7 The 'Cleaning-Up Period' in Dutch Water Quality Management: Policy Instruments Assessed

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7.1 Introduction

The period between the entry into force of the Pollution of Surface Waters Act in 1970 and the launch of the second indicative five-year plan in 1980 is often regarded as the 'cleaning-up period' in Dutch water quality management. After a run-up period during which most of the administrative machinery was put in place, the government launched a five-year water quality management plan entitled: 'Countering Surface Water Pollution 1975-1979'. The stated policy objectives - based mainly on an inventory of the expectations and plans of the regional water quality managers - were fairly ambitious. One of these objectives was to reduce the degradable organic pollution in industrial effluents by a quarter.

In addition, the portion of industrial and household pollution eliminated in sewage treatment plants was to be doubled to more than 55%.[1] The aims regarding other pollutants were much less specific. In 1977 an extensive evaluation study into this policy was started up by the then fledgling Faculty of Policy and Public Administration of Twente University. The survey set out to answer the following four questions:

1 To what extent were the policy objectives achieved?
2 To what extent were these objectives achieved by virtue of the policy? In other words: how effective was the policy?
3 To what extent was the policy's effectiveness attributable to the degree in which the various policy instruments were applied?
4 Which administrative factors are related to the degree in which the policy instruments were applied and to the effectiveness of these instruments?

The effectiveness of a given policy can be defined as the contribution which that policy makes to the achievement of certain policy objectives. A study into the effectiveness of a given policy could therefore be limited to the first two questions. The conclusions drawn from even such a limited study could provide useful information. After all, it is often far from clear how effective substantial government efforts actually are in resolving social problems. But we can make our study even more informative by not just measuring (question 2) but also explaining (questions 3 and 4) the effectiveness of the adopted policy instruments. Such an explanation, after all, can tell us how to make policies more effective.

Therefore, in the letter accompanying the questionnaires, Mr. Kienhuis, then the Manager of the Union of Water Boards, informed the regional water quality managers that: "Unlike earlier surveys, this study aims to provide insight into the policy results and their underlying factors. After approximately 10 years of experience, it would seem that such a policy evaluation is also in the interest of the collective water quality boards."

The questionnaire was not the only data collection method used for this study. Other sources included documents, two pilot studies, the data on discharge levels collected under the second indicative five-year plan (broken down by regional water manager, type of pollution and industry), and finally a series of face-to-face interviews with representatives of the managers of the larger regions. The research was confined to the policy on surface water pollution from national sources (i.e. excluding cross-border pollution of e.g. the Rhine) and to two types of pollution: degradable organic substances and heavy metals.

Despite these limitations, the remaining territory still represents the bulk of the Dutch government's efforts in the field of water quality management in terms of both financial and human resources. However, we should point out that the selection of certain types of pollution may distort the picture somewhat. After all, a comprehensive evaluation of water quality policy should not only examine whether the policy has been effective in

tackling certain kinds of pollution, but should also look at whether the surface water has been permanently damaged or is being increasingly damaged by other substances. The present study however ignores polices that, rightly or wrongly, were not implemented and focuses exclusively on the policy that was implemented.
This policy had two central objectives:
1 the purification of sewage water;
2 the abatement of pollution from industrial effluents.

The sections below discuss our findings regarding each of the two objectives, dealing in turn with the four questions formulated above.

7.2 The purification of sewage water

The purification of sewage water is not an effective means of countering pollution from heavy metals. For, from an environmental point of view, there is usually little to choose between heavy metals in purification sludge and heavy metals in surface water. But when it comes to biodegradable substances, the purification of sewage water does have a vital role to play. The indicative five-year plan of 1975 envisaged a significant expansion of the purification activities between 1975 and 1979. In 1975 26% of biodegradable pollution was eliminated in water treatment plants. By 1980 the percentage had risen to 46%. This increase represented two thirds of the increase projected for 1980. The policy target for the purification of biodegradable substances in sewage water was therefore largely, though not wholly, realised. The results achieved in the various regions differed widely. In some regions the situation deteriorated while in other regions the achievements far surpassed expectations.

To make an accurate comparison of the progress of the various regional managers, we need a reliable yardstick. The 'achieved improvement in the elimination of pollution measured by population equivalents' is not a good yardstick as the regions vary strongly in size. If we take 'the percentage of

the envisaged increase that was actually achieved between 1975 and 1980', managers who set themselves low targets would automatically score better results than their more ambitious colleagues. The 'difference between the 1975 and 1980 percentages of pollution elimination' puts managers who had already achieved much in 1975 at a disadvantage as it fails to take into account that the last lap is always the toughest.

A reliable comparison requires a yardstick that is not sensitive to such distortions. One possibility would be the following yardstick:
(% elimination 1980 - % elimination 1975)/(100 - % elimination 1975) or in simple terms: the part of the purification job that still had to be done in 1975 but was completed in 1980. By no means all of the managers have the ultimate aim of achieving (almost) 100% elimination of organic pollution in water treatment plants. For this reason, our assessment will probably be even more accurate if the situation projected for 1985 at the time of the publication of the second indicative five-year plan is taken as a provisional final target. Our yardstick then becomes: the 'part of the increase in the elimination percentage projected for the period 1975-1985 that was already achieved in 1980'. Incidentally the scores derived from these last two yardsticks are closely related.

According to these yardsticks, good progress was achieved in the regions of Twente, Flevoland, de Veluwe, de Achterhoek and parts of East Brabant. Relatively little progress, by contrast, was made in Groningen, de Betuwe, Amstel-en Gooiland, most of the former smallish water boards in South Holland, Zeeland and West Brabant.

Having ascertained the degree to which the purification policy was effective (two thirds of the target, significant regional differences), we must now examine the extent to which these results were achieved thanks to the pursued policy.

It is highly improbable that large-scale sewage purification would ever have got off the ground without government policy efforts. Sewage

purification is a 'collective good'. One characteristic of a collective good is that it is very difficult, if not impossible, to exclude people, voluntarily or involuntarily, from the consumption of that good.

Olsen demonstrates (for large groups) that collective goods are never created on the initiative of individuals. Because the costs have to be borne individually and because everyone has access to the benefits, everyone has an interest in ensuring that as many people as possible participate in the production of the good...except for themselves. As a result, nothing happens unless the maximum amount that one person is willing to contribute is large enough to pay for the collective good, which of course is virtually never the case.[2] The same mechanism will also apply when every individual thinks the benefits, i.e. the complete fulfilment of his need of the good, easily outweigh his personal contribution towards the costs. Under these circumstances, individual rationality (which strives to maximise the net benefits) leads to collective irrationality (the non-provision of a collective good of which the benefits exceed the costs). When the provision of a collective good like sewage purification depends on the initiative of a few individuals, following this theoretical argument it will inevitably come to nothing.

Practice did actually reflect this. Before the institutional arrangements and access to financial resources provided by the 1970 Pollution of Surface Waters Act few treatment plant have been build and virtually none were build as a private initiative. It follows therefore that the purification policy deserves full credit for the results achieved in this field. This however does not necessarily apply to all policies of water quality management, as we will see in the next section which deals with the efforts to clean up industrial effluents.

Our next question is: Which policy measures made the greatest contribution towards the improvement of the purification results? The relevant measures focused on: the improvement of the quality of plant management, the improvement of the quality of the plants -particularly the

replacement of old mechanical plants by plants equipped with biological purification ladders - the optimisation of the use of the existing purification capacity and...the expansion of the purification capacity.

In the period till 1980 purification took an enormous flight, multiplying many times over in certain areas. This was only possible thanks to an expansion of the actual purification capacity. The amount of organic pollution purified in the forty water quality management regions into which the Netherlands was divided bears an almost absolute relationship to the scale of the purification capacity available in the various regions. (Pearson correlation in 1975: $r = .97$; in 1980: $r = .98$). If the tremendous increase in the amount of dirt purified in water treatment plants was largely brought about by the expansion of the purification capacity, then there must be a strong relationship between the two. And indeed there is, though the Pearson correlation is slightly lower: $r = .84$. Without wishing to belittle the significance of the other measures mentioned, we can safely assert that the expansion of the purification capacity played a central part in the purification policy in the period under review.

It follows from the above that the increase in purification capacity projected for 1975-1979 was realised in almost the same proportion as the projected increase in purification. The capacity was expanded by over six million population equivalents compared with a targeted 9.3 million. So about 65% of the targeted expansion was achieved. This result points to frequent delays in the construction of new plants.

Up to 1980 the forty regional water quality managers - who were in charge of water quality management for the greater part of the period 1975-1979 - worked on the realisation of about 220 new plants. In over 40% of the cases the managers felt that the projects had met with 'some delay'. It also transpires that the various water quality managers have very different experiences as to how long the construction of a new water treatment plant actually takes. The minimum period quoted varies from 1 to 4 years (on average a good 2 years) while the normal period varies

from one-and-a-half to almost 6 years (on average 3.25 years). The greatest discrepancies occur in respect of the maximum time required. The periods mentioned here vary from 2 to 12 years! The average maximum construction period is put at almost 5 years.

This raises the question: where were the bottlenecks? Were the delays caused by technical or administrative problems? The construction of new water treatment plants involves many different processes such as applying for grants, preparing building specifications, obtaining the various permits, acquiring the building site and, of course, the construction itself. The second and last processes are dominated by technical aspects while the others are mainly of an administrative nature. In 18 cases the delays were partially or wholly attributed to problems during the construction phase. Problems concerning the building specifications were mentioned in only four cases as a source of delay. On the other hand, grant problems were mentioned in eight cases as a delaying factor. In 22 cases obtaining permits proved a problem, particularly permits under the Public Nuisance Act, and in no less than 47 cases delays were caused by difficulties in finding and acquiring suitable building sites!

A glance at the average duration of all these processes, including the exceptional cases, shows that obtaining permits under the Public Nuisance Act and finding a suitable site are the most time-consuming and unpredictable processes. In addition the water boards who had been involved in the construction of new water treatment plants before 1975 also stated that these processes generally took longer to complete in the period 1975-1980.

In short, the main bottlenecks impeding the expansion of the purification capacity are not of a technical, i.e. physical, nature but of an administrative, i.e. social, nature.

These administrative problems can be analysed in various ways. One method is to focus on the people and organisations involved in the various

administrative processes and analyse their behaviour from different points of view. That is the approach adopted in this study. The first point of view concerns the objectives of the various parties. The second is the information available to the various parties and the communication between them. The third centres on the various parties' sources of power and their ability to influence each other's behaviour. Though lack of sufficient information on various subjects played a significant role in cases of delay, the main conclusions drawn in this article are based on the goals and power of the actors involved.

The most important parties involved in the Public Nuisance Act and physical planning procedures for the construction of water treatment plants are: regional water quality managers, local authorities and private individuals. For the sake of clarity I will limit the discussion to these parties, even though others, such as health inspectors and provincial authorities, also often play an important role.

Goals

The aim of the water quality manager is to build the projected plants in the shortest possible time at a fair price. This aim need not necessarily coincide with the interests of the local authorities and private individuals. In the many conversations I had with representatives of water quality managers, one salient point emerged time and time again: "Everyone knows the environment needs to be cleaned up. But nobody wants a water treatment plant on his doorstep. So it's got to be built on a site where it doesn't bother anyone. And that's often impossible". People are often worried that the plants will cause nuisance in their immediate surroundings. In addition, the water treatment plant has often got to compete with alternative plans for the area, such as the development of new residential estates. Financial disputes may also come into play. If one or more of these issues crop up - and they often do - serious procedural delays can result.

Illustration 7.1 shows the proportion of involvement of the actors

mentioned and their rivalling goals in causing the obtaining of building sites and permits to delay the construction of new water treatment plans. The illustration is to be read as follows: The score 'one third' in the row 'municipalities - residential development' and the column 'builiding sites' means that in one third of the cases of delay this aim of this actor played a role of some importance.

Illustration 7.1 The involvement of various actors and their aims in cases of delayed construction of treatment plants in the Netherlands 1970-1980

Actors	Goals	Building sites	Permits
Water boards	Total	All	All
	Building progress (environment)	All	All
	Financial (low cost)	Quarter	Nearly all
Municipalities	Total	Two thirds	Half
	Residential development	One third	Quarter
	Financial	Some	Some
	Employment for residents	One tenth	None
	Nuisance protection (plus: prestige)	Quarter	Quarter
Private individuals	Total	Three fifths	Half
	Nuisance protection	Half	Half
	Financial	Quarter	None

Power

The water quality manager often finds himself in a rather weak position when faced with such problems. The greatest statutory powers rest with the local authorities - who are responsible for drawing up and modifying zoning plans as well as for granting permits under the Public Nuisance Act - and with private individuals who have fairly far-reaching rights of appeal against the local authorities' decisions in this respect. The water quality manager often feels at the mercy of the other parties. He has few legal rights with which to press his case for the modification of a zoning plan or for the granting of a permit under the Public Nuisance Act. Basically he is totally dependent on the cooperation of other parties to obtain short cuts, e.g. the permission to go on ahead of the modification of the zoning plan or a compulsory purchase order.

Managers seeking to build water treatment plants as quickly as possible often experience the delays -which can drag on for years- as more of a disadvantage than their opponents. The latter, in fact, often see the delay as an advantage. This also has consequences in the private law sphere. The seller of the land enjoys a strategic advantage in that he generally doesn't need the purchase sum as badly as the manager needs the building site. The Dutch effluent charges system, under which the cost of building and exploiting treatment plant are being passed on to the polluters, gives the managers fairly easy access to financial resources. Without these resources, they would be forced to go through even more time-consuming compulsory sale proceedings than is already the case.

All in all, the water quality manager is at a great disadvantage in these proceedings. So it is hardly surprising that these proceedings present the greatest obstacle to the expansion of the purification capacity.

Can anything be done about this? Yes. And the analysis, of which only a few of the conclusions are set out here, shows that there are various options. I will again confine myself to a single example. One of the weaknesses that undermine the water quality manager's position is his very

eagerness to avoid delays. As a result, every means of slowing down the proceedings becomes a weapon for the opponents of the projected plant. Objections of private individuals can hold up the process for years, even though these objections may later prove totally unfounded. Initially created to protect the individual, the right of appeal has gradually become part of the consultation process. It goes without saying that consultation is a valuable right.

But appeal proceedings have become so lengthy and unpredictable that they now constitute an unintended, and even unfair, weapon in the hands of the private individual. The certainty that an appeal can delay plans for years, even though it may eventually be rejected, is a powerful and unintended source of power. By giving its citizens the opportunity to appeal against decrees without equipping itself with the machinery necessary to handle these appeals efficiently, the State of the Netherlands is throwing a spanner in its own works. The social costs of the cumbersome appeal machinery may well be many times higher than the additional resources required to set up a machinery that is able to process appeals within a short and predictable timespan.

7.3 Cleaning up pollution in industrial effluents

Having discussed several results concerning the purification of sewage water, we will now concentrate in this section on a number of findings regarding policies aimed at the abatement of pollution in industrial effluents. One of the principles underlying the water quality policy is to 'counter pollution at source'. However, household pollution - both from degradable organic substances and from heavy metals (through the mains, etc) - is virtually impossible to fight at source. Industrial effluents, by contrast, can be tackled at source.

Up to 1980 the efforts to clean biodegradable pollution in industrial effluents were - barring one important exception - even more successful

than projected in the indicative five-year plan. The exception concerned effluents from the starch industry. From 1975 to 1979, the biodegradable pollution in industrial effluents was reduced by about 27%. Again the results in the various regions differ widely.

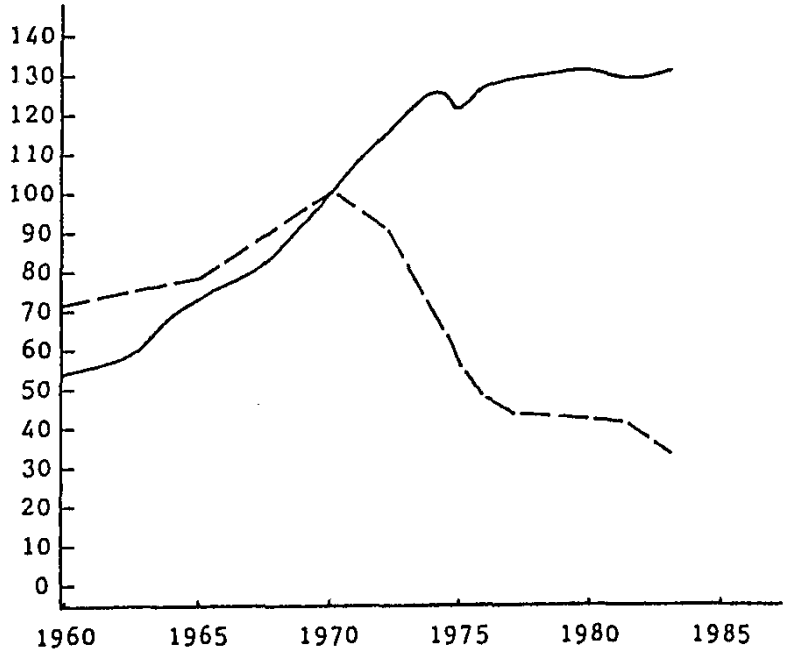
The indicative five-year plan did not set any quantitative targets for the abatement of heavy metal pollution in industrial effluents. However, with the exception of lead (20%), reductions of over 50% were achieved for the seven most important heavy metals (zinc: 54%, copper: 56%, cadmium: 75%, nickel: 85%, chrome: 87%, mercury: 91%). Here too the results in the different regions show strong variations. In the case of all substances, the difference between the largest and the smallest (negative) improvement was over one hundred per cent.

The overall picture, therefore, suggests that the Dutch water quality policy is fairly effective in terms of goal attainment. Though not all targets were met, substantial improvements have been achieved. These improvements concern both the purification of sewage water and the abatement of pollution in industrial effluents. In this context, however, we should remember the limited scope of this study. Certain heavily toxic and accumulative substances, for instance, were not included in the analysis, partly due to the lack of data!

Unlike the purification of sewage water, the abatement of pollution in industrial effluents is not obviously the result of government policy. All sorts of other factors may have contributed to the reduction. Often an experimental approach is the best way of establishing whether there is a causal relationship between two phenomena (in the present case the water quality policy and the abatement of pollution in industrial effluents). But, as is often the case with policy studies, the experimental approach could not be applied here owing to the impossibility of manipulating the circumstances. We therefore chose to use a combination of alternative methods.

Firstly a time-series analysis was carried out to chart the movements of biodegradable organic pollution levels in industrial effluents over time. After rising steadily for years, there is an abrupt turnaround in 1970. After 1970, the year in which the Water Pollution Act came into effect, there was a sharp continuous decline.

Illustration 7.2 Index figures of the amount of industrial production (solid line) and biodegradable pollution in industrial effluents (dotted line)



Source: own recalculation of figures of Central Agency for Statistics and Ministry of Transport and Public Works)

However, even such a marked turnaround does not in itself provide watertight proof of a causal relationship between the policy initiated in 1970 and the achieved abatement of pollution. For this reason, an inventory of rival factors - i.e. other factors that could also explain the reduction in the levels of pollution - was drawn up and discussed.[3] These factors were:

1 reduction in the volumes of production;
2 technical developments;
3 (increases in) raw materials prices;
4 (increased) environmental awareness;
5 information from non-governmental bodies.

The conclusions of these discussions all pointed in the same direction; the rival factors cannot explain the abatement of pollution, but may have reinforced or impeded the effect of other factors (policy).

- Production levels have by and large not been reduced. It is unclear whether a reduction in output would have had an equal impact on pollution. But if there is a causal relationship between production volumes and pollution, then the fact that industrial production has on the whole increased till at least 1975 (see ill. 2) can be seen as a policy-impeding factor.
- The development of environmentally-friendly technology does not come out of nowhere. So it will not have been an independent cause of the abatement. Sometimes, however, technology is indispensable to achieving the abatement that is deemed desirable on other grounds.
- It is unlikely that the environmental awareness of captains of industry and the public at large has, in itself, helped to counter pollution, partly because of the 'logics of collective action'. The degree and speed of the policy's effectiveness, however, may be influenced by the general level of environmental awareness.
- The provision of information, particularly by non-water quality managing bodies, also makes a supplementary contribution to the cleaning-up efforts. Though information on environmentally-friendly behaviour is a necessary tool in the fight against pollution, it is virtually never sufficient in itself to achieve an actual reduction in pollution levels.

Having established that the effectiveness of the policies aimed at the purification of sewage water and the abatement of pollution in industrial effluents is not directly related to non-policy factors, we must turn to

policy factors to explain the success achieved so far. If we are able to demonstrate that policy-related variables are by far the most important factors in the abatement of pollution in sewage water and industrial effluents, this can be taken to be conclusive evidence of the effectiveness of the water quality policy.

To demonstrate this, we will analyse the wide discrepancies between the abatement rates of the various regions. Part of the regional differences may be attributable to differences in the composition of the regional industries. In some sectors, for instance, it is easier and cheaper to reduce pollution levels than in others. The same applies to the composition of heavy metal pollution in industrial effluents. The regional abatement figures were therefore adjusted to take these factors into account. The composition of the regional industry can statistically account for almost two thirds of the regional differences as regards the abatement of organic industrial pollution.[4] With heavy metals too, over half of the regional differences are attributable to the different compositions of heavy metals and to the different proportions of metal-emitting branches in regional industry.[5] But even the adjusted figures still show marked divergences between the various regions in terms of goal attainment.
The initial, i.e. unadjusted, differences break down into two components:

1 differences that derive from the composition of regional industry (and, in the case of metal pollution, also the relative proportion of the various metals);
2 other differences.

In both cases we can ask to what extent policy factors are responsible for the differences.

Re 1. Only two sectors account for the lion's share of heavy metal pollution, so this aspect cannot be statistically analysed. We will therefore limit our explanation to the sectoral differences in the abatement rates regarding biodegradable pollution in industrial effluents.[6] This explanation is based on three factors, namely:

- the impact of charges on production costs;
- the cleaning-up costs per unit of pollution;
- the increase or decrease in production.

The first factor indicates the effect of a policy measure, i.e. charges. The other two factors are intended to check whether any causal relationship established between this measure and the sectoral differences is genuine or whether it disappears as soon as other relevant variables are included in the analysis. The three factors jointly account for 63% of the differences between the various sectors. Of these factors, the most important by far is the impact of the charges on production costs, having a correlation of r = .73 with the abatement of pollution. If we ignore two sectors that are less sensitive to charges, the correlation even runs up to r = .84. In that case the three factors jointly account for 76% of the difference between the sectors.

Re 2. Our earlier conclusion that non-policy factors did not play a decisive role in the abatement of pollution in industrial effluents suggests that the adjusted regional differences in pollution abatement must be directly related to regional differences in the application of policy instruments.[7] In the case of most policy instruments, incidentally, the regional differences are enormous!
The policy instruments fall into six categories:
1 permits and prohibitions (including municipal connection permits);
2 monitoring and sanctions;
3 the imposition and collection of charges;
4 measures to stimulate the improvement of technological know-how (e.g. in conjunction with T.N.O, a Dutch organisation for applied scientific research);
5 the provision of advice to companies about existing abatement techniques;
6 consultation, persuasion and informal negotiations.

We found that the boards in charge of water quality management attribute

the abatement of organic pollution first and foremost to the effluent charges system which, in their estimation, had a great to very great effect. The permit-granting system, monitoring and consultation are deemed to have had a moderate to great effect. The stimulation of technological know-how, by contrast, was considered to be largely ineffective. Opinions were divided as regards the effectiveness of the provision of information. But on the whole it was agreed that information efforts did have some effect. As regards the abatement of heavy metal pollution, the permit-granting system was clearly seen as by far the most effective instrument, while much less influence was attributed to the role of charges.

Quantitative analyses revealed that the charges system had a much greater impact on the abatement of organic pollution in industrial effluents than the water quality managers initially thought - even though abatement was not the primary aim of these charges. After adjusting the regional abatement in organic pollution of industrial effluents to take into account the degree of abatement expected on the basis of the composition of the regional industries, it turned out that there was a strong correlation between the regional abatement rates and increases in the charges (Pearson r = .92).

The degree of abatement expected on the basis of the regional industry (where the sensitivity of the various sectors to charges also plays an important role; see under Re 1.) and the increases in the charges jointly accounted for 96% of the differences between the water quality managers as regards the abatement of organic pollution in industrial effluents. The fact that the level of the charges was not used here as a deliberate policy instrument suggests that the application of policy instruments designed specifically to abate pollution - such as the permit-granting system - had only a very limited effect. The quantitative analysis reveals that there were only some signs of additional influence in those municipalities where the permits gave the manager some influence over the discharges into the sewage system and the weighted number of abatement plans agreed with the companies involved.

The abatement of heavy metal pollution in industrial effluents also depends heavily on increases in the charges (initial correlation: r = .65). In this case, however, other policy measures (abatement plans and reports on non-compliance) also make a demonstrable contribution to the relative success of the efforts to clean up heavy metal pollution in industrial effluents. Together with the degree of abatement expected on the basis of the composition of the regional industry and the composition of the heavy metal pollution, the three policy measures mentioned jointly accounted for 91% of the regional differences in the abatement of heavy metal pollution in industrial effluents in the period from 1975 to 1980.

All in all these analyses lead to the remarkable conclusion that the abatement of pollution in industrial effluents between 1975 and 1980 is attributable to the application of a policy instrument which was not officially designed for that purpose, i.e. charges, rather than to specific anti-pollution policy measures, such as physical regulations. Why did the regional water quality managers observe this with organic substances but not with heavy metals? Because the managers have all clearly seen that charges do prompt companies to reduce organic pollution in their effluents, but are rarely sufficient on their own to stimulate companies to take action against heavy metal pollution.

Discharging heavy metals is simply the cheaper option. In virtually all cases special abatement plans and constant monitoring are required to persuade companies to do something about the problem. What the water quality managers did not, and basically could not, see from their individual perspectives is that these abatement plans are far more successful in areas where the charges have relatively strongly increased than in other areas. In both cases the manager had to give companies a push in the right direction, but in certain cases they had to be pushed all the way. Evidently, even if the charges are insufficient in themselves to motivate the companies to take action, they still play an extremely important role by facilitating the task of the water quality manager.

Naturally charges or other policy instruments do not work like a machine that springs into action at a press of a button. Policy effects are brought about by a great many activities and interactions in processes often involving many different people and organisations. The effect of policy instruments is to influence the course of these processes. In this case the negotiation processes between the water quality manager and companies are vital. Informal consultation plays a central part in these negotiation processes.

There are two sides to this informal consultation. In the first place, it acts as a 'lubricant' in order to ensure that the mechanisms activated by the policy instruments operate as smoothly as possible. To illustrate this point let me quote the words of one water quality manager: "When I go to talk with a company about reducing the pollution levels in their discharges I always take a pocket calculator along with me. I work out the potential savings in charges and that, I assure you, always sparks off an interesting conversation." This - mainly informative - function of the consultation process is particularly important when the other circumstances and applied policy instruments are potentially strong enough to prompt abatement action. This situation will occur more frequently with organic substances than with heavy metals.

In the case of heavy metals, consultation - in addition to its informative function - also offers a means of exercising power. This function is based on the circumstances that a. the water quality manager and the companies often have very different views regarding the necessity of further abatement efforts and b. that neither party is strong enough to force his will upon the other. The significance of consultation between the water quality managers and the companies only becomes really clear when consultation is not seen as an instrument alongside the other instruments, but as the way in which the water quality managers exercise the power provided by their instruments. What matters here is not the power that the water quality manager derives from each separate instrument, but rather the power he derives from the entire policy mix in order to influence the companies.

Unless the available policy instruments and other sources of power are strong enough to enable the water quality manager to achieve his objectives without delay by the strict application of these instruments alone, he must adopt a rational approach by selectively applying the available policy instruments within the framework of a process of consultation and negotiation with industry.

Notes

1 See for an account of these and other figures in this article: Hans Th.A. Bressers, *Beleidseffectiviteit en waterkwaliteitsbeleid* (Policy effectiveness and water quality policy), diss., Twente University, Enschede, 1983.

2 Compare: Mancur Olson, *The logic of collective action: Public goods and the theory of groups*, Cambridge (Mass.), 1971.

3 This part of the analysis was conducted following Michael Scrivens "Modus Operandi Method". Michael Scriven, Maximizing the power of causal investigations, in: Gene V. Glass (ed.), *Evaluation Studies Review*, Annual I, Beverly Hills/London, 1976.

4 Pearson correlation: .79

5 Pearson correlation: .74.

6 This analysis was published in english before and in more detail in: Hans Th.A. Bressers, The role of effluent charges in Dutch water quality policy, in: Paul B. Downing and Kenneth Hanf (eds.), *International comparisons in implementing pollution laws*, Boston etc., 1983, pp. 143-168.

7 This analysis was published in english before and in more detail in: Hans Th.A. Bressers, A comparison of the effectiveness of incentives and directives: The case of Dutch water quality policy, in: *Policy Studies Review*, 1988, no.3, pp. 500-518.