taipower in the neighborhood was the culprit, and demanded that the power plant pay compensation for the damage. Through intermediary efforts by members of the Legislative Yuan elected from the district, Taipower and the Kaohsiung County government agreed to pay NT\$10 million each to the victimized oyster farmers. However, Taipower did not admit responsibility for causing the pollution. Later, research conducted by the Environmental Protection Bureau of the Taiwan Provincial Government demonstrated that the cause of the pollution was illegal disposal operations by scrap metal recovery firms near Er-ren-hsi River. However, it was impossible to determine which of the many operators was responsible. Even if the culprit was found, it was clear that the operators concerned were incapable of making compensation payments. The oyster farmers asked the administrative authorities to compensate them for the damage. In April 1989, the Executive Yuan (central government) paid NT\$20 million, and the Kaohsiung County government and Taiwan provincial government NT\$10 million each, for a total of NT\$40 million, to the oyster farmers (Terao 1993, pp. 167–71; EPA various issues).

(2) The second Linyuan incident and the Talin incident

Around 1990, on top of the change in the government’s attitude toward environmental movements, public opinion turned somewhat against them (Terao 1993, pp.

180–82; Ho 2000, chap. 5). After it was reported that some protesters had received large sums of money in compensation, self-relief movements arose whose main purpose could be seen as to acquire as much compensation money as possible. As a result, environmentalists came to be regarded as semiprofessional activists or professional troublemakers.

After the Linyuan incident in 1988, in which enterprises were forced to pay a large sum of money in compensation to pollution victims, a similar incident involving the leakage of wastewater at the same petrochemical complex occurred in May 1989. People near the complex surrounded the plant once again. When members of the Legislative Yuan intervened to settle the dispute amicably through mediation, the plant management promised to build a hospital and employ people in the neighboring area on a priority basis, but adamantly refused to make any compensation to individual residents, notwithstanding the fact that compensation had been paid to individual victims in the first incident. There was criticism within the government that the Ministry of Economic Affairs reached a compromise settlement in the Linyuan incident in 1988 too easily, and that an excessively large sum of money was paid to individual residents concerned; this may have had an effect on the way the Linyuan case of 1989 was settled (Terao 1993, pp. 180–81; EPA 1994, p. 204).

Following the second Linyuan case, an accident occurred on May 2, 1992, at CPC's Talin plant in Kaohsiung County, with large quantities of steam leaking from the plant. Residents in the neighborhood surrounded the plant in protest. Research by the Environmental Protection Administration of the Executive Yuan concluded that no pollution had been caused by the leakage. However, local residents did not accept this explanation and demanded that CPC pay NT\$1.5 million to a local fund and NT\$0.8 million to each local household. On May 25, local residents surrounding the plant clashed with police trying to disperse them, resulting in many injuries and arrests. In the end, the residents were unable to gain any compensation (Terao 1993, pp. 180–81; EPA 1994, p. 237).

## V. DEMOCRATIZATION, INSTITUTION BUILDING, AND THE CALMING OF ENVIRONMENTAL DISPUTES IN THE 1990s

### A. *Impacts of Democratization*

The first effect of democratization was to ensure the freedom of association, promoting the organization of environmental movements to organize themselves. Until the lifting of martial law in 1987, the establishment of civil organizations was severely restricted by the government. The Civil Organization Law controlled civil organizations, including political parties. When the opposition party DPP, founded illegally in 1986, was legalized by the amendment of the law in 1989, regulations



on civil organizations other than political parties were also drastically relaxed. Restrictions on establishment were practically abolished, and replaced by a simple registration system (Terao 2002, pp. 270–75).

Before this amendment, as argued in Wakabayashi (1992), social movements, including environmental protection movements, and political movements were fighting together, as a result of the limits on opportunities to express their collective discontent with the KMT regime. Organized political movements and social movements were able to support unorganized self-relief movements utilizing the “opening of political freedom” created by the popular challenges to the KMT regime, and the latter helped to further widen the space of political freedom. Particularly in the case of the movements against the Taiwan’s Fourth Nuclear Power Plant construction plan of Taipower, local communities, activists, and DPP politicians forged a strong partnership, and worked together to oppose the plan for many years.

After the legalization of civil associations, social movements, including those for environmental protection, became able to establish civil associations, and some self-relief associations were organized into local environmental protection associations. An islandwide civil association for environmental protection, for example, the Taiwan Environmental Protection Union, was also established after the lifting of martial law.

Secondly, as the political system was democratized and the opposition party DPP grew, the relationship between the environmental movements and the DPP started to change.<sup>7</sup> When the DPP began to win significant number of seats in the elections of the Legislative Yuan and in local governments in the early 1990s, some of its members began to make efforts to absorb support from a wider range of society in order to take power in the future, and began to keep a distance from social movements (Ho 2000, pp. 128–35). At the same time, the government was gradually building institutions to solve environmental disputes. As a result of these changes, most political and islandwide environmental problems became administrative and/or local issues.

### B. *Institution Building by the Government*

Viewed from this framework, our conclusion is that the solution of disputes through self-relief movements produced larger losses to social welfare than would have occurred if a system for dispute resolution had been in place. It is necessary to lower the transaction costs for negotiations and narrow the scope for opportunistic behaviors by the parties concerned by establishing systems for dispute resolution and compensation to victims, as well as through institutionalized mediation by ad-

<sup>7</sup> Many environmental movements have maintained alliances with the DPP because the KMT government is seen as a common enemy. In particular, their relations were very intimate in the early stage. As a result, environmental disputes in those days were not only pure social issues but also very important political issues (Terao 2002, pp. 264–70).

ministrative authorities. In actuality, efforts in this direction have been made since the establishment of the Executive Yuan's Environmental Protection Administration in 1987 (Terao 1993).

In 1992, the Public Nuisance Dispute Mediation Act was promulgated, drawing upon the experiences of the Environmental Dispute Settlement Law of Japan, and organizations were set up to institutionalize administrative mediation in pollution disputes. From the beginning of 1993 to the end of 1999, "mediation councils" set up by each municipal and county (city) government accepted applications for 107 cases. Among them, the parties concerned reached agreement in 21 cases, and did not in 55 cases (13 cases were still ongoing at the end of 1999). Among the 55 unresolved cases, 33 were submitted to the "arbitration council" set by the central government (the Environmental Protection Administration). Among them, arbitration decisions on 33 cases had been issued by the end of 1999 (EPA 2000b).

In addition to the administrative mediation system, the government tried other policy instruments to prevent potential pollution disputes beforehand. For example, as the environmental policy administration system was established, complaint-processing systems by administrative authorities became more extensive, and they were able to accept many complaints. In 1999, administrative authorities received 93,555 complaints on environmental pollution. The administrative processes resolved at least some of them before they developed into serious disputes (EPA 2001, p. 369). Even when the authorities could not prevent problems, they gained detailed information on them before they developed into disputes, so that they could quickly present reasonable proposals for solution.

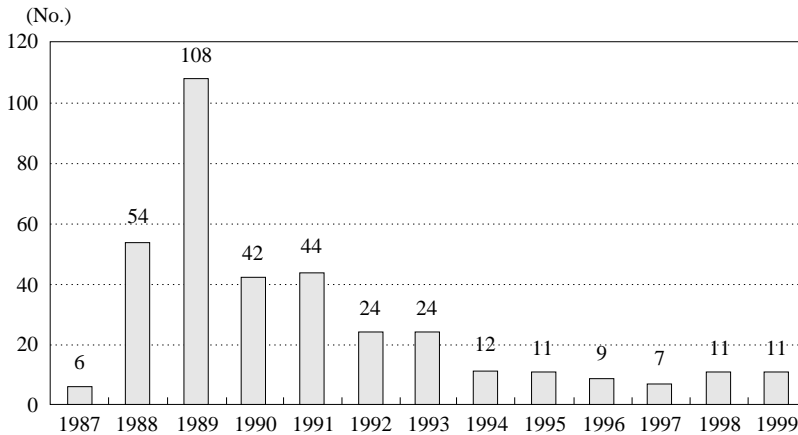
Moreover, the environmental protection authorities started to conduct research on the cause-and-effect relationships of pollution incidents, or to evaluate damages caused by pollution, if requested by the parties concerned. Such government activities can be considered a kind of public good, which can lessen the asymmetry of information-gathering abilities between polluters and victims, and reduce the transaction costs of negotiation among parties concerned. The information provided by the process of environmental impact assessment (EIA) can also be considered as a form of public goods, which can reduce uncertainty and the transaction costs of negotiations. Environmental impact assessment is also important in respect to public participation.

Many pollution problems which would not have appeared as disputes before the introduction of the dispute resolution systems might have emerged through a reduction of the transaction costs. With the resolution of the individual pollution problems that could have emerged as a result, social welfare as a whole might have improved.

### C. *The Calming of Disputes*

In the late 1990s, the term "self-relief" has appeared with less frequency with regard to environmental or other social problems. In the media, fierce collective

Fig. 1. Number of Significant Environmental Pollution Disputes, 1987–99



Source: EPA (2001, p. 373)

- Notes: 1. For 1987, the number represents those from September to December only.  
 2. All numbers represent disputes that the central government (EPA) could identify and recognize the importance of.

protests have become much less common than they were around 1990. Does this indicate a decrease in environmental disputes?

Figure 1, which is based on data from the EPA, shows that the number of significant environmental disputes had already begun decreasing from 1993. Ho (2000, pp. 142–43) points out that the sudden decrease in environmental disputes in Figure 1 is too drastic compared to reality, but his estimation also shows that the number *did* decrease slightly during early 1990s. He also concurs that there was a calming of environmental disputes in the 1990s, in that the agitations on the streets decreased (Ho 2000, pp. 145–46) and introduces the new activities of environmental movements. He calls this change the “institutionalization of social movements” (Ho 2000, pp. 138–41).

What caused the change? Initially, the building of administrative organizations, laws and regulations, and the implementation of pollution control policies made a significant contribution. The introduction of extensive pollution control policies in Taiwan was a response by the government to the frequent self-relief social protests at that time. Second, owing to political democratization, channels of dispute resolution other than those of local governments, without capabilities, were diversified, and potential environmental disputes could be resolved before they became serious and led to self-relief movements. In addition, Ho (2000, pp. 146–58) emphasizes changes of strategy by the social movements themselves. According to his research, in the 1990s environmental movements started to use more diversified strategies. In the most advanced cases, local people not only protested against development projects

which might destroy the environment, but proposed alternative projects which would cause lesser damage.

## VI. CONCLUSION

In summary, the self-relief movements brought the following positive and negative results. Concerning positive results, the following points must be mentioned: (1) they functioned to a certain extent as a means of realizing quick compensation to victims in ex-post-facto pollution disputes, and as a means of reflecting the opinions of local people concerning the siting of factories and other facilities in their before-the-fact movements; (2) they served to promote the formulation of laws and the establishment of administrative systems for environmental management, resulting in the rapid expansion of pollution-prevention measures by businesses; and (3) together with other social movements, they promoted the transition of the political system from an authoritarian one to a democracy.

The most important problem they engendered is that self-relief is based on direct negotiations between the parties concerned, so that the outcome of each dispute reflected only the transient balance of forces between the parties concerned. Thus the experiences gained in negotiations did not accumulate to a sufficient extent to evolve into social norms. This problem became clear when political freedom was won through progress in democratization, and when self-relief lost its function as an emergency measure. The frequent outbreaks of self-relief movements discouraged private entrepreneurs from making investments in manufacturing in Taiwan. Furthermore, the solution of disputes through self-relief movements allowed a larger scope for opportunistic behaviors, and thus cannot be said to be the socially optimal means of achieving successful resolution. It may be that resolutions could have been achieved at a lower social cost in a more comprehensive way through an administrative system of dispute resolution and relief to victims and by effective environmental impact assessments. With regard to institution building, such as law and administrative systems, it may be said that proper measures against environmental pollution could have been taken earlier by business and administrative authorities if there had been a way of reflecting the opinion of people in forms other than self-relief movements, of which they were many.

In the 1990s, Taiwan's political system was being democratized, the government was building institutions such as dispute mediation, and environmental movements were changing and diversifying their strategies, resulting in a calming of the serious disputes, which meant the decrease of the self-relief movements. This process can be seen as a kind of coevolution of political, administrative, and social systems.

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