

**INDUSTRIAL RESTRUCTURING AND REVITALISATION IN THE UK COASTAL
ZONE**

by

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ABSTRACT

INDUSTRIAL RESTRUCTURING AND REVITALISATION IN THE UK COASTAL ZONE

Sarah Jane Harcombe

This thesis provides an analysis of the social, economic and environmental consequences of oil refinery closures in the coastal zone of the UK. It assesses the subsequent economic regeneration of the sites affected, and discusses in particular the redevelopment processes that have occurred at two of the sites. Despite recent calls for a more integrated approach to the coastal zone, much work that is done still takes place within single disciplines. In contrast this work adopts an holistic approach and therefore also contributes to the growing body of interdisciplinary coastal studies.

A variety of research methods was used, ranging from desk-top studies involving literature searches and postal and telephone correspondence, to original data gathering via social research methods. The latter type of work included the use of postal and door-to-door structured questionnaires as well as more qualitative interview-based techniques.

It was found that the consequences of oil refinery closures were commonly less straightforward and predictable than might be expected. For example, the economic and social costs of closure varied greatly across the sites and in some cases were scarcely significant at all. On the other hand, environmental gains were frequently not as great as expected.

Although some economic regeneration had taken place at five of the eight sites, in the main it was not extensive and frequently provided little local economic advancement and relatively few new jobs. Redevelopment was usually in the form of industrial estate development or larger-scale, usually port-related, industry. The processes involved in this regeneration involved a mix of market forces and planning influences. After initial site designation, market forces appeared to be dominant, although legislative controls administered through the Town and Country Planning system were able to bring about considerable modifications to several of the proposed coastal developments.

The thesis thus provides a wide-ranging and inter-disciplinary analysis of the changes that have taken place as a result of industrial restructuring in specific types of coastal zone environment. To underline its contribution as an overview, a model of decline and revitalisation processes is suggested in the penultimate chapter. It is hoped that the thesis as a whole will help to offset the previous lack of academic research into decline and revitalisation of coastal areas outside inner-urban harbour locations, and that it will also add a wider perspective to most existing studies of waterfront change.

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AUTHOR'S DECLARATION

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Second British-Italian Seminar in Transport Geography, Venice, Italy, 11-13 March, 1994.

Environmental Policy and practice in Eastern and Western Europe, Pecs, Hungary, May 30th-June 1st, 1994.

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Pembrokeshire Coast National Park
Dyfed County Council
Institute of Petroleum

Signed Suzah J. Harcombe Date 8/3/96

CHAPTER 1

DE-INDUSTRIALISATION AND THE CREATION OF DERELICT LAND IN THE COASTAL ZONE: TOWARDS A NEW RESEARCH FOCUS

1.1 INTRODUCTION

The study of the decline and revitalisation of port zones in inner-urban areas is well established and has generated an extensive literature. Recent wide-ranging overviews of this research field include Hoyle, Pinder and Husain (1988), Hoyle (1989, 1990), International Centre Cities on Water (1991), Pinder and Hoyle (1992), van der Knaap and Pinder (1992) and Bruttomesso (1993). Most recently of all, the contribution by Breen and Rigby (1994) offers - among other things - a bibliography including more than 250 items.

In an attempt to clarify issues in this major research arena, Pinder, Hoyle and Husain (1988) have proposed a model of forces and trends involved in waterfront retreat, land redundancy and revitalisation. As Figure 1 demonstrates, this model proposes that although historically (t1) the growth of redundant waterside land was primarily caused by retreat from inner-urban harbours, more recently (t2) the problem has also begun to spread to newer port zones. Moreover, it is also argued that, while this new type of abandoned land may have affected areas developed during postwar port expansion projects, decline may also have spread to port-related industries constructed on greenfield

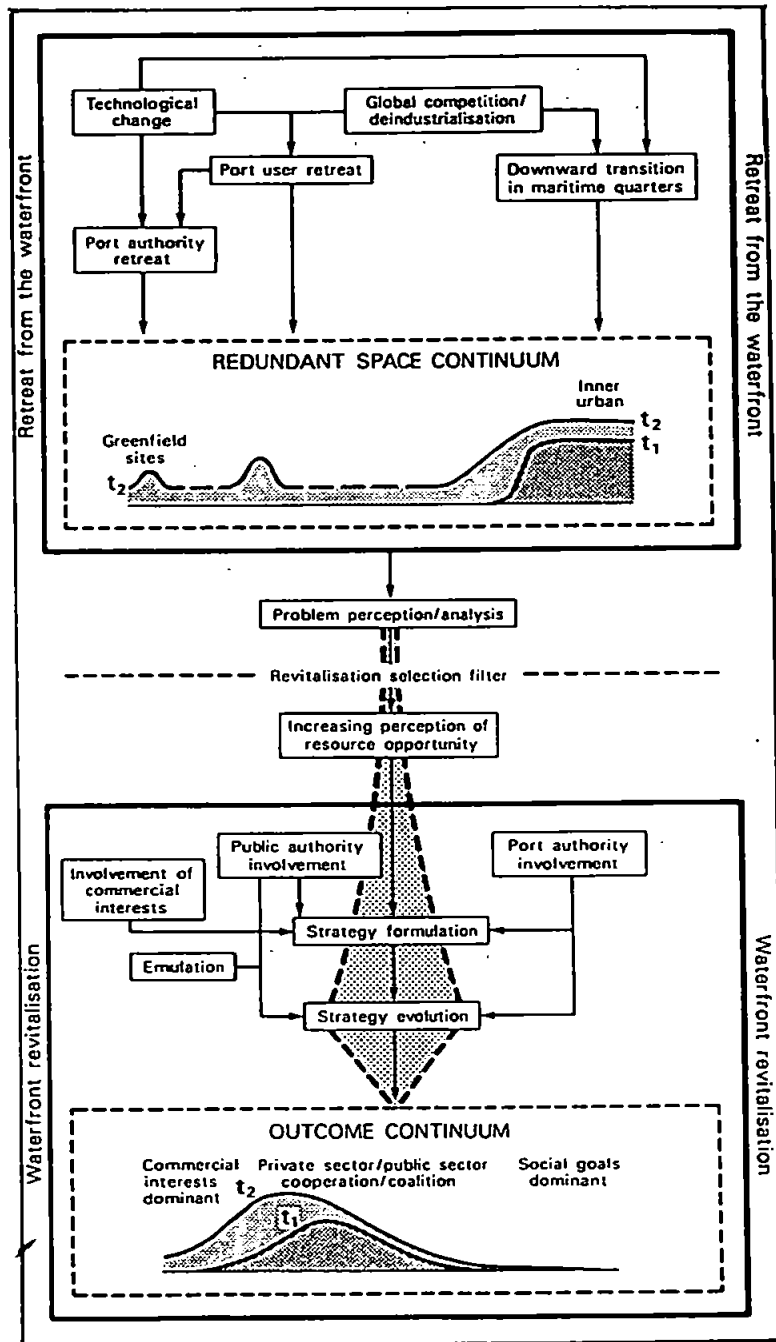


Figure 1 Waterfront decline and revitalisation model
 Source: Pinder, Hoyle and Husain, 1988

sites beyond the main port areas. In this way the model suggests that the problems of waterfront decline have become more diverse and complex in the last 10 to 20 years. Also - of great importance for this thesis - it implies that current definitions of the waterfront are often too restricted. Although there is certainly much research to be undertaken on inner-urban waterfront revitalisation, to concentrate on this at the expense of change in different types of waterfront location is to neglect important opportunities.

This view results from observation of the long-term evolution of land-use and economic development in the coastal zones of economically advanced countries. Earlier this century, these coastal zones began to be colonised by industries such as shipbuilding, steel production, oil refining and the manufacture of petro-chemicals. In most cases the new activities were seeking adequate space for development but, as is well known, their choice of the coastal zone also usually reflected their maritime orientation. Steel industries, for example, were drawn to tidewater locations to take advantage of imported materials, as at IJmuiden in the Netherlands and Dunkerque and Marseilles in France (Tuppen, 1981; Pinder and Witherick, 1990). Similarly, although pipeline technologies allowed oil refineries to be built in the heart of western Europe, two thirds were developed on the coasts where they could take

full advantage of economies of scale in maritime transport.

Particularly since the 1970s, however, most of these industries have come under economic attack (Riley and Shurmer-Smith, 1988). Not infrequently this has been the result of deep economic recession; in some instances it has been a consequence of demand shifts; and in others coastal manufacturing has been hit by global competition. Whatever the cause, however, the results have been that companies have failed to develop prepared sites (Pinder and Witherick, 1990), have trimmed existing operations and, in extreme but not infrequent cases, have closed down plants altogether.

This closure process has, of course, generated substantial areas of redundant land in the coastal zone. Indeed, as Pinder and Husain (1988) have emphasised, new redundant areas of this type have commonly been much more extensive than derelict inner-urban docklands in nearby cityports. This scale factor, they believe, is in itself an important argument for extending waterfront revitalisation studies to this alternative type of location, but they also suggest that there are other justifications. The closure of waterside industries and any subsequent regeneration of derelict land may well produce diverse impacts affecting both land and inshore waters. Apart from physical change, a range of social and economic effects - different to those experienced in inner-urban districts - is likely to be

experienced by local communities. And, although redundant space in traditional port areas is increasingly regarded as an asset rather than a liability, stimulating economic interest in more peripheral derelict areas may provide a particularly difficult challenge for local planning and port authorities. In brief, such land is likely to have:

"distinctive characteristics, problems and constraints [which may require] policy approaches quite different to those appropriate in 'typical' revitalisation areas"

(Pinder and Husain, 1988, 232).

Despite the rationale for adding a new dimension to waterfront revitalisation studies, however, little practical progress has been made in this direction. The most substantial academic study in this field is still Pinder and Husain's (1988) investigation of restructuring in the European oil refining industry, the paper originally responsible for the argument that waterfront revitalisation research should extend far more widely in the coastal zone. The case studies in Breen and Rigby (1994) and, indeed, the bibliography in their volume, demonstrate very clearly how the focus of attention has remained on urban waterfronts. And, taking the example of the UK, there appears to be little official pressure for work on economic restructuring in the broader coastal zone. For example, the Environment Committee (1992) gives two paragraphs to the discussion of the "broadly urban" coast, including one reference to

"the development or renewal of areas already developed ... in order to ease the pressure on

other areas" (para 106).

The Planning Policy Guideline on Sport and Recreation confines itself to recommending the re-use of redundant harbour areas for watersports (Department of the Environment, 1991). Meanwhile, the draft Planning Policy Guideline on Coastal Planning (DoE, 1992a) does no more than restate Local Authorities' duty to include proposals in their development plans for the regeneration and restoration of rundown and spoilt stretches of coastline. Conceptually, this somewhat low-key official stance may be a consequence of the emergence of New Right planning attitudes, a subject to which the discussion will return in Chapters 2 and 6. But it is perhaps significant that UK private sector interests have argued for greater government help and encouragement to developers so that rundown developed coastal sites may be regenerated (Shostak, 1992).

1.2 OIL INDUSTRY RESTRUCTURING AND WATERFRONT ISSUES

Against this background, the overriding aim of this thesis is to further this neglected research field by undertaking a major investigation of waterfront decline and revitalisation in the broader coastal zone. For practical reasons of expense and language barriers, the research has concentrated on the UK, and within this country it has focused on the consequences of the restructuring of a single major economic activity, oil refining. This restructuring is discussed at greater length below, and here it is

appropriate to note the range of considerations underpinning the selection of this industry as the subject of the investigation.

First, a base for research in this context already exists as extensive investigations into the nature and scale of oil industry restructuring have already been completed (Molle and Wever, 1984; Pinder, 1986, 1994; Pinder and Husain, 1987a, 1988). Second, as will be shown, the scale of restructuring in this industry has resulted in the creation of very large derelict waterside sites, almost all of which lie outside inner-urban revitalisation areas. Third, as will again be demonstrated, these sites are sufficiently numerous, and sufficiently widespread, for wide-ranging comparisons to be made between them. Fourth, although Pinder and Husain have drawn attention to this form of land dereliction in the coastal zone, their 1988 paper was essentially an initial exploratory exercise. No detailed investigations were possible into the consequences of decline at specific sites and, because the wave of refinery shutdowns was only just drawing to a close at the time of the research, discussion of the revitalisation process was necessarily confined to conjecture. Consequently, although Pinder and Husain were able to underline the potential of the subject, in many ways they could do no more than highlight the need for future research. Finally, because almost a decade has elapsed since the industry's intense

restructuring came to a close, significant regeneration has now occurred on a number of sites. Thus new opportunities have arisen for the current research to evaluate the consequences of both decline and revitalisation, rather than simply those of decline.

While the investigation has adopted a very specific focus, however, it must be emphasised that work in this sphere is seen as being only part of a broader research agenda for those concerned with change on the waterfront. Thus the problem of derelict coastal oil refineries is not confined to the UK. Indeed, Western Europe as a whole has experienced recession and closures within the refining industry, and some countries - notably Italy - have probably been more seriously affected than the UK. Even more importantly, it must be stressed that the study of redundant refinery land has been selected as an example of a wider problem involving the retreat of several major industries from post-1945 port areas and greenfield coastal sites. The thesis will return to this broader view later in Chapter 6, and also in the concluding chapter.

1.3 GROWTH, CRISIS AND RESTRUCTURING IN WESTERN EUROPEAN OIL REFINING

Against this background, more detailed examinations of oil industry evolution, and of the derelict sites produced by this sector's restructuring in the UK, are necessary. The oil refining and petrochemical industries expanded sharply

in the post-1945 growth era (Bachetta, 1978; Odell, 1986; Pinder and Witherick, 1990). Bachetta (1978) reports that demand for oil products in Western Europe rose enormously after the second world war and, even more impressively, after 1960. Between 1960 and 1972, for example, the contribution of oil to Western European energy needs increased from 32 to 63 per cent, and by the later date total annual oil consumption had reached 626 million tonnes. To meet this demand, the oil industry naturally invested heavily in new European refining facilities. In 1950 only a handful of refineries existed, and their total annual capacity was less than 50 million tonnes (Pinder, 1986). Yet by 1972 there were more than 150 refineries, with a combined capacity approaching 1000 million tonnes. Moreover, as has been indicated, despite the construction of crude oil pipelines extending inland from ports such as Rotterdam, Marseilles and Genoa, the large majority of the new refineries were coastal. Almost without exception, these seaboard refineries were to be found either in new port extensions which the authorities had built out into the coastal zone, or on greenfield sites developed beyond port areas (Figure 2). In the UK the number of refineries had reached 22 by the late 1960s, of which all but 4 were coastal installations (*Oil and Gas Journal*, 30/12/68)¹.

In the early 1970s oil industry planners and governments anticipated continued uninterrupted growth, but this

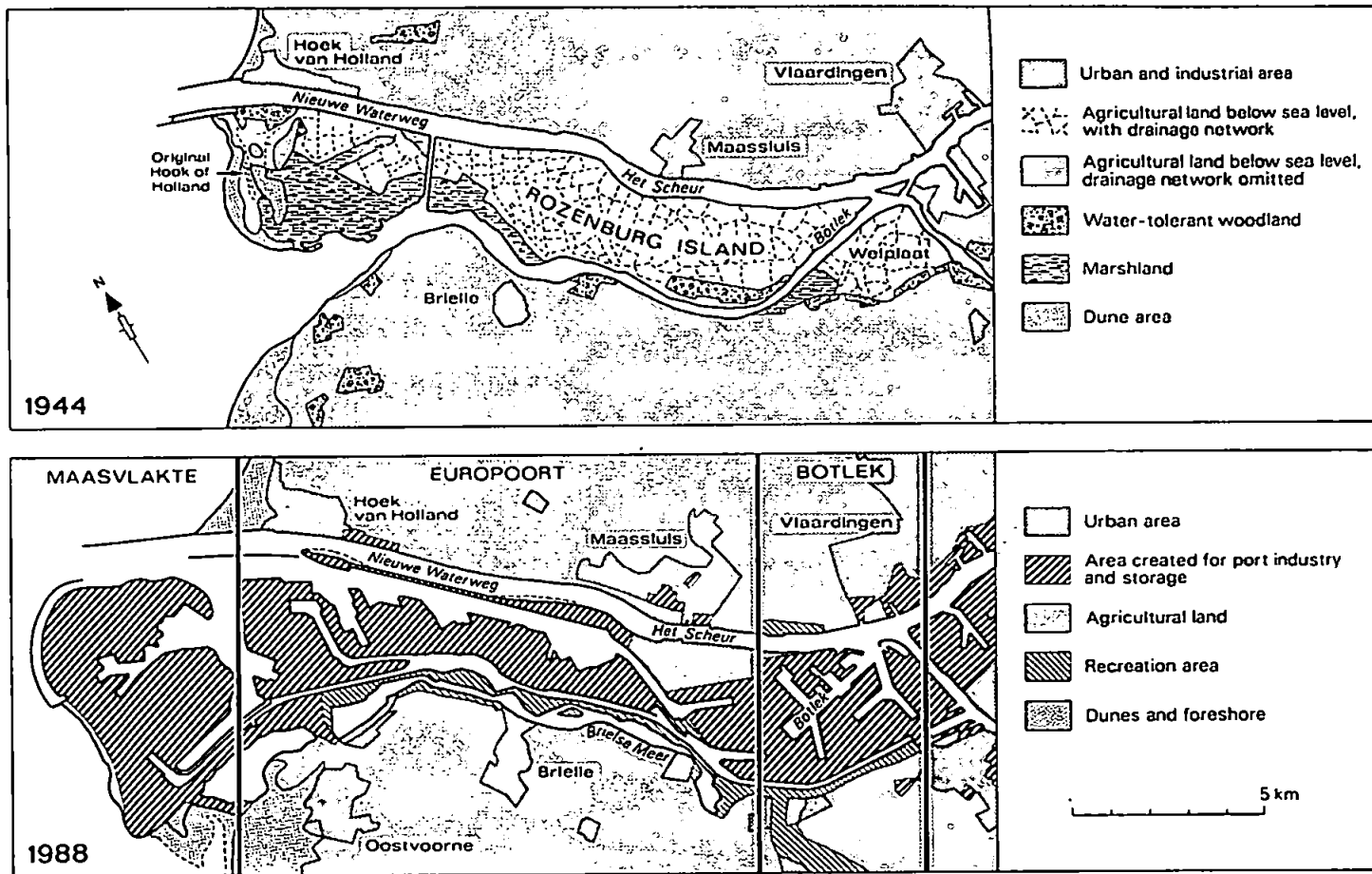


Figure 2 Port development on green field sites at Rotterdam

Source: Pinder and Witherick, 1990

scenario was destroyed by the first oil price shock of 1973-74. Although the immediate effect of this was to trigger a severe fall in total demand for oil, the most significant long-run development was that the price shock and subsequent economic crisis resulted in an alteration in the structure of demand. As Bachetta (1978, 98) has underlined, the fundamental shift was

"a considerable change in the ratio [of demand for] heavy and light products".

In particular, demand for one of the European industry's major products, fuel oil, began to fall rapidly (Figure 3). This was partly because the reduction in the rate of economic growth affected heavy industries (the main users of fuel oil) much more than individual consumers, and partly because major industrial consumers began to substitute other energy sources for fuel oil. Above all, the latter's markets were eroded by rapid growth of natural gas consumption.

One result of this shift was that oil companies abandoned most of their expansion policies. Despite Bachetta's (1978) prediction that the changes in the nature of demand would be permanent, companies were in effect planning for stability while they waited to see the degree to which the economy - and perhaps therefore the demand for fuel oil - would recover. However, a second oil crisis in 1979 caused a further demand slump which demonstrated to the industry the seriousness of the challenge to be faced. West European oil

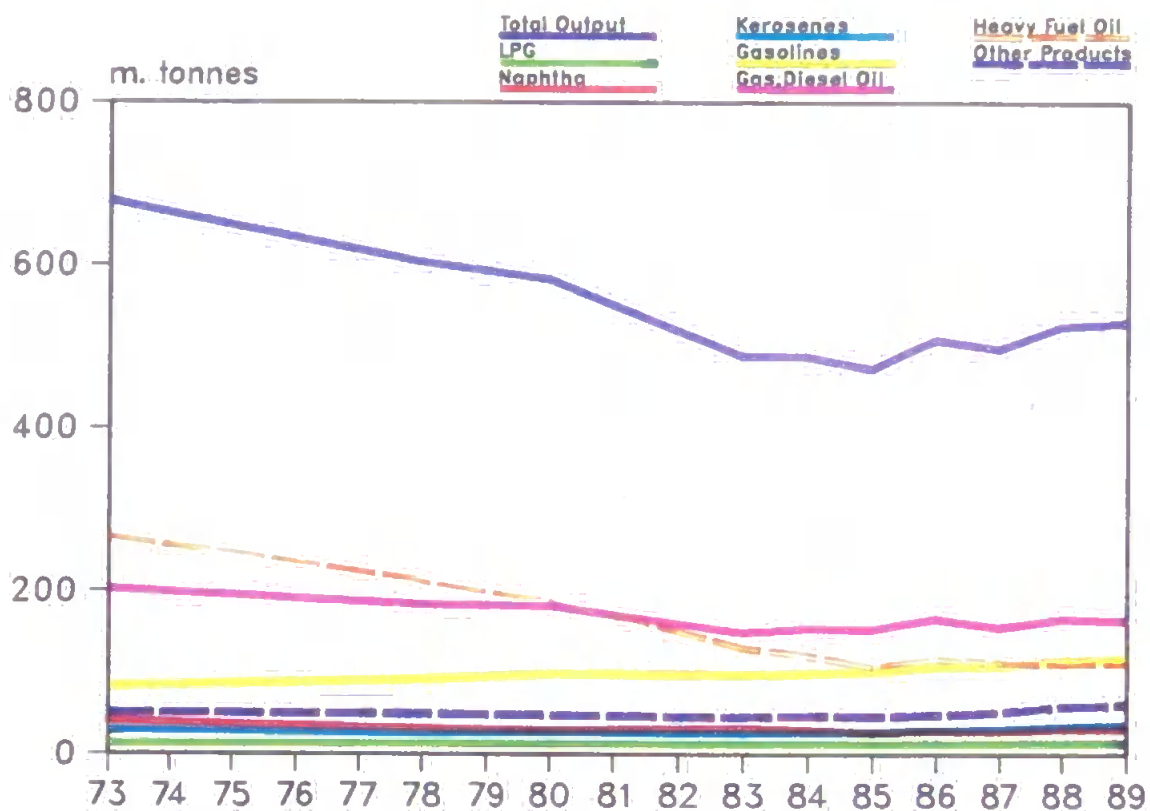


Figure 3

Demand for oil products in Western Europe

Source:

BP Statistical Review of the world oil industry, various years

consumption was 16 per cent lower in 1981 than in 1979, while

"the European market for fuel oil deteriorated more rapidly than for any other refined product" (Pinder and Husain, 1987a, 305; 1988, 233).

As Figure 3 reveals, the remainder of the 1980s confirmed the permanence of the downward trend in fuel oil demand. This in turn led to the emergence of excess refinery capacity and a "fuel oil lake" (Pinder and Husain, 1988, 233). Already in 1981 refinery throughput was only 50 per cent of capacity, whereas a utilisation rate of 80 per cent is normally considered necessary in the industry (Figure 4). But it was also apparent that this highly unsatisfactory situation would deteriorate further unless refining industry planners undertook large-scale restructuring.

Previous studies (Pinder, 1986, 1994; Pinder and Husain, 1987, 1988) have demonstrated that the industry's approach to restructuring depended on three strategies which ultimately returned it to high utilisation rates (Figure 4). Two were designed to safeguard refineries and ensure their survival - thus reducing the scale of land redundancy which eventually occurred. One of these was 'upgrading', the addition of 'conversion' technologies to refineries. This enabled them to convert surplus fuel oil into lighter products, such as transport fuels, for which demand remained relatively strong. The second was 'downrating', a disinvestment strategy which improved refinery efficiency by

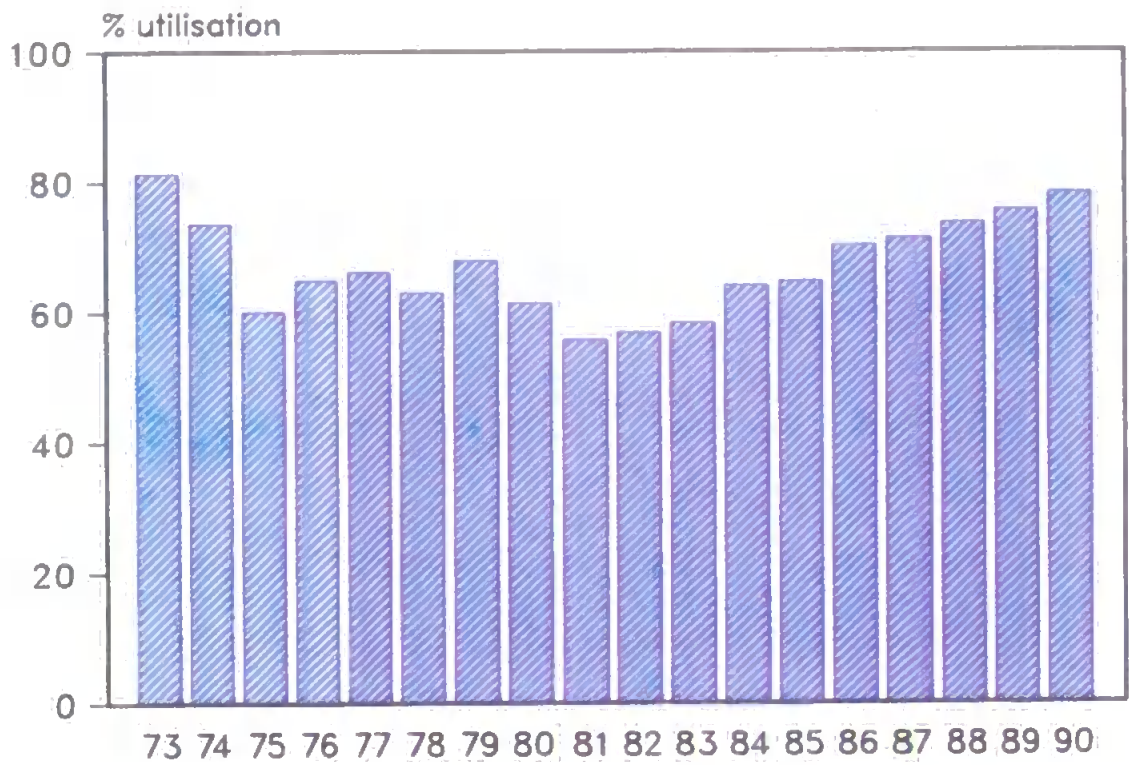


Figure 4 Refinery utilisation rates in Western Europe

Source: *BP Statistical Review of the World Oil Industry*, various years.

cutting a plant's annual capacity (but not its land requirements).

Thirdly, however, refining companies also relied heavily on total plant closures. Between 1979 and 1986 24 coastal refineries were abandoned in Western Europe; this meant the shutdown of one refinery in five and a 15 per cent decline in coastal refining capacity (Figure 5). In selecting plants for closure companies did not, of course, act randomly. Rather, particular types of refinery were selected, and especially those that were too technologically unsophisticated and too small to benefit from upgrading and downrating strategies. Although this bias towards refineries with below-average capacities naturally tended to limit the scale of the redundant land problem, it by no means reduced it to negligible proportions. Consequently it has been estimated that between 40 and 45 square kilometres of redundant refinery sites became available throughout Western Europe's coastal zones by 1987 (Pinder and Husain, 1988, 236-7). Placing this in a broader waterfront decline context, this was roughly twice the area administered by the well-publicised London Docklands Development Corporation.

1.4 ABANDONED COASTAL REFINERIES - A UK OVERVIEW

Eight coastal refineries have closed in the UK and have therefore become the subject of this study. Details of their sites are provided by Table 1 and Figure 6. Almost all

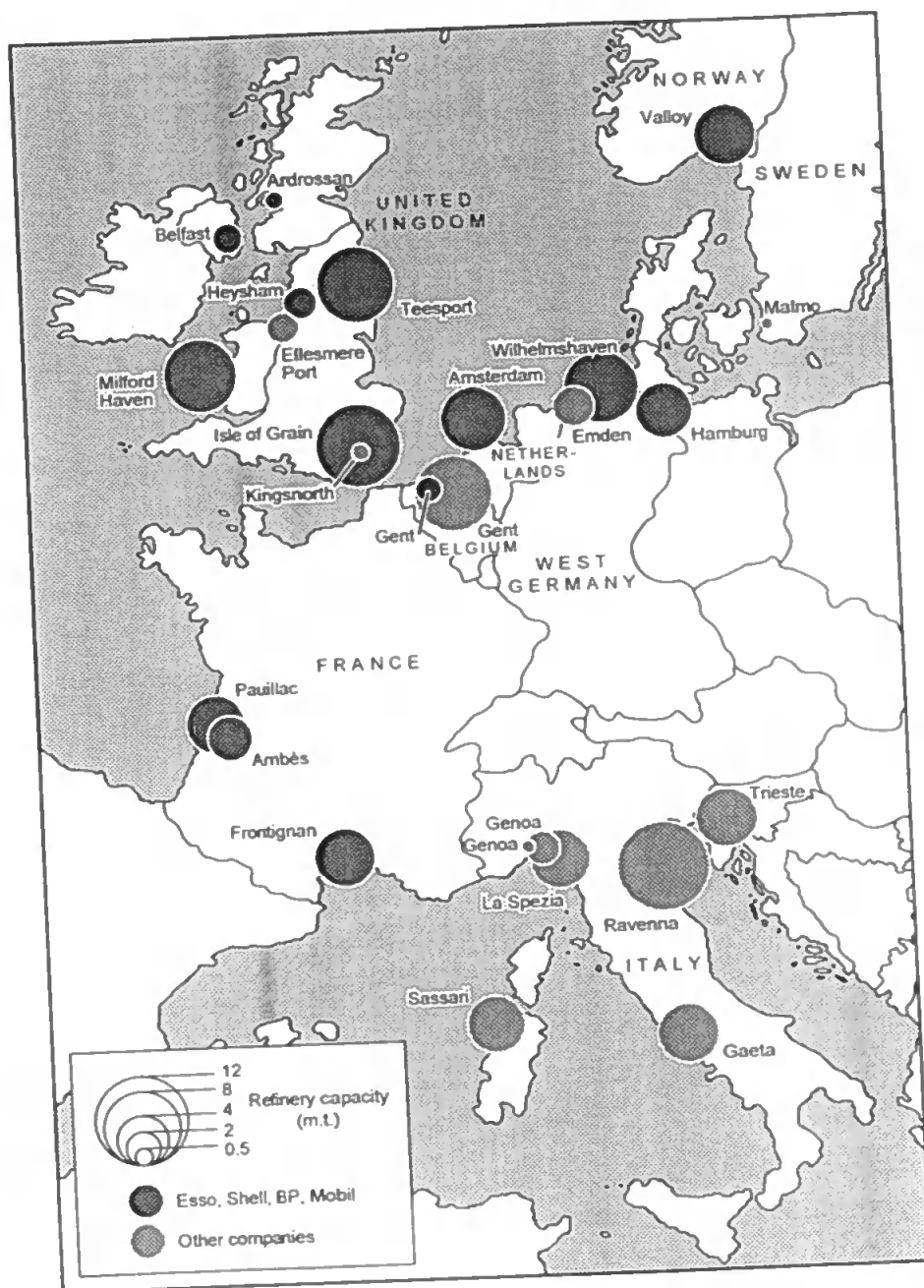


Figure 5 Coastal refinery closures in Western Europe
 Source: Pinder and Husain, 1988

Table 1 **Characteristics of closed UK oil refineries**

Name	Oil co.	Year shut	Age at closure	Crude cap. (mt/y)	Technologies installed	Gross land release (ha)
Isle of Grain	BP	1981	28	11.1	vacuum dist. cat cracking, hydroprocess, lube mftr., asphalt mftr. alkalytion	525
Kings North	Berry Wiggins	1977	47	0.31	lube mftr. asphalt mftr.	30
M. Haven	Esso	1983	23	8.6	visbreaking, cat. reforming	220
Heysham	Shell	1976	28	1.92		100
Elle. Port	Burmah Oil	1981	47	1.25	cat. reforming, hydroprocess, lube mftr. vacuum dist.	100
Teesport	Shell	1985	17	5.12	therm ops., cat. reforming, hydroprocess	120
Ardros'n	Shell	1986	58	0.25	asphalt mftr.	13
Belfast	BP	1982	18	1.6	cat. reforming, hydroprocess	40

Abbreviations:

M.Haven: Milford Haven

Elle. port: Ellesmere Port

Ardros'n: Ardrossan

Sources: Oil and Gas Journal; various years, author's correspondence.

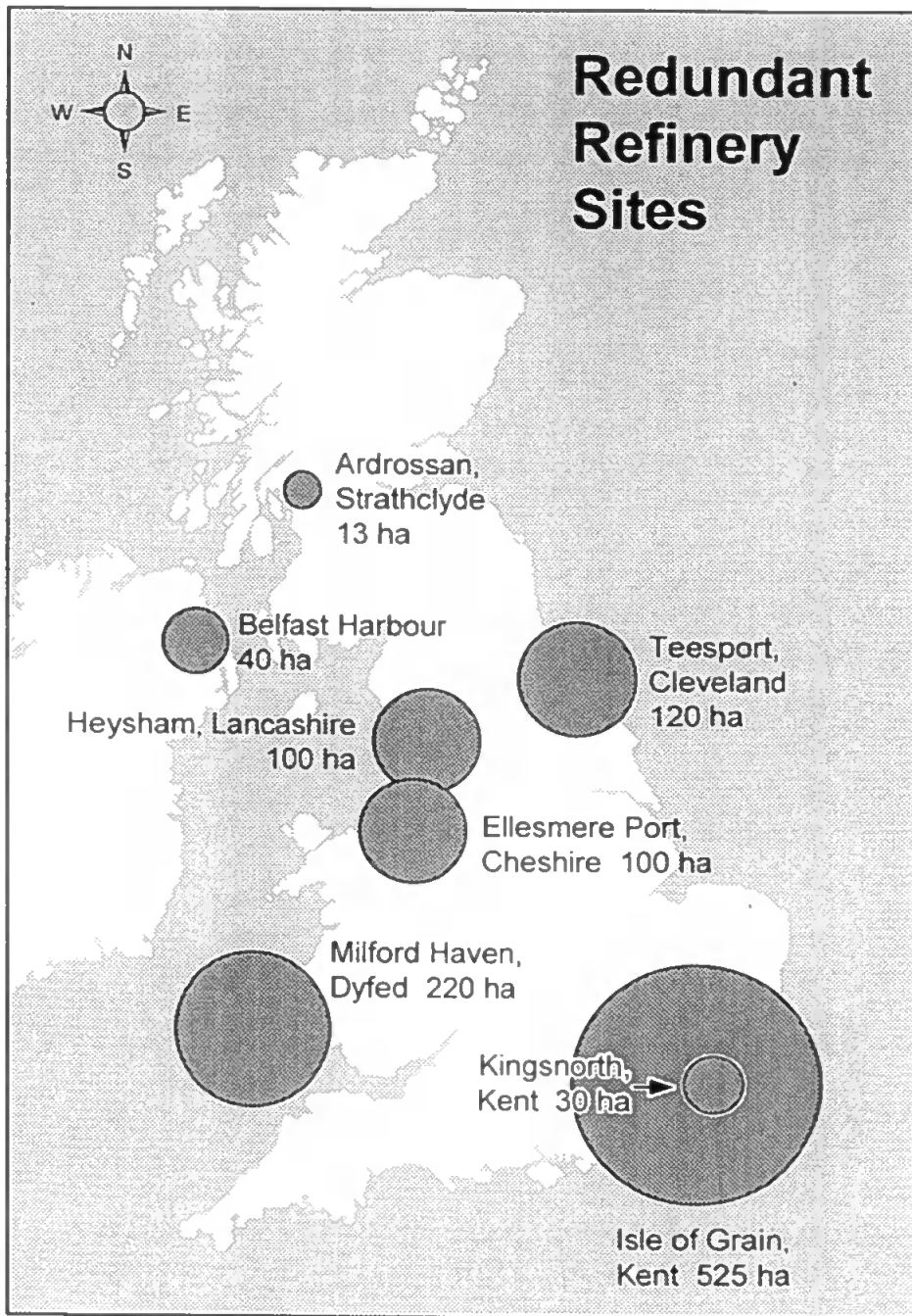


Figure 6 UK redundant refinery sites

were originally operated by multinational concerns² but, from the viewpoint of this thesis, it is important to emphasise their diversity as much as - or even more than their similarities.

For example, in terms of pre-closure output, two main groups may be identified. Ardrossan, Ellesmere Port, Heysham and Kingsnorth were small enterprises refining less than two million tonnes of oil a year, and in some instances substantially less. In many ways these can be considered typical European closures, in that they were representative of the small and therefore inefficient undertakings on which refining companies tended to concentrate shutdown programmes. In contrast, the end of refining by Shell at Teesport, Esso at Milford Haven and BP on the Isle of Grain affected much larger activities, with BP's Isle of Grain shutdown being virtually the largest in Europe. Above all, these major closures reflected the leading refiners' willingness to view their production systems as a whole, and close even large advanced plants if they inhibited the optimisation of company output (Pinder and Husain, 1987b).

Given these contrasts in former production capacity, the abandoned sites resulting from closure also naturally vary in scale. What is clear, however, is that almost all shutdowns have made available significant areas in the coastal zone. Five of the eight sites extend over 100 ha or

more, with the Esso Milford Haven and BP Isle of Grain sites accounting for no less than 2 square kilometres and 5 square kilometres, respectively. Moreover, sites of 30 ha and 40 ha at Kingsnorth and Belfast are not negligible. Linked with this question of scale is one of topography: the needs of refinery processing plants, and storage tanks for crude oil and refined products, normally required a site to have extensive level areas. Thus refinery closures have released substantial sites that are potentially highly attractive for large-scale industrial or commercial activities. As Table 2 demonstrates, this has already stimulated significant re-use at several locations, to be explored further in Chapter 5.

Beyond this, the sites are widely distributed around the UK coast, ensuring that they differ considerably in terms of their nearness to regions or cities which might provide the impetus for regeneration (Figure 6). Thus, at the interregional scale, two lie in the South East and two in the North West, while Wales, the North East, Scotland and Northern Ireland each account for one. Intraregional contrasts are also evident in terms of sharp differences between the sites' relationships to the urban-rural divide. For example, those at Ellsemere Port and Teesport are located on highly industrialised estuaries, while those at Belfast and Ardrossan are also essentially urban. Esso's former site at Milford Haven, in contrast, is situated in a very rural environment and is even bisected by

Table 2 Economic activity on former refinery sites, 1993

Refinery	Activity surviving from refining era	New activity	Approved future activity
Isle of Grain	Oil products storage	Container/coal terminal, CCGT power station, aggregate terminal	LNG import
Teesport		Car export terminal (until 1994) Fine chemicals plant	
Milford Haven			
Heysham		Industrial estates, individual SMEs, solvent recovery	
Belfast	Oil products storage		
Ellesmere Port	Lubricant production		
Ardrossan			
Kingsnorth	Bitumen production	Industrial estate	

Abbreviations: SME -Small, Medium-Sized Enterprises

Sources: Company data, local authorities and field survey.

the Pembrokeshire National Park boundary (Figure 7). Meanwhile, sites in Kent (at Grain and Kingsnorth, both on the Isle of Grain), and that at Heysham, Lancashire, are located in areas which support some industrial activity but which are not truly urban.

The theme of diversity is continued in the post-closure ownership of sites, a criterion that is important because of its potential to influence the choice of regeneration strategies. In this context, several distinctions must be made. First, four sites belong to their original landowners. In three instances - Teesport, Belfast and Ardrossan - this means that ownership is in the hands of the local port authority; in a fourth - Esso Milford Haven - the original multinational company remains in control. Secondly, there has been a clear trend for portions of the sites to pass into local authority ownership. This has occurred at both Ellesmere Port and Heysham, and at both of these locations, the local authorities are trying to regenerate derelict land. Lastly, but by no means dominantly, some land has passed directly into private sector ownership. Above all this is the case on the Isle of Grain, where large parts of the former BP site now belong to British Gas and Thamesport, a major new coal and container port development.

As a group, therefore, the sites in question are contrasted in many important respects, and it might be argued that this

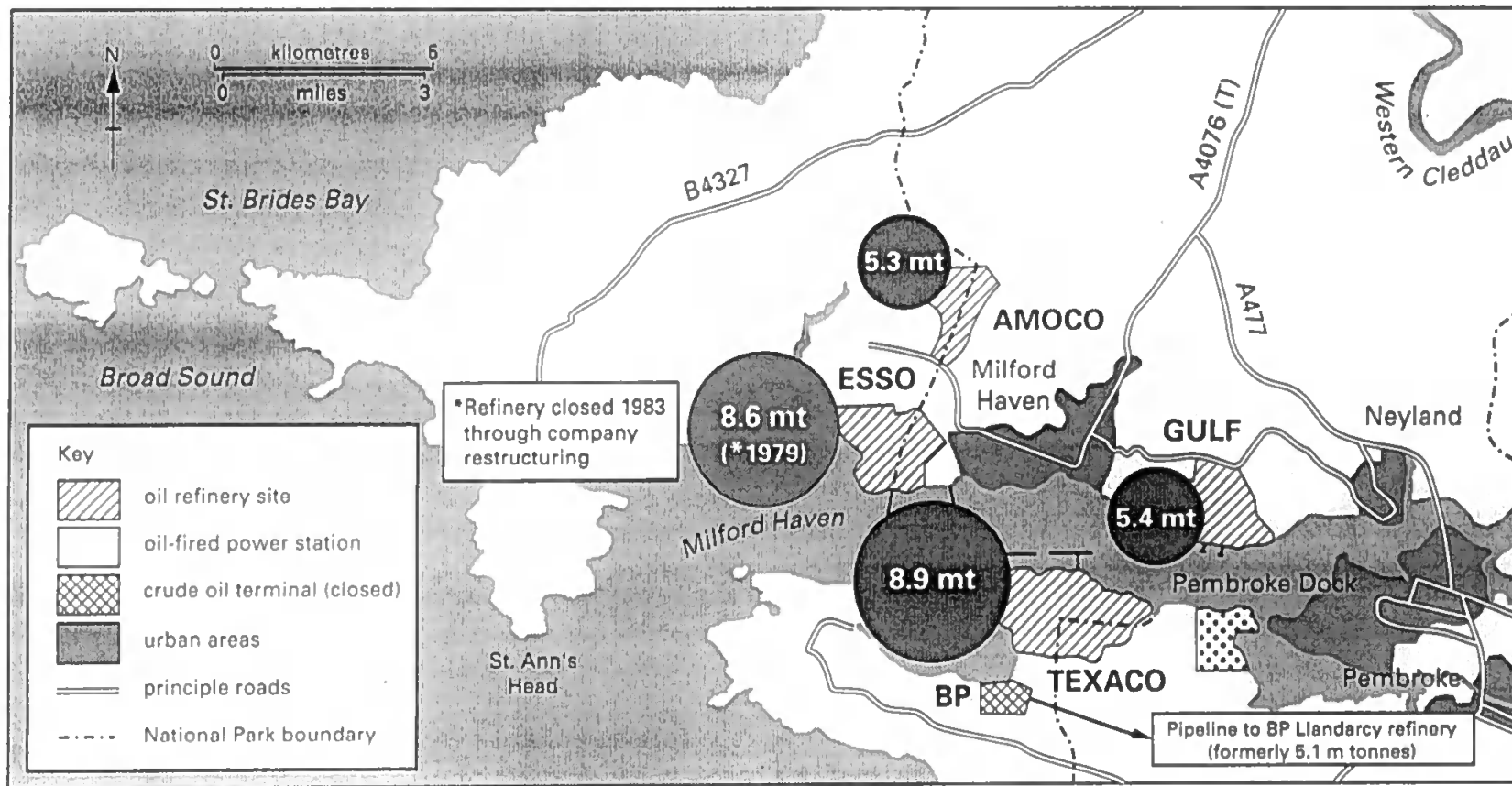


Figure 7 The Pembrokeshire Coast National Park boundary in relation to the Esso site

is the first important finding of the investigation. Certainly, the complexities of the situation have been reflected in subsequent approaches to research design and analysis. Initially the intention was to adopt a model-building approach synthesising, throughout the thesis, findings from sites with common attributes in order to construct models of decline and revitalisation that could be compared with the seminal model offered by Pinder, Hoyle and Husain (1988). In practice the diversity demonstrated above proved a major obstacle to this approach, and much of the investigation has therefore sought to exploit, rather than play down, the many contrasts which may be observed. Consequently most of the chapters which follow are primarily concerned with comparative analysis rather than with the attempt to achieve what might well be considered an artificial and misleading degree of synthesis. Even so, the idea of modelling change has not been abandoned altogether, and Chapter 7 therefore presents a proposed model capable of direct comparison with that of Pinder and Husain (1988).

1.5 TOWARDS A RESEARCH AGENDA

As has already been indicated, the ultimate objective of this thesis is to explore and assess - in the context of oil refining - waterfront decline and revitalisation outside traditional areas of port decline. To achieve this, the first step in the investigation was to take an analytical approach to the overall objective and, through this, derive

a series of more specific aims which could define the need for subsequent research. This section sets out these aims and examines the logic underpinning them.

'Mainstream' studies of waterfront decline have long since acknowledged the value of appreciating the economic and, to some extent, social consequences of the demise of port activity. Traditional port areas routinely employed hundreds of dockers; had significant labour forces in port-related manufacturing; and also supported extensive networks of ancillary services. The loss of these was inevitably highly damaging to the economic and social fabric of cityports, and it is clearly important that this study should seek to establish the extent to which oil industry restructuring has also been a negative process for local communities.

Moreover, not least because of the dominant role which refining may play in a locality, it is also important that exploration of this question should extend beyond consideration of the impact of decline on individuals. In the wider community, for example, how has the loss of refining affected port authorities, and how have they responded to this pressure? Similarly, what have been the financial implications for local authorities, whose budgets may have been heavily dependent on local taxation levied on local refineries? The answers to these questions are examined in Chapter 4.

Concern for this type of impact, however, should not be allowed to obscure the fact that refining is a potentially damaging industry. Air and water pollution are obvious threats; the journey to work by large labour forces may place pressure on local road systems; and these systems - at least in many instances - must also bear the brunt of oil product distribution by road tanker. Consequently, while localities are likely to suffer economically and perhaps socially through the closure process, conceptually such losses may be counterbalanced by environmental gains. Because this possibility has not previously been proposed in the waterfront revitalisation literature, it is particularly important that it is investigated by this study, and Chapter 3 therefore provides insights into this idea.

So far as revitalisation is concerned, the appropriate logic is largely the mirror image of that outlined above. Incoming activities should bring economic - and consequently social - benefits. Also, it must be envisaged that these benefits are able to extend beyond individuals to include business in the vicinity and institutions such as local and port authorities. Establishing the extent to which this is the case should therefore be a fundamental goal of the research and the results of such an assessment are given in Chapter 5. But any influx of new activity which compensates for the closure of a refinery could arguably be a mixed blessing. Continued maritime activity, for example, may entail the

danger of various types of marine pollution; the labour force is likely to rely heavily on the private car for journeys to work; and any significant growth will probably generate appreciable freight traffic by road. From this it is evident that the research should also investigate whether the price paid for economic revival is an environmental penalty which effectively diminishes any environmental gains resulting from the original refinery closure. These more negative environmental aspects of regeneration are considered in Chapter 3 which, in response to them, introduces the concept of net environmental gain.

While these aims are designed to shed light specifically on the nature and consequences of decline and revitalisation, it is also helpful to set the work in a broader and more conceptual context. This can be done from two perspectives.

First, this form of waterfront decline may be viewed against the background of external control and decision-making. As Dicken (1986) has outlined, multinational companies have been heavily criticised for the impact which their unilateral disinvestment decisions may have on the affected localities. Clearly, the restructuring of oil refining can be set firmly in this context: the industry is dominated by international companies; almost all closures have been made by the multinational refiners (Pinder and Husain, 1988); and there is no evidence of local involvement in the decision-

making by any company. While this would suggest that oil refining restructuring offers a classic example of multinationals' failure to adjust to the interests of localities, however, it may be unwise to assume that this is necessarily the case. Evidence that there has been no concern for local communities is required, and the search for this has therefore been made an additional aim. The discussion returns to this point in both Chapters 4 and 6.

Secondly, it is appropriate to set the research in the context of planning concepts. Recent work by academics (Vallega, 1992; Carter, 1988; Jolliffe and Patman, 1985) has argued the value of integrated coastal management. This view echoes the earlier arguments of Ketchum (1972) and rests on the belief that coastal zones are frequently highly delicate environments, yet are also subject to extreme pressure from conflicting interest groups. These emanate from the world of business, the public sector, local communities and society at large. Consequently, it is proposed, planning and management must be organised in order to mediate between these interest groups, meeting their needs where possible yet at the same securing the protection of the coastal zone environment. In the context of this study, the need to revitalise derelict refinery sites undoubtedly opens up opportunities to adopt such an approach, but for two reasons one may question whether in practice progress towards this academic ideal has been achieved. On the one hand,

historically, the UK is widely regarded as lacking collaborative planning for the coastal zone. (See, for example, submissions to the House of Commons Environment Committee by the Royal Society for the Protection of Birds, Wildlife Link and the Association of Local Authorities (Environment Committee, 1992.) Meanwhile, on the other hand, the era of oil refining restructuring coincided closely with the application of New Right philosophy to the planning system (Rydin, 1993, 71). Given this historical background and the priority accorded to the market by the New Right, the need arises to test the proposition that integrated coastal management has made little progress in this sphere. In terms of this more conceptual aspect of the research, Chapter 6 provides the principal discussion of the links between actual revitalisation processes, planning strategies and coastal management ideas. However, as coastal planning and management clearly provide an important backdrop to the project as a whole, their emergence and development require consideration at an early stage, and have therefore been made the focus of Chapter 2.

Synthesising from this discussion, the majority of the thesis has been structured into three broad sections, each with its distinctive perspectives. First, the present chapter and Chapter 2 are essentially introductory and designed to provide the foundations and rationale for the research. Second, Chapters 3, 4 and 5 report on the

empirical core of the research, examining in some detail the processes and consequences of decline and regeneration at the various sites. Third, Chapters 6 and 7 set these empirical findings in a more conceptual context, initially by examining relationships between planning approaches and the ideals of coastal zone management and subsequently by proposing a model of decline and revitalisation. Finally, Chapter 8 provides the conclusion for the thesis as a whole. The aims of this chapter are to review and assess the work's major findings; to examine its implications for the major fields of waterfront studies and coastal zone planning; and to identify further research opportunities in this important subject area.

1.6 METHODOLOGIES

1.61 Secondary data collection

The secondary information required for the research primarily comprised the existing academic literature and other written materials. Because the project's concern with aspects of waterfront decline and revitalisation was of interdisciplinary interest, it was evident at an early stage that literature searching should extend over a wide range of subject areas including economic geography, sociology, planning, environmental studies and environmental science. Searches in these subject areas were chiefly conducted in the Plymouth University library, using electronic systems such as CD-Roms to ensure national and international

coverage. Relevant literature not available in the Plymouth library was naturally gathered via the inter-library loan system.

Additional material was identified by using three other strategies. First, searches were conducted for specialist collections incompletely covered by the electronic search systems outlined above. Of particular importance in this respect was the London-based Institute of Petroleum library. This houses an internationally regarded collection of energy-related information, extending from major authored works to numerous document files relating to highly specific topics. Several days were spent at the Institute of Petroleum, partly to gain familiarity with oil industry literature in general, but chiefly to focus on archive files relating to specific UK refineries. Much background information on individual closures, and operations prior to closure, was gained in this way.

Second, attempts were made to identify archives created by organisations with interests in specific sites where closures had occurred. This yielded less extensive information than that gained through the Institute of Petroleum, but was nonetheless worthwhile. Relevant information from this type of source came partly from public organisations. For example, the archives of the Dyfed County Museum at Haverfordwest were found to contain documents

relating to the Milford Haven refining industry, including several on the operation and closure of the Esso plant. In addition, however, other significant data sources had been assembled by voluntary organisations, the Kent Trust for Nature Conservation being a good example. As might be anticipated, this body's collection included official documents such as Environmental Impact Statements relating to proposed redevelopments on the BP Isle of Grain site. But it also extended well beyond this type of information to include more ephemeral material, some of which might well be regarded as primary data. For example, it was through this source that access was gained to the postal correspondence that had occurred between conservation interests and planners regarding proposed developments at Grain.

Third, during contacts with individuals such as local authority officials, oil company employees and developers, opportunities were taken to obtain relevant documents such as planning committee reports, Environmental Impact Statements, Local Plans and Structure Plans. While much of this information was collected at a relatively early stage in the research, the search for this type of material continued throughout the project and some of the later material obtained proved to be particularly useful. For example, much of the discussion of refinery linkages in Chapter 4 is derived from a report on the local impact of refining prepared jointly by Dyfed County Council and

Preseli Pembrokeshire District Council. This report was not available until year 3 of the research.

1.62 Primary data collection

A variety of primary data collection methods was used for this research, the dominant methodologies being postal surveys, door-to-door community questionnaire surveys and semi-structured interviews with key actors. The following section details the rationale and research design issues which underpinned the various approaches that were adopted.

Initial postal investigations

The first investigation entailed direct approaches by letter to statutory bodies and businesses at each refinery site and was intended to obtain basic information relating to the economic and environmental effects of refinery closures. It was, therefore, primarily designed to gather information relevant to Chapters 3 and 4. Table 3 illustrates the organisations which were initially questioned, and provides a summary of the types of information sought from them. It will be seen that in some cases the same information was requested from different sources, a policy adopted partly in an attempt to ensure that sufficient data were obtained, and partly to validate the results by assessing the extent to which different respondents gave similar accounts.

The addresses and the names of the relevant officials to

Table 3 The initial survey: organisations contacted and information sought at each site

Authorities Approached	Types of Information Sought
Local Planning Authorities (LPAs) (District level)	Current ownership and status of site, plans for site, records of pollution incidents since closure, proximity to designated sites (eg SSSIs, AONBs).
Treasury Departments (District level)	Effects of closure on Local Authority incomes.
Environmental Health Departments (District level)	Records of pollution incidents during refinery operations.
Planning Departments (County level)	Numbers of jobs lost on closure.
Highways Departments (County level)	Traffic volumes generated by refineries compared to current traffic levels around site.
Port Authorities	Effects of closures on port authority income and jobs.
Oil Companies	Current ownership of site, plans for site (if applicable), perceived socio-economic impacts of closure, action taken to ameliorate impacts.

Abbreviations:

SSSI Site of Special Scientific Interest

AONB Area of Outstanding Natural Beauty

contact were obtained from telephone directories and subsequent telephone calls. These officials were then sent an individual letter requesting information on specific topics. Initial problems encountered by this aspect of the investigation were that in many instances officials claimed that the information requested was no longer available, while others did not reply. To reduce the latter difficulty, non-respondents were approached a second time by means of a telephone call, and additional letters were also sent to other organisations. These included the National Rivers Authority (NRA) for each region;³ the Marine Pollution Control Unit (MPCU) of the Department of Transport; Her Majesty's Inspectorate of Pollution (HMIP); and several relevant trade unions. Although this extension of the survey did not result in complete coverage of the information sought (Table 4), it nonetheless provided valuable data on the local consequences of corporate restructuring.

The second postal survey undertaken aimed to assess the extent and nature of economic redevelopment that had taken place at each of the eight sites. Its chief goal was therefore to assemble data relating to revitalisation that would be relevant to Chapters 5 and 6.

The first step in this survey was to identify the survey population, i.e. the new businesses that were present at the sites. All mainland sites were visited, and the names and

Table 4 Responses to questions in initial survey of organisations

	LPA	CC (jobs)	CC (Highways)	Treas-ury	Env. Health	Port Auth.	Oil Co.
M. Haven	Yes	Yes	No	Yes	No	Yes	Yes
Isle of Grain	Yes	Yes	Part	Yes	No	Yes	No
Kings North	Yes	Yes	Part	No	No	No	No
Tees-port	Yes	Yes	No	Part	Yes	Yes	Yes
Hey-sham	Yes	No	Part	No	No	Part	Part
Elle. Port	Yes	No	No	No	No	Yes	Yes
Ard-ros'n	Yes	No	No	No	No	Part	Yes
Bel-fast	Part	No	No	Part	No	Part	No

Yes: fairly full information given,
 No: no information given,
 Part: partial information given.

Abbreviations:
 M.Haven: Milford Haven
 Elle. port: Ellesmere Port
 Ardros'n: Ardrossan

addresses of businesses located on them were recorded. Having previously studied the sites on Ordnance Survey maps, their identification in the field did not generally pose problems, and most were naturally readily visible. The only instance in which it was difficult to establish the site boundaries precisely was the ex-Burmah Oil site at Ellesmere Port, and in this case advice was sought from local people working in the area. Outside the mainland, Belfast was not visited, communication with the Port Authority having indicated that there was no new economic activity on the site of the demolished BP refinery.

A structured questionnaire (Appendix 1) was then devised which aimed to elicit information on the following topics for each individual business identified:

- a) the types of economic activity in which the incoming firms were engaged;
- b) the numbers and types of workers employed;
- c) the reasons for locating on the ex-refinery site in question;
- d) the extent of new firms' economic links with the local area;
- e) and any particular problems or benefits that had been experienced at the site.

Questions were predominantly closed, and a covering letter

stressed that the questionnaire was straightforward, could be completed quickly and was essential for the research. A pre-paid envelope was included with each questionnaire, the decision to provide this being a reflection of issues raised by Bailey (1987)⁴.

Two pilot surveys were undertaken to test this questionnaire. The first targeted six firms located in the Milford Haven Enterprise Zone but, possibly because of business closures, this yielded only three replies. To extend the piloting exercise, therefore, the second survey was directed at businesses on a new industrial park in Cornwall⁵. This second attempt elicited a response from 10 of the 11 enterprises on the entire site (more than 90 per cent). Because neither set of pilot responses identified problems with the questionnaire, it was then sent unaltered to businesses at the refinery sites.

Out of 104 questionnaires despatched, 8 were returned by the Post Office (where the company had closed or moved from its original address), and two were sent back by addressees who claimed that the questionnaires were not applicable to them. In one case this was because the firm in question was only a holding company, while the other was the industrial estate owner. These returned questionnaires were excluded from the calculation of response rates in accordance with accepted practice (see Babbie cited in Bailey 1987).

Many of the remaining 94 questionnaires were completed and returned within days, but two reminder letters were sent where necessary and telephone calls were also made as a third reminder. This follow-up work extended over a three month period. On an individual site basis the lowest response rates achieved were at Ardrossan, where there were only two firms operating on the site, and at Kingsnorth and Heysham (Table 5). In these latter instances, however, failure to respond should not be overemphasised. Actual response rates were 50 and 70 per cent respectively, and for the survey as a whole a rate of just over 73 per cent was achieved. According to Bailey this is 'about right' for a survey with proper follow-up procedures. However, this writer also notes that others, for example Babbie, consider 75 per cent to be a 'very good' response rate:

"I feel that a response rate of at least 50% is *adequate* for analysis and reporting. A response rate of at least 60% is *good*. And a response rate of 70% or more is *very good*"

(Babbie, 1973; cited in Bailey, 1987, 169).

The completed questionnaires were coded and entered into a Quattro Pro database. (It was decided to code questions *after* the questionnaires were returned in order to avoid making them appear over-complicated, and therefore perhaps daunting to potential respondents.) Once the data had been assembled and verified in Quattro Pro, the final step was to read them into the Statistics Package for the Social

Table 5 Response to economic questionnaire

	Grain	Tees- Port	Ardro- ssan	Kings- north	Hey- sham	Totals
Replies Received	18	10	1	12	28	69
No. Deliv'd, ques.	19	14	2	19	40	94
Response Rates	95%	71%	50%	63%	70%	73%

Sciences (SPSS), the primary software used for their analysis.

Social surveys and semi-structured interviews

Two sites, at Milford Haven and the Isle of Grain, were selected for further investigation of the effects of refinery closures and subsequent redevelopment. For these sites the opinions and attitudes of company representatives, and of local authority and port authority personnel, were elicited by semi-structured interviews which typically lasted for around 45 minutes. In addition, local public opinion and attitudes were canvassed by means of survey questionnaires.

The major reason for attention to be concentrated on the Grain and Milford Haven sites was that many of the others were not appropriate for community survey work. For example, at Kingsnorth, Teesport, Ellesmere Port and Belfast Harbour, it was considered likely that ex-refinery land would be relatively unimportant in local peoples' perceptions. At Kingsnorth this was because this small site was situated on a little-used road 2 miles from the nearest village. Similarly the sites at Teesport, Ellesmere Port and Belfast were relatively remote from residential areas. In these instances, however, an additional consideration was that the abandoned land lay in the middle of port/industrial complexes. This, it was felt, would seriously handicap any

investigation because respondents would have difficulty in distinguishing the closed refinery from the industrial complex in general.

The Heysham site, in contrast, was close to a residential area, but had been closed in the late 1970s and was therefore excluded because of the probability that many people in today's local community would not remember the effects of its closure very clearly. Meanwhile Ardrossan, despite its proximity to an urban population, was not included because of its unique location in an old port area rather than the broader coastal zone. In addition its small size, only 13 hectares, meant that it would be difficult to make meaningful comparisons with other redundant refinery sites.

Conversely, the land released by the Milford Haven and Grain closures was distinct from any other local development and, in both cases, was also situated close to significant settlements. This suggested that these two locations would provide access to communities capable of providing an effective survey response, since they were likely to be strongly aware of the refining history and current land-uses on the former refinery land. In addition the case for concentrating on these sites was strengthened by the fact that they were both large (covering 220 hectares and 525 hectares respectively), and could therefore provide useful

comparisons with each other and with other major abandoned refineries elsewhere in Europe.

Community survey design

The sample targeted by this survey was selected from the electoral register by starting from a random point on the list, and taking names at fixed intervals. A rough calculation was made at the start of the selection process, so that the intervals between selected respondents would yield a total of around 180 names at each site. In addition, 20 extra names were selected from the Grain population for use as a pilot survey. The electoral wards to be sampled were identified by contacting the relevant District Council to establish which wards the target communities occupied. In the case of Grain, just one ward covered the entire village, while in Milford Haven it was necessary to sample three. Two of these covered the Hakin area, while the third was based on Herbrandston village (Figure 8).

The questionnaire that was devised predominantly consisted of closed questions - the most suitable structure for 'delivered' surveys (Moser and Kalton, 1982; Bailey 1987; Fowler, 1988,). As Appendix 2 reveals, the questions explored residents' current perceptions of their respective areas, their desired uses for any remaining derelict land at the local refinery site, their attitudes to the current

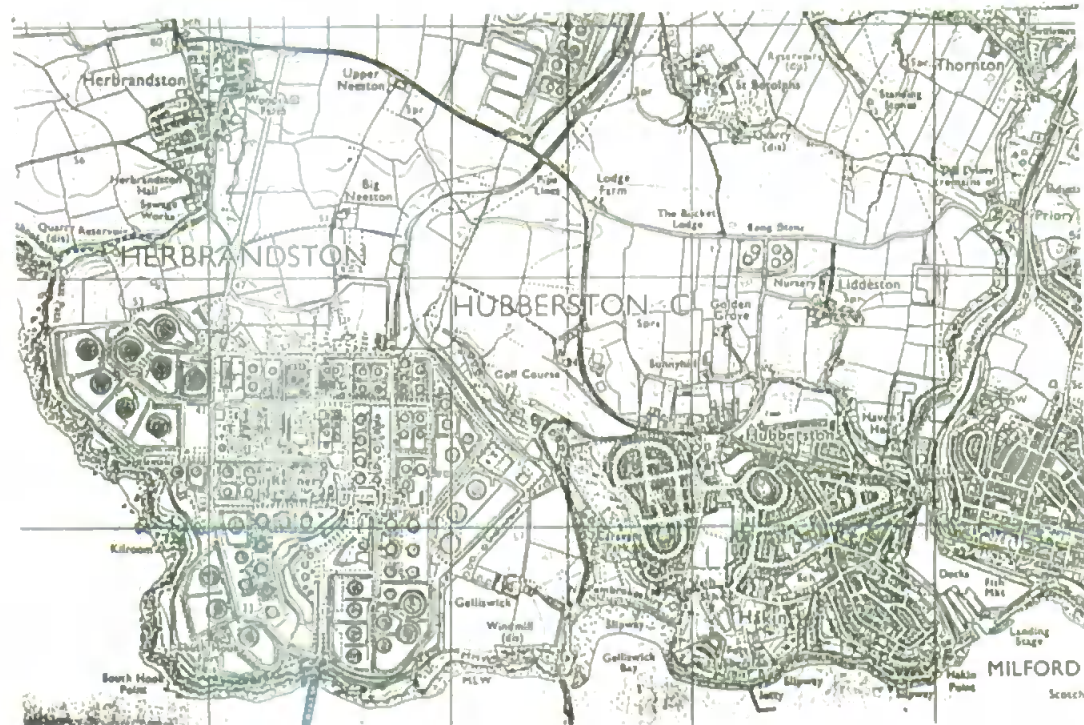


Figure 8 Areas sampled for questionnaire surveys at the Isle of Grain and Milford Haven sites

situation at the site, and their opinions of the impacts of the previous refining activity. As far as possible, identical questions were asked at the two sites, but some differences were inevitable, particularly in relation to the current land-uses. Classification questions were limited to assessing the age, sex and occupational status of respondents. The latter category was based on the Registrar General's classification of social class (Haralambus, 1985), with some additional classes added to include housewives, retirees, the unemployed and students. Unusually, these classification questions were inserted before the final section (which investigated attitudes to previous refining activity). This was to ensure that the latter section - which would only be applicable to respondents who were long-time residents of the area - could be placed at the very end of the questionnaire.

The initial intention was to distribute the questionnaire by post, and this strategy was in fact tested in the Grain pilot survey. Questionnaires were distributed with an accompanying covering letter and a pre-paid envelope. This pilot investigation revealed no serious problems with the questions themselves, so that it was not necessary to amend the questionnaire, but the response rate was no more than 50 per cent. It was decided, therefore, that a better response rate might be achievable if questionnaires were hand-delivered. In addition it was believed that personal visits

to the communities would help to consolidate the investigator's 'feel' for them.

Door-to-door visits were made, firstly at Grain, and later at Milford Haven. Each respondent was asked for in person, the purpose of the research was explained, and a questionnaire was then left with the respondent - or a member of their household - to be collected later. If there was no one at home the questionnaire was left with a covering letter addressed specifically to a named individual, and with information regarding the proposed time of collection.

Completed questionnaires were collected one or two days after delivery. At least two attempts were made to collect questionnaires, but if the second attempt met with failure (when there was no one at home, or if respondents had not had time complete the questionnaire), a pre-paid envelope and explanatory letter were left. At Grain these collection envelopes and letters were handwritten and stamped; at Milford Haven, they were word-processed and the envelopes were marked with a university pre-paid label. It is possible that this difference was partly responsible for the higher response rates at Grain (78 per cent compared to 60 per cent at Milford Haven). This would certainly concur with ideas put forward by Bailey (1987), namely that the personal

touch and use of 'real stamps' can enhance response rates appreciably.

Clearly there may be biases with this type of approach to community survey work. The sampling system would have missed anyone not on the electoral role, and general criticisms of mail-based questionnaires (Bailey 1987) can be fairly applied to this survey. For example, questions may have been misinterpreted by respondents because they completed the questionnaire without the guidance of the researcher. And, although respondents were asked for by name, anyone in the household could have completed, or helped to complete, the questionnaire. However, all social survey methods are associated with problems of one form or another, and the response rates reported above must be considered good in the general social survey context. In absolute terms they produced substantial samples (of 136 at Grain and 107 at Milford Haven), providing useful evidence for the empirical section of the thesis. Moreover, the visits also fulfilled the subsidiary aim of establishing insights into the lives and environments of people in the communities investigated.

Semi-structured interviews

The in-depth semi-structured interviews were conducted with officials at each of the two sites. At both locations interviews were undertaken with a local planning officer

(district level), an economic development officer and a port authority representative. In addition, at the Isle of Grain each of the three main developers, the Highways Officer of the County Council, and a County Council planner were interviewed. At Milford Haven, additional interviews were undertaken with a job centre manager, an officer of the Pembrokeshire Coast National Park Authority and a representative of Esso. In most cases, potential interviewees for this aspect of the investigation were identified during preparations for the initial postal survey of organisations discussed earlier in this chapter.

Questions were typed and two copies made. At interview, the interviewee was presented with one copy, while the researcher referred to the other. The questions that were asked were of an open-ended nature, as is appropriate for interview-type surveys (Moser and Kalton, 1982; Bailey, 1987; De Vaus, 1986), and the researcher restricted her activity to probing for additional explanations. An example of a typical interview schedule is provided in Appendix 3. At the request of the interviewee, three interviews were recorded simply via notes, but in all other instances notes were used only to supplement tape recording. Later these taped interviews were all fully transcribed and their content assessed in conjunction with the notes.

In all cases, questions were devised in advance of the

interview. Some interviewees were asked specific questions to help fill data gaps left by other aspects of the research, but the overriding aim was to shed light on planning processes and the extent to which the planning system had been positively involved in the redevelopment (or planned redevelopment) of the sites. For example, an attempt was made to understand the extent to which redevelopment had been initiated by planners, or alternatively had been led by market forces. Similarly, steps were taken to assess the level of cooperation and communication achieved between different agencies and interest groups. Respondents were also asked to comment on what they believed the futures of the sites would be and, where redevelopment had taken place, to state what they saw as the principal associated benefits and costs. For example, economic development officers were asked to elaborate on the economic and social impacts of the refinery closures. Investigations on these lines were particularly designed to explore relationships between planning and revitalisation processes, and also to question the extent to which revitalisation took place in a context approximating to integrated coastal zone management. For these reasons the semi-structured interviews were considered an important source of information for Chapters 4 to 7.

1.7 CONCLUSION

Chapter 1 has sought to meet three main objectives. The

first of these has been to identify the set of issues and problems to be addressed by the research, while the second has been to highlight the importance of investigations in this field. Above all, the argument that has been advanced with respect to these two objectives is that, while far-reaching progress has been made by what may be called 'mainstream' waterfront revitalisation studies, simultaneously there has been neglect of the many consequences and challenges generated by industrial dereliction in the broader coastal zone. This neglect is serious, partly because the areas in question are typically more extensive than those involved in urban port decline, and partly because the coastal zone is increasingly perceived to be a fragile environment subject to many competing pressures.

Thirdly, the chapter has set out to establish the methodologies and research design adopted in order to explore this subject area effectively. It will be apparent that the approaches selected have been chosen to ensure that the thesis provides a comprehensive overview of decline and revitalisation. The possibility of focusing on a single aspect of the subject, such as the economic consequences of closure or the nature of subsequent revitalisation, has been deliberately rejected. This reflects two considerations. On the one hand, there is a need to gain insights into the full range of processes involved in this form of waterfront

change, not least so that they may be compared with those operating in the more extensively researched context of urban decline and revitalisation. And, on the other hand, a wide-ranging approach is the most appropriate in the light of recent calls for a more holistic view to be taken of the coastal zone (Vallega, 1992). The case for this holistic approach has been strongly argued, and consequently it is to the evolution of the concepts and practices underlying coastal zone management that attention must now turn.

NOTES

1. The non-coastal refineries consisted of 3 very small plants at Weaste, Manchester and Dundee; and the much larger (179,500 b/cd cap) refinery at Llandarcy, South Wales. Although this last refinery was situated very close to the coast at Swansea, it is considered to be non-coastal because its supply of crude arrived by pipeline from Milford Haven.
2. The only closed refinery which was not run by a multi-national concern was the small bitumen-producing plant at Kingsnorth. This was run by the Berry Wiggins Company, later to become B.O.M Holdings.
3. For Ardrossan the organisation approached was the River Purification Board, while the appropriate body for Belfast was the Department of the Environment (Northern Ireland).
4. Bailey's discussion is useful in that it offers a wide-ranging overview of postal questionnaire techniques and even discusses, for example, such details as the relative merits of post-paid and pre-stamped envelopes.
5. Victoria Business Park on the A30 between Bodmin and Newquay, mid-Cornwall.

CHAPTER 2

TOWARDS INTEGRATED COASTAL ZONE MANAGEMENT? CONCEPTUAL ARGUMENTS AND THE UK CASE

2.1 INTRODUCTION

In Chapter 1 it was proposed that the research would be most productive if, rather than focusing narrowly on change at the abandoned refinery sites, it were set in the broader context of the pressures and challenges facing coastal zone planning. To provide the basis for this approach, this chapter has two main objectives. The first is to explore a number of conceptual developments in this field, tracing in the process the emergence of what to many observers is today's ideal planning paradigm: Integrated Coastal Zone Management (ICZM). The second is to relate this paradigm to the current UK planning environment, exploring in the process the divergence between ideal and reality. In working towards this latter objective, however, the chapter does not simply assume that the political attacks on planning during the 1980s necessarily exacerbated the system's tendency to fall well short of the ICZM ideal. Instead, while it is certainly not proposed that this ideal has been achieved, it is suggested that a number of significant planning initiatives in the 1990s have perceptibly redressed the balance. Consequently it may be argued that, as revitalisation of the abandoned refinery sites gathers pace, it does so in a planning environment which places considerably more emphasis on the holistic evaluation of

proposed developments than seemed possible in the 1980s.

2.2 CONCEPTS OF COASTAL ZONE MANAGEMENT

Coastal zone management concepts have developed substantially since the early 1970s, when the argument began to emerge that the coastal zone should be treated as a special type of area for planning and management purposes. Their emergence at this time can be attributed largely to two forces. The first was the postwar economic development of advanced countries, which had been rapid and often placed pressures on coastal locations. The second was the rise of environmentalism and widespread greater awareness of the long-term undesirable impacts development frequently caused. Pinder (1981) has shown how, between the mid-1960s and the mid-1970s, this rising awareness forced the Dutch port and planning systems to revolutionise their attitudes towards the use of the coastal zone.

At an early stage the view that the coastal zone required special treatment and attention depended on perceptions of its distinctiveness. To quote Ketchum (1972, 6):

"In the coastal zone the land meets the sea, and ... processes depending on the interaction between land and sea are intense. It is both the occurrence of these processes, and for human beings - which are land animals - the simple presence of the expanse of water that make the coastal zone unique."

Ketchum's subsequent description of the natural

characteristics of the coastal zone need not be repeated here, but it is necessary to emphasise that coastal zones tend to be rich in natural resources and locational opportunities. Over the centuries, but not least in recent decades, these advantages plus the uniqueness identified above have made many coastal areas a highly attractive focus for human activity.

Arguably, with the passage of time, this focus has frequently been linked with a shift from sustainability to unsustainability. Thus, for example, areas typified by small fishing and farming communities have in many instances been transformed by pressures imposed by tourism, retirement migration or industrialisation. Oil refining, the empirical subject of this study, is of course just one example of the latter type of pressure.

Ketchum (1972, 10-16) has analysed the nature and diversity of human activity in coastal zones, and Carter (1988, 357) has summarised these as:

- * residential and recreational usage
- * industrial and commercial development
- * waste disposal
- * agriculture, aquaculture and fishing
- * the creation of nature reserves
- * and military and strategic usage.

Carter argues that many shorelines have to support several of these activities so that, in addition to pressures which a single use may place on resources and the environment, there is great scope for the coastal zone to be the scene of conflict between contrasting activities. Carter has explored and illustrated this potential by reference to a compatibility matrix which displays the range of coastal activities in a way which highlights the interaction between uses. While this interaction may be complementary, not infrequently it entails conflict.

Vallega, too, has used the idea of conflicting and compatible uses in the coastal zone in his discussion of a coastal "use-use relationship model" (Vallega, 1992, 137). In this, he demonstrates the conflicting and compatible relationships between different types of sea pipeline and hydrocarbon exploitation facilities (Figure 9). It can be seen that Vallega identifies conflicting relationships between most types of sea pipeline and hydrocarbon installation. The only pipeline types which do not conflict at all with hydrocarbon exploitation activities are those which are themselves associated with oil and gas development and are therefore dependant on the latter activity.

In addition to conflicting with each other, coastal activities may also conflict with the natural environment (Vallega, 1992, 141-6) An example of the effects of various

5. SEA PIPELINES x_j 9. HYDROCARBONS x_i	5.1 slurry pipelines	5.2 liquid bulk pipelines	5.3 gas pipelines	5.4 water pipelines	5.5 waste disposal
9.2 exploitation					
9.2.1 extended onshore drills	B1	B3	B3	B2	B2
9.2.2 steel framed structures	B1	B3	B3	B2	B2
9.2.3 steel platforms	A	B3	B3	B2	B2
9.2.4 concrete platforms	A	B3	B3	A	B2
9.2.5 hyperbuoyant leg platforms	A	B3	B3	A	B2
9.3 storage					
9.3.1 waterfront facilities	A	B3	B3	B2	B2
9.3.2 floating storages	B1	B3	B3	B1	B1
9.3.3 submerged storages	B2	B3	B3	B2	B2

Abbreviations:

A: no existence of relationships
B: existence of relationships

B1: neutral relationships
B2: conflicting relationships
B3: reciprocally beneficial relationships
B4: relationships beneficial to use x_1
B5: relationships beneficial to use x_j

Figure 9 **The Coastal Use-Use Relationship Model: relationships between oil and gas installations and sea pipelines.**

Source: Vallega, 1992

coastal activities on the natural littoral environment is provided by the western shore of Southampton Water. Historically the environmentally sensitive New Forest extended down to this shore along the full length of the Water, where it was bordered by extensive wetland including salt marshes and reed beds (Cadman, 1964). Immediately inland from the shore the area was typified by farming and a scatter of settlement. One index of the lack of pressure on this environment is that, when in the 1920s the AGWI Petroleum Company¹ decided to build in this area what would today be seen as an extremely small refinery, the road system was considered inadequate to bring in many of the materials. As an alternative, a major form of transport used in the construction was the sailing barge (Mayo, undated).

In the postwar period this situation changed dramatically as new land uses, stimulated by the coastal zone location and the development of the South East, encroached on the Forest (Pinder and Witherick, 1990). At the southern end of the Water, Esso Petroleum bought the AGWI plant shortly after the war in order to expand the installation into one of Europe's largest refineries. This not only consumed a large area of surrounding farmland, but also encroached substantially on the extensive neighbouring marshes. Meanwhile the CEBG constructed a power station at the northern end of the Water in the mid-1950s, again consuming part of the shoreline, and planned a second and much larger

generating plant to be built adjacent to the Esso refinery in the 1960s (Figure 10). This, too, required extensive wetland reclamation. Outside the energy sector, from the early 1950s onwards the Port of Southampton dammed off the wetland in a substantial embayment, using the enclosed area to dispose of silt dredged from the navigable channel (Coughlan cited in Pinder and Witherick, 1990). Other areas - admittedly on a smaller scale - were also lost to water-related activities, while landward improvements in accessibility resulted in significant housing expansion. The combined effect of all these individual developments was, of course, totally contrary to conservation goals for the New Forest, but the latter was not represented by a body powerful enough to protect the area against external interests. Ultimately, in 1964, the boundary of the Forest was withdrawn inland beyond all the development described. This left a corridor of land between the Forest and the Water where development could continue without technically impacting on Forest land.

Against this background of pressure and real or potential conflict, proponents of coastal zone management argue that management systems are required which will reduce conflicts and ensure that resources are only exploited in a sustainable manner. Thus Ketchum's early view that the objectives of coastal zone management must be:

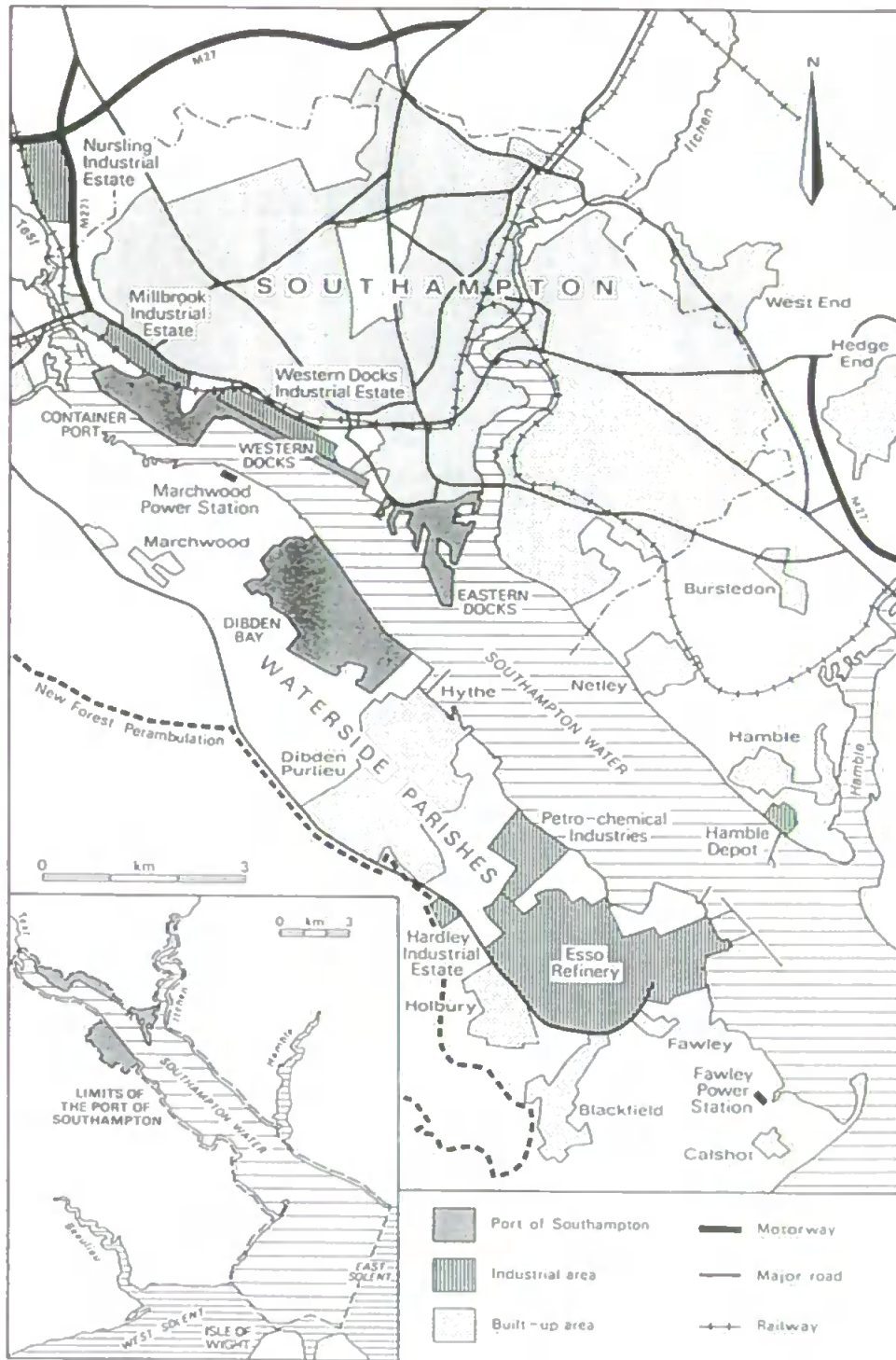


Figure 10 Development around Southampton Water

Source: Witherick, 1981

"maximum rational use of coastal resources consistent with the retention of life-support systems, beauties, and amenities of the coastal zone for future generations"

Ketchum (1972, 1)

is largely consistent with the much more recent definition provided by the Coastal Area Management and Planning Network (CAMPNET) in 1989 and cited by Gubbay (1990, 18):

"A dynamic process in which a co-ordinated strategy is developed and implemented for the allocation of environmental, socio-cultural and institutional resources to achieve the conservation and sustainable use of the coastal zone."

A fundamental implication of these views is that an holistic perception of the coastal zone is required if the many complex interactions noted by Carter are to be effectively observed. Similarly, holistic approaches are needed if effective coastal zone management is to be undertaken. In the words of the UK parliament's Environment Committee (1992, xviii),

"the coastal zone should be treated as one integrated unit, embracing inshore waters, intertidal areas and maritime land".

Some observers, however, would go even further down the holistic road. For Vallega (1992, 150) in particular, our view of the natural coastal system should include the air and also an extremely broad definition of the coastal zone's human dimension. Hence Vallega's "coastal use structure" (i.e. the coastal area) comprises:

"i) a natural component including terra firma, the sea and the atmosphere, and ii) a social component consisting of facilities, activities, behaviour and attitudes with impacts on land, sea and atmosphere".

Related to the idea of interactions and relationships are two further concepts. The first is that of the coastal zone as a dynamic environment with which human activity should be harmonised. Indeed, implicit in the argument for coastal zone management is acceptance that human-induced changes can result in various feedback and 'knock-on' effects, some of which may be totally unforeseen. In this context Jolliffe and Patman (1985, 5) cite the history of the Mersey estuary in the UK. Until the start of the twentieth century this was

"in a state of dynamic equilibrium, with significant fluctuations of tidal cubature but about a mean state; but ... large scale engineering 'improvements' soon led to a progressive and unacceptable loss of tidal capacity and the need for substantial maintenance dredging."

Jolliffe and Patman (1985, 5)

Once this viewpoint has been accepted, it is then only a short step to the concept of Integrated Coastal Zone Management (ICZM). In this, the essential function of those engaged in the management process is to achieve coordination of the various interests and potentially conflicting demands, thereby steering the system in such a way that it does not decline into unsustainability (Vallega, 1992, 157).

The second concept is that, although coastal zone management may emphasise the nature of the coastal area as an

integrated unit, it is recognised that this unit is not self-contained. Instead, natural and social factors arising externally can have profound effects upon and within the coastal zone. To quote just one example, the United Nations Department of International, Economic and Social Affairs has noted the complex changes that can occur when agricultural practices in a river catchment are altered (UNDIESA, 1982). Freshwater drainage patterns may be modified, increasing the silt load carried to the marine environment and, as a direct result, depressing the sea's primary productivity by reducing light penetration. A chain reaction such as this is likely, for example, to lower shrimp populations, which will in turn impact on fish stocks and ultimately cause coastal communities to suffer decreased incomes as the local fishing industry declines.

2.3 TOWARDS A SYSTEMS-BASED APPROACH TO COASTAL ZONE MANAGEMENT

Conceptually the ideas set out above have many links with general systems theory, and these conceptual similarities have led directly to the view that this approach is able to provide an effective theoretical framework for ICZM. Ketchum (1972) was once again an early advocate of this view, but more recently it has been proposed most forcefully by Vallega (1992). Further examination of this theory is therefore appropriate at this point.

General systems theory involves the perception of the world

in terms of the interrelated systems of which it is composed. The Oxford English Dictionary definition of a system is that it is

"a complex whole, a set of things or parts, a department of knowledge or belief considered as an organised whole",

and the connections and relationships within a system are its essential characteristics (Chadwick, 1971, 36).

Thus the adoption of general systems theory as a philosophical basis for coastal zone management has, for its proponents, the major attraction that it allows coastal regions to be conceptualised in terms of their numerous inter-relating natural and social components (Figure 11). Moreover, the appeal of this viewpoint does not simply rely on systems theory enabling the observer to understand the coastal zone by exploring more deeply its internal relationships. Instead, an important feature of the theory is that, by recognising the existence of 'open systems' it is able to allow for the fact that the coastal zone has complex external relationships with the wider world (Figure 12). Consequently Vallega (1992, 14) is able to claim that

"the inclusion of the external environment in the analysis - particularly when it is management oriented - is one of the most innovatory features of general systems theory vis-à-vis structuralism"².

An additional attraction of general systems theory is that,

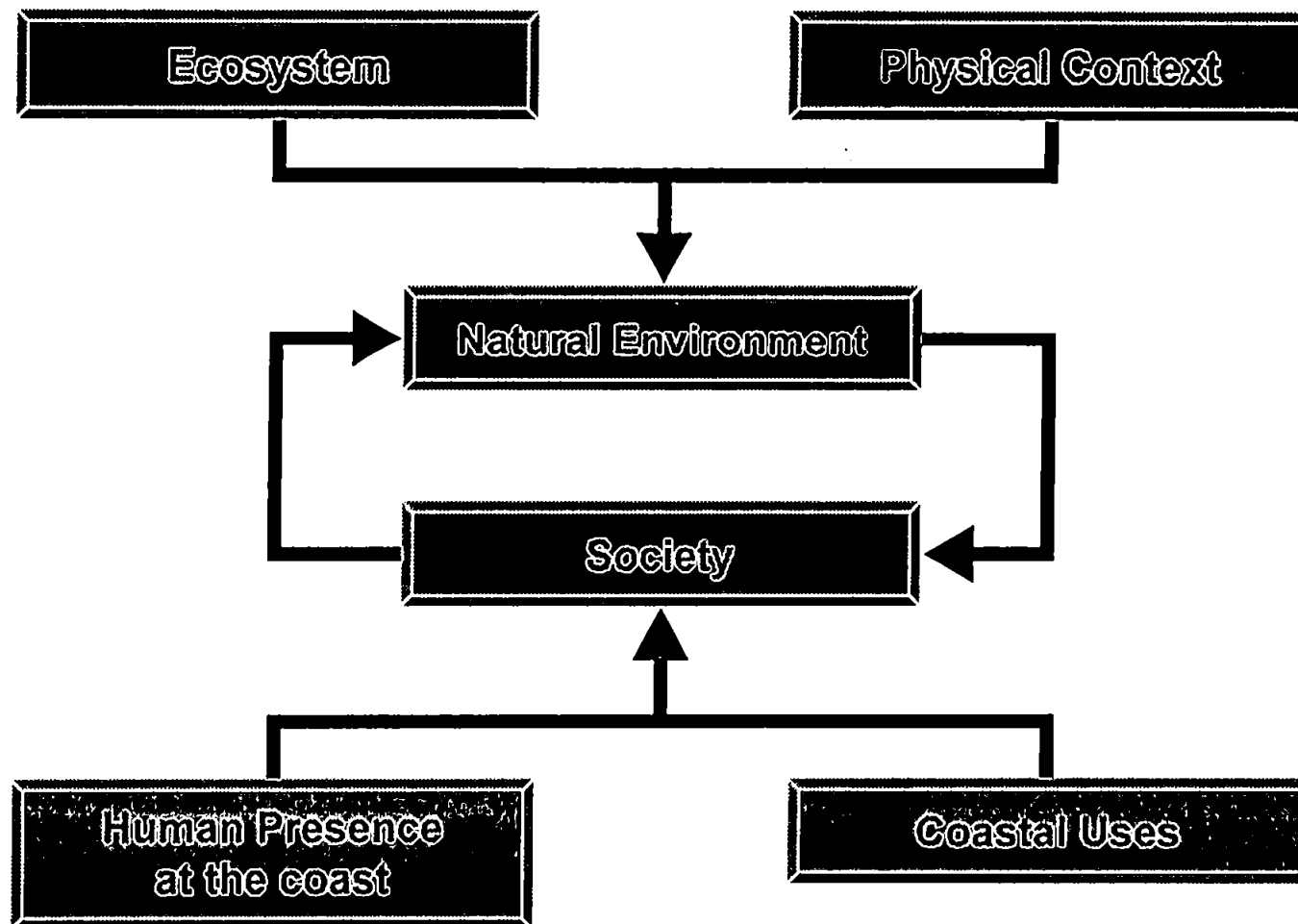


Figure 11 A Systems View of the Coastal Zone (1): the coastal use structure consisting of natural and social components

Source: Adapted from Vallega, 1992

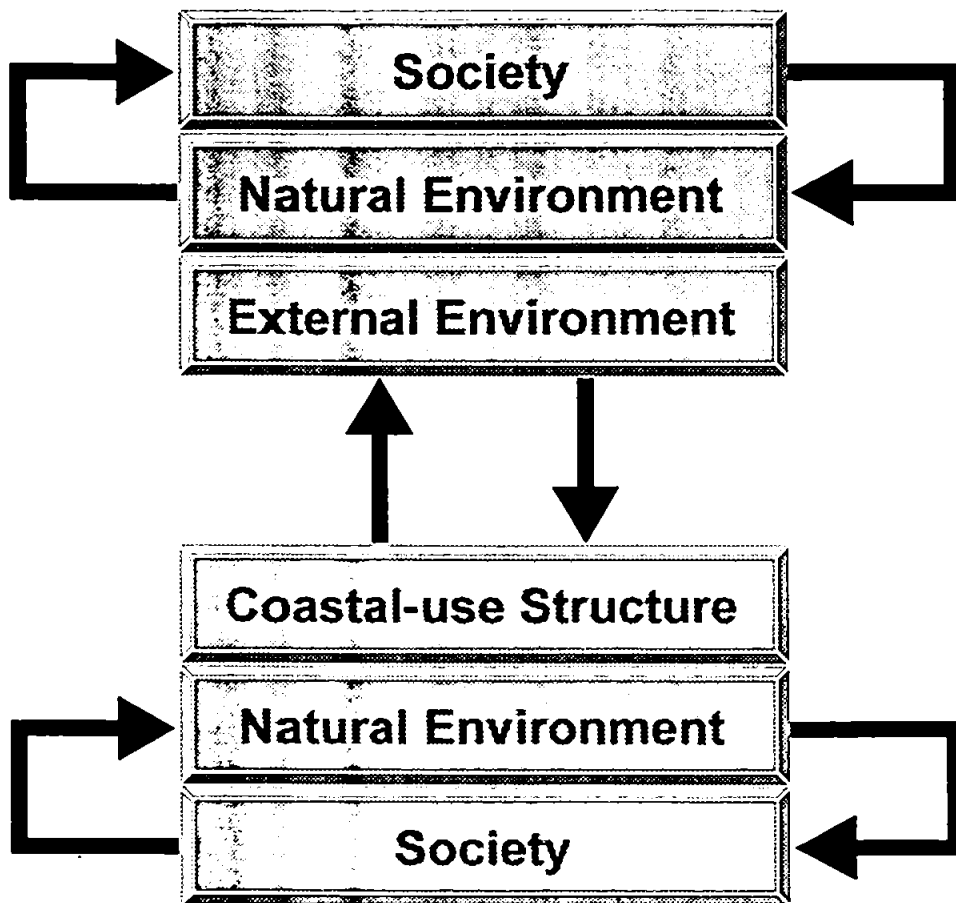


Figure 12

A Systems View of the Coastal Zone (2): the interaction between the coastal use structure and its external environment

Source:

Adapted from Vallega, 1992

because it "joins together the ideas of process and change" it is able to reflect the dynamic nature of ecosystems such as those found in the coastal zone (Vallega, 1992, 15). From this perspective a system can be seen as something which evolves along a specific trajectory, undergoing change as it does so. If profound changes occur - either because of development within the system, or in its external environment, or in both - then the system is said to have undergone morphogenesis. When this happens the interaction 'web' between the system's elements adjusts radically, new sets of relationships become established and, consequently, the system adopts a new trajectory (Vallega, 1992, 17).

This analysis perhaps suggests that the application of systems theory in order to achieve effective ICZM should be a relatively straightforward process. However, the ideas of process and change outlined above are in turn related to the theory of complexity which, as will be shown, raises questions concerning our ability to understand in full the likely outcomes of intervention in the coastal zone.

The complexity principle proposes that systems are able to act as 'non-trivial machines'. This means that systems do not necessarily change their internal state in direct proportion to the inputs to which they are subjected (Vallega, 1992, 15-21). As a result, for any given system it may be impossible for the observer to determine exactly how

the system will react to a specific modification. While this non-deterministic way of regarding systems may have long been accepted with respect to social systems, for example a human community, it is a more radical idea when applied to an ecosystem and its physical context. However, the physical elements of a coastal area can behave in unforeseen and complicated ways. Thus

"the future behaviour [of an ecosystem] cannot be predicted in a deterministic way because it is not regarded as a consequence of the past".

Vallega (1992, 21)

This in turn leads to the view that the most appropriate ethical standpoint is to

"minimise any implications on the marine ecosystem ... of human presence and activities".

One conclusion to which this theoretical viewpoint leads us, therefore, is that emphasis should be placed on the preservation of the environment. From the viewpoint of this thesis, however, a second conclusion is also appropriate. On the one hand we may argue - on the basis of systems theory - that effective management of the coastal zone demands an integrated approach to the reconciliation of conflict between the physical environment and human activity. Yet, on the other hand, this same theory warns that - because of the prediction problems identified by the complexity principle - achieving desired outcomes and avoiding serious pitfalls may be difficult or impossible to achieve.

This discussion has been designed to explore, firstly, the antecedents of ICZM and, secondly, the conceptual basis for this type of approach to the coastal zone. As is widely recognised, however, the fact that concepts may be highly developed is no guarantee that they will be adopted in reality. In many instances a substantial gulf exists between theory and practice, and it is therefore important to relate the ideals identified above to real-world planning attitudes and approaches. The following section attempts to do this.

2.4 ICZM AND THE UK CONTEXT

As has been indicated, a review of the conceptual literature reveals that a truly integrated coastal zone management system needs to provide an overview, usually expected to take the form of a national policy, and to adopt approaches which are comprehensive and have long-term goals, but are also flexible. It must also be able to provide coordination and integration between different policies (see, for example, Gubbay, 1989; 1990). Knecht (1993), in a discussion of ICZM in the United States, elaborates on this theme and identifies four types of integration that are desirable: those between sectors, between disciplines, between different levels of government and between the land and sea elements of the coastal zone. Other writers (such as Gubbay, 1990) also see integration between the public and decision-makers as an important element of ICZM.

In the UK the closest approximation to a coastal management system that is presently operating is that provided by the town and country planning framework. Although this is not responsible for day-to-day management of the coast, through its powers of development planning and development control it does at least provide a means of regulating and coordinating activities introduced into the coastal zone. The fact that these powers fall far short of those envisaged by ICZM can, of course, be readily demonstrated. For example, town and country planning legislation has no force below the low water mark. Nonetheless, because this regulatory system is central to current planning in the coastal zone, closer examination of its recent development is highly pertinent. In this respect the politically driven changes that occurred during the 1980s are particularly important, as are less-publicised - yet still significant - reactions which have tended to characterise the 1990s.

The current popular image of the role of the planning system is frequently that created by the fundamental political reappraisal to which it was subjected in the 1980s. Throughout that decade the system was restructured to be more market oriented in terms of its approach to both its primary functions: development planning and development control (Rydin, 1992, 62). Within development control, for example, this move was epitomised by Government publications such as *Lifting the Burden*, a White Paper which essentially

"set out the need to reduce planning constraints on business"

(Rydin, 1993, 61).

In the case of development planning, the importance of this function was reduced by a requirement to accelerate Structure Plan preparation. This requirement also led to restrictions on the scope of Structure Plans, on survey work undertaken for them and on public participation. The end results were shorter Plans which were also down-graded in comparison with district-wide Local Plans, although these too were generally given less importance within the planning system (Rydin, 1993, 163). Rydin quotes policies as set out in circulars in order to illustrate this decreased emphasis on the power of the planning system generally, and one crucial example may be repeated here:

"where a developer applies for planning permission which is contrary to the policies of the approved development plan, this does not in itself justify reason for refusal".

(DoE Circular 16/84, cited in Rydin, 1993, 64)

The emergence of this new stance coincided almost exactly with the refinery closure movement in the UK, and for this reason it might be assumed that revitalisation opportunities arose in a dominantly *laissez-faire* planning environment. As will be shown later in the thesis, however, much of the revitalisation did not begin until the 1990s, by which time official attitudes to planning were shifting once again. To

a degree, as Rydin details, this new shift was in favour of greater emphasis on district-based Local Plans, and certainly did not represent a return to the earlier Structure Plan system. But, from the viewpoint of this thesis, a more significant point is that evolving attitudes led to the reinstatement of the previously discarded principle that:

"development control decisions were to be based on the development plan unless there were good reasons to the contrary"

(Rydin, 1993, 77).

To some extent, this reorientation was probably partly driven by pressures from outside the UK planning system. For example, throughout the 1980s the EU had increased significantly its emphasis on environmental protection. In this respect the adoption of the *EC Directive 85/337 on the Assessment of the Effects of Certain Private and Public Projects on the Environment* (Bell and Ball, 1994, 234-249) was of particular importance to the UK planning system. This directive raised existing provisions for the assessment of environmental effects in planning decisions to a more formal level. It achieved this by demanding that, for certain specified projects, the developer should consult with various agencies to determine all the likely environmental effects of a proposal. These effects had then to be outlined in a statement, and the statement submitted as part of the development control process. In addition,

the European Commission has also recently stated that it is soon to prepare a strategy on

"integrated management and planning of the [European Unions'] coastal zones" (Environment Committee, 1992, volume 1, para 23).

Greater environmental awareness in planning was also, however, the result of pressures from within the system. Many planning professionals enthusiastically took up the ideas of sustainable development³ which, in the late 1980s and early 1990s, was a key concept, arising from initiatives such as the 1988 Brundtland Report (World Commission on Environment and Development) and the Rio 'Earth Summit' in 1992. And the ideas found in integrated coastal management (eg. the stress on the importance of the ecosystem, the long-term view and the need for public participation) are totally compatible with those of sustainable development.

It is also important to recognise that a number of concrete developments within the UK have been highly relevant to the status and operation of the planning system in the coastal zone. Without doubt, the most prominent of these is Planning Policy Guidance 20 (PPG 20) (Department of the Environment, 1992a). Introduced in 1992, this provides specific planning guidance for the coastal zone, and injects a countrywide perspective into planning at the coast. One view of this is that it is in some respects limited. For example, it only represents:

"guidance within the existing system and it does not address the more fundamental issues ... which would require fresh legislation".

(Environment Committee (1992), vol 2, 296)

The fundamental issues referred to here include the fact that there is a plethora of agencies and departments operating independently in this country's coastal zone. These, it is argued, need to be coordinated by a strong national lead, in the form of a lead agency and through national legislation (Environment Committee, 1992, vol 1, paras 35 and 39). Less obviously, but of similar importance with respect to obstacles to ICZM, the fact that PPG 20 is a planning document means that it can only apply above the low water mark and therefore cannot facilitate integration between land and sea elements of the coastal zone. However, PPG 20 does at least acknowledge the point that local authorities should consider the offshore impacts of onshore development which, as Smith and Warren (1994) have remarked, is probably as far as it can go in encouraging local planning authorities to look beyond the low water mark.

Another strength of PPG 20 is that it is pro-conservationist, and at the very least attempts to take an holistic and integrated view of the landward side of the coast. To take just one example, as Smith and Warren (1994, 60) have pointed out, a significant step forward has been achieved by recognition that

"there is a need to take account of the cumulative effects of small developments that may not, on their own, be damaging".

The potential impact of incremental change has been well demonstrated by the Southampton Water example discussed above. In a similar conservationist and strategic fashion, the planning policy document distinguishes between areas of coast in which natural beauty should be enhanced, urban areas that require regeneration, and spoiled industrial coastline which is in need of restoration (Smith and Warren, 1994).

Moreover, the planning guidance refers to ways in which better coastal management can be achieved through the development plan system. In this respect, it suggests that there is a strong need for inter-authority communication and collaboration on coastal issues, and for a better understanding of natural coastal processes and of the impacts of development on them.

Even more recently, in December 1994, the Government set up a 'Coastal Forum'. This is a standing forum of representatives of interested bodies such as central and local government and conservation, commercial and recreation-based organisations which will discuss issues related to the coastal zone in England. In addition, a summary of coastal policy guidelines, a best practice guide of coastal management plans, and a review of coastal bye-law

making powers are all currently being produced (Local Government Management Board/Department of the Environment, 1995).

The initiatives mentioned above all arise from central government, but local steps which arguably move planning in the direction of ICZM have also appeared in the UK over the last few years. These include a range of non-statutory plans which have been categorised by the Department of the Environment (DoE 1992b) in three ways:

- * Estuary Management Plans (EMPs)
 - * Coastal Management Plans (CMPs)
- and
- * Shoreline Management Plans (SMPs).

The essence of these initiatives is that they involve coordination between different agencies. None are therefore purely planning-based, although a review of some examples will help to illustrate that the planning system does play a major part in the formulation and implementation of such steps.

Examples of *Estuary Management Plans* include those for the Mersey (Cox, 1992, cited in DoE, 1992), the Exe (Brooke, 1991, cited in DoE, 1992) and more recently, the Tamar (Plymouth City Council, 1995). Such plans take a comprehensive view and try to integrate the policies and demands of the many organisations which have interests in

estuaries. Table 6, based on the vision statement for the Mersey Estuary Plan, illustrates this point. Further, the various types of integration identified by Knecht can also be observed in many estuary management plans. Thus an additional feature of the Mersey Estuary Plan is consideration of estuary dynamics, water quality, biodiversity, landscape and townscape, commercial navigation, port development, economic regeneration and recreation (University of Liverpool, 1994). This mixture of interests demands a cross-disciplinary perspective which also involves links between land and water elements. Moreover, the Plan also reveals a desire to achieve integration between (1) different sectors of activity and (2) different levels of Government. Here the magnitude of the task is underlined by the fact that relevant bodies included

"some forty organisations including the bankside local authorities, major companies with a direct role in the Estuary, as well as statutory agencies with responsibility for different aspects of the Estuary,"

(University of Liverpool, 1994, 2).

Coastal management plans tend to be more limited in terms of meeting the requirements of integrated coastal zone management. This is partly because they are usually undertaken by Local Authorities and are thus confined to consideration of landward issues. Moreover, these issues may be fairly narrow in scope. For example, the Sefton

Table 6 Extract from the Vision Statement for the Mersey Estuary Plan

The Mersey Estuary Management Plan will provide a framework for coordinated action....

The Management Plan is based on a vision of the future of the Mersey Estuary as one of the cleanest developed estuaries in Europe, where the quality and dynamics of the natural environment are recognised and respected and are matched by a high quality built environment, a vibrant maritime economy, and an impressive portfolio of estuary-related tourism and recreation facilities.

Source: University of Liverpool, 1994.

Coast Management Scheme was established by agreement of the County Council, the Borough Council and the Countryside Commission, and concentrated only on conservation and recreation issues⁴. Nonetheless, CMPs represent an attempt to achieve a more comprehensive view of selected stretches of coast. They also approach at least some elements of the planning problem in an integrated way, and to a degree foster coordination between disciplines, sectors and local authorities. In addition, predominantly conservation-based coastal management plans such as the Sefton Coast Management Scheme, tend to provide a long-term strategy for the areas of coast covered and recognise the need for the flexibility necessary to deal with the dynamic nature of coastal ecosystems.

Shoreline Management Plans address regional coastal defence issues; examples include the Anglian Sea Defence Management Study (Fleming 1989; Townend and Fleming, 1990, cited in DoE, 1992) and the SCOPAC Sediment Transport Study (Bray, 1991, cited in DoE, 1992). Because of the emphasis on coastal defence, the cross-sectoral and cross-disciplinary links in SMPs tend to be restricted to those that are involved with geomorphological characteristics of the coast. But, even so, they take a comprehensive view in the sense that they often involve the cooperation of coastal defence agencies across traditional administrative boundaries. Stretches of coast covered by a specific plan are typically

defined according to the natural processes of erosion and deposition, while non-natural boundaries such as local authority borders are effectively ignored. Management policies, agreed through coordination between the various bodies involved, then aim for optimum protection and management of the shoreline within this natural 'sediment transport cell'. Beyond this, given the very dynamic interface of land and sea, a recurring feature of management strategies is long-term flexibility. And, although SMPs are in themselves limited in scope, related studies of shoreline dynamics are increasingly being linked to other sectoral interests. For example, Planning Policy Guidance 14 (Development on Unstable Land) (Department of the Environment, Welsh Office, 1990), includes a paragraph requesting Local Planning Authorities to consider restrictions on development in areas of coastal erosion, as well as the possibility that stabilisation works might need Environmental Assessment (paragraph 29). These points are re-iterated in PPG 20, the Planning Policy Guidance for coastal planning (Department of the Environment, 1992a).

2.5 CONCLUSION

This chapter has examined the evolution of planning ideas related to the coastal zone, placing particular emphasis on the uniqueness of the coast, its propensity to come under pressure and the conceptual rationale underpinning the case

for Integrated Coastal Zone Management. In the UK case it has not been argued that the planning system practises the ideal of ICZM. Indeed, given the failure to include two particular types of integration in the measures quoted earlier (between the public and decision-makers, and also between sea-based and land-based activities) to argue such a case would be unrealistic. Equally, however, evidence has been produced that failure to move towards the benefits of integrated approaches can be over-emphasised. Even though the 1980s was certainly a decade in which the power relationships between investors and planners were in general altered in favour of the former, a basis has now been established for more coordinated planning in the landward side of the coastal zone. European legislation and PPG 20 were the highest-profile features of this shift, but other initiatives - such as EMPs, CMPs and SMPs - were also significant steps in the same direction. Although there is no clear national strategy, a number of elements in current UK coastal planning are nonetheless beginning to take up some of the challenges of ICZM.

Relating this finding to the present study, it may be suggested that the revitalisation of former refinery sites will have reflected this emerging concern to analyse and control environmental impacts. Assessment of this proposition in the light of empirical findings is one main concern of Chapter 7, but in the meantime it is appropriate

to turn to the investigation itself and begin by focusing on the environmental consequences of oil industry restructuring.

NOTES

- 1 The Anglo Gulf West Indies Petroleum Company.
- 2 The comparison is made with structuralism because this is the theoretical perspective from which general systems theory evolved (Vallega, 1992).
- 3 Sustainable development - commonly taken to mean development that meets the needs of the present without compromising the needs of future generations to meet their own needs - also carries implications of grass-roots democracy and empowerment of ordinary people. (See for example, the World Commission on Environment and Development, 1988).
- 4 This strategy document considered dune conservation, land management, nature conservation, recreation, interpretation and education, monitoring and research (Sefton Metropolitan Borough Council, 1989).

CHAPTER 3

ENVIRONMENTAL GAIN AND LOSS¹

3.1 INTRODUCTION

As was suggested in Chapter 1, conceptually it may be argued that refinery closures will lead to environmental gains but economic and social losses. On the one hand, a range of pollution and risk factors should be reduced while, on the other hand, the localities affected will feel the impact of changes such as employment losses and declines in port dues, income from business taxation, etc. However, two points must be made concerning this proposition. First, depending on the nature of later revitalisation, localities may experience new environmental losses generated by incoming activities which also bring significant economic and social gains. Viewing the closure and regeneration process as a whole, therefore, it is necessary to recognise that the eventual consequences of refinery closures will depend on the balance achieved between gain and loss with respect to both the environment and local socio-economic conditions. Second, very little research has been undertaken to establish more clearly the nature or scale of these gains and losses. Given this omission, it is important that attempts are made to investigate this research issue. As Chapter 1 has indicated, the present chapter aims to do so with respect to environmental gains and losses arising from

both the abandonment and the subsequent reuse of the refinery sites studied. Chapter 4 will then consider decline in terms of its local socio-economic consequences, while Chapter 5 will focus on the economic effects of revitalisation.

Initially it was anticipated that much of the data considered necessary for this chapter would be obtained through the initial survey of official organisations (Chapter 1). However, the first finding of the investigation was that, although the contact network established by the survey was extensive, the environmental information that it could provide was far from comprehensive. In many instances data on specific subjects were simply unavailable, because they had either not been collected or had never been archived or had simply been lost or destroyed. For example, the last UK refinery to shut was Ardrossan in 1986, and files relating to air pollution emissions from this plant were destroyed two years later. In other cases information could be supplied, but often it was of a partial nature. At an early stage, therefore, it became clear that the investigation could not proceed simply on this basis.

As an alternative it was decided that the discussion of environmental gain and loss should be built upon a conceptual framework which systematically analysed the range of *potential* gains and losses which decline and

revitalisation might be expected to produce. This conceptual framework (Figure 13) was based on three predictions: that closures would be associated with environmental gains and losses; that certain losses, such as the existence of derelict and contaminated land, would in time tend to be ameliorated by clearance linked to redevelopment; and that, despite any such improvements, further losses may be caused by environmental pressures arising from new activities involved in the revitalisation process. Once evidence from the survey had been linked to this framework, it became possible to highlight knowledge gaps left by the existing data sources. Steps were then taken to fill the gaps identified by drawing evidence from the community survey, by using appropriate technical, academic and industry literature and by making estimates. Here it is necessary to note that at this stage a deliberate decision was made to incorporate into the work material published in the mid-1970s. This was considered appropriate because, compared with more recent publications, the reports in question were more likely to reflect conditions in the pre-restructuring era.

Against this background the remainder of the chapter offers a discussion of the conceptual framework for environmental gain and loss, and of the extent to which existing data sources allow the framework to be linked directly or indirectly with available evidence.

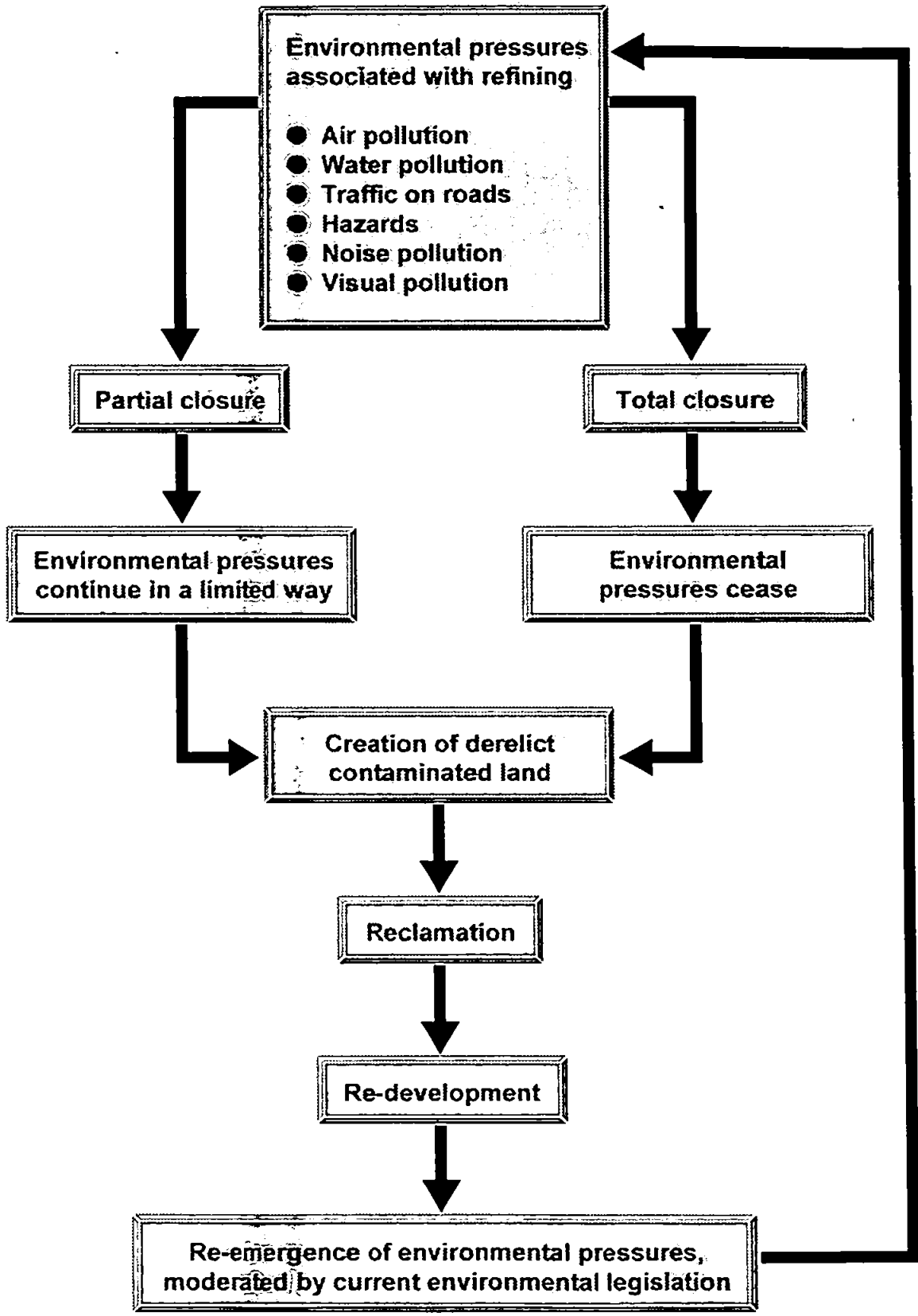


Figure 13 Environmental gains and losses arising from refinery closures; a conceptual framework

3.2 CLOSURES AND ENVIRONMENTAL GAIN

3.21 Reductions in atmospheric pollution

Perhaps the most obvious potential gain resulting from refinery closures is a decline in air pollution resulting from the refining process itself. Much of this pollution is produced by the fuels burnt to run a refinery, normally a mixture of residual fuel oil and refinery gas.

A striking feature of the initial survey of organisations was that virtually no systematic information on this form of pollution could be provided by local authorities, pollution control agencies or refining companies in the eight areas studied. This was the case although oil refining is a prescribed process and should therefore have been monitored by the Alkali Inspectorate (now Her Majesty's Inspectorate of Pollution, HMIP). HMIP could only provide air emission records for one refinery, Teesport, (see below) and the relevant agencies for Northern Ireland and Scotland (the Northern Ireland Environment Service and HMIP, Edinburgh) similarly had very little information. Given this lack of systematic data concerning the impact of the refining process, it is necessary to estimate what the scale of unrecorded pollution from the closed refineries might have been. Progress towards this goal may be made by considering the case of sulphur dioxide (SO_2), one of the primary air pollutants associated with refining operations (CONCAWE, 1970; 1977a). It is known that in 1984 the Teesport

refinery emitted 2,500 tonnes of SO₂ while processing 1.924 million tonnes of crude oil (Shell, 1993, pers. comm.). This gives an average SO₂ output figure of 0.0013 tonnes per tonne of crude oil processed, and this average may be applied to all the closed refineries. If this is done by working on the unrealistic assumption that all the plants were working at 100 per cent capacity, then the resultant SO₂ output estimates are likely to come close to representing a worst-case scenario. This scenario is shown in Table 7, column 3, which demonstrates that - in total - these plants are unlikely to have produced more than 40,000 tonnes of SO₂ in a year. If they had been operating at 80 per cent capacity the figure would probably have been little more than 30,000 tonnes (Table 7, column 4). And if their average utilisation rate had been as low as 40 per cent, which was the actual figure for Teesport in 1984, SO₂ output might well have been below 20 million tonnes (Table 7, column 5).

Even when viewed in isolation, these estimates do not suggest that the refinery closure movement produced major gains in terms of the reduction of this form of pollution, and this conclusion is strengthened if comparisons are made with SO₂ emissions from coal and oil-fired power stations (Table 8). Thus, a 2,000 MW coal-fired station would probably have produced more SO₂ than any of the closed refineries, even if it had been equipped with

Table 7 Refineries' estimated previous SO₂ production under a range of scenarios

Refinery	Refinery Capacity ('000 t)	Scenario A	Scenario B	Scenario C
Grain	11,100	14.4	11.5	5.8
Milford Haven	8,600	11.2	8.9	4.5
Teesport	5,100	6.6	5.3	2.6
Heysham	1,900	2.5	2.0	1.0
Belfast	1,600	2.1	1.7	0.8
E. Port	1,300	1.7	1.3	0.7
Kingsnorth	300	0.4	0.3	0.2
Ardrossan	300	0.4	0.3	0.2
Totals	30,200	39.3	31.3	15.8

Scenario A SO₂ output with refinery at 100% capacity ('000t)

Scenario B SO₂ output with refinery at 80% capacity ('000t)

Scenario C SO₂ output with refinery at 40% capacity ('000t)

Source: Author's calculations, based on Teesport data (production of 0.0013 tonnes of SO₂ per tonne of oil refined).

Table 8 SO₂ production from power stations¹

Type of power station (all 2000MW)	Approx. SO ₂ emitted/year ('000 tonnes)
Coal-fired with sulphur removal	17
Coal-fired without sulphur removal	177
Oil-fired without sulphur removal	215

¹ Because of complications relating to power station load factors and varying sulphur content in fuels, estimates should be regarded as approximate.

Source: National Power, pers. comm.

desulphurisation facilities. If these facilities had not been installed, which in most instances was the case, a single coal-fired power station of this size would have produced substantially more SO₂ than all the closed refineries combined. And an oil-fired power station of similar size would have been even worse in this respect.

Although these calculations suggest that national air pollution gains were modest, this does not necessarily mean that refinery closures were not perceptibly beneficial for local communities. The latter it is true, were intended to be protected by the refineries' tall furnace stacks, the purpose of which was to disperse pollutants. But stacks may not operate effectively in all weather conditions, and it is known that in certain circumstances significant local pollution concentrations can occur. In particular, inversion layers associated with high pressure may lead to pollutants being 'trapped' close to ground level. In Rotterdam, for example, stable atmospheric conditions have at times produced pollution considered a threat to public health (Pinder, 1981). Alternatively, very unstable conditions may cause pollutant gases to be blown down to the ground before they can be properly diluted (Figure 14). In addition, as Figure 15 shows, in coastal locations it is possible for the juxtaposition of sea breezes and off-shore winds to create circulating cells in which pollutants discharged by plants such as refineries are likely to accumulate.

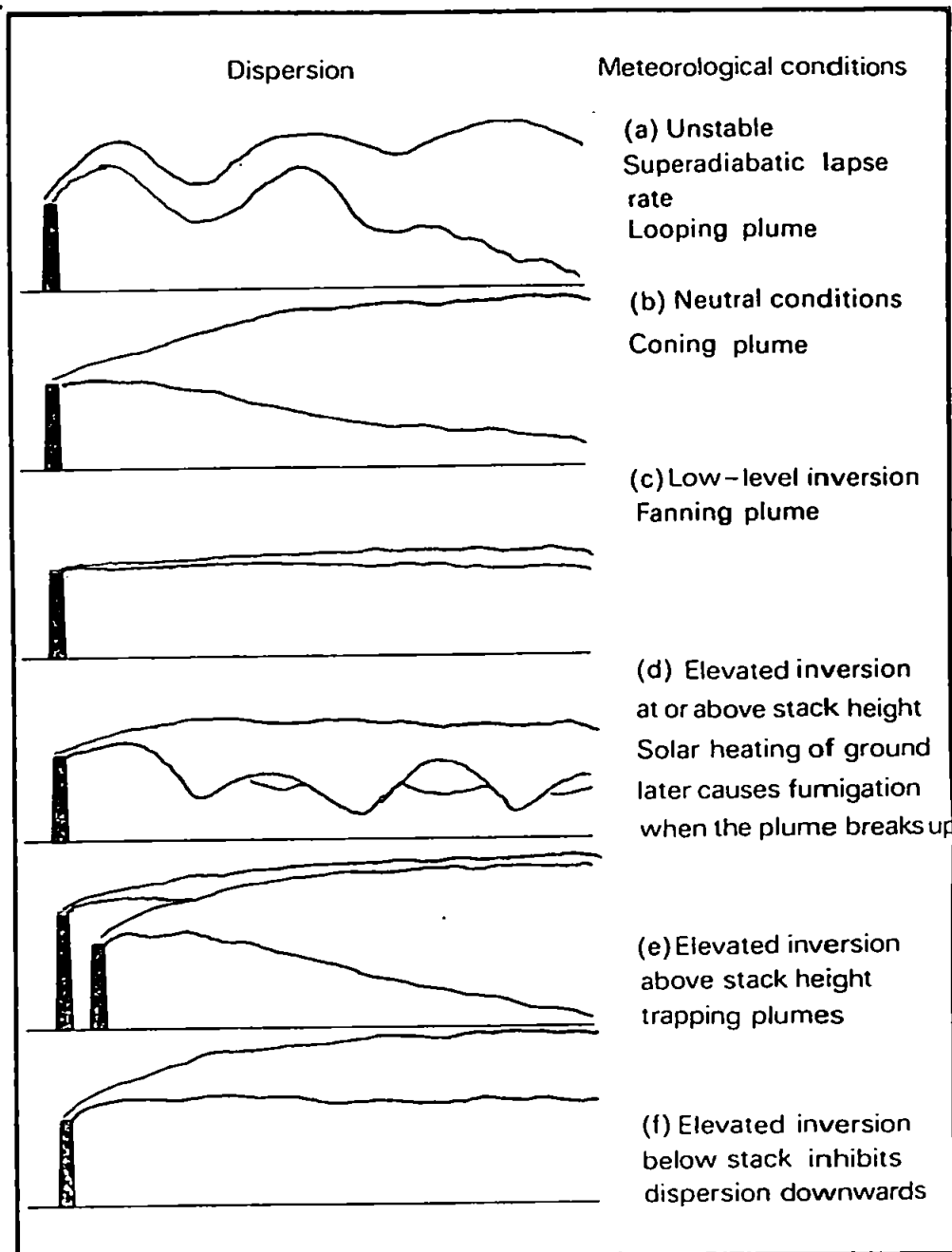


Figure 14 **Some principal types of plume dispersion**
Source: **Open University, 1975, 46**

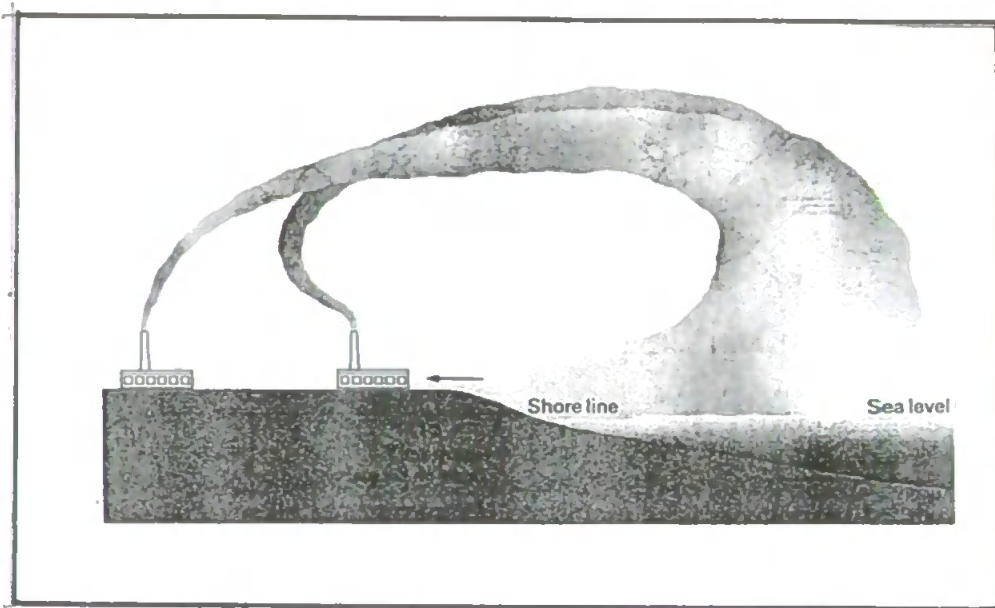


Figure 15

The circulation cell which may arise from the sea-breeze effect

Source:

Open University, 1975, 56

Against this background, evidence from the questionnaire surveys conducted among communities situated close to the BP Isle of Grain and Esso Milford Haven sites becomes relevant. Just over 200 respondents at the two sites could remember these plants when they were in operation, and half of these recalled that pollution in the form of dust, smoke or eye irritants was at least a slight problem. Moreover, another fifth believed that local impacts had been substantial (Table 9). Even more clearly, there was a strong perception that odours (probably arising from compounds such as hydrogen sulphide, mercaptans and hydrocarbons) (CONCAWE, 1975) had previously been significant. Well over 80 per cent of all respondents felt that their local communities had been affected by this form of nuisance, including approximately a third who believed that this had been a major problem (Table 10). As Tables 11 and 12 demonstrate, statistical testing reveals that at both the Grain and Milford Haven sites, awareness of odours was significantly more pronounced than reactions to general air pollution such as dust, smoke or eye irritants.

Although no official records exist, and although the evidence presented is based on the respondents' powers of recall, the questionnaire results therefore suggest that

Table 9 Local community attitudes to air pollution

Responses to statement: 'When the refinery was operating, air pollution (eg. dust, smoke, eye irritants) affected the communities around here:'

	Milford Haven n=100* (%)	Grain n=103* (%)
a lot	20	25
slightly	51	44
not at all	18	21
don't know	8	8
missing	3	2
total	100	100

* total number of respondents who could remember the refinery in operation.

Source: Author's community questionnaire surveys.

Table 10 Local community attitudes to refinery odours

Responses to statement: 'When the refinery was operating, smells from it affected the communities around here:'

	Milford Haven n=100* (%)	Grain n=103* (%)
a lot	31	34
slightly	58	53
not at all	7	6
don't know	3	6
missing	1	1
total	100	100

* total number of respondents who could remember the refinery in operation.

Source: Author's community questionnaire surveys.

Table 11 **Comparison of Isle of Grain community attitudes to general air pollution and refinery odours**

Variable	Respondents believing that variable affected local people: a lot	Respondents believing that variable affected local people: slightly	Respondents believing that variable affected local people: not at all	Row total
general air pollution	26 (30.5)	45 (49.2)	22 (13.8)	93
smells from the refinery	35 (31)	55 (50.8)	6 (14.2)	96
Column total	61	100	28	189

Notes: Bracketed data are expected values generated by the Chi-squared test.

Chi-squared = 11.5; degrees of freedom = 2; therefore the distributions differ significantly at the 0.5 per cent level.

Source: Author's community questionnaire surveys.

Table 12 Comparison of Milford Haven community attitudes to general air pollution and refinery odours

Variable	Respondents believing that variable affected local people: a lot	Respondents believing that variable affected local people: slightly	Respondents believing that variable affected local people: not at all	Row total
General air pollution	20 (24.5)	51 (52.4)	18 (12)	89
Smells from refinery	31 (26.5)	58 (56.6)	7 (13)	96
Column total	51	109	25	185

Notes: Bracketed data are expected values generated by the Chi-squared test.

Chi-squared = 7.5; degrees of freedom = 2; therefore the distributions differ significantly at the 5 per cent level.

Source: Author's community questionnaire surveys.

closures benefitted local communities by bringing about perceptible air pollution reductions. Admittedly, the extent of these reductions should not be over-stressed because, in all probability, this type of environmental impact tended to be intermittent. As has been indicated, obtrusive air pollution is closely connected to meteorological conditions that are relatively infrequent, while odour nuisance may also be linked with unpredictable operational faults and leakages (CONCAWE, 1977a). Nonetheless, the strength of the results indicates that the cessation of refining brought very real environmental gains to the affected communities.

One further point is relevant to this discussion of local community gain: so far attention has centred mainly on the question of nuisance rather than risk. However, as early as 1980, Morrell and Singer were expressing concern as to the effect that hydrocarbons emitted from oil industry installations might have on human health, and in the 1990s there has been a growing belief that exposure to this form of pollution may be injurious. The role of benzene as a carcinogen is, for example, one factor behind EU moves to limit evaporation at petrol stations and this potential problem has also been raised by CONCAWE reports (CONCAWE, 1995). Similarly, the organisers of a recent course on refinery loss control have highlighted evaporative losses as a major theme, arguing that the:

"environmental impact of losses is of enormous importance in all stages of oil processing and retailing"

(IBC Technical Service, 1995, 2).

Moreover, while there is as yet no proven evidence of ill-health 'hot-spots' associated with refineries, there have been a number of studies which indicate possible correlations between ill health and the oil industry. For example, although Rushton and Alderson (1980) themselves found no raised levels of illness in their epidemiological study of refinery workers, they nonetheless referred to work which found increased mortality from lung cancer, brain cancer, genital cancer, lymphoma and non-malignant diseases of the digestive system.

Similarly, while the work of van Steemis has been criticised in various respects (ENDS Report, 1995), his assertion that there may be a link between 1) the refining industry and electricity generation and 2) the use of inhalers by children has yet to be refuted. Working in the Milford Haven area, this study showed that, downwind from the refineries and the Pembroke power station, inhaler usage among schoolchildren was typically around 14 per cent. In contrast, on the North Pembrokeshire coast, usage rates fell to between 1 and 5 per cent (Figure 16). While work such as this certainly cannot be considered conclusive, the possibility clearly exists that health gains for local

communities may accrue from the elimination or reduction of refinery pollutants.

3.22 Reductions in other hazards

In addition to the health hazards noted above, attention must also be given to the more direct type of hazard generated by refineries, and therefore to the gains to be made by the removal of danger and perceived danger.

Refineries are undoubtedly hazardous industrial plants. In 1994, for example, electrical storms caused fires at two of the three surviving refineries at Milford Haven. The most spectacular of these incidents occurred at the Texaco refinery on the south shore of the Haven, and it was graphically described by the local newspaper:

"a massive explosion ripped through Texaco, the largest of the three refineries, sending an orange fireball 500 feet into the sky"

(*Western Telegraph*, 27/07/94, 1).

However, the survey of community attitudes to the BP and Esso refineries shows that the majority of people were not concerned about the potential danger they posed. At both Milford Haven and Grain 69 per cent of those sampled who could remember the Esso and BP refineries in operation said that they had never been worried about the presence of the plants. Thus, while the actual gains from reduced hazards are likely to be real, perceived gains may not be so

significant. Here, however, it is important to recognise that the Milford Haven survey was undertaken before the fire reported above had taken place. Perceptions can be subject to sudden change and it seems likely that - had the survey been after the Texaco fire - responses on this subject might have been very different.

3.23 Reductions in marine pollution

It is also evident that refineries and their associated activities have clear potential to pollute the marine environment. Analysing this potential systematically, the main dangers are (1) the release of crude oil or petroleum products as a result of handling spillages or tanker accidents, and (2) marine pollution caused by refinery effluents.

Tanker accidents and spillages

Tanker collisions and groundings naturally receive widespread publicity and can, of course, produce a substantial environmental impact if cargoes are released. However, not least because of port traffic control systems, almost all serious accidents of this type occur away from refineries and their numbers are very small. Risk is not, therefore, high in the vicinity of refining ports, and the probability that the eight refinery closures have produced environmental gain by reducing potential accidents is not great.

Conversely, cargo spillages are much more common and are also likely to occur in the vicinity of the coast. For example, in one survey of 359 spills, 80 per cent occurred within 50 miles of land (DoE, 1970). At Milford Haven, where four refineries had a total capacity of 27.2 million tonnes, 988 pollution incidents involved spillages from ships between 1961 and 1984 (Table 13). Most of these spillages arose from everyday operations, particularly the loading and unloading of oil products (General Manager, Milford Haven Port Authority, pers. comm).

As with air pollution, comprehensive data on spillages directly related to the eight refineries studied are not available. However, it is once again possible to produce estimates - at least in terms of frequency - in this instance using as a base the Milford Haven statistics referred to above. Here it must be acknowledged that there are clearly potential problems in extrapolating figures from port to port because conditions are likely to differ between ports and through time. However, it is arguable that these difficulties are likely to produce both over- and under-estimates of spillage frequency, and that these errors will tend to cancel each other out. Thus, so far as over-estimation is concerned, since the mid-1970s greater environmental awareness and stricter regulations should have reduced the probability of spillages occurring, even if the refineries had not closed. Conversely, however, it is well

Table 13

Milford Haven oil pollution statistics 1961-1984

Year	Total spills	Total spill volume (tonnes)	Total oil cargo tonnage (million tonnes)	Total no. ships
1961	45	n/e	9.9	1066
1962	33	n/e	11.5	1192
1963	28	9.8	13	1286
1964	34	8.8	17.7	1392
1965	83	35.8	24.9	1985
1966	72	30.5	28.9	2378
1967	50	267.4 ¹	28.2	268
1968	52	13.6	30	2669
1969	58	16.5	39.9	3226
1970	56	14.9	41.3	3400
1971	50	161 ²	43.1	3490
1972	59	17.8	45.7	3465
1973	50	2316.5 ³	53.1	3659
1974	45	14.5	59.2	4186
1975	25	67.2 ⁴	44.7	3331
1976	29	63.9 ⁵	43	3576
1977	28	10.1	38.5	3567
1978	37	10.8	40.8	3679
1979	32	13.1	41	3997
1980	26	4.9	38.8	3933
1981	34	18.6	32.1	3954
1982	21	6.4	35.7	4104
1983	21	12.8	30.6	3668
1984	20	109.11	31.9	3436
totals	988	3224	823.5	73,31

n/e spill volume not estimated

¹ 250 tonnes from a single spill

² 150 tonnes from a single spill

³ 2,300 tonnes from a single spill

⁴ 50 tonnes from a single spill

⁵ 50 tonnes from a single spill

Source: Milford Haven Port Authority.

known that Milford Haven - on which this study's estimates are to be based - has long been an especially vigilant port with respect to the control of oil spills (DoE, 1976). For this reason, spillages elsewhere may well be underestimated.

Working on this basis, in the period in which the 988 pollution incidents occurred, 73,316 oil-carrying ships entered Milford Haven, giving an average of 0.0135 incidents per ship. If this average is applied to a major closed refinery, an estimate can be gained of likely incident frequency towards the upper end of the scale. For example, at the Isle of Grain (where 2,300 oil-related shipping movements occurred each year in the mid-1960s) the outcome is an estimate of 31 pollution incidents a year. Meanwhile at Belfast, one of the smaller refineries to have closed, the 500 movements per year may well have generated around 7 spillages. Estimates such as these suggest that spillages were not infrequent and that a clear environmental gain from the closures is likely to have been achieved.

This finding, however, must be qualified in the light of a further feature of the spillage data. This is that most spills are minor events in terms of the quantities of oil or oil products released into the local aquatic environment. For example, although van Gelder-Ottway and Knight (1976) identified a spill of 1,700 tonnes in the Medway Estuary, 59

per cent of the incidents in Milford Haven between 1961 and 1974 involved less than 80 gallons of pollutant. And between 1961 and 1984 the average amount spilt per incident was only 3.26 tonnes (Table 13). Thus the graph of environmental gain resulting from spillage reduction might be expected to approximate to a Poisson distribution: substantial numbers of relatively minor advances and much smaller numbers of more substantial improvements.

In addition the cumulative environmental gain from spillage reduction is likely to have been related to two other factors. First, gains will depend on the nature of the marine environments with which refineries are associated. Sheltered tidal flats and salt marshes are likely to be worst affected by spillages, because such places have high biological productivity coupled with low energy conditions that do not disperse oil quickly. Furthermore, attempts to remove oil by chemical or mechanical means can result in more ecological damage in these environments. In contrast, 'hard' coastal environments, such as those with exposed rocky cliffs, are unlikely to suffer much lasting damage, (National Academy, 1985). Placing these observations in the context of the present study, it can be argued that

spillage reductions in low-energy environments, such as those around the Isle of Grain and Kingsnorth, will have been more beneficial than in the vicinity of Milford Haven. Returning to the example of the 1,700-tonne spillage into the Medway noted earlier, in this sheltered low-energy environment the outcome was the heavy pollution of 8,000 acres of saltings and the death of an estimated 5,000 birds. Extensive damage was also recorded among algae, saltmarsh plants, fish and many intertidal invertebrates (van Gelder-Ottway and Knight, 1976). This was in an area recognised for the complexity of its ecology and the high conservation value of its marshland (British Gas, 1992).

From this discussion it will be evident that, while the concept of environmental gain resulting from spillage elimination can be supported, it must be accepted that precise gains must depend on individual circumstances. The nature of the local environment, the vigilance of the port and the scale of spillages experienced in the years before closure will all have influenced the benefits that were realisable at a specific site. Moreover, this conclusion is reinforced if one more variable is added to the equation, namely the type of oil or oil product discharged. Those containing a high proportion of light aromatic compounds are usually the most toxic, but also tend to evaporate quickly. Heavy oils, on the other hand, are normally more persistent in the environment and may cause problems by smothering

marine life (National Academy, 1985). Referring again to the Medway spillage, one reason for its substantial impact was that it involved Nigerian light crude, and was therefore relatively toxic being a light oil.

Refinery effluents

The various sources of waste water within a refinery have been classified by Cobb (1978) as: cooling water, process water, ballast water (discharged by tankers), rain-water run off, sour water (from processes such as distillation and conversion) and sanitary sewage. Between them these wastes are likely to contain inorganic salts, ammonia, hydrogen sulphide, soluble organic material, oil and oil products. They may also carry heat to the marine and estuarine environment. At the Ardrossan refinery, for example, a 'once-through' effluent system used 90,000 tonnes of seawater each month for cooling purposes (Shell, 1960), while at the Isle of Grain refinery the 'greater part' of the 27,000 m³/hour discharge was cooling water (Wharfe, 1975).

In some instances effluent volumes and therefore potential marine pollution were reduced by employing partly air-cooled installations. Esso Milford Haven and the Teesport, Ellesmere Port and Belfast refineries were all of this type. Yet many coastal refineries have not, traditionally, been required to treat waste water as fully as those inland

(CONCAWE, 1977b), and it seems likely that the quality of the effluent from the eight closed refineries would not have met the standards expected today. This assertion is based on evidence relating to the Teesport refinery, the most modern of the closed plants. This had an effluent control system in which all the water recovered from the refining process had contaminants removed in a distillation column. Effluents then passed to parallel plate interceptors in which oil was separated out, air pollution being avoided by means of an airtight lid. Rainwater drainage from the site was handled by similar interceptors, as was oil-contaminated ballast and any water polluted by process upsets. Finally, water from the interceptors flowed to a holding basin and was then discharged into the Tees (Teesport information, undated). However, despite these processes, the Biological Oxygen Demand (BOD) and suspended solid content of the final effluent were considerably higher than those allowed for a modern estuary-based sewage treatment works with secondary treatment (Table 14).

Given this evidence, it should be no surprise that examples of ecological damage arising from refinery effluent discharges can be found. At Esso Milford Haven, Petpiroon and Dicks (1982) identified a number of adverse biological effects around the outfall. These included reductions in the numbers of several shore species (notably grazing gastropods) and corresponding increases in the numbers of

Table 14 Teesport refinery effluent¹ compared with modern sewage treatment consent²

Parameter	Medium-size STW* (consent limits)	Teesport refinery** (Monitored effluent)
pH	8	7.7
Biological Oxygen Demand ATU mg/l	10	180
Suspended solids, mg/l	20	34

¹ monitored in 1984

² listed in 1993

* Marsh Mills sewage treatment works (STW), Plymouth, Devon: consented flow 6- 18,000 m³/day

** 5.1mt/year refinery operating at about 40% capacity at this time.

Source: NRA North West region, NRA South West Region.

furoid algae within 200m of the discharge point. Changes in the barnacle population were also observed in this area. It was hypothesised that the low salinity of the effluent (compared to the very high salinity of the Haven) plus the burden of oil and other contaminants in the effluent, were responsible for these effects. Similar trends have been identified around the outfall at the Isle of Grain refinery (Wharfe, 1975). Here there was an absence and reduction of certain types of intertidal invertebrates (Figure 17). In this case, neither the salinity nor the temperature were thought to be responsible, although the Isle of Grain refinery was largely water cooled. Rather it was suggested that the harmful ecological effect of the effluent was

"caused by the refinery using large volumes of water ... carrying [into the estuary] low but continuous levels of oil and other materials"

(Wharfe, 1975, 11).

From this evidence it appears that distinct environmental gains in the marine environment should have followed the cessation of refining at the sites in question. What must also be recognised, however, is that the evidence available does not suggest that aquatic environmental degradation from pollution was at all extensive. Working around the BP Isle of Grain and Esso Milford Haven refineries while they were still in use, Dicks and Level (1989) and Wharfe (1975) showed that adverse environmental effects could be identified chiefly within a 100 metre radius of the outfall

Species list	Bed-	Mot-	East	Gill-	EL- BP											Cock-	Isle							
	lams	ney	Rain-	ing-	Dam-	Cole-	phin-	No. 2	BP	BP	BP	BP	BP	BP	BP	BP	BP	Horse-	Horse-	le-	of			
	Bot-	Hill	ham	ham	Upnor	head	mouth	stone	Barge	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	Out-	No. 7	No. 8	No. 9	shoe	shoe	shell	Grain	
	tom					Creek	Creek	Point	Jetty	Jetty	Jetty	Jetty	Jetty	Jetty	Jetty	flow	Jetty	Jetty	Jetty	Bay	Point	Hard	(rowe.	
<i>P. benedeni</i>	•	•	•	•	•	•	•	•	•											•	•	•	•	•
<i>T. costatus</i>																								
<i>C. capita</i>	•		•																					
<i>C. zetlandica</i>	•	•	•	•																				
<i>N. diversicolor</i>	•		•	•																				
<i>A. marina</i>																								
<i>P. ciliata</i>																								
<i>S. bombyx</i>																								
<i>H. ulvae</i>	•	•	•	•	•	•	•	•	•	•										•	•	•	•	•
<i>L. littorea</i>	•	•	•	•	•	•	•	•	•															
<i>L. littoralis</i>	•	•	•	•	•	•	•	•	•	•	•	•	•											
<i>M. edulis</i>	•	•	•	•	•	•	•	•	•															
<i>M. balthica</i>	•	•	•	•	•	•	•	•	•															
<i>S. plana</i>		•																						
<i>P. pholadiformis</i>		•		•	•																			
<i>M. arenaria</i>		•		•	•																			
<i>C. edule</i>		•		•	•																			
<i>C. fornicata</i>		•		•	•																			
<i>L. cinereus</i>	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
<i>E. modestus</i>	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
<i>B. balanoides</i>	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
<i>L. depressa</i>	•		•			•	•	•																
Cirratulid-																								
<i>A. tentaculatus</i>		•																						
<i>C. maenas</i>	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Figure 17 Changes in invertebrate distribution around the Isle of Grain discharge

Source: Wharfe, 1975

pipes. From this it appears that the elimination of effluent will only have achieved measurable environmental gain in very limited areas.

3.24 Reductions in local traffic levels

Less obviously than either air or water pollution, the journey to work on local road systems is one further way in which refineries may increase pressure on the environment. Respondents to the survey of organisations were again able to offer very little concrete information on this aspect of the closed refineries' previous operations, but estimates can be made by using employment numbers as a base.

The maximum car usage possible will have been one vehicle per worker, suggesting that at shift change-over times the largest sites could have contributed up to 1,300 cars to local road traffic (Table 15). Because shift change-over times are usually 8.00 to 8.30 a.m. and 4.00 to 4.30 p.m., the resultant movements would have added to normal peak-hour traffic flows (Shell, pers comm). It is very unlikely, however, that usage rates as high as one car per worker were normal. One reason for this is that car sharing is a common practice in industry, not least when the activity in question is located some distance from workers' homes. To recognise this, a second estimate of car usage has been made, based on the assumption that half the employees car-share at the rate of 2.5 workers per car. Although this

**Table 15 Alternative scenarios for car-based
 commuting**

Scenario	Car usage: 600- employee refinery	Car usage: 1,300- employee refinery
No use of public transport; no car sharing	600	1,300
No use of public transport; car sharing by 50% at average 2.5/car	420	910
Public transport carrying 1/3; no car sharing	400	870
Public transport carrying 1/3; car sharing by 50% of remainder at average 2.5/car	280	610

Source: Author's calculations.

naturally substantially reduces the estimates of pressure, it still indicates that a major refinery such as the Isle of Grain plant may have generated up to 900 movements on the local road network at each peak hour.

Estimates of car usage should also be reduced to take into account the possible use of public transport. Although this possibility is limited when refineries lie beyond urban areas, for those within port cities it is certainly an option. Information provided by BP, for example, indicates that approximately a third of the workforce at the Belfast refinery regularly relied on bus services. Similar estimates for other port-based refineries are unfortunately not available, but the Belfast proportion may be applied to obtain at least a broad estimate of the effect of public transport availability (Table 15).

Overall, these estimates suggest that the refinery closures in question will not have resulted in an exceptionally large reduction in car movements. This is, of course, partly a reflection of the fact that a number of plants were small, but it is also a consequence of the increasing capital intensity and automation of the oil refining industry. Compared with many other industries, its labour requirements per hectare are low (Molle and Wever, 1984). Although the gains from reduced car usage were not exceptional, however, they cannot be dismissed as insignificant. For port-based

plants, reduced traffic levels will at least have contributed to restraining growing urban congestion, and the shutdown of refineries in rural areas has undoubtedly alleviated flows on basic road networks which were never originally intended to serve major industrial activities. Perhaps the best illustration of this point is provided by Esso Milford Haven, with its location astride the Pembrokeshire Coast National Park boundary.²

Before leaving the journey-to-work question, consideration must also be given to temporary increases in labour forces which chiefly occur in association with plant refurbishment or extension. Attention was drawn to these rises by a respondent from Esso, and they are significant in that they may increase the number of workers by several hundreds - or even by one or two thousand - when they occur. For two reasons, however, the gains to be made from the cessation of these activities should not be over-emphasised. One is that they are genuinely highly intermittent and short lived. It would be unusual for a refinery to experience this type of influx more than once every five years, and in most cases it would not last more than a few months. Rapid completion of work is important for profitability. Secondly, as the Esso correspondent stressed, the tendency with such work is to bus contract workers to the site, not least to minimise the congestion problems which a free flow might well generate.

Refinery closures also have the potential to reduce pressure on road networks by eliminating product distribution by road. The evidence from the eight closures is that this potential is closely related to the overall distribution strategies operated by individual refineries, and these were very varied. At one end of the scale, Esso Milford Haven operated a pipeline (to major markets around Birmingham, Nottingham and Manchester) which carried over 60 per cent of its products. Movements by sea, mainly of fuel oil, normally accounted for a further 30 to 35 per cent, while a number of specialist and customer-specific products were distributed by rail. In many years, therefore, road transport accounted for no more than 5 per cent of all production. This means that, if this refinery were to have operated at 70 per cent capacity, the annual rate of distribution by road would have been no more than 294,000 tonnes. Given that a typical road tanker before 1985³ had a capacity of 21 tonnes, this would suggest that the potential gains in terms of reduced road movements would be no more than 38 per day.

Conversely, BP Belfast supplied products by road to the whole of Northern Ireland, while the Shell site at Ardrossan was also heavily geared to road usage, supplying as it did

"a large area of south-west Scotland with its day to day needs" (Shell, 1960, 2).

As Shell have indicated, road tankers were

"constantly on the move delivering petrol, paraffin, diesel oil for vehicles, gas and fuel oils and bitumen" (Shell, 1960, 2).

In the 1960s the Ardrossan road fleet was covering over 1.1 million miles a year. A significant point relating to this example is that, because of the site's location in the old port area, road tanker movements imposed heavily on the urban area, as well as on the rural network. In addition, however, Ardrossan also demonstrates the way in which road pressure may not simply be a consequence of the need to move locally refined products to market. In fact the site concentrated on bitumen production, and the large majority of the road movements involved the distribution of other products that had been refined elsewhere and channelled by Shell through Ardrossan as part of its national marketing strategy.

It is therefore evident that the potential for localities to gain from the elimination of tanker movements was significant. Although it is possible for a refinery to make few demands in terms of road transport, as with Esso Milford Haven, this is not typical. Most installations are regional or sub-regional distribution centres, and road tanker movements are necessarily focused on the road network in the vicinity of the sites. Often they are concentrated on just one or two main approach routes, and it was indeed this concentration which offered the potential gain from closure around the sites studied. This was certainly the case at

the large BP Isle of Grain refinery, for example, where a single carriageway road (the A228) is the only route into Grain village and the refinery site.

3.25 Noise and visual pollution issues

Oil refineries generate noise, and therefore possibly cause nuisance, in a number of ways. The operation of furnaces, for example, may cause noise across a wide frequency range, with low-frequency rumble being audible up to several kilometres from refinery sites. Other potential sources of noise pollution include heat exchangers, compressors, pumps, air-fin coolers and air and steam leaks (CONCAWE, 1976). However, it is also true that the aural impact of a plant may be limited by a range of factors. If they are not located very close to residential areas it is arguable that there will be few problems for local communities. Individuals living locally are likely to adjust to background process noise, accepting it as a fact of life in that area. If a number of industrial plants are grouped together they will tend

"to elevate the overall noise level in the community to such an extent that the additional noise of an individual plant is limited"

(Bugliarello et al, 1976, 219).

Weather conditions may be of relevance, in that winds disrupt and disguise sound waves because of their turbulence. And, at least during the working day, process noise is likely to merge with high ambient noise levels from

a wide range of other sources.

The view that the environmental gains to be made from process noise reductions are limited is apparently supported by results from the initial survey of organisations, which yielded no reports of noise nuisance associated with any of the refineries. Here, however, the results of the community questionnaire surveys are once again pertinent. As with general air pollution, half the respondents who could remember the Milford Haven and Grain refineries in operation recalled that there had been at least perceptible noise levels associated with them (Table 16). But what must also be noted is that the degree of nuisance caused by noise appears to have been appreciably less than the impacts arising from general air pollution or refinery odours. As Tables 17 to 20 reveal, at both Milford Haven and Grain, respondents were significantly more aware of past air pollution and odour problems than they were of intrusive noise.

Summarising, therefore, it would appear that reductions in noise levels which occurred on closure were likely to provide some environmental gains but only modest ones compared with the elimination of other nuisances. As was noted above, moreover, the impacts of noise on local residents were probably related to the locational settings of the refineries. At Milford Haven and Grain, where the

Table 16 Local community attitudes to refinery noise

Responses to statement: 'When the refinery was operating, the noise from it affected the communities around here:'

	Milford Haven n=100* (%)	Grain n=103* (%)
a lot	5	8
slightly	55	40
not at all	30	37
don't know	7	13
missing	3	2
total	100	100

* total number of respondents who could remember the refinery in operation.

Source: Author's community questionnaire surveys.

Table 17 Comparison of Milford Haven community attitudes to general air pollution and noise

Variable	Respondents believing that variable affected local people: a lot	Respondents believing that variable affected local people: slightly	Respondents believing that variable affected local people: not at all	Row total
General air pollution	20 (12.4)	51 (52.7)	18 (23.9)	89
Noise from refinery	5 (12.6)	55 (53.3)	30 (24.1)	90
Column total	25	106	48	179

Notes: Bracketed data are expected values generated by the Chi-squared test.

Chi-squared = 12.2; degrees of freedom = 2; therefore the distributions differ significantly at the 0.5 per cent level.

Source: Author's community questionnaire surveys.

Table 18 Comparison of Isle of Grain community attitudes to general air pollution and noise

Variable	Respondents believing that variable affected local people: a lot	Respondents believing that variable affected local people: slightly	Respondents believing that variable affected local people: not at all	Row total
General air pollution	26 (17.6)	45 (44.4)	22 (31)	93
Noise from refinery	8 (16.4)	41 (41.6)	38 (29)	87
Column total	34	86	60	180

Notes: Bracketed data are expected values generated by the Chi-squared test.

Chi-squared = 13.8; degrees of freedom = 2; therefore the distributions differ significantly at the 1 per cent level.

Source: Author's community questionnaire surveys.

Table 19 Comparison of Milford Haven community attitudes to noise and odour

Variable	Respondents believing that variable affected local people: a lot	Respondents believing that variable affected local people: slightly	Respondents believing that variable affected local people: not at all	Row total
Smells from refinery	31 (18.6)	58 (58.3)	7 (19.1)	96
Noise from refinery	5 (17.4)	55 (54.7)	30 (17.9)	90
Column total	36	113	37	186

Notes: Bracketed data are expected values generated by the Chi-squared test.

Chi-squared = 32.9; degrees of freedom = 2; therefore the distributions differ significantly at the 0.1 per cent level.

Source: Author's community questionnaire surveys.

Table 20

Comparison of Isle of Grain community attitudes to noise and odour

Variable	Respondents believing that variable affected local people: a lot	Respondents believing that variable affected local people: slightly	Respondents believing that variable affected local people: not at all	Row total
Smells from refinery	35 (22.6)	55 (50.4)	6 (23.1)	96
Noise from refinery	8 (20.4)	41 (45.6)	38 (20.9)	87
Column total	43	96	44	183

Notes: Bracketed data are expected values generated by the Chi-squared test.

Chi-squared = 41.9; degrees of freedom = 2; therefore the distributions differ significantly at the 0.1 per cent level.

Source: Author's community questionnaire surveys.

surveys were conducted, the refineries stood alone in relatively rural environments, and any noise emissions would therefore have been easily identified by local people. However, refineries such as those at Teesport, Ellesmere Port and Belfast were situated amongst other industrial plants, thereby probably limiting noticeable noise from individual premises. Thus, gains from reduced noise levels at these locations are likely to have been even less marked, compared to other pollution nuisances, than those found in the survey.

So far as visual pollution is concerned, it is accepted that

"oil and gas facilities can disrupt the visual quality of coastal landscapes" (Nassauer and Benner, 1984, 323).

Certainly, several of the refineries in this survey would have presented a significant intrusion into the landscape. In this respect, the plants at Milford Haven and Grain (ie. the two locations at which the survey of residents was implemented) were likely to have been the most important. This is because the Esso refinery at Milford Haven was set in an area of accepted high natural value; while the BP plant at Grain was located in a predominantly rural, and absolutely flat, environment which allowed the refinery structures to be highly visible. However, authors such as Naussauer and Benner have also noted the potential for people to enjoy views of industrial activities, even in the coastal zone. This is despite the fact that coasts are

valued by many for their natural scenic qualities. Thus, again, the question of the degree of environmental gain likely to be achieved by the removal of the visual element of refining operations is likely to be a complicated one.

This observation is borne out by further results from the community questionnaire surveys (Table 21). These show, firstly, that a substantial proportion of respondents appears to have been indifferent to the visual effects of the Esso and BP plants. Secondly, a very small proportion believed these refineries were consistently attractive additions to the landscape, while considerably larger numbers felt them to have been permanently intrusive. Thirdly, however, a very common response was that the plants could be attractive, but only at night. To this it may be added that, unlike some of the earlier results from the community surveys, Table 21 also suggests that different sets of perceptions tended to prevail at Milford Haven and Grain. In particular, despite Milford Haven's fine natural setting, respondents here appear to have been less inclined to regard the installations as intrusive, and more prepared to see them as attractive night-time features. When tested for significance, this apparent difference between Milford Haven and Grain is shown to be significantly different at the 2.5 per cent level⁴.

These results point to the conclusion that the assessment of

Table 21 **Local community attitudes to visual impact of refineries.**

Statement	Milford Haven n=100* (%)	Grain n=103* (%)
The refinery was always ugly to look at	15	31
The refinery was always nice to look at	3	7
The refinery only looked nice at night	34	24
I didn't really think about how the refinery looked	42	26
I can't remember and/or don't know	3	8
Missing	3	4
Total	100	100

* total number of respondents who could remember the refinery in operation.

Source: Author's community questionnaire surveys.

perceived visual environmental gain and loss is complex. Although many local residents may be indifferent in this respect, the perceptions of the remainder are likely to be divergent and to vary substantially from one locality to another. Despite this lack of consistency, however, the findings correspond reasonably well with those of Nassauer and Benner (1984) in their study of the perception of oil and gas facilities on a Louisiana Gulf Coast island. Their findings suggested that such facilities could be perceived as attractive in coastal settings under certain conditions. One of these was viewer adaptation, i.e. the tendency for people who had viewed the oil and gas facilities for many years to accept them completely. A second was the possibility that such industrial developments could create night-time "focal elements with light displays", a phenomenon found to be attractive to four-fifths of the respondents.

3.3 POST-CLOSURE DEVELOPMENTS

Evidence that refinery closures do indeed lead to environmental improvements is provided by experience of ecological recovery in coastal waters around the Esso plant at Milford Haven. Figure 18 demonstrates some of the ecological changes that took place following the closure of the refinery in 1983, after which time the discharge of oil effluents from the plant virtually stopped. It can be seen that, in the years following the closure, there was a very

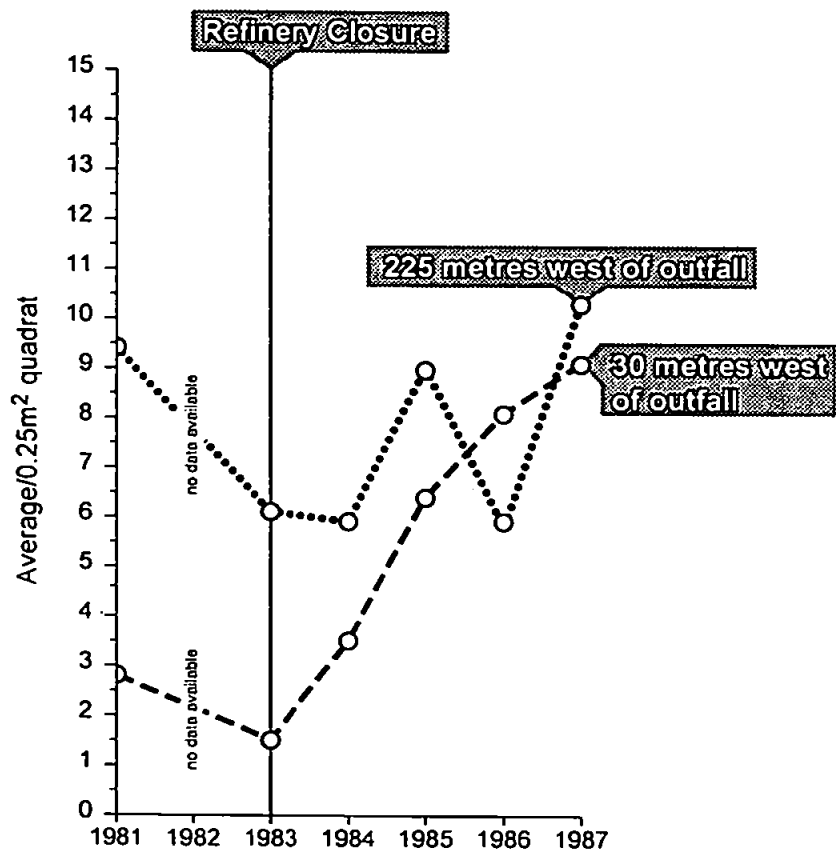


Figure 18 Changes in density of *Patella vulgata* before and after the closure of Esso Milford Haven

Source: adapted from Dicks and Levell, 1989

noticeable increase in the number of limpets (*Patella vulgata*) at a location close to the outfall.

However, surveys of the eight sites indicate that any assumption that environmental gains will be made across a broad front, and without problems, would be over-simplified. In reality, for a wide range of reasons, environmental impacts may continue and can in some instances actually increase. It is therefore necessary to replace the concept of gross environmental gain from closure with one based on net gain. This idea recognises that progress in some respects may be accompanied by continuing problems in others and, indeed, by the emergence of new environmental impacts. The remainder of this chapter explores how this occurs. It does so by considering three subjects: environmental impacts associated with derelict refinery land: continuing activity related to the oil industry; and the effects of new economic activities developing on former refinery sites.

3.31 Dereliction problems

These problems relate primarily to landscape aesthetics and soil contamination. So far as the former is concerned, five sites are currently either substantially or completely unused, having had the refining plant removed. These sites are at Milford Haven, Ardrossan, Ellesmere Port, Teesport and Heysham. In these instances, despite the visual gain resulting from abandoned plant clearance, visual problems

can be said to remain because of land dereliction. This can be readily demonstrated by reference to the Milford Haven and Heysham sites. At Milford Haven, although the process plant has been removed, a number of refinery buildings remain, as do roadways and the foundations of large structures such as process plants and storage tanks. This dereliction is clearly visible at points on the Pembrokeshire Coast Path, and also from the landward boundary of the site, which is relatively elevated (Figure 19). The seriousness of the problem is perhaps indicated by the fact that Esso (which still owns the site) has engaged landscape consultants to prepare a plan for reclamation with emphasis on wildlife potential (National Park Officer, Pembrokeshire Coast National Park Authority, 1992, pers comm.). But it is evident that any plan will take many years to reach fruition, and in the meantime this large-scale area of dereliction continues to span the boundary of the Pembrokeshire Coast National Park. Heysham is a less-sensitive site, in that it is not in an important landscape or conservation area. Nonetheless, after 12 years, around 50 per cent of the site remains an unkempt zone, crossed by abandoned refinery roads and with the remains of refinery buildings. Even those areas which have been developed as industrial and business parks are blighted by pieces of old refinery infrastructure, and in a survey of new activities (Chapter 5), several tenants reported problems associated with operating in a run-down physical environment.

This highlights the need for a holistic approach in redevelopment planning, but also underlines the current difficulty of achieving that approach in an era of financial hardship.

Continuing soil contamination problems are also well illustrated by Heysham. One aspect of this is that water soaking underground has entered old ducts and pipelines containing hydrocarbon residues, allowing contaminated effluent to enter a surface drainage system. Although the degree of contamination is not severe, the National Rivers Authority has had to take remedial action by pumping the effluent away from the site for treatment elsewhere. Additionally, chemical hot spots and oil-laden drainage channels have necessitated capping with concrete. Bacterial treatment has been used on some pockets of soil contamination and the rehabilitation programme envisages treatment of 10,000m³ of sludge and site material. It can be argued that these problems reflect the early history of this site: consent for the Heysham refinery was given in 1940 when pollution control was a low priority. However, it is possible that similar problems will emerge once development accelerates on other sites. At Ardrossan, for example, a need has now been recognised to deal with pockets of hydrocarbon-contaminated soil, even though there is no apparent threat to external water supplies (Managing Director, Shell Bitumen, 1993 pers. comm.). What may also

be noted is that the Heysham case illustrates the long-lived nature of some contamination problems. These are still being experienced 12 years after closure occurred.

3.32 Continuing use of refinery sites by the oil industry

A second reason why potential environmental gains are not maximised is that the oil industry does not necessarily withdraw completely from a refinery site. This is shown by four of the eight closures.

At Ellesmere Port, Burmah Oil has retained 6 ha of the 100 ha site to continue to produce lubricating oils. Lubricants produced under the Castrol label are an important source of revenue for the Burmah Group. Pollution effects (such as the possible release of sulphur, nitrogen oxides, carbon oxides, smoke, grit and dust from the flue combustion gases) are therefore likely to continue at this site, if only on a reduced scale. The processing of lubricating oils may also cause releases of organic compounds, hydrocarbons and sulphur compounds into the Mersey. Moreover, the Burmah Group still uses the Manchester Ship Canal to import and export products for this business (Figure 20), and so the risk of spillages and consequent estuarine pollution remains. These risks and impacts are, of course, substantially less than those associated with the full refinery, but they nonetheless exist.

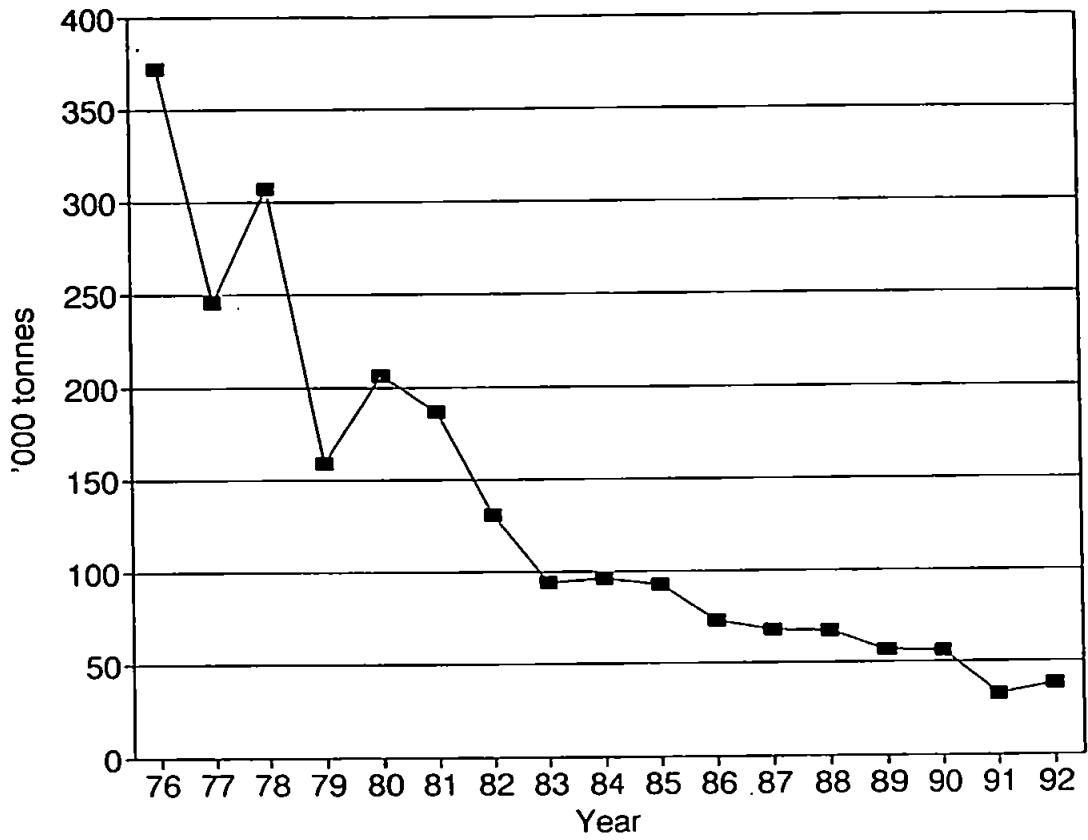


Figure 20

Imports and exports of petroleum products to the Burmah Oil site before and after closure

Source:

Marketing and Administration Officer, Manchester Ship Canal Co., pers. comm.

Similarly at the Isle of Grain, a bitumen plant that was originally part of the BP refinery continues to operate as before. This occupies 7 ha and has air pollution and spillage implications similar to those at Ellesmere Port. Additionally, the bitumen from the Grain plant is made into products at the Kingsnorth site nearby, and these are distributed by road tanker, thereby also maintaining at least partially the road pressures and hazards linked with that site.

In addition to the retention of specialised processing, environmental impacts may be maintained by continued oil products storage and trade. Usually this is because an oil company may require a marketing base in the area, even though production there is no longer advantageous. Thus products are brought in, usually by sea, stored in pre-existing tanks on the refinery site and then redistributed. This strategy may be a temporary stop-gap. For example, it was used extensively in the mid-1980s by Esso when oil products produced at this company's Fawley refinery on Southampton Water could not be marketed easily in the Midlands and North because of a lack of pipeline links from Fawley. While a major pipeline was under construction, products from Fawley were shipped to Milford Haven, stored and then distributed by the pipeline noted earlier. But the retention of marketing bases on old refinery sites may also be part of a long-term strategy, and this is in fact the

case at Belfast and the Isle of Grain. In these instances, continued activity means sustained risk of hydrocarbon emissions from storage tanks, and of spillages during loading and unloading. A serious feature of these spillages would be that, because no crude oil is shipped, they are likely to involve the more toxic refined oil products. Here it is important to note that shipping movements may be very numerous. At Belfast, for example, gas oil, fuel oil, kerosene and motor spirit are all now imported, thereby generating around 450 tanker journeys into the harbour each year. In addition, imports of bitumen and LPG are brought in by 70 bitumen tankers and 60 LPG tankers (Belfast Harbour Commissioner, Belfast Port Authority, 1993, pers.comm). At Grain, around 50 vessels a year now import Jet A1 aviation fuel and 8 ships a year bring in bitumen (Distribution Co-ordinator BP Bitumen, pers. comm. 1994).

Because the throughput of products may be very high, the risks and impacts on the road system may be little different from those associated with an operational refinery. At Belfast, for example, the Department of the Environment (NI) believes there to have been "no discernible effect" on the public road network resulting from the refinery closure. Conversely, however, specific circumstances may limit the resultant continuing environmental pressures. This is the case at the Isle of Grain where the aviation fuels brought in are distributed by pipeline to Gatwick airport, thus

reducing onward movements by road tankers.

3.33 New uses and environmental impacts

New activities are now colonising the former refinery sites, and will be examined in more detail in Chapter 5. For the purposes of this chapter, the relevant aspect of this trend is the variety of new land uses that is emerging. Industrial estates at Heysham and Kingsnorth house mainly workshop and service-based businesses, while transshipment and port storage terminals have also been established at Grain for containers and coal and at Teesport for coal. In addition, at Heysham and Teesport new chemical plants have revived processing activities not dissimilar to oil refining.

Most of these activities do not pose serious air or water effluent problems as a result of the processes undertaken, and there is similarly little danger of spillage pollution. Noise and industrial hazard levels are also low compared with those likely to have prevailed when the refineries were in operation. In these senses, therefore, a number of the new developments can be considered environmentally benign. This is, however, least true of chemicals developments at Heysham and Teesport which, respectively, involve solvent recovery and fine chemical manufacturing. Indeed, these types of plants may produce similar types of environmental problem to the oil refineries. As has been shown, odours

from the refineries appear to have been an important nuisance for local communities, and it is known that solvents in particular are likely to produce odour nuisances - not least because even trace amounts of these substances can be detected by the human nose. Thus, in cases where chemical industries have replaced refining, environmental gains in pollution reduction are likely to have been less than at other sites⁵.

Quite apart from 'normal' pollution and hazards, most of the new land uses have major environmental implications with respect to traffic. Compared with a refinery, for example, industrial estates are far more labour intensive and are therefore liable to generate substantially more car-based journeys. The extent to which this may occur is demonstrated by the new industrial estate on the small Kingsnorth site. Although as yet this occupies only around two thirds of the vacant land at this site, its employment (at least 150 people) is three times the number formerly employed by the refinery. Similarly, three industrial estates occupying parts of the larger Heysham site employ almost 600 workers, compared with the earlier refinery's labour force of only 200. At Kingsnorth it was believed that in 1993 almost 2,500 vehicles moved in and out of the site daily; and by 2000 the figure is expected to have increased by another 2,700 vehicles because of the expansion of the existing industrial estate and the development of new

industry onto the remainder of the refinery site as well as onto some adjacent land (British Gas, 1992). These figures are far higher than those associated with typical refineries. Moreover, unlike refineries, industrial estates do not normally have shift working, and therefore generate unidirectional peak-hour flows; inward in the morning, outward at night. The consequences of this will, of course, be felt most deeply where road access to sites is most restricted, as at Kingsnorth and, to a lesser extent, Heysham and the Isle of Grain. Basic considerations such as these indicate that certain aspects of environmental gain produced by closures might easily be more than offset by replacement developments.

In addition environmental loss reflects the fact that abandoned refinery sites - offering extensive stretches of prepared level land - are starting to prove attractive to land uses generating substantial HGV traffic. The impetus that can be given to this form of traffic growth is well demonstrated by developments on the Isle of Grain site (Figure 21). Current work on a new gas-fired power station is naturally the source of large-scale construction traffic, but completed projects at Grain also underline the capacity of the revitalisation process to generate major permanent traffic flows. The outstanding example of this is Grain's Thamesport development, with its advanced container-handling facilities and coal-import terminal. Although containers and

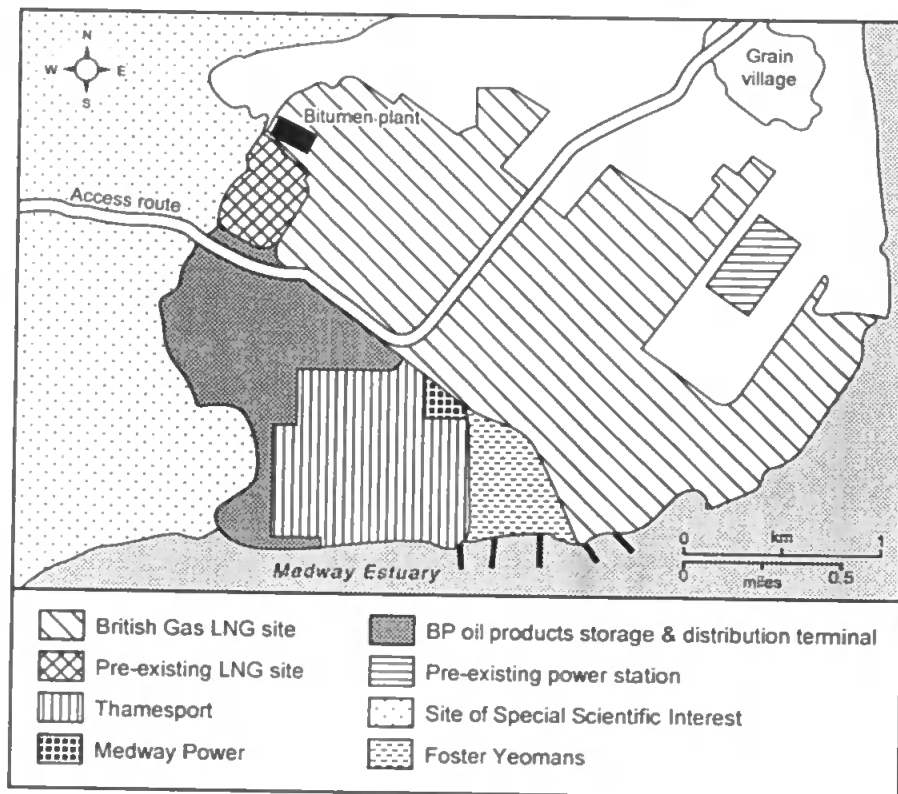


Figure 21 **New economic activity at the Isle of Grain site, 1993**
 Source: adapted from British Gas, 1988

coal will naturally arrive at the site by sea, and some domestic movement may involve sea or rail transport, in the early years of its operation Thamesport's demands on the local road system are already proving obtrusive. Coal, for example, will increase road movements to and from the Thamesport site substantially, under a contract to distribute over half a million tonnes of coal a year to industrial customers in South East England (*Dock and Harbour Authority Journal*, 1992, 123). Overall, Kent County Council has predicted that in 1996 Thamesport will produce 950 HGV movements, and at least 1,100 light vehicle movements, per day. In the long term at least half the imported coal (a minimum of 250,000 tonnes per year) is likely to move by road, and Thamesport's total impact on the road network will far exceed that of the original refinery. Clear evidence that heavy goods traffic is already producing undesirable consequences is provided by the community-based questionnaire investigation conducted in this area. Out of the 139 households in Grain village, 95 per cent of respondents believed new developments at the refinery site to be the cause of excessive road traffic, and three quarters considered this to be the result of growing HGV activity. In contrast, only 10 per cent who had lived in the area when the refinery was operational described traffic at that time as very heavy. Even allowing for retrospective use of rose-tinted spectacles by many respondents, this

discrepancy strongly suggests that sharply increased pressure on the road system has occurred.

From this it is evident that reductions in the movement of heavy road vehicles as a result of refinery closures may be a temporary phenomenon. Depending on the nature of replacement activity, gains made in this respect may be completely eliminated and, indeed, it is possible for a greater road traffic burden to develop.

3.4 CONCLUSION

This chapter has highlighted the fact that the assessment of the environmental consequences of refinery shutdowns is a complex subject. This partly reflects the problem of objective data availability, and therefore the need to rely on estimates. But it is also a consequence of the fact that the benefits of some gains, such as those from the reduction of oil spillages, may vary in relation to the nature of the local environment. And, in addition, it is apparent that change in the balance of environmental gain and loss through time is also a powerful complicating factor. Despite these difficulties, however, four significant conclusions can be identified.

First, of the potential environmental gains identified in Figure 13, several have been shown to be relatively unimportant. This is particularly true in relation to the

cessation of effluent pollution, which appears to have been modest and highly localised. Similarly, the questionnaire surveys indicate that large sections of local communities were not seriously troubled by noise or the intrusion of refineries into the landscape. Indeed, substantial numbers of respondents felt that - especially at night - the plants in question had been positive landscape features. In terms of air pollution, SO₂ estimates also suggest that the gains from closures were limited, especially in relation to the production of this type of pollutant by power stations.

Equally, however, it is possible to identify a second set of gains which were far more tangible. Although detailed spillage data are only available for Milford Haven, the evidence in this respect is that closures relieved localities of the burden of relatively frequent small-scale discharges, and also eliminated the unpredictable - but very real - hazards associated with large-scale accidents. While the effects of spillages vary with the local environment, the reduction of this pressure was clearly significant. In the case of air pollution, even though the estimates suggest that actual gains were modest, there is also community survey evidence that it was sufficiently severe to be perceived as a genuine imposition. This was partly true of general air pollution, but was especially the case with respect to intrusive odours. Although the possible health hazards of these were not seen as an issue, they were

undoubtedly considered highly objectionable by large sections of the communities investigated. In addition, it has also been argued that valuable reductions in traffic pressure, generated by journey to work and product distribution, are likely to have been a positive local environmental consequence of the closure movement.

Thirdly, the work has demonstrated that the actual gains achieved by closure will be dependent on company strategy. If this dictates that some form of activity should continue, either for production or distribution, the potential gains will not be realised in full. Indeed, in some respects and perhaps especially in the case of traffic pressure arising from product distribution, the progress made may be negligible or non-existent.

Finally, the results underline the need to recognise the power of revitalisation to transform gross gain into a set of lesser benefits. Here again, the work suggests that the environmental consequences of traffic pollution are central to the debate. Although revitalisation has yet to be examined in detail (Chapter 5), it is already apparent that traffic impacts generated by this process may equal or even exceed those previously associated with refining. In part this reflects a tendency for some revitalising activities to be more labour intensive than refining. But it is also a consequence of the propensity of new businesses engaged in

transshipment and distribution to be the source of
substantial HGV movements.

NOTES

- 1 Material from this chapter has been incorporated in the paper 'Oil industry restructuring and its environmental consequences in the coastal zone' to be published in B.S. Hoyle (ed) *Cityports, Coastal Zones and Regional Change*.
- 2 This is the current situation, although moves are afoot to transfer the site out of the Park. See Chapter 7.
- 3 In 1985 the permissible weight was increased to allow 38 tonne lorries to carry a payload of around 25 tonnes. Prior to this, the maximum weight allowed was for 32 tonne lorries to carry a payload of 21 tonnes.
4. This finding is based on a Chi-squared test of the first 3 data rows in Table 3.15. Chi-squared is 8.82 and, with 2 degrees of freedom, is significant at the 2.5 per cent level.
5. However, such gains will still be felt because of modern, tougher environmental legislation such as the European Community Directive on Environmental Impact Assessment, the UK Environmental Protection Act, 1990, and the Water Resources Act, 1991.

CHAPTER 4

ECONOMIC AND SOCIAL IMPACTS OF REFINERY CLOSURES

4.1 INTRODUCTION

The most obvious local economic and social impacts associated with restructuring and disinvestment are those arising from redundancies and the severance of linkages with local businesses. These have serious implications for the individuals affected, for their families and - through changes in local purchasing power - for the economy of a locality. It is therefore appropriate that Chapter 4 should begin by exploring this theme. Less obviously, the demise of a major plant such as an oil refinery may have other significant economic consequences for an area. If previous activity involved commodity movements by sea, the possibility arises that the local port authority will have been forced to adjust to a substantial fall in income. Similarly, because localities have traditionally benefited from local business taxation - the business 'rates' - there is potential for local authority budgets to be seriously affected.

To obtain a more balanced overview, therefore, the chapter also explores these two additional themes, the impacts on port and local authority incomes. In addition, discussion of all three themes is underpinned by consideration of their

more general contexts. With respect to the implications for port authorities it is helpful to explore ownership structures and increasing pressure for profitability. In the case of local authority budgets, a knowledge of business rating principles is necessary. And, so far as local economic and social impacts are concerned, it is appropriate to use as a background the relationships between redundancies, the labour market and social dislocation.

Data for Chapter 4 have been derived from the initial survey of organisations; from the semi-structured interviews with key officials; from the community survey; from the archival investigations, which were particularly useful for contemporary accounts of closures; and from the broader literature searches.

4.2 REDUNDANCY EFFECTS: A GENERAL OVERVIEW

It is evident that, in the economy in general, redundancies may occur through the reorganisation of production, through the partial closure of a plant, or through total closure. Taking a broad industrial view, in recent years redundancies in western countries have commonly been associated with the decline of

"particular and often hitherto strategic industries"

(Lee, 1987, 3),

including major manufacturing enterprises located at the coast. As Chapter 1 has indicated, examples are provided by

shipbuilding, steel production and of course oil refining. In the past, often because of the fear of problems and uncertainty likely to be brought about by redundancies, workers frequently tried to resist them. Thus strikes and other forms of protest were a fairly common by-product of redundancy programmes, especially where communications between workers and management were poor (Love, 1988). But protests were rarely successful (indeed, they often ensured that an already painful redundancy process became yet more traumatic) and in recent years they have virtually disappeared as economic conditions and new legislation have curtailed the frequency and power of strikes.

The concentration of de-industrialisation within certain types of industry, and often therefore within specific localities, has resulted in areas of deprivation (Anderson, Duncan and Hudson, 1987). Consequently, in places where redundancies occur, local rates of unemployment are already likely to be higher than national averages. In the context of this study this may be self-evident with respect to refinery closures in localities such as Milford Haven and Teesport. As will be shown below, however, even the Isle of Grain and Kingsnorth closures occurred in what may be termed an employment blackspot within the South East.

The extent to which redundancies actually result in increased levels of unemployment for any significant length

of time will clearly depend in part on existing rates of joblessness in a given area. In a strong labour market, for example, all newly redundant workers from a plant might be able to fill job vacancies that would otherwise remain vacant or stimulate the creation of new employment. In this case theoretically there would be no overall rise in unemployment. But even in this healthy scenario the characteristics of the labour market are important, particularly with respect to the degree of overlap which exists between the types of employment available and the skills and aptitudes of new job seekers (Mackay *et al*, 1981). If this overlap is limited, as it might be when a local economy is shifting from a reliance on heavy to lighter industry, redundancies may still arise. Moreover, where 'background' unemployment rates are already significant - as has commonly been the case over the last ten years - newly redundant workers are likely to experience distinct difficulties in finding work which they are capable of undertaking. Consequently a further increase in unemployment will be brought about. What is also possible is that, in a weak labour market such as this, some ex-workers may re-enter employment by accepting jobs requiring lesser skills than they are able to offer, possibly in return for lower remuneration and worse working conditions. Here the significant point is that, in accepting these new positions, they may fill vacancies that would otherwise be taken by different workers. They may therefore *displace*

others, thereby causing a rise in overall unemployment that is only indirectly linked to the original redundancies (Mackay *et al*, 1981).

One of the deteriorations in working conditions which may be experienced by redundant employees is a need to accept temporary employment. This has been particularly cited in the literature (eg. Lee, 1985 and Morris 1987, both cited in Lee, 1987). Of particular interest here is an example quoted by Lee (1985). This showed that post-redundancy employment at a steelworks that had laid off a large number of employees tended to be characterised by irregularity. That is, redundant workers were frequently employed on a contract basis for short-term work, thus exposing them to economic instability. Lee also noted that it was only some of the ex-steelworkers that were given access to this new (albeit irregular) employment, others found it difficult to get any new work at all. Thus the pool of redundant workers became divided according to their degree of disadvantage in the labour market.

Redundancy may cause other social impacts in a community. For example, if redundant workers cannot find new jobs, then families will have to face the prospect of readjustment when the (previously) principal wage earner is unemployed. If individuals and families seek to cope with this situation by migration then, as Hudson (1992, 35) states, this has to be

done at

"the price of uprooting themselves from networks of friends, neighbours and relatives; [thereby also loosening] the cohesiveness of those networks and of local social structures."

Hudson also points to the fact that social deprivation and poverty may lead to tensions, especially amongst the young people who

"are confronted with a world of consumerist affluence from which they are excluded".

Other possible social consequences of redundancies must also be recognised. As noted above, large-scale redundancies in western countries have often been associated with 'heavy' industries, which on the whole have tended to employ large proportions of male manual workers. With the closure of such plants, women are likely to become relatively more important within a local labour force. Moreover, the age structure of the economically inactive population may also change because labour-shedding programmes often encourage older workers to leave on early-retirement schemes. This tendency has been discussed by, for example, Bytheway (1987). Under such schemes, workers often cannot look for re-employment and thus the average age of the retired local population is reduced. Further, the effects on those individuals of changing to a new life means that they may have

"unprecedented choice [but be] devoid of direction"

(Bytheway 1987, 111).

The consequences of this for the individual may be enormous.

4.3 LOCALITIES, INDIVIDUALS AND REFINERY CLOSURES

The refinery closure movement may now be considered against this background. Even though the consequences of redundancies are clearly not replicated in all industries, many of them can be expected to be reflected in the experiences of communities affected by oil industry restructuring. This is especially the case, given that most of the literature already cited relates to redundancies in "large-scale bureaucratised and unionised plant" (Lee, 1987) such as those which became typical in an industry dominated by multinational business. In exploring this theme, the discussion begins by focusing on direct employment decline, before moving on to consider its broader implications for those displaced. Finally the section considers the indirect consequences of disinvestment, placing particular emphasis on the likely knock-on effects of closures on local business environments.

4.31 Direct job losses

Estimates of the job losses at each refinery are provided in Table 22. This table also summarises the information available concerning unemployment in the area and whether or not there was any continuing oil industry (see Chapter 3) at the sites which would have preserved at least a small number of jobs.

Table 22

Refinery closures and employment loss

Refinery	Oil company	No. of direct employees preceding closure	Continued oil activity
Isle of Grain	BP	1670	Oil products terminal
Kingsnorth	Berry Wiggins	50	Bitumen products plant
Heysham	Shell	100	None
Ardrossan	Shell	64	Oil products terminal until 1990
Teesport	Shell	260	None
Ellesmere Port	Burmah Oil	1100	Lubricating oil manufacturing plant
Milford Haven	Esso	290	None
Belfast	BP	100	Oil products terminal

Source: Author's initial survey

It is immediately evident that job preservation through continuing oil activity was a minor feature because, where oil-related activity did continue, it took the form of oil product terminals or much reduced oil-based manufacturing activity. Neither of these activities has the propensity to employ large numbers of people. Table 22 also shows that the sites were polarised in terms of the number of jobs lost. In two cases (Ellesmere Port and the Isle of Grain) more than a thousand direct redundancies occurred, but in most other instances the total was substantially less than 500. These figures, of course, reflect the industry's need for capital intensity and also its preference for labour-saving plants. Thus for most of the plants the number of direct redundancies was relatively low, and therefore it can be proposed that the consequences of the closures were serious for the individuals and families which bore the brunt of disruption but less so for the local labour markets.

This interpretation, however, must be modified in the light of other information gathered by the initial survey of organisations. So far as the localities are concerned, responsible officials saw several of the refinery closures as significant contributors to a larger wave of decline. If other firms had not been restructuring simultaneously, these refinery closures might have been absorbed reasonably easily. But other cutbacks meant that disinvestment in

refining must be interpreted as a substantial blow to the labour market. At Ellesmere Port, for example, the loss of 1,100 Burmah Oil jobs in 1981 exacerbated a 76 per cent increase in unemployment over twelve months. This was caused primarily by the loss of 3,000 jobs at the Vauxhall car plant and more than 1,500 at Bowater's newsprint mill (*Financial Times*, 1981a). Likewise at Grain, the local Economic Development Officer (1992, pers. comm.) has stated that the closure resulted in an

"increase of some 33% on the level of unemployment in the area at that time".

Taking a rather wider perspective, the shutdown of BP Isle of Grain was seen as part of a series of blows to employment in the North Kent area. These produced in the order of 8-10,000 job losses, quite apart from the announcement of the closure of Chatham dockyard (which employed 7,500 people) in the early 1980s (Rochester upon Medway City Council Economic Development Officer, 1994, pers. comm).

Considerations such as these may mean that it was no accident that the Grain and Ellesmere Port closures appear to have precipitated the strongest opposition to the industry's restructuring. At Grain, the Transport and General Workers' Union (TGWU) responded to the announcement of the BP refinery's shutdown with a demand for a withdrawal of the notice of closure and for further discussions, together with a threat that strike action had not been ruled

out (*Financial Times*, 1981b, 6; *The Times*, 1981). At Ellesmere Port, meanwhile, workers called for support from local people in a campaign against the closure (*Financial Times*, 1981a), and did in fact undertake an overtime ban and work-to-rule to try to

"persuade [the] management to improve severance terms" (*Financial Times*, 1981c)

What must also be recognised, however, is that - at least in the case of Grain - such responses reflect the geographical concentration of redundancies as well as simply their scale. For example, in the Grain community questionnaire survey, a quarter of the respondents claimed to have worked in the refinery in some capacity, while a third had had at least one refinery employee in their households. Further insights into the social significance of the industry at Grain can be gained from the fact that BP had constructed and run the community's social club, while even the local public house was named after the refinery's catalytic cracker.

While this evidence points to the conclusion that considerable weight should be given to redundancies caused directly by refinery shutdowns, a further significant finding, in this case arising from the survey of organisations, is that company strategies in some instances ameliorated the effects of closures. In part this occurred through the early retirement of workers in their mid- and late 50s, but in the main it was achieved by relocating

workers to other oil installations. This type of strategy was pursued by two companies, Shell and Esso. Thus the closure of Esso Milford Haven resulted in the transfer of 127 staff to the company's other UK refinery at Fawley, Southampton (Dyfed County Council, County Planning Officer, 1992, pers. comm). Other employees from this plant went to the Mossmoran terminal in Scotland, and contract work at Rotterdam was also made available to some. In the long run this clearly saved a significant number of workers and their families from the worst effects of unemployment, while the immediate problems of removal were minimised by generous relocation packages offered by the company (Dyfed County Council, County Planning Officer 1992; Economic Development Officer, 1994, pers. comm). Similarly Shell attempted

"to minimise the impact on its staff by finding alternative employment within the company whenever possible"

(Shell, Public Affairs Officer, 1992, pers. comm).

Following the decision to shut the Teesport plant, the company established a re-employment and retraining office at the site, and many of the 260 employees who were directly employed by the company were found alternative employment (Docks Director, Teesport and Hartlepool Port Authority, 1993, pers. comm).

These findings on redeployment and relocation may be related to an issue raised in Chapter 1, the role of multinational

firms in the restructuring process. A frequent assumption about these firms is that their role is disadvantageous to a locality, since external decision-making excludes the possibility of significant local influence being exerted. While the findings reported above do not directly challenge this interpretation, they do indicate that multinational capital does not necessarily ignore completely the consequences of its disinvestment strategies. This is not to argue that the Shell and Esso strategies were entirely altruistic; no doubt they owed much to the desire to minimise redundancy payments and bring experienced workers into vacancies that were appearing elsewhere in the companies' systems. Even so, the effect of these company policies was undoubtedly to provide substantial support for many of the affected individuals and their families.

What may also be argued, however, is that a price was paid for the benefits that were experienced. In part this price was the social disruption borne by families involved in relocation¹. In addition, if less obviously, the process involved displacement in the wider labour market, because most relocated workers took jobs which would otherwise have been available to job seekers from outside the firm. And, quite apart from these types of consequences for families and individuals, it can also be suggested that the locality paid a price for relocation. Paradoxically the reality of this price is signalled by the claim that

"unemployment of the actual Esso workers was not significant"

(Dyfed County Council, Economic Development Officer, 1994, pers. comm).

On the one hand, this indicates that the Milford Haven area benefited because it was saved from an increasing burden of joblessness. But, on the other, it also underlines the fact that this economically weak region lost even the unemployment benefit to which workers would have been entitled if they had not migrated.

What is also evident is that an employee's chance of benefiting from relocation was closely related to the general health of the corporation for which (s)he worked. This is demonstrated particularly by the case of BP. At the time of the closure of its Isle of Grain refinery, this company announced that "all practical steps" would be taken to find alternative jobs in other BP plants and offices for its redundant employees. However, in the early 1980s BP was reported to be

"ahead of most groups in making closures", [and]
"on target for a 25% reduction in its West European refining capacity between 1980 and the end of this year"

(*Daily Telegraph* 25/8/82, 15).

Also, a year after the Grain closure, BP shut its Belfast plant and curtailed much of its refining capacity at Llandarcy in 1985. Against this background of wholesale disinvestment, there was clearly limited scope for worker relocation from Belfast and the Isle of Grain on any

significant scale.

When workers could not be redeployed, it appears that their chances of obtaining alternative work depended to an important degree on the skills demanded by their previous job in the refinery. As Table 23 shows, refinery labour forces largely comprise skilled and semi-skilled workers, and it might be assumed that this emphasis on skills would facilitate movement into other employment. What was decisive in this respect, however, was the extent to which redundant workers' skills were transferable between industries. Some were highly marketable, while others were arguably a handicap. The best insights into this were provided by correspondence from an Amalgamated Engineering and Electrical Union (AEEU) official with knowledge of the aftermath of the Burmah Ellesmere Port closure. In his view, craftsmen - such as electricians - would usually have been able to find work because they had transferable skills. But process plant operators (who made up around half of the refinery workforce)

"would [have found] their job experience relevant to only a small minority of prospective employers in the Merseyside area"

(Wirral and West Cheshire District Secretary, AEEU, 1992, pers. comm).

4.32 Indirect and induced job-loss estimates

In addition to the direct job losses caused by the closure of the refineries themselves, the economic and social

Table 23 **Types of occupation in a typical refinery**

Job type	Percent of employees
Process operators	28
Maintenance workers	23
General labourers	14
Storemen	2
Fire and safety employees	3
Foremen	7
Scientific and technical	6
Admin. and clerical staff	9
Engineers	5
Drivers	3
	100

Source: Energy Commission Paper no 18, Institute of Petroleum.

disruption instigated by redundancies and unemployment would in all cases have extended beyond the plants' direct employees. This is because the refineries' own workforces were only part of the economic contribution that was provided in local communities. Localities would also have suffered from:

- the loss of 'indirect' effects, which were essentially the linkage benefits local businesses experienced by supplying the refineries with materials and services;

and

- the decline of 'induced' effects related to the consumer spending power arising from refinery employment.

No surviving records were found which would shed light on the precise consequences of the loss of indirect and induced effects in the vicinity of the eight closed refineries. However, in 1991, Dyfed County Council and Preseli Pembrokeshire District Council published a joint report relating to this issue which may be used as a base for estimates (Dyfed County Council and Preseli Pembrokeshire District Council, 1991). In adopting this approach it is important to recognise that the councils had every reason to maximise their report's estimates of the economic and social values of refining. At the time, the Elf Petroleum Company was attempting to purchase a majority interest in Amoco's Milford Haven refinery, and the local authorities were

concerned to encourage the success of this bid in order to secure the plant's future. With this caveat, however, the report provides highly relevant information.

Two approaches were taken to the estimation of indirect and induced benefits. The first was essentially a macro-scale analysis based on financial flows and multiplier effects. Thus, so far as induced effects were concerned, a multiplier of 1.33 was adopted from Glasson *et al* (1987) and used to predict that the plant's £7.3 million salary bill would produce a £2.4 million multiplier effect in the locality. Relating this latter figure to average local income levels, it was estimated that consumer spending by the refinery's workforce would support the equivalent of 161 full-time jobs. Similarly, in the case of indirect effects, it was argued that Amoco's expenditure of £3.3 million each year on maintenance and supplies could be translated into an estimate of 290 local jobs supported. With respect to the port, annual dues of £1.6 million were believed to maintain 142 local jobs. In total, therefore, this multiplier-based approach suggested that almost 600 jobs were created outside the refinery. This, in turn, was a substantial figure compared with the refinery's basic workforce of 335.

These estimates, however, must be treated with caution. Viewing them critically, it seems likely that the first figure (the equivalent of 161 jobs arising from consumer

spending) is the most robust. The consumer expenditure of £2.4 million by 335 families appears reasonable and - given the relative isolation of Milford Haven - much would have been spent locally. Much more questionable are the estimates based on jobs dependent on refinery purchases and harbour dues. So far as purchases are concerned, consideration does not appear to have been given to the propensity of multinational companies to import goods and services from well outside a locality. Port dues, meanwhile, support many types of expenditure other than employment. Indeed, as far as the eight closed refineries were concerned, the impacts of the shut-downs on jobs at the associated port authorities appear generally to have been relatively mild, although the exception to this was the Sheerness Port Authority which did lose a considerable number of jobs as a result of the closure of the BP Isle of Grain refinery (Table 24 and section 4.4, below).

Thus it would seem unwise to accept the multiplier arguments of job generation other than that related to consumer spending. The problem, however, can be overcome by turning to the second approach adopted by the report, a micro-scale analysis of the Amoco refinery's local linkages. Evidence from this analysis is presented in Table 25, and it gives a very different picture to that set out above. Little more than a handful of local firms had significant linkages with the Amoco plant; only two had ten employees or more that

Table 24

**Refinery closures as a trigger for port
employment decline: port authority responses**

<p>Burmah Oil refinery, Ellesmere Port, closed 1981</p> <p>Manchester Ship Canal Company: "no jobs were lost directly by Manchester Ship Canal as a result of the closure of Burmah Refinery. [But] since 1980 a few thousand jobs have gone from all points on the 36 mile stretch of the canal".</p>
<p>Shell Refinery, Teesport, closed, 1984</p> <p>Tees and Hartlepool Port Authority: "There was virtually no loss of jobs in the Port Authority or port service companies".</p>
<p>BP refinery, Isle of Grain, closed 1982</p> <p>Port of Sheerness Ltd: "A number of redundancies were made and patrols and river inspections were reduced".</p>
<p>Esso refinery, Milford Haven, closed 1983</p> <p>Milford Haven Port Authority: "It is not really possible to identify a specific number of port jobs lost through the closure. There have been reductions in launch crews, pilots and a few other areas since the refinery closure but the reduction in activity at the Esso Refinery was only one factor in those decisions."</p>
<p>Shell refinery, Ardrossan, closed 1986, site closed completely, 1990</p> <p>Ardrossan Harbour Company Ltd., Clydeport: "yes, (jobs were lost) indirectly".</p>
<p>BP refinery, Belfast, closed 1983</p> <p>Belfast Harbour Commissioners: "From a financial point of view there was almost a breakeven situation" [before and after closure].</p>
<p>Shell refinery, Heysham, closed 1976</p> <p>Heysham Port Ltd., Sea Containers Ports: "Port staff...were unaffected as the whole operation was carried out by Shell employees</p>

Source: Various Port Authorities, pers. comm.

Table 25 Local businesses linked to Amoco's Milford Haven refinery, 1990

Firm	Total employment, 1990	Jobs linked to Amoco refinery
Austwell Engineering	50	30
Milford Site Services	c. 25	10
De-Val-Ca Engineering	34	9
Various waste-disposal companies	not known	2-3
Trentmere Electrical Services	8-18	1
		52-53 (total)

Source: Compiled from Dyfed County Council and Preseli Pembrokeshire District Council (1991).

were dependent on the refinery; and, in total, less than 60 jobs would have been threatened if the plant had closed. If this result is combined with the earlier estimate of 161 jobs created by induced effects, this would suggest that the total indirect local employment associated with the Amoco refinery was in the region of 220. Relating this to the plant's own labour force indicates that total job creation was between 60 and 70 per cent greater than the refinery's direct employment. Although this is admittedly only a crude yardstick, at present it is the best multiplier available to apply to the employment data in Table 22. When this is done the result suggests that total job loss associated with the closed refineries may have been in the vicinity of 2400 (Table 26).

In turn, however, this calculation must also be questioned, at least with respect to a selection of closures. This is necessary because, up to this point, the argument has not recognised that by the late 1970s a number of oil companies had begun to abandon the traditional practice of themselves employing all permanent workers in a plant. Instead, as is now common in other major industries, the practice of hiring contract workers to perform ancillary jobs was beginning to emerge. This considerably increased a company's flexibility in terms of trimming the size of its workforce, and also limited its social security and legal responsibilities. By the 1980s the approach had gained significant footholds in

Table 26 Estimated number* of jobs lost in local shops and services as a result of refinery closures

Refinery	Estimated number of jobs lost in wider community as a result of refinery closures*
Isle of Grain	1085
Kingsnorth	32
Heysham	65
Ardrossan	41
Teesport	169**
Ellesmere Port	715
Milford Haven	188**
Belfast	65**
Total	2360

* Based on multiplier used in the Elf Study, ie. 335 direct jobs giving rise to 161 shops/services jobs (Dyfed County Council and Preseli Pembrokeshire District Council, 1991).

** Possible underestimate because contract workers are excluded from the calculation.

the BP Belfast, Shell Teesport and Esso Milford Haven refineries, (Belfast refinery leaflet, Teesport refinery leaflet, both undated; Economic Development Officer, Dyfed County Council, 1994, pers. comm). This is an important issue because it considerably increases the numbers of workers affected by plant closures in these cases. Moreover, workers in this situation were unlikely to have had the benefits of possible re-deployment within a multi-national enterprise. Thus with the closure of Shell Teesport, 350 contract workers (mainly security and office staff, firemen and maintenance crews) became the responsibility of their employers. Similarly in Belfast, 90 contracted staff were mostly employees of the Harland and Wolf shipyard, which had taken on work for BP in order to limit its own redundancy programme. And at Milford Haven, Esso had relied on around 80 contract workers in addition to its directly employed staff. Indeed, it could be argued that it was these and other workers who lost their jobs though indirect or induced effects who often faced the greatest difficulties following refinery closures rather than the direct employees.

4.4 PORT FINANCE: AN OVERVIEW

Port revenues come predominantly from charges imposed on the vessels, cargoes, vehicles and passengers that pass through and use port facilities. This revenue is used to finance expenditure, for example, on wages and salaries,

maintenance, rents, loan interest, etc. Where ports are run by companies, port dues must also fund shareholders' dividends.

From the viewpoint of this chapter, however, this picture is not static. Over the last 15 years there has been increasing pressure for ports to make profits, so that those facing the loss of major revenue sources have found themselves in a more vulnerable position. To a great extent the goal of profitability is a reflection of the new political expectation that activities such as ports should make money in their own right. This contrasts with earlier views, which were often inclined to consider ports to be part of the nation's economic infrastructure, contributing to the profitability of large parts of the private sector. As the following discussion demonstrates, these earlier views were closely associated with extensive public ownership which is now being broken down.

Between 1948 and the early 1980s about one third of UK ports were run by nationalised bodies while the majority were owned and administered by port trusts which were by tradition non-profit making public bodies. The remainder were either owned and administered by local authorities (eg. Bristol, Sunderland and Portsmouth) or were company ports. Only the latter, such as the ports of Liverpool, Manchester and Felixstowe, involved shareholders and the requirement

for profit-making (Thomas, 1994). Throughout the 1980s, however, ports were privatised in increasing numbers, starting with the large nationalised group operated by the British Transport Docks Board. This group became Associated British Ports, after which the privatisation was extended to the nationalised ports run by a subsidiary of the British Rail Board. These included ports such as Folkestone and Holyhead, which became part of Sealink Harbours Ltd.

Although the privatisation of trust and local authority ports then proved more difficult, in 1991 an enabling piece of legislation (The Ports Act) was passed. This provided

"for the transfer of statutory port undertakings [trust ports] to companies limited by shares and registered under the Companies Act 1985"

(Thomas, 1994, 143).

Since then eight more ports have been privatised, and the municipal Port of Bristol has entered into an arrangement with a private management company. Further, the power of the 1991 Act is now being used to ensure that ports which have not yet been privatised are sold in the near future. In May 1995, for example, the Secretary of State for Transport asked three of the larger Trust Ports (Ipswich, Dover and Tyne) to commit themselves to privatisation (*Dock and Harbour Authority Journal*, 1995a).

Thus the ports involved in this study have been operating in a dynamic ownership environment. Since 1991, many have

become private companies. For example, Heysham is now part of Sealink Harbours Ltd; and the port authorities at Ardrossan and Teesport - both previously Trust ports - are now limited companies (Table 27). Against this background, it is clearly important to consider the impact which oil industry restructuring has had at the level of individual ports.

4.5 CLOSURES AND PORT AUTHORITY INCOMES

Analysis of all the available information from the various sources noted in the introduction to this chapter produces five major findings. First, it is evident that this type of restructuring can indeed have serious financial consequences for a port authority. Although financial details were not released, Ardrossan Harbour was reported to have suffered

"considerable financial losses because of the closure of the refinery"

(Port Manager, Clydeport Port Authority, 1993, pers. comm).

Meanwhile the Tees and Hartlepool Port Authority faced a loss of about £1 million a year as a result of the Teesport shutdown. This drop was equivalent to about 4 per cent of the port authority's total income in 1985, the year of closure. However, a few years earlier, fees from Shell had provided the port authority with an even higher proportion of its total income - nearly 9 per cent in 1982 (Figure 22). One comment from the Authority was that

Table 27

Summary details of port authorities associated with closed refineries.

Refinery	Port Auth owners in yr. of closure	Type of port ownership in yr. of closure	Port Auth. owners 1993/94	Type of ownership 1993/94
Isle of Grain	Medway Port Auth.	Trust	Port of Sheerness Ltd.	Limited Company
Kings-north	As above	As above	As above	As above
Heysham	Sealink	Nation-alised	Sea Containers Ports	Limited Company
Ardrossan	Ardrossan Harbour Authority	Trust	Clydeport	Limited Company
Ellesmere Port	Manchester Ship Canal	Company	Manchester Ship Canal Company	Company
Port of Liverpool	Mersey Docks and Harbour Company	Company	Mersey Docks and Harbour Company	Company
Milford Haven	Milford Haven Conservancy Board	Trust	Milford Haven Port Authority	Trust
Teesport	Tyne and Tees Port Authority	Trust	Tees and Hartlepool Port Authority	Limited Company
Belfast	Belfast Harbour Commissioners	Trust	Belfast Harbour Commissioners	Trust

Source: Authors' correspondence with port authorities.

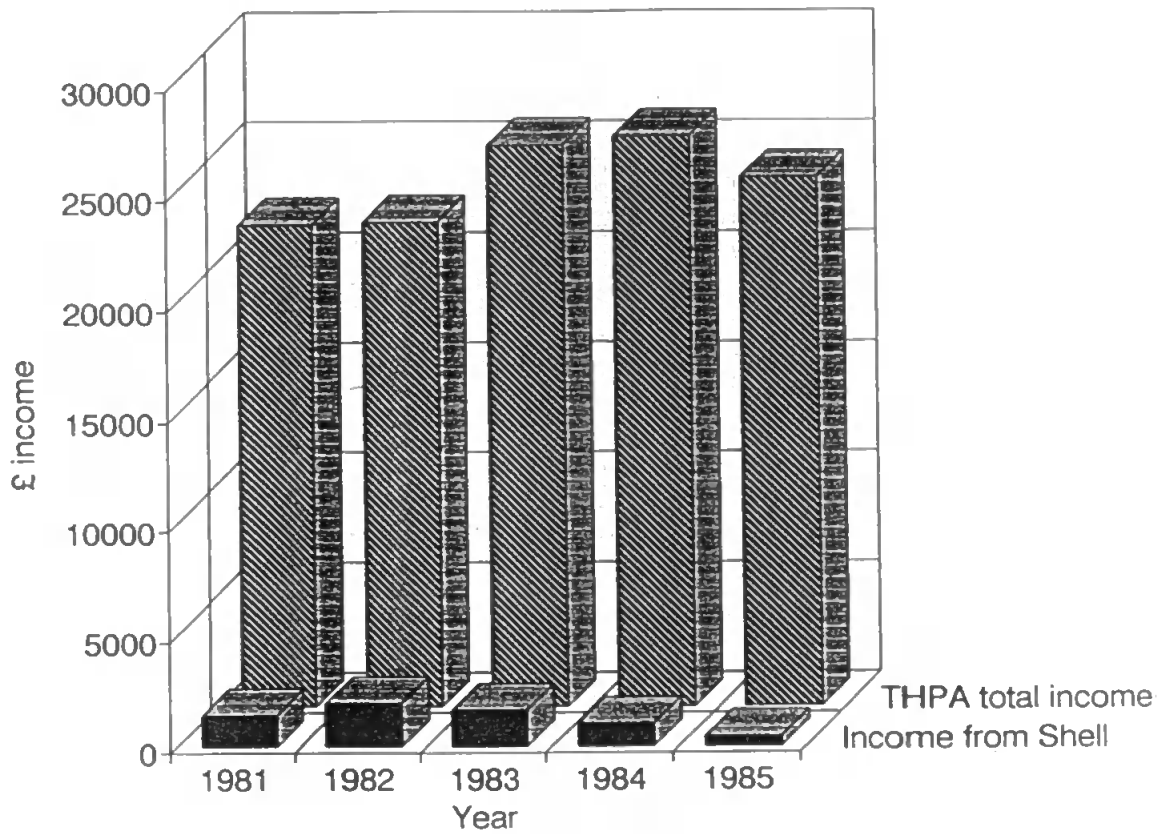


Figure 22 **Income from Shell as a proportion of total port income at Teesport 1981-1985**

Abbreviations:

THPA = Tees and Hartlepool Port Authority

Source:

Consultant, Teesport and Hartlepool Port Authority, 1993, pers. comm.

"As there were virtually no variable costs to the Port Authority for handling the Shell tonnage the loss came totally off the bottom line."

(Docks Director, Tees and Hartlepool Port Authority, 1992, pers. comm.)

Similarly, the Medway Port Authority (now Sheerness Port Ltd.) appears to have undergone severe problems as a result of the closure of BP Grain, chiefly because of the nature of the port's organisational structure and the scale of the immediate financial loss. Organisationally, it was the river section of the port, which operated fairly autonomously from the rest, which took the brunt of the financial impact. Thus:

"the closure of the refinery and the subsequent loss of VLCC traffic, meant a loss of conservancy revenue of some £750,000 per year."

(Deputy Harbour Master, Port of Sheerness Ltd. 1992, pers. comm).

The £750,000 loss was, in fact, 6 per cent of the port's total operating revenue for 1981, and roughly half of the port authority's river revenue (Lones, 1981). Decline on this scale forced the port authority to restructure its conservancy activity by radically reorganising the River Department, gradually increasing all conservancy charges and implementing a redundancy programme (see Table 24) (Deputy Harbour Master, Port of Sheerness Ltd. 1992, pers. comm).

Secondly, however, the results indicate that - despite the experience of the Medway Port Authority - substantial falls

in income did not necessarily mean that ports immediately ran into financial difficulties. At Milford Haven, for example, income fell by £330,000 a year following the closure of the Esso plant, a decline equivalent to approximately 9 per cent of total revenue. Yet in the words of the port authority respondent:

"There were no major problems for the port authority because although Esso was one of our major customers, we had several other large customers as well, and so we didn't have to lose any people. So it did mean some cutbacks but not in people other than by natural wastage, so there weren't any drastic ones."

(Chief Accountant, Milford Haven Port Authority, 1994, pers. comm).

This distinction between the experiences of the Medway and Milford Haven Port Authorities may well reflect the contrasted nature of the two ports. On the one hand, Milford Haven was essentially a modern port, developed rapidly in the postwar period to specialise in the handling of crude oil and refined products. Because of the presence of other refineries, heavy investment had not been made simply to support Esso's operations, and the cost of maintaining the oil port could therefore be spread with little difficulty among the Haven's other refiners. In contrast the Medway was much more of a general port, where the problem was to maintain a wide (and therefore costly) range of port services despite the sudden loss of income from a single high-value port user.

Thirdly, it is evident that, for a variety of reasons, some

ports had the benefit of being able to adjust to closures in what amounted to an unplanned transition phase. At Ellesmere Port, for example, a legal commitment was instrumental in providing temporary support for the Manchester Ship Canal Company, which had until then benefited from the fact that Burmah Oil shipped approximately 1 million tonnes of cargo per year through their waters. Although the loss of this traffic was described as a "major blow" (Gronback, 1981), the impact was in fact cushioned by a special 17-year tonnage and revenue guarantee agreement with Burmah Oil. This meant that the oil company continued to pay port dues until the end of 1984 - despite the fact that the refinery closed in 1982. Also at Ellesmere Port, oil-related dues continued to be earned on a small scale because Burmah Oil continued to use the Manchester Ship Canal to import lubricating oils for their white oil business which remained at Ellesmere Port after the refinery had shut down (Figure 20) (Marketing and Administration Officer, Manchester Ship Canal Company 1992, pers. comm.), (see also, Table 22).

Similarly, losses at Milford Haven were tempered in the short term by the fact that Esso continued to ship products through the site for 5 years after its refinery closure (Planning and Investment Manager, Esso, 1995, pers.comm). In this instance the driving force was not a legal agreement but, as was indicated in Chapter 3, the company's need to maintain product flows to major markets. Although in the

medium-term this was achieved by the construction of a pipeline from Fawley to the Midlands and North, in the short-term products were sent by sea from Fawley to Milford Haven, and then moved on to market via an existing pipeline. Continuing oil industry activity also cushioned the effects of disinvestment at BP Isle of Grain where BP used part of its site as a staging post for aviation fuels en route to Gatwick Airport. Above all, however, the continued need for a product distribution depot was particularly important at Belfast. Here, because BP expanded its imports of oil products after the refinery closure, the quantity handled decreased only slightly following the shutdown (from 1.4 to 1.2 million tonnes). In addition the relatively high dues levied on oil products (higher than those imposed on crude oil) also boosted revenue. Consequently the Belfast Harbour Commission was the one port authority which reported never to have suffered any real financial loss as a result of refinery closure. Instead, in terms of port revenue associated with oil traffic, the situation before and after closure was about "breakeven" (Belfast Harbour Commissioner, Belfast Port Authority, 1993, pers. comm).

Fourthly, the results suggest that, far from being a disadvantage to port authorities, closures can in some circumstances be financially advantageous. In this respect the prime example is provided by the former BP Isle of Grain site which, as will be demonstrated in Chapter 5, has been

the one locality to attract significant port-related uses. These did not come immediately, with the result that the Port Authority was obliged to restructure as described above. But in the 1990s revitalisation on this site has meant that significant numbers of large ships have returned to the Medway bringing with them

"about 2.5 million tonnes of general cargo and containers and ... about half a million tonnes of coal...[such that] they have ... brought us up, almost back to where we were before."

(Deputy Harbour Master, Port of Sheerness Ltd., 1994, pers. comm).

As Chapter 5 will show, this expansion seems certain to continue, so that there is every prospect that future port revenues will exceed those previously lost through oil industry disinvestment. Moreover, the Port Authority is now re-structured in such a way that it should be able to survive the new competitive port economics more effectively, thus:

"[at the time of the Isle of Grain closure] we were totally over-manned, but because money was pouring out, nobody worried about it. Now we're much more conscious of that and therefore, I suppose we are leaner and fitter and therefore we are not in a position of saying we will shed a lot of people, you know, we're not vulnerable to that anymore"

(Deputy Harbour Master, Port of Sheerness Ltd., 1994, pers. comm).

Despite this positive outcome, however, one final conclusion demonstrates that revitalisation can be a precarious process

which does not necessarily produce lasting change. This is demonstrated by the recent history of the Teesport site.

When all oil-related activity at Teesport ceased, the port authority (as owners of the land) had the site quickly cleared by Shell. In these early days:

"The closure of the Shell Refinery at comparatively short notice seemed at the time to be a serious blow to the Port and the various providers of port services, such as the pilots, Tugs and Boatmen."

(Docks Director, Tees Hartlepool Port Authority, 1992, pers. comm).

Very quickly, however, the Nissan car company - the owners of a new production plant at nearby Washington - decided to establish a new car export terminal on the former refinery land. Indeed, revitalisation of much of the site took place so soon after the Shell withdrawal that it was observed by the port authority that

"We were effectively constructing car storage areas and PDI [Pre-delivery Inspection] facilities in the old workshops as Shell were demolishing the refinery plant and tanks."

(Docks Director, Tees and Hartlepool Port Authority, 1992, pers. comm).

Thus the prospect of replacing lost oil revenues rapidly appeared and, moreover, the new terminal was soon seen as potentially more lucrative than the previous refinery:

"The Nissan business generates a larger contribution to overall profits than Shell did, so

the financial loss was soon more than offset by the new business. I suspect that the port service companies have also made more money from the Nissan business than they did from Shell."

(Docks Director, Tees and Hartlepool Port Authority, 1992, pers. comm).

But this apparently healthy position began to deteriorate in 1993 when Nissan introduced short-time working at their plant, halving throughput at the terminal. Then, early in 1994, car traffic was lost completely when Nissan transferred its terminal to Sunderland, a port location much nearer to the company's manufacturing plant. Above all, this experience underlines the dangers of setting great store by new highly remunerative activities if they are inherently mobile because they do not involve large-scale fixed-capital investments.

4.6 LOCAL AUTHORITY FINANCE: AN OVERVIEW

One further financial impact of refinery closures remains to be considered, namely the effects on local authority incomes. To understand this subject, it is necessary to review the means by which local authorities were funded at the time of the restructuring of the refining industry.

Towards the end of the 1970s, British local authority expenditure was funded from four principal sources: non-domestic rates; domestic rates; a rate support grant; and various service-specific grants (Figure 23). The two forms of rates were both property taxes levied on business and

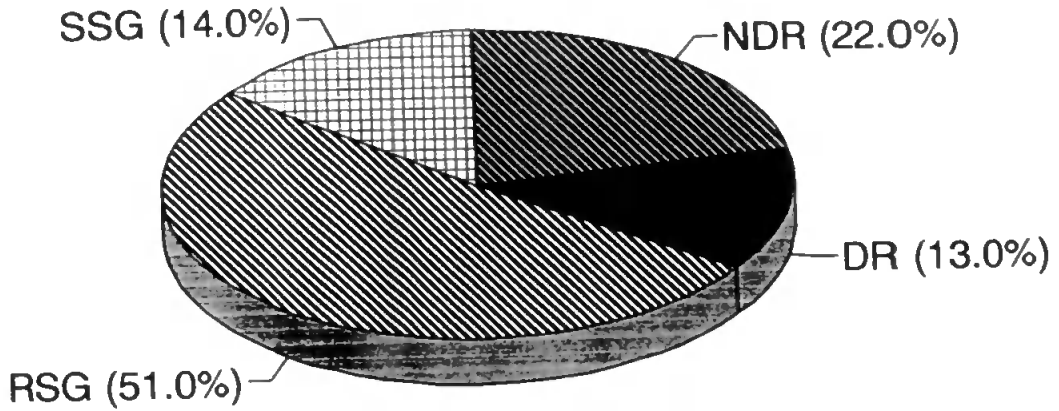


Figure 23 Main sources of English local authority net expenditure in the mid-1970s

Source: Wilson and Game, 1994

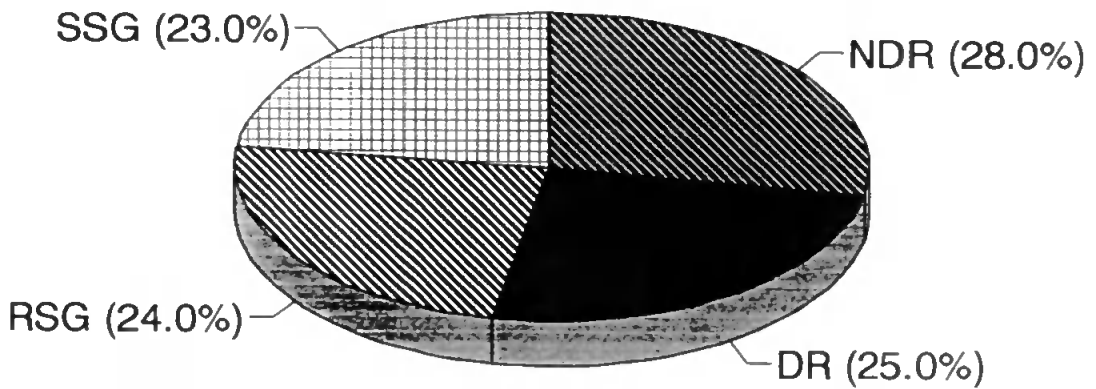


Figure 24 Main sources of English local authority net expenditure in the late 1980s

Source: Wilson and Game, 1994

Abbreviations: SSG=Service Specific Grants, RSG=Rate Support Grant, NDR = Non-Domestic Rates, DR=Domestic Rates.

housing in a locality. They were set according to the value of a property (Hepworth, 1985), and local councils themselves could determine the amount to be paid per pound of rateable value (Wilson and Game, 1994). By 1980 this system had been a traditional form of income generation for decades, but during the early 1980s a significant modification was introduced to extend central government control. In 1982 the Conservative Government introduced in Scotland the means to limit directly the amount that selected local authorities could charge in rates. This process of 'ratecapping' was targeted at perceived high-spending councils, and in 1984 the system was extended to England and Wales (Wilson and Game, 1994). One arguable consequence of this was that councils' ability to compensate for sudden losses - such as the closure of a major industry - became constrained.

Grants, in contrast, were subventions made by central government to local governments out of central taxation. They were intended to even out discrepancies between the spending needs and resources of different authorities, to subsidise local taxpayers and to give central government a degree of influence over council spending. As Figure 23 demonstrates, the most important grant source for local authorities in the mid-1970s was the Rate Support Grant (RSG) and over half of the local authorities' income at that time was raised in this way. The RSG was a general grant,

not tied to specific spending programmes, and local authorities could use it largely at their own discretion. This situation did not fit well with the Thatcher Government's concern to reduce public spending and local government autonomy, and modifications were quickly made to the RSG under the Local Government Planning and Land Act, 1980. These changes involved the introduction of a block grant which combined the needs and resources elements of the previous system, and they meant that

"local authorities which spent in excess of their 'true needs' (ie. those perceived by government), would not receive the same proportionate level of grant support as authorities which exercised restraint on their spending"

(Byrne, 1990, 228).

The relative importance of the RSG was therefore reduced between the mid-1970s and the end of the 1980s (Figures 23 and 24).

Service-specific grants, meanwhile, were awarded for given purposes, for example to promote spending on individual services, to enforce standards or to encourage the implementation of central government policies. They were, therefore, essentially a form of hypothecated funding. As such, they could be used as a means by which central government could influence the structure of local authority spending. Consequently it is interesting to note that this source of grant aid became relatively more important as the

general RSG became increasingly limited.

Thus, throughout the 1980s, local authorities were under increasing financial pressures as opportunities to raise income through rates and government grants became more restricted. It is against this background that local authorities' ability to raise substantial incomes from the non-domestic rates requires further consideration. Viewing the country as a whole, sources of non-domestic rate income naturally tended to be concentrated in areas of commercial and industrial activity. For example, in the mid-1980s, the London area accounted for about one third of England's total non-domestic rateable value (DoE, 1986). Thus metropolitan authorities were in the fortunate position of being able to rely on large sums of non-domestic rate income from a variety of enterprises. However, outside urban areas, local authorities were unlikely to have access to more than a few such sources of non-domestic rates. Any large industrial plants that were present in such an area could therefore be expected to make a substantial contribution to that local authority's overall income. For example, the DoE (1986, 11) notes that

"the contribution from a single power station can make up a very large proportion of the total rate income of a non-metropolitan district council".

From this it might be inferred that, where local authority areas had only one, or at most a few, large business

premises, industrial closures were likely to produce large problems for district treasuries. This point is highly relevant to this report because several of the closed refineries were in predominantly rural areas such as the Isle of Grain and Milford Haven.

4.7 REFINERY CLOSURES AND LOCAL AUTHORITY INCOMES

In the initial survey of organisations, all District Councils whose areas included a closed refinery were contacted concerning the former rate income from the plants in question. Information was requested on both the absolute income received and its relative importance to total council funding. Although the responses were once again incomplete, the data that were provided illustrate a variety of cases, ranging from the shutdown of a refinery in a very industrialised urban local authority area, through one in a small town, to the closure of plants situated in largely rural environments. Selective though it is, this information provides the basis for testing the inference that local authorities in urban areas will be better able to withstand the financial effects of individual plant closures than those in more rural environments.

At first sight the available evidence clearly supports this interpretation. For example, in an essentially urban example, the Teesport finance officer indicated that the £167,303 obtained from the Shell plant the year before it

closed was "negligible" in comparison to the £40-50 million which was the council's total income at the time. Moreover, he also emphasised the relative unimportance of the closure to the local authority treasury by stating that environmental and social factors linked with the shutdown were probably more significant than those associated purely with council finances (Finance Officer, Langbaugh District Council, 1992, pers. comm). Conversely Cunninghame District Council, the authority covering Ardrossan, reported that non-domestic rates accounted for around 20 per cent of its income in the early 1980s, and that the majority of this was threatened by the closure of the refinery and a (now) redundant power station. Meanwhile at Grain, where the majority of the District Council's total rate income was provided by BP (Figure 25), the authority understandably reported that the

"council suffered a significant financial setback with BP Grain's closure"

(Rochester upon Medway District Council, 1992, pers. comm).

Similarly at Milford Haven, although the District Council continued to receive substantial revenues from the area's surviving refineries, the closure of the Esso plant meant the loss of 10 per cent of total council income (Assistant Treasurer, Preseli Pembrokeshire District Council, 1993, pers. comm.)

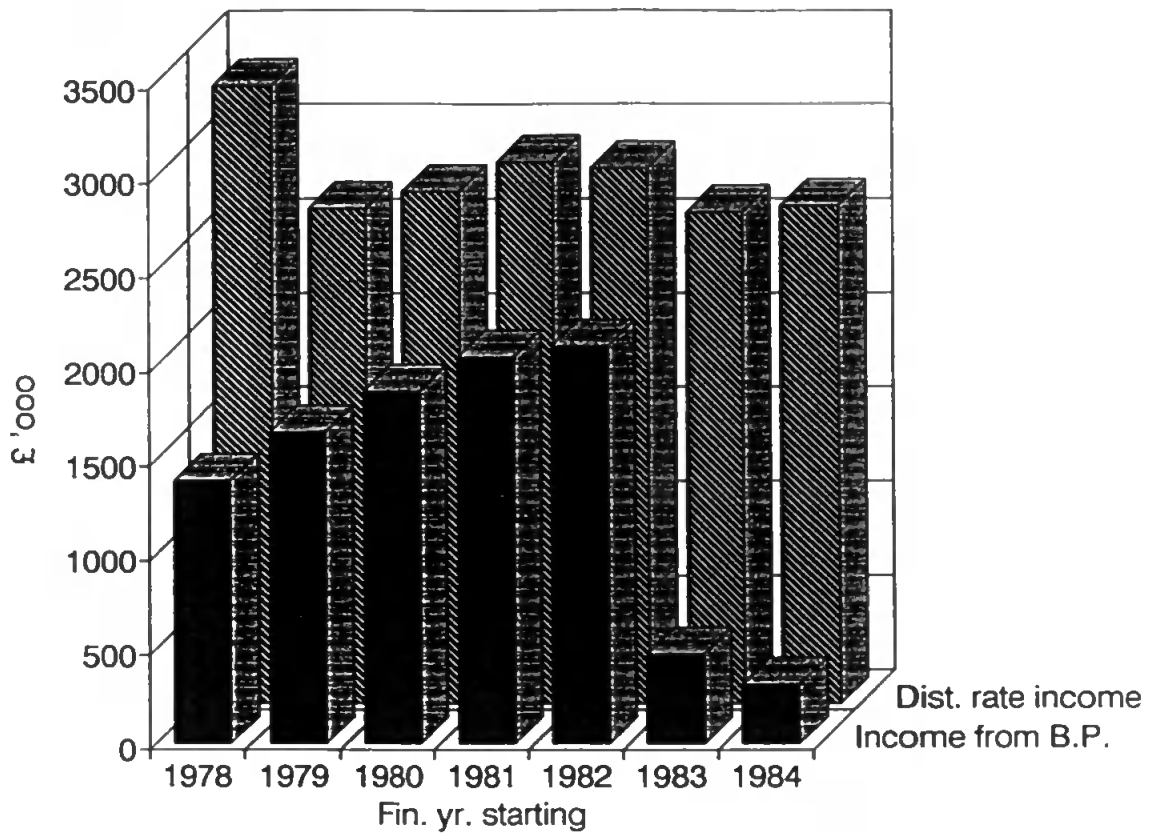


Figure 25 **The contribution of the BP Grain refinery to District Council rate income**

Abbreviations:
 Dist = District
 Fin = Financial

Source: Rochester Upon Medway City Council, 1992, pers. comm.

While this evidence suggests that the closure movement may indeed have had far-reaching consequences for the less-urbanised local authorities, however, two considerations indicate that the long-term financial impacts may be easily overestimated. First, while closures may lead to significant falls in rate income, this may be counteracted by other developments in a local authority's area. On the Isle of Grain, for example, a new oil-fired power station came on stream on a nearby site shortly after the refinery closed, offsetting completely the loss of rates from BP (City Finance Manager, Rochester upon Medway District Council, 1992, pers. comm). In the same way, the closure of Shell's Heysham refinery in the late 1970s coincided with the construction of a nuclear power station in the area. Naturally, if the refineries had not closed, the areas in question would have actually gained substantially in terms of total income, and in this sense it can be argued that the authorities in question did indeed suffer losses. But the fundamental point is that new activities unrelated to the closures brought replacement income, the effect of which was to protect the levels of service the authorities were able to provide.

Second, the impact of closures was in some instances mitigated by the government action. One special case was provided by Belfast, where exceptional rating regulations applied. In Northern Ireland as a whole, political

influences have meant that particularly strong efforts have been made to encourage industrial development (Teague, 1993), including the suspension of non-business rates. Under the Rates (Northern Ireland) Order 1977, all industrial properties in the province were de-rated as a means of encouraging economic development in the region, and central government funding was increased in order to compensate. Thus the BP Belfast refinery paid no rates, and its closure consequently had no local taxation implications (Assistant Manager, Belfast Rates Services Agency, 1992, pers. comm). More generally, however, local authorities severely hit by losses were able to apply for government assistance through an adjustment to the RSG. In this case the principle was that authorities had long-term commitments, and might in some instances require additional support in order to fulfil them in changed circumstances which they were unable to control. The best example of this principle in action was provided by Cunninghame District Council which, as has been noted, lost income from the Ardrossan refinery and a power station almost simultaneously. Although this threatened nearly a fifth of the Council's income, RSG supplementation was almost complete, so that the local director of finance was able to report that the closures "had no real effect" (Finance Officer, Cunninghame District Council, 1992, pers. comm).

Although data were not forthcoming for all closures, therefore, the available evidence suggests that the impact of disinvestment on local authority budgets was less damaging than might initially be supposed. In the more urbanised areas income reductions tended to be proportionately small. In some instances where they were larger they were offset by gains from new activities. And, although the general thrust of government policy was to curtail local authority expenditure, the RSG mechanism provided an effective safety net where circumstances were genuinely problematic.

What may be added is that recent developments in the non-domestic rating system have meant that local authorities in England and Wales are now protected even more effectively against income declines caused by industrial restructuring. Since the financial year 1989/90, the government has set a uniform rate poundage for all non-domestic properties in England and Wales². Although the rates are still collected by local government, they are now paid into a national fund which is then distributed back to the councils according to their populations (Wilson and Game, 1994). This, of course, can be regarded as a double-edged sword. Because the distribution formula is based on population, a local authority is no longer able to benefit directly from rising business taxation in its area. But this disadvantage must be weighed against the assurance that large-scale industrial

disinvestment will not expose an authority to a potentially severe funding crisis.

4.8 CONCLUSION

This chapter has considered three major types of economic impact arising from refinery closures: those relating to employment, to port authority incomes and to local authority incomes. In terms of the employment impacts it has been suggested that direct job losses were not, on the whole, a significant problem. To a great extent this was because most refineries, being highly automated and capital intensive, did not employ large labour forces. But the direct redundancy effects were also lessened by two other factors. One, admittedly minor, influence was that continuing oil-related activity sometimes sustained a small number of jobs. The other was that, at least in some instances, oil company strategies allowed employees to be redeployed to other parts of the company system. It can be argued that for those involved the effect of this was to ameliorate the economic consequences of closure, since they did not become unemployed. This in turn can be said to have alleviated social stress, although it must also be recognised that an enforced move to another part of the country - or even abroad - will also have brought its own stresses for most of the individuals and families affected.

To this cautionary note must also be added the finding that the scale of direct redundancies should be assessed in the

context of local labour market conditions. Even though absolute numbers were in general quite restricted, there is evidence that two sets of circumstances had the ability to enhance their importance. Both were well illustrated by experience at the Isle of Grain. On the one hand, Grain village demonstrated how unemployment could be concentrated in relatively small dependent communities. Meanwhile on the other hand, the surrounding area had suffered other major plant closures and was therefore ill-prepared to absorb the unemployment created by the BP closure.

So far as the indirect employment effects are concerned, the results suggest that the severance of linkages with local businesses added only marginally to the growth of unemployment. Refineries are able to internalise many functions, have important linkages that are not local and tend to be closely connected to only a limited number of small local firms. Although these can naturally be seriously affected by the closure of a major customer, the consequences for the locality are typically restricted because each firm has only a modest workforce.

What is also reasonably clear is that the ports and local authorities affected by the shutdowns were, in the most part, able to survive the trauma without great difficulty, even though the consequences for them might be expected to be severe. So far as the port authorities were concerned,

this reflected a wide range of factors such as opportunities to spread costs across other port functions, the existence of financial agreements which maintained income for a period after closure and the emergence of new sources of port revenue. In the case of local authorities a tendency was detected for the effects to be more severe in rural areas than in urban ones, chiefly because refineries tend to be more prominent in rural districts. But even the effects of closures in these localities were overcome within relatively short time-scales. As the analysis has shown, this relative immunity can be explained in terms of both market forces and public-sector systems. In some instances new large-scale activities emerged through market processes and replaced lost income, while serious continuing shortfalls in local authority funding were dealt with through the rate support mechanism.

The primary conclusion to be drawn from this chapter is, therefore, that the economic consequences of this type of deindustrialisation may be less than anticipated, given the fact that the closure of a refinery is normally a major event. However, it is also important to recognise that the effects of shutdowns will be amplified as a result of the reduced spending power of former refinery workers and their families; lower expenditure will generate further unemployment in the service sector and that the effects of this may be significant. Even though the estimates offered

by the Dyfed County and Presili Pembrokeshire District Councils' report (1992) cannot be considered impartial, those relating to reduced private expenditure in a locality were relatively convincing and suggest that further research into the likely scale of this effect would be justified.

NOTES

1. It is arguable that this social disruption was even greater when redundancy was followed by a move overseas. The numbers adopting this solution are impossible to estimate.
2. The existing non-domestic rate system whereby Local Authorities set a rate poundage, to be paid per £ of a property's rateable value, was retained in Scotland. Domestic rates, were, however abolished and replaced by the community charge in 1989 - a year earlier than in England and Wales.

CHAPTER 5

ECONOMIC REVITALISATION

5.1 INTRODUCTION

Although previous chapters have touched on the question of revitalisation, particularly with respect to its environmental implications, the nature and economic consequences of revitalisation processes have yet to be considered in full. What forms of revitalisation can be identified? Why is this form of redundant space attractive to firms? And how substantial does their contribution to local development appear to be? This chapter is designed to address questions such as these. It does so by reviewing systematically the developments that have occurred at the various sites; by examining the locational attractions of this form of redundant space, as perceived by large firms and small and medium-sized enterprises (SMEs); by exploring the extent to which new development is integrated into the local economy; and by devising an overview of the employment consequences of revitalisation projects. Before turning to these themes, however, the discussion sets them in a broader academic context by reviewing the revitalisation predictions made by Pinder and Husain (1988). These authors suggested several pathways which regeneration might take, and it is important to assess the extent to which their early work on the subject matches present-day realities.

5.2 REVITALISATION PREDICTIONS

A fundamental assumption made by the 1988 study was that revitalisation would not follow the mixed-use model that has become so familiar in the recovery of inner-urban port areas. This view can be said to have rested on three considerations. First, in almost all instances, abandoned refinery sites are found at some distance from their local city's Central Business District (CBD). As a result, upward transition is unlikely to be brought about by demand related to the growth of business activity and retailing. As many contributions to this field have demonstrated, these forces have been fundamental to the revival of the city-centre waterfront (Church, 1988). Second, because they are not an integral part of the inner city, the sites in question are not part of the 'inner-city problem' and therefore have no claim on public resources made available for purposes such as land clearance, rehabilitation and access improvements which tend to pave the way for the mixed-use model (Tweedale, 1988). In the true inner-city, especially where Urban Development Corporations have controlled development, and where government and European urban revitalisation funds have been targeted, this support has been significant. And, third, the scale of dereliction associated with oil industry restructuring is far greater than that generated by traditional dockland decline. Even though it is not unusual for these docklands to be larger than their neighbouring CBDs, in almost all instances they are still smaller than a

typical refinery site. Thus, even if there were at least some impetus for the mixed-use model, it is most unlikely that land demand would match the supply created by oil industry disinvestment. To these points should be added the fact that, since Pinder and Husain's (1988) study, the British economy has experienced deep recession. One result has been to slow or even halt many mixed-use revitalisation schemes, making this model an even less likely vehicle for the redevelopment of the sites in question.

Conversely, the 1988 paper proposed that a range of more likely forms of revitalisation could be anticipated. One outcome, it was suggested, might well be the conversion of refinery sites to light industry, warehousing and other storage activities. This option, it was suggested, would be popular with site owners where sites were outside port limits, and therefore free from port operators' tendency to prefer activities that would restore port traffic. At the macroscale the likelihood of revitalisation taking this pathway was also increased by the economy's general shift towards light industry and distribution. And, at the microscale, the infrastructure already available on former refinery sites - such as roads, water supplies and drainage - could similarly be seen as a factor likely to encourage this type of change.

In contrast, where sites lay within port limits - as at

Teesport - it was proposed that redevelopment might be steered to favour the expansion of port activities. Similarly, where sites occupied greenfield locations outside port areas, it was also envisaged that they might be acquired by ports which would then assimilate and refurbish them for port use. This argument depended partly on the view that ports would wish to replace lost revenue by generating new maritime traffic. In addition, however, it was believed that this type of strategy would be economically attractive because the redevelopment of an already prepared site would be less costly than the creation of an entirely new port area (Charlier, 1992). And, equally important, revitalising a previously industrialised site would be likely to attract less environmental opposition than proposals for port development on previously untouched coastal land.

Lastly, the 1988 study envisaged that another potential new use for sites outside port areas might be their exploitation for

"leisure, recreation and tourist facilities, but in a rather different form to that typical of older port areas"

(Pinder and Husain, 1988, 240).

In this context, and against the background of a rapidly expanding and evolving leisure industry, it was proposed that private-sector capital could well become the driving force for developments such as theme parks. Alternatively, where this impetus was absent, public bodies could take the

lead in recycling sites for informal recreation along lines similar to the provision of country parks. Both solutions, it was felt, would be well-suited to the scale of land release by the oil industry, while the development of informal recreation in particular would be likely to assist the restoration of environmental degradation in the coastal zone.

5.3 REVITALISATION IN PRACTICE

When the sites were surveyed for this research in 1993, five years after the publication of Pinder and Husain's study, it was immediately apparent that revitalisation had occurred but had been a very uneven process. As a result two sites (Esso Milford Haven and BP Belfast) had experienced no redevelopment - although as indicated earlier in the thesis - parts of the Belfast site continued to be used as an oil terminal. Ardrossan, where the abandoned refinery site was the only one to be located in a traditional area of dockland decline, had attracted only two small businesses. These were both located in old refinery buildings and were in fact widely differing activities. One was a manufacturer of sweeping equipment - the other a computer-based library filing service. And although the District Council at Ellesmere Port had won derelict land grant to clear 40 ha of the Burmah Oil site, and prepare some of this for industry, no developers had come forward. Most of the remainder of the old Burmah site (54 ha) which had been sold to Shell was

also totally undeveloped at the time of the survey, while Burmah continued to use just 6 ha for its continued lubricant manufacturing activities. There was, therefore, a failure to achieve a significant new economic impetus on half the sites, and this problem clearly requires further consideration.

As will be demonstrated in Chapter 6, the widespread failure to revitalise at these sites cannot be attributed to the working of the planning system. The standard procedure adopted by local authorities following closure was to confirm the sites' designation as industrial and commercial areas, thereby making them available to a wide range of investors. In some cases, however, it may be argued that potential investors' interest will have been dampened by obstacles to redevelopment which were created at the time of refinery decommissioning. At Milford Haven, for example, a decision was taken to remove the public utility infrastructures, and this naturally increased the potential development costs of new users. While this might not have deterred a major business interested in a costly redevelopment of the site, its significance could well have been greater for a developer interested in industrial estate development on a modest scale. In addition there is some evidence - again most clearly from Milford Haven - that oil company attitudes can inhibit redevelopment. Esso Petroleum still owns this site, and among other key actors in the

vicinity a belief has taken root that the company has little enthusiasm for disposing of it because it is considered a long-term strategic asset which it would be unwise to release. To quote the county Economic Development Officer:

"Esso certainly would not have sold the site to any rival ... They did sell some small parcels of land to Amoco ... but generally they were quite restrictive in who they would dispose of the site to."

Moreover, when a potential purchaser from the Far East emerged soon after the closure:

"Esso [were] co-operative to a certain extent on that. But they've got a high value on the site which, at the time of closure, probably wasn't there."

(Economic Development Officer Dyfed County Council, 1994, pers. comm)

Beyond this, it can be suggested that redevelopment proposals may have been impeded by potential investors' uncertainty concerning the nature and cost of the revitalisation challenge. Here a significant point is that, at two of the sites where redevelopment has been achieved, ground contamination by oil and oil products has emerged as a significant problem. At Heysham the National Rivers Authority is treating affected areas which threaten ground water, (see Chapter 3) while at Grain soil contamination is at least one factor that has delayed plans by British Gas for a liquified natural gas (LNG) terminal (see below). In addition, at Ardrossan Shell have had to undertake a

decontamination programme for the site. In these circumstances it is obviously possible that potential developers may be deterred by suspicion that - at best - plans might be delayed while decontamination was undertaken and - at worst - the expense of the clean-up process might have to be added to their project's development costs.

Even more broadly, however, account must be taken of the fact that redundant refinery land has become available on a large scale in a period of economic recession. In this economic environment land supply has understandably exceeded industrial and commercial demand, and this cyclical tendency has been exacerbated by long-term structural economic change. One of the most striking features of the post-1980 period is that large-scale construction projects, consuming land on the scale of that released by the refining industry, have become rareties. Here a significant related point is that this demand shift has been clearest in the national periphery where the refinery sites that have failed to regenerate are located. To this can be added the fact that, because of the problems of peripherality, ex-refinery sites in these locations are normally in areas where the supply of development land is particularly great. This intensifies the competition for available investment in a locality and consequently reduces the chances of achieving successful revitalisation. Moreover, for two reasons, development incentives provided by regional policy do little to help the

sites overcome these handicaps, even though several sites are in locations qualifying for regional assistance (Table 28). First, reductions in the value of UK regional policy (Harris, 1993) mean that it has become more difficult to attract investment from more buoyant parts of the country. Second, within the periphery itself the refinery sites must compete with other land offering equal or even greater incentives. These include Enterprise Zones and localities for which Urban Development Corporations are responsible (Rydin, 1993, 159-168). This point is well demonstrated by the case of Milford Haven. Although when closure occurred in 1983 this site was able to offer investors full Development Area incentives, since 1984 its status has been that of an Intermediate Area. Yet, within a few miles of the Esso site, the Milford Haven Enterprise Zone has been able to offer not simply stronger financial incentives including rate relief, but also simplified planning procedures.

This discussion demonstrates that a complex range of factors may be brought into the equation in order to shed light on the failure to revitalise. However, the scale of failure should not be allowed to obscure the fact that in number of instances revitalisation has been substantial. Although previous chapters have already provided an outline of the developments in question, it is appropriate that they are examined systematically at this point.

Table 28

Proximity of sites to state-sponsored economic revitalisation initiatives

Site	Year shut	Regional policy?	UDC in immediate area?	EZ in immediate area?
Hey-sham	1979	Site in development area until 1984	No	No
Ellesmere Port	1981	Site in SDA until 1984, then in development area	Merseyside Development Corporation established in 1981	Speke EZ (across Mersey), established 1981
Teesport	1985	Site in SDA until 1984, then in development area	Teeside Development Corporation established in 1988	Yes EZ established Middlesbrough 1983
Ardrossan	1986	Site in SDA until 1984, then in development area	No	No
Belfast	1982	NI reg. policy	No	Yes, EZ established 1981
Grain	1981	No	No	Yes EZ established Medway Towns 1983
M. Haven	1983	Site in development area in 1983, intermediate area from 1984	No	Yes, EZ established Milford Haven 1984
Kings north	1979	No	No	Yes, EZ established Medway Towns 1983

Abbreviations and Notes

SDA: Special Development Area.

EZ: Enterprise Zone - EZs usually lasted for 10 years.

UDC: Urban Development Corporation - UDCs usually lasted for 5-8 years.

Heysham

A number of small-to-medium sized enterprises have become established at this site. Two are situated on individual plots on the periphery, a plant hire firm and a rigid urethane foam manufacturer. The latter business was originally owned by ICI, the company which used to operate a fertiliser plant associated with the Shell refinery. These two businesses employed 63 and 66 workers respectively at the time of the survey. A third individually-sited business on the site is SOLREC - a solvent recycling company which is a potential source of severe air pollution. Because of this it has had difficulty in finding suitable places to locate (see Chapter 3), even though in terms of economic regeneration the business must be seen as very positive for Heysham. Since its start in the late 1970s, just as the refinery was retreating from the site, employment has grown from 2-3 people to 79.

All of the other SMEs on the Heysham site are now situated within business/industrial estates, of which there are three. Thus, for the most part, revitalisation has been dependent on one of the leading methods proposed by Pinder and Husain, estate development. The three privately run estates provide around 55 industrial units for individual businesses along with 17 units of office space, mostly located in old refinery office areas. At the time of the survey 41 of the industrial units were in use (though in

several cases one business occupied more than one unit), and all of the offices appeared to be occupied.

A substantial minority (one third) of the businesses within these industrial estates provide support to British Gas' offshore exploration activities. These firms tend to be branches of large organisations with sites in other areas of offshore activity. So, for example, Milpark Drilling Fluids (now part of Baker Hughes Inteq), AMOD (Aberdeen Marine Oil Developments) and Inspec all set up at Heysham to create an additional site for their existing business - existing locations being at places such as Aberdeen, Great Yarmouth and Lerwick.

Similarly, several firms now located at the Heysham site provide services such as engineering repairs (pumps and motors, etc.), pipeline installation, shotblasting, industrial coating services and the provision of welding equipment to Heysham's two nuclear reactors. Indeed, even a two-person photography business, which undertakes industrial and aerial photography alongside more conventional wedding subjects, listed Nuclear Electric as its major customer.

The remainder of the businesses present at this location are mostly involved with a variety of light industrial activities such as the repair of second hand vehicles, and

warehousing.

In various respects, therefore, Heysham might appear to provide an ideal example of estate-based revitalisation, but this conclusion should be tempered by two additional considerations. First, although there is substantial provision for small and medium-sized businesses, and although the site has attracted the solvent-recovery plant, the revitalisation process has long-since faltered. Indeed, at the time of the survey, one of the estate operators was in receivership. Little construction occurred throughout the 1980s and two-thirds of the site at present remains undeveloped. Second, connected with this failure to redevelop completely, and with the fact that the estates date from the late 1970s, the site is unkempt and much of the property shabby and run-down. This is immediately obvious from simple observation, but a variety of firms commented on it in terms of the effects on their business. This drawback is highlighted by Table 29, which summarises the problems firms felt were associated with the site.

Kingsnorth

Since the mid-1980s this site has similarly been revitalised by means of estate development, in this case undertaken initially by BOM Holdings - a descendent of the oil company, Berry Wiggins. In 1990 the industrial estate was sold to Whitsands Ltd., a company which also owns two other such

Table 29

Problems with the Heysham site; some responses to the question 'briefly explain any other problems experienced at the site' (see Appendix 1).

"Main problems are contaminated land and buried foundation/air raid shelters"

"Unattractive, semi-demolished site, wasteland"

"The site is very old and very untidy and is not attractive for businesses. The owners have not spent or invested any money to upgrade the site, security has been a problem, and we have had problems with electricity due to the age of the site. The site requires major upgrading and investment..."

"General run down appearance of site"

Source: Authors survey; economic questionnaire survey.

estates in different parts of Kent.

The present industrial estate occupies 6 ha of the ex-refinery land and comprises 45 units, 32 of which were occupied at the time of the survey. As at Heysham, several businesses occupied more than one unit, and consequently a total of 19 viable firms were identified. Twelve of these responded to the survey of firms. One immediate finding relevant to the impact of revitalisation was that the majority of firms (58 per cent) were relocations that had moved to the site from premises within a 50-mile radius and mostly from areas less than 10 miles away. Equally evident was the fact that the relocating firms created only 9 new jobs between them on setting up at Kingsnorth, and it is likely that they brought existing workforces with them. Indeed, overall very few jobs appear to have been created at this site. No completely new businesses were established there, and those which had not relocated had set up to provide additional branch locations for existing firms. Although this process might be expected to create new employment, it does not appear to have done so in this instance. For example the largest of the firms to move there for this reason had brought 50 employees with it and created no new jobs on arrival at Kingsnorth. Moreover, by 1993 this particular firm only employed 27 workers at the site. Indeed, by that time the total labour force of the 12 responding firms was only 161 people.

Despite these relatively low figures, there is much expectation of further development in the immediate area. Another 113 ha of land adjacent to the present industrial estate are currently under the ownership of companies which are planning to develop another (larger) industrial estate and possibly also a Combined Cycle Gas Turbine (CCGT) power station¹. (These companies are the Abacus Trust and Kingsnorth Power Ltd.) In addition, around one half of the old refinery area is still occupied by the oil industry - in this case a plant producing bitumen products. This activity, although descended from Berry Wiggins, has had several owners over the years, the most recent being Kingsnorth Bitumen Products Ltd., which took over in 1994. This continuing bitumen production increases site employment by 50.

The Isle of Grain

As was indicated in Chapter 4, BP did not entirely abandon its Isle of Grain site, but instead retained an 80 ha distribution terminal handling aviation fuels. However, the large majority of the site was made available for new activity, and four major projects have been largely responsible for making this the most striking example of revitalisation.

The most extensive project is the Thamesport port terminal, a container handling and coal import facility that is now

part of the Maritime Transport Services group. Developed since 1989 Thamesport takes full advantage of the flat topography and occupies 87 ha, that is, around 17 per cent of the site (Figure 21). In its early days the development experienced considerable financial difficulties, but its operators now claim that since 1993 it has become self-sustaining as a result of the highly competitive rates it charges (Thamesport Senior Ship Planner, 1994, pers. comm.) By 1994, the most recent year for which data are available, Thamesport's throughput had reached 160,353 container movements and 473,580 tonnes of coal (Thamesport Ltd., 1995, pers. comm). As might be anticipated, the development as a whole is highly capitalised, and this level of throughput was consequently achieved with a direct labour force of just over 200.

A second development is essentially an aggregate import, storage and distribution depot established and operated by Foster Yeoman. This company is a major construction contractor. The project owes its origin to the demand for aggregates created by the Channel Tunnel, and was established at Grain in 1987 with temporary planning permission lasting until the Tunnel's completion. However, the firm subsequently applied successfully for permanent planning permission², and its Grain site is now in effect a major supplier for the regional aggregate market. Foster Yeomans occupies 30 ha of the site and has a labour force of

39.

Following electricity privatisation, two electricity companies (Seaward and Southern and AES Electrical) established a new company (Medway Power) to construct and operate a CCGT power station on the BP site. Construction began in 1992, is scheduled to finish in 1996, and is in the hands of a related company (AES Medway). Employment on this project during construction peaked at around 300, but this is likely to fall to around 35 once the power station is in operation. So far as land consumption is concerned, Medway Power occupies just 7 hectares.

British Gas, the fourth major newcomer, has leased 350 ha of the site for a Liquefied Natural Gas (LNG) terminal. The choice of Grain for this project partly reflects the availability of appropriate space in one of the country's leading market areas, but is also a reflection of the fact that LNG is potentially an extremely hazardous cargo (Rijnmond, 1983). Although any accident would be unacceptable, the relatively small populations living in the vicinity mean that this is a part of the South East where the threat to life can be minimised. While full plans for the project have been approved, however, work on its construction has yet to start, and no date for commencement has been given. One explanation of this is that for British Gas the site is a strategic reserve that is available for development if justified by market conditions. But it is

also true that decision-making on the project will now be influenced by the new competitive climate in which British Gas must operate. Any decision to continue will depend on the company being confident that it can win markets which exceed supplies piped from the North Sea. Meanwhile, while the project may appear to contribute to revitalisation, as yet it creates no economic impact. Indeed, it could be argued that it has had a negative effect, sterilising a substantial site which might well have been used more effectively by an alternative activity. The discussion returns to this point in Chapter 6.

This overview of Grain draws out the contrast between the changes brought about by an influx of major companies and those generated by estate development. What must be noted, however, is that Grain has also attracted a number of linked activities that have increased local growth. To a degree, these businesses have come in to exploit the locality's general economic expansion. There are, for example, two catering firms serving Thamesport workers and the large number of HGV drivers who pass through the site. Similarly, an electrical contractor numbers the BP depot and Thamesport among its main customers. But, in addition, Thamesport has itself attracted a dozen port-related activities such as shipping lines, port agencies, container-maintenance firms and a coal blender. All but one of these activities are branches of large firms, and some have moved to Grain to

take advantage of the new port's competitiveness. For example the container shipping company Evergreen UK Ltd chose Thamesport over its existing site at Felixstowe because it offered:

"A more personal service. Priority berthing for our ships. Competitive pricing. Proximity to London and main continental ports."

(Evergreen UK Ltd, author's survey, 1993).

Moreover, other firms followed: Russell Davies UK (a transport company) moved to the site because Evergreen had located there, while Railfreight UK (previously part of British Rail) established its Thamesport branch chiefly to serve Russell Davies UK and Evergreen. To some extent, therefore it may be said that Thamesport has functioned as a growth pole, although the degree of impetus this has given should not be exaggerated. Ninety per cent of all small firms and branches at the Grain site responded to the survey, but their total employment was only 117 workers.

Teesport

There have been two major new corporate activities at this site although, in both cases, these companies' contributions to economic regeneration have not been as straightforward as originally envisaged. The first was Nissan Shipping, which established a car import and export terminal at the site in 1989 in order to serve its manufacturing plant in Sunderland. This move was greeted ecstatically by the Port

Authority, which claimed that the income generated by this business would more than offset that lost by the removal of Shell tankers (see Chapter 4). Between 1989 and 1993 Nissan Shipping employment at the terminal grew from 7 to 38 but, as Chapter 4 has already indicated, this regeneration was short-lived. In 1994 this company withdrew completely from Teesport to a site closer to its manufacturing plant in Sunderland.

The second major development at the site is a chemicals manufacturing plant that was originally to be built by the North East-based company MTM Services Ltd. This, it was claimed, would eventually produce around 700 jobs (*Hartlepool Mail*, 1989), but this figure now looks unlikely to be achieved, and the plant, now renamed Hodgson Products Ltd. following the take-over of MTM by BTP in 1993, is currently employing just 48 people; a number which is likely to grow to just 96 by 1998, (Plant manager, 1996 pers. comm).

The opportunity for port authorities to expand onto vacant land, as predicted in Pinder and Husain's 1988 paper, has been realised, at least on a very limited scale at Teesport. Thus, the Teesport and Hartlepool Port Authority has expanded its container handling operations, partly in response to privatisation pressures and opportunities, and has in the process made use of a small area of ex-refinery

land. In addition, the authority has recently proposed a new Ro-Ro facility for the Shell site, but no formal planning application has yet been made, (Chief Planning Officer, Teeside Development Corporation, pers. comm, 1995).

A further feature of Teesport is that, as at Grain, revitalisation has attracted a number of smaller enterprises, apparently giving a modest growth-pole effect. Twelve businesses were attracted and nine - with a total workforce of 60 - responded to the survey of firms. Shipping companies, freight forwarders, shipping agencies and similar activities are all present, and a particular feature is that most firms have colonised surviving refinery buildings, such as the canteen, that were adaptable to the needs of new activity. In general these businesses are, once again, branches of national or multinational companies (for example Matt Solex, Tower Express Ltd., Cory Brothers and Antrak Liner Services). However, not all are new to the area. Three, for example, were based in Middlesborough before the Teesport site became available, and subsequently moved downstream. Their survey responses indicate that, in doing so, they were motivated by the opportunities of additional space and also greater proximity to customers. In contrast to Grain, however, the evidence is that the majority of these smaller activities were not directly linked to the major new investments, but instead migrated to the site to serve the port community more generally.

5.4 PREDICTIONS REVIEWED

From this analysis it is apparent that the revitalisation scenarios proposed by Pinder and Husain (1988) were only partially correct. On the positive side, estate development for light industry and distribution has certainly figured substantially³; land released by the oil industry has to a degree been recycled by port authorities for alternative port uses; and there is evidence that maritime functions can be sustained by major new businesses which perceive opportunities to launch initiatives such as Thamesport. Yet, on the negative side, it is also evident that revitalisation has not involved the development of leisure and recreation opportunities, either involving private capital or public initiatives. Nor has it always succeeded in bringing about permanent change, as the case of Nissan illustrates particularly well.

Despite the failure of some scenarios to figure in revitalisation, it is evident that it has been a relatively heterogenous process involving a substantial range of economic activities. Although this heterogeneity implies that any example of revitalisation may require individual examination if it is to be understood in full, it is already possible to review the outcome of redevelopment to date and reach at least provisional conclusions on the movement. These provisional conclusions are discussed below in terms of (1) the forces attracting firms to the ex-refinery sites,

(2) the extent to which the businesses in question are integrated into the local economy and (3) the employment impact of the incoming firms.

5.5 LOCATIONAL ATTRACTIONS

If the forces motivating the revitalisation movement are to be understood, investigations are necessary into the attractions which the sites originally held for incoming businesses. In the eyes of the firms themselves, what factors gave these locations an advantage, and what lessons may be drawn for the development of future revitalisation strategy? Insights into these issues can be gained from responses to the survey of new firms.

Despite the government's emphasis on new firm creation since the early 1980s, there is strong evidence that newly formed businesses did not consider these sites attractive. In the survey of firms, only 11 per cent of the 69 respondents indicated that their firm began life on the site (Table 30). Moreover, this small number included major enterprises such as Thamesport and Medway Power. Even the industrial estates, tailor-made for small businesses, produced few start-ups. As a result, the large majority of firms arrived at the sites through the operation of two other processes. On the one hand, approximately a third had relocated entirely from an earlier site to their new locations (Table 30). As might be anticipated, this group primarily comprised small

Table 30 **Reasons given by firms for locating at refinery sites**

	All sites (%)
Start New Business	11.6
Re-locate existing unit	31.9
create additional site	36.2
extend business	1.4
other	13
missing value	5.8

Source: Author's survey; economic questionnaire survey.
N=69

independent companies. On the other hand, a slightly larger group (36 per cent) were essentially branches of existing businesses. In this case, parent companies had created additional sites on the refinery lands in order to take advantage of newly arisen opportunities.

5.6 ATTRACTIONS OF THE SITES FOR MAJOR BUSINESSES

Extending the analysis beyond this relatively simple classification, a considerable body of evidence indicates that ex-refinery sites have the capacity to appeal to the developers of major projects in a variety of ways. In part this is demonstrated by Teesport, where the temporary attraction of Nissan owed much to deep-water access and the availability of an extensive area for car storage. Beyond this, however, the intrinsic attractions of these sites are best demonstrated by the Isle of Grain. Here the availability of extensive low-lying level land was ideally suited to the development of Thamesport's container and coal-handling terminals. Similarly the deep-water channel that had been essential for the oil industry ensured that there would be no access problems for Thamesport's customers, while the road and rail systems that had previously served the refinery were likewise seen as surviving infrastructural assets. In the same way, both British Gas and Foster Yeoman emphasised the importance of good sea access for, respectively, LNG and aggregate traffic. And, although Medway Power had no need for sea

transport, access to the estuary was nonetheless important since it was to be this electricity generator's source of cooling water.

What must be added, however, is that the exploitation of these site attributes might have been much less far reaching had this site not offered the additional attraction of a location in the South East. For Thamesport, the site allowed container shipping to be diverted into a major European market without imposing a financial penalty caused by a lengthy detour. In a similar fashion, for Foster Yeoman, Medway Power and British Gas the site's market-oriented location was a fundamental consideration which allowed investors to capitalise on Grain's specific attributes.

Two other locational influences identified by major developers may be noted. First, although this chapter has already established that government financial incentives are not in general a strong positive force encouraging revitalisation, one site - Teesport - has been able to capitalise on its location in the area administered by the local Urban Development Corporation. Without the substantial incentives associated with this, it seems unlikely that the MTM project would have been placed in the UK. To quote one local newspaper:

"The project was secured for Britain with the help of grants totalling £8.5 million over five years

from the Department of Trade and Industry under the Regional Selective Assistance Scheme ... The firm had said earlier that unless DTI help was available, the planned plant would be developed in the United States where costs were lower."

(Hartlepool Mail, 23/12/89)

Second, it is apparent that sites such as these appeal to potential investors at least partly because of the lack of resistance to their redevelopment that is likely to be encountered. To a degree this reflects planning system attitudes. As was noted earlier, and is discussed at greater length in Chapter 6, the rapid reaction of planning authorities was to zone the abandoned refinery sites for continued industrial and commercial uses. But it is also clear that the perceived lack of resistance is linked to relative isolation and local community attitudes. In the words of one Medway Power representative,

"the site is "far out" so therefore people are not so bothered that things are running 24 hours a day"

(Project Manager, Medway Power, 1994, pers. comm).

Similarly the managers of Heysham's solvent recovery plant made it clear that its location on a former refinery site was one of relatively few where such a 'prescribed process' would be allowed (Environmental Protection Act, 1990; Ball and Bell, 1991).

5.7 ATTRACTIONS OF THE SITES FOR SMALL BUSINESS UNITS

As an earlier section in this chapter has demonstrated, some

small firms were attracted to their new sites by major developments. Thamesport became the focus for 16 firms providing services of various types for new port users, while work by British Gas on the offshore Morecambe gasfield brought to the Heysham site at least eleven small businesses and branches of larger firms specialising in aspects of offshore support. In addition, approximately four SMEs at Heysham undertook activities linked to the nuclear industry in the area. In addition, small units at Teesport had located at that site in order to serve both existing and expanding port operations. However, in many cases small firms were not drawn into the revitalisation process through powerful linkages such as these. At the Kingsnorth industrial estate, for example there was no clear 'pull' factor attracting firms; and although the proximity of British Gas and Nuclear Electric activities were clearly important for around half of the businesses at Heysham, these firms *could* conceivably have set up at other locations around the town. Consequently it is to the locational advantages perceived by these firms that attention must now turn.

From responses to the survey of firms at Heysham and Kingsnorth a clear ranking of specific locational attractions can be identified (Table 31). Least influential was the availability of financial assistance, while access to water, labour availability and the proximity of suppliers were considered important by only a minority of firms. In

Table 31 **Locational attractions for SMEs at Heysham and Kingsnorth**

Per cent replying that certain factors were 'very' or 'quite' important.

	Cheapness of site	Need for adeq. space	Ind. use permitted	Prox. to markets	Prox. to suppliers	Avail of labour	Avail of grant	Need harb-our
Heysham	77	89	65	50	25	29	7	25
K'nth.	83	75	75	42	42	17	17	25

Source: Author's survey; economic questionnaire survey.

contrast, a substantial majority of the respondents highlighted three quite different factors, all of which appear to have exerted a similar degree of influence. One provides echoes of an observation made earlier in connection with major revitalisation projects. For many small firms, an important attraction of the former refinery sites was that they provided ready access to land on which industrial development was not only permitted but also encouraged. By moving to an industrial estate on a former refinery site, a small business was successfully avoiding many of the time and financial costs which would have been incurred if an attempt had been made to occupy a site requiring new planning permission and the construction of premises.

Secondly, it is clear that a powerful motivation for movement to these sites was to gain additional space. Three quarters of the Kingsnorth respondents, and almost 90 per cent of those at Heysham, underlined the importance of this factor. This suggests that the estates on these sites became the magnets for relatively successful small businesses that had reached the point at which accommodation constraints had begun to limit further development. Thirdly, however, any suggestion that the estates were populated by relatively successful small businesses must be tempered by the fact that the final attraction cited was that of low-cost sites. Here it may be argued that the scale of land release by the refining companies created a situation in which low land

values were a positive force assisting would-be migrant firms in search of growth space. What may also be noted, however, is that the location factors emphasised by the industrial estate respondents were not, on the whole, ones which demonstrated a need to locate in the coastal zone. A minority, it is true, required access to water. But most could have operated perfectly well at inland locations and only contributed to the re-industrialisation of the coast because that is where earlier economic restructuring released appropriate land.

5.8 LOCAL ECONOMIC INTEGRATION

One argument advanced earlier in this thesis was that, apart from the spending power of their employees, refineries are not activities that are closely integrated into their local economies. Local linkages may involve a modest number of firms, but many of their inputs are acquired outside the locality, while their products are similarly sold across a geographically wide market area. Against this background it is appropriate to examine the incoming businesses to assess the extent to which they are integrated with the local economy. Are they, too, relatively isolated, or is there evidence that they have a stimulating effect in a locality through their patterns of input purchasing and sales?

Evidence relating to this question is presented in Tables 32

and 33. These tables are based on responses to questions 12a and 12c (Appendix 1) of the survey of businesses, which adopted as their definition of 'local' a radius of 40 miles around a revitalised refinery site. Using this definition it is immediately apparent that the revitalisation process is not dominated by local linkages. Nearly 40 per cent of respondents represented firms which purchased less than a quarter of their inputs from local businesses. Similarly, in rather more than 40 per cent of cases less than a quarter of output (measured by turnover) was accounted for by local markets. This clearly suggests that it is not simply the major businesses - such as Thamesport with its role as a link in a multi-modal international transport system - that are well integrated into the much broader national and international economies.

Conversely, however, it is important that the orientation away from local suppliers and customers is not overemphasised. As Tables 32 and 33 also reveal, 39 per cent of respondents purchased at least half their inputs from other local businesses, and in most instances the proportion obtained locally was more than three-quarters. In the same way, nearly a quarter of all firms reported that at least 75 per cent of all sales went to other businesses in the locality, and for 42 per cent of the businesses the proportion of local sales was 51 per cent or more. On this basis it is clear that this form of revitalisation is at

Table 32 Proportion of purchases supplied by local firms

Proportion of purchases supplied by local firms	% Response
0-25% of purchases	38
26-50% of purchases	10
51-70% of purchases	13
76-100% of purchases	26
Missing responses	13

Source: Author's survey; economic questionnaire survey.
 N=69

**Table 33 Proportion of turnover accounted for by
local customer firms**

Proportion of turnover to local firms	% Response
0-25% of turnover	43
26-50% of turnover	9
51-75% of turnover	19
76-100% of turnover	23
Missing Responses	6

Source: Author's survey; economic questionnaire survey.
N=69

least partially integrated into sub-regional economies.

In interpreting these results it is tempting to relate them to the growth pole function performed by Thamesport at Grain and British Gas at Heysham, on the grounds that this has produced many local linkages. This view must, however, be questioned. In the case of British Gas the linked small businesses are not serving a local firm and, similarly, at Thamesport the cluster of small firms serves port customers spread widely at the national and international scales. More probably, substantial levels of local orientation reflect the dominance of small firms noted earlier plus the fact that a high proportion have been migrants attracted from the vicinity by the availability and low cost of land. In these circumstances it is natural that many relocating businesses will have minimised the disruption and uncertainty of movement by maintaining existing local linkage networks.

5.9 EMPLOYMENT IMPACT

One of the most interesting features of employment change was that the structure of the jobs created matched relatively closely those lost through refinery closures. Thus the majority of the incoming firms required skilled or semi-skilled staff (Table 34) while the demand was primarily for male employment (Table 35). In addition part-time employment - either for men or women - was negligible in scale. In these respects the findings are distinct from

Table 34 Structure of responding businesses' workforces

Percent of workers in each work category, at each site.

	Grain	Ardrossan	Teesport	Kingsnorth	Heysham	All 5
Mgt/Supervisory	20	17	35	15	18	19
Skilled	55	33	21	35	29	37
Semi-skilled	16	17	19	32	30	26
Unskilled	6	33	19	18	16	13
Other	3	0	6	0	7	5
	100	100	100	100	100	100

Source: Author's survey; economic questionnaire survey,

Note: Numbers replying for each site are as follows:

Grain 18, Teesport 10, Ardrossan 1, Kingsnorth 12, Heysham 28, Total 69.

Table 35 **Proportions of male/female and fulltime/parttime employees in the responding firms**

Site	% male, FT	% fem, FT	% male, PT	% male, PT
Grain	86	11	0.3	2.7
Ardrossan	50	17	33	0
Teesport	77	18	4	1
Kingsnorth	79	9	4	8
Heysham	88	7	2.5	2.5
All five	86	9	3	2

Source: Author's survey economic questionnaire survey
N=69

those of other investigations of economic restructuring which have commonly highlighted the growth of female employment and the rise of unskilled jobs (Cooke 1986). They are also at variance with the outcome of 'traditional' inner-urban waterfront revitalisation schemes. These tend to produce service and office jobs, particularly for female and part-time workers, bearing little relationship to the skills and aptitudes of earlier port-related employees (Church, 1988, 208; Edwards, 1988).

From these findings it is tempting to suggest that the form of revitalisation identified by the present study may have minimised the social stress and disruption generated by the original refinery closures. This view is also supported by the fact that, having established themselves at their new locations, the incoming firms have on average tended to expand. At the time of the survey the total employment of responding firms amounted to just over 1320, compared with only around 900 if the date that each firm set up at the sites is used as a base. Moreover, it will be remembered that the response rate for this survey was 73 percent and extrapolation suggests that the total number of jobs in all firms may have been as high as 1800. There is evidence therefore that incoming firms are creating some real job growth.

This interpretation, however, must be modified in the light

of other employment-related findings. The most obvious is that job numbers were relatively small compared to those lost directly through refinery closures. Table 36 indicates the numbers of jobs existing at responding firms at the time of the survey. Even when the total figure is extrapolated, as above the total number of jobs is no more than 50 per cent of all jobs originally lost from the eight refineries. Moreover, the survey's results demonstrate clearly that - as in other studies (Morgan and Sayer, 1981) - many of the 'new' jobs which appeared were merely transferred from other localities which therefore lost as the ex-refinery sites gained. Overall, a third of the firms investigated had relocated from earlier sites, and together these accounted for 575 jobs or 44 per cent of total employment in the responding firms. Moreover, such relocations frequently result in workers moving with their jobs and, given the fact that more than half the firms which moved travelled less than 40 miles, this is likely to have occurred in this instance. Against this background, while precise calculations are impossible at this distance in time, it may well be that the genuinely new employment created amounted to less than 1000.

On balance, therefore, the evidence suggests that the employment impact arising from the revitalisation movement should be viewed cautiously. On the one hand, the type of employment created appears to have been reasonably well

suited to the nature and skill levels of those originally made redundant. Yet, on the other hand, the revitalisation impetus was insufficient to match redundancy job for job; in reality many jobs were probably not available to redundant refinery workers because they were already occupied by employees relocating with firms; and any new jobs which were created would have been available to all jobseekers, not simply those formerly employed in oil refining. Given these caveats it is appropriate to note that, at the Grain site, the community survey investigation showed a significant level of concern about new employment. Almost 40 per cent of all respondents disagreed or strongly disagreed with the proposition that the three main developments at Grain - by Thamesport, Foster Yeomans and Medway Power - were good providers of jobs for local people.

Table 36 Numbers employed by responding firms at each site

Site	Grain	Ardro- ssan	Tees- Port	Kings- north	Hey- sham	All Five
No.	383	12	98 ¹	161	671	1325

Note ¹ The MTM/Hodgson products company did not reply to the original survey, this figure does not therefore include the 48 currently employed at that plant.

Source: Author's survey; economic questionnaire survey.

5.10 CONCLUSION

Many of the lessons to be learned from this investigation of current economic activity will be incorporated in Chapter 7, the primary aim of which is to model revitalisation processes. As a conclusion to this chapter, therefore, it is appropriate to confine the discussion to a selection of central findings identified by the analysis.

One of the striking results is that revitalisation is by no means a guaranteed process. Three sites studied had failed to attract any alternative uses, while a fourth had been occupied by only two small businesses. Recessional conditions have no doubt been partly responsible for this, but the failure to recover also signals that - perhaps in contrast to inner-urban revitalisation projects - there are inherent difficulties in regenerating such sites. These include their large size, in some instances a lack of appropriate infrastructure and geographical locations often on the economic periphery of the country. This last difficulty may be compounded by the proximity of other, smaller, areas which enjoy state-sponsored regeneration initiatives such as Enterprise Zone status.

Beyond this the evidence is that, where economic regeneration has begun, the firms involved have been sharply contrasted in terms of their size and with respect to their need for coastal zone locations. Thus, although large firms

in the study included MTM, a manufacturing concern with no need for a coastal location, most major enterprises appear to have good economic or operational reasons for locating in the coastal zone. The primary example is, of course, the Thamesport development. Small firms, meanwhile, may also have a genuine need for a coastal site, for example to provide port-related services or support for off-shore activity; but it is much more typical for the coast to be irrelevant to them, and for the primary attraction of the sites to be the availability of low-cost adequate space on standard industrial estates. Findings such as these indicate that revitalisation processes are evolving - at least partially - along pathways anticipated by Pinder and Husain (1988).

A further striking feature of the revitalisation process is its implications for the labour market. Because nearly all the incoming businesses were port and/or industrially based enterprises, their labour requirements were quite traditional. Male, full-time skilled and semi-skilled positions dominated, and there was little shift towards female employment and part-time work such as has frequently occurred elsewhere. Superficially this might be taken as a sign that revitalisation directly ameliorated the effects of refinery closures by providing jobs fitting the nature and aptitudes of redundant workers. In reality, however, the extent to which this is the case is highly questionable. The

primary reason for this is that, as has been shown, the number of genuinely new jobs created has not been large. This partly reflects the fact that most incoming businesses have not required large labour forces, but it has also been caused by the tendency of workers to move with the incoming firms from their earlier locations.

Lastly it is appropriate to note the propensity of revitalisation to re-kindle the local economy through economic linkages. Precise conclusions here are not possible due to the nature of the data, but the evidence is that a substantial minority of firms make at least half their purchases and sales in the local area. Although with the information available these relationships cannot be translated into job creation, it is evident that the linkages lost through oil industry restructuring have been at least partially replaced. Indeed, given the conclusion that the oil industry's local linkages are generally weak, it may be that revitalisation compensates well for this type of loss.

NOTES

1. Not all of this land had been occupied by the refinery structures, but Berry Wiggins (the refinery's old owners) had owned it.
2. The Foster Yeoman application for permanent consent was initially refused because of its road traffic implications, but was eventually granted on appeal to the Secretary of State (Kent County Council and Medway Ports Limited (pers. comms.)). See also Chapter 6.
3. This, it may be suggested, is because this option is comparatively easy to put into operation. Existing refinery buildings may be utilised as offices and workshops, and such development is generally quite cheap. It may also be that estate development was encouraged by the small business ethos created by the Conservative government. As Hart *et al.* (1993, 176) have observed, this ethos was developed because new and small firms were seen as a means of promoting enterprise and reducing unemployment.

CHAPTER 6

PLANNING, CONSULTATION AND THE REVITALISATION PROCESS

6.1 INTRODUCTION

Previous chapters have explored in detail the processes of decline and revitalisation, particularly with respect to their environmental and economic consequences. As was indicated at the outset, however, it is also important to relate the investigation to its planning context. Disinvestment and rejuvenation have been prominent features of the coastal zone and - at least among theoreticians - there is a widespread view that the fragility of this environment justifies extensive planning guidance and control. As Chapter 2 has indicated, this view finds its best expression in the argument for Integrated Coastal Zone Management (ICZM).

At this point, therefore, it is appropriate that attention should turn to the planning system and seek to examine a group of related questions. Given the potential for conflict in the coastal zone, how smoothly has the system operated? How powerful has the system been, particularly in relation to the interests of private capital engaged in the revitalisation process? Have planners established outcome preferences and, if so, to what extent has it proved possible to bring them to fruition? And, given the

observations in Chapter 2 concerning New Right attitudes to planning and recent reactions to them, what evidence is there of significant movement towards the principles of ICZM? To explore these issues this chapter focuses initially on the redesignation of derelict land; turns to the relationships between the planning system and revitalisation processes; and finally offers an interpretation of the findings. Because the major examples of revitalisation have occurred on the BP Isle of Grain site, a case study of planning developments at this location is naturally central to the chapter¹.

6.2 FUTURE USE DESIGNATION

The first major finding relevant to this theme is that the dominant reaction of local authorities was not to engage in detailed and possibly lengthy reappraisals of appropriate land use. Instead the typical reaction was to confirm within a short time continued designation for industrial uses. This was the case even when environmental factors might have been expected to produce more protracted consideration. For example, at the Isle of Grain and Kingsnorth, sites in close proximity to a major Site of Special Scientific Interest (SSSI), a candidate Special Protection Area and a Wetland of International Importance under the Ramsar Convention², steps were quickly taken to confirm industrial usage. Thus, in relation to the BP Grain site, the local authority viewpoint was that the primary requirement was to modify the Local

Plan for the Medway Towns to incorporate an explicit policy protecting the *status quo*:

"The former Isle of Grain site shall be developed primarily for general industrial use (Class B2) and warehousing (Class B8)."

(Rochester Upon Medway District Council, Draft Local Plan, 1990).

It may be suggested that this virtually automatic process of redesignation for industrial and commercial uses reflected various influences. Local authorities, for example, no doubt came under pressure from site owners keen to ensure that the potential value of derelict sites could be maximised. In a time of recession, there was also an expectation that local authorities would take every opportunity to promote economic development. And in the minds of many local authority officers, councillors and oil company executives, there was doubtless an in-built tendency to assume that no satisfactory outcome could be achieved by - at the most extreme - allowing a site to revert to a more natural state. Whatever the factors involved, however, it is clear that a major function of the planning authorities in the transition phase from dereliction to revitalisation was to project into the future attitudes to land use carried over from the past.

Equally striking, however, is the fact that this planning approach provoked virtually no opposition and debate in the areas affected by oil company disinvestment. From the survey of key actors it is apparent that community opposition to

the authorities' strategies did not materialise, and organisations and agencies concerned with conservation similarly failed to intervene in zoning decisions to a significant degree. This was despite the fact that by the mid-1980s the fragility and importance of coastal zone environments were recognised.

In seeking to explain the freedom enjoyed by the planning authorities in this respect, it is important to relate the discussion to the earlier findings concerning the social and economic impacts of refinery closures (Chapter 4). Shutdowns typically occurred in areas of weak economic impetus, and it is understandable that a widespread community reaction would be to welcome steps paving the way for the creation of alternative employment. Meanwhile for conservation groups, a significant feature of planning authority proposals was that they envisaged the reuse of land already devalued by industrialisation, and in no case did they suggest that additional parts of the coastal zone should be consumed. In these circumstances it is not difficult to imagine why redesignation for industrial and commercial functions was essentially uncontroversial. No additional threats to the coastal zone were proposed, and to many conservationists - rightly or wrongly - it probably appeared likely that replacement activities would if anything be less environmentally damaging than oil refining. Indeed, the approach of re-using already damaged coastal land for

development became one of the key points in Planning Policy Guidance 20 when that document was drafted in 1992 (Chapter 2).

Although the findings point strongly to the conclusion that industrial redesignation was a natural and largely unproblematic procedure for the planning system, two examples demonstrate that uniformity of experience should not be overemphasised. One of these relates to Ardrossan. Here the responses of key actors made it clear that the planning authority had stood back and taken a more wide-ranging appraisal of the problems and opportunities posed by oil company disinvestment. The result was the adoption of proposals to recycle derelict land for uses very different to past activities. In this case the view taken was that the:

"policy recognises that a major opportunity is represented by Ardrossan Harbour where the withdrawal of Shell UK offers an extensive waterfront location of real potential."

(Cunninghame District Council, Ardrossan, Saltcoats and Stevenson, Local Plan policy no. IND 2A, 1992)

Hence possible new uses for the site were thought to include:

"a mix of industrial/commercial, housing and leisure development."

(Cunninghame District Council, Ardrossan, Saltcoats and Stevenson, Local Plan policy no. IND 2A, 1992)

In this case, therefore, the preferred local authority strategy was to encourage a reorientation of land use,

creating a new environment akin to the mixed-use revitalisation that is so frequently associated with abandoned docklands. This example, however, is very much an isolated instance, and stems directly from the fact that the Ardrossan refinery was an atypical plant, both in terms of its small size and its location in a traditional port area. Both these features might well encourage a planning authority to consider redevelopment along the alternative lines proposed, and for these reasons it is arguable that the example should be seen as the exception proving the rule. In addition it is important to emphasise that it was an exception that did not engender planning conflict. Thus the proposal to reorient land use was as uncontentious as the continuation of the industrial designation at most other locations.

In contrast the second example, that of Esso Milford Haven, demonstrates that a dominantly uncontentious process may in some circumstances evolve to produce planning conflict. This is the only instance in which designation proposals have met with significant opposition, and therefore merits consideration at some length.

6.21 Designation conflict at Esso Milford Haven

As at other sites, the local planning authority opted to confirm the designation of the Esso site for industrial purposes. Indeed, because of its unique nature, the

authority went further than is normal by attempting to reserve it for strategic industry. This was on the advice of a consultants' report, the Tibbalds Colbourne Strategic Study (1988). Thus:

"It is the policy of the district council to reserve the site for strategic industrial development. Proposals for non-industrial uses or piecemeal redevelopment of the site will not be permitted."

(Preseli Pembrokeshire District Council Local Plan, 1994, Policy EC27)

This preference may well reflect the fact that the area is well-endowed with other redundant land which is suitable for relatively small developments and which, moreover, in several locations has Enterprise Zone status (Chapter 5).

It will be recalled, however, that the Esso site lies partially inside the Pembrokeshire National Park boundary, and it is in this connection that the above designation has generated conflict. In essence this has centred on the appropriate position of the National Park boundary, with two different camps arguing (1) for the total exclusion of the site from the National Park and (2) for a boundary adjustment which would place the redundant land wholly within the Park. In the former case, the expectation would be that revitalisation would eventually be permitted in line with the policy outlined above. In the latter instance the planning policy would be revoked since new industrialisation entirely within the Park would be deemed inappropriate.

Clearly, these alternative outcomes are highly polarised, and as a result it is perhaps not wholly surprising that the local planning system proved unable to mediate between the conflicting views. Consequently it has been necessary to take the boundary line issue to a public inquiry. This was held at the end of 1991 and, for reasons which will emerge below, it seems likely that the eventual outcome will be the site's exclusion from the Park.

The fact that a public inquiry has been held to resolve the dispute is, of course, a significant deviation from the general rule that continued industrial designation of redundant refinery land is not controversial. However, an equally important point highlighted by this example is that the compositions of the opposing factions in a dispute may not be those which one would expect at first sight. The outline given above might well suggest that confrontation arose between, on the one hand, the planning authority and the site owners, Esso , and, on the other hand, an alliance of conservation groups. The latter would be expected to include the National Park Authority and what is now known as the Countryside Council for Wales (CCW)³.

In reality, however, the structure of the conflict has been fundamentally different, primarily because of the attitudes struck by the National Park Authority. First, this has proposed that the parts of the site

"lying within the National Park shall be reserved solely for industrial uses requiring convenient deepwater access"

(National Park Authority Draft Local Plan, 1994).

Second, it has advocated almost complete removal⁴ of the site from the Park on the grounds that it is inappropriate to include current dereliction, and possible future industrial regeneration, in an area of outstanding landscape value. And, third, it has rejected the Countryside Council for Wales' argument that the site could acquire:

"some general symbolic value illustrating how even a most heavily industrialised landscape could be restored to conservation value" .

(Pembrokeshire Coast National Park Authority Officer, 1992, pers. comm).

Conflict, therefore, has not simply been between conservation groups and a cluster of planning/economic interests. Instead the latter have been greatly strengthened by their alliance with a National Park Authority taking what it believes to be a realistic stance on how it should deal with large-scale dereliction. This, in its turn, has greatly weakened the position of conservationists led by the CCW, placing them in an isolated and relatively powerless position. The importance of this isolation has been graphically demonstrated by events at the public inquiry. Following cross-examination by Esso's QC, the CCW entered into behind-the-scenes negotiations with Esso and agreed a compromise solution (National Park Authority Officer, 1992,

pers.comm). Under this the CCW abandoned its major demand, that the whole site should become part of the National Park, and proposed instead that only a small area of cliff-top land should retain this status, as in the National Park's original proposal.

The current widespread expectation that the public inquiry will recommend almost complete removal of the site from the Park is based on this retreat under pressure by the CCW. If the decision does indeed go in this direction there is a danger that in future years the change will be seen as a rational planning decision arising from the proper application of the public inquiry system (Rydin, 1993). Indeed the thoroughness with which the inquiry was conducted may well encourage this view:

"... everybody felt they had had their say. Members of the public, commercial groups, interest groups and national pressure groups - right up to ... refining companies. Everybody had a fair crack of the whip. And some had more than a fair crack of the whip!"

(Preseli Pembrokeshire District Council Local Planning Officer, 1994, pers. comm.)

As has been shown, however, this interpretation is seriously open to question. In reality conflict involved two imbalanced interest groups and, although the details of the "reported behind-the-scenes negotiations" are of course unknown, there is a strong suggestion that retreat by the conservation lobby arose from persuasion exerted by the QC

for the conflict's major vested interest - the site owners.

6.3 PLANNING VERSUS CAPITAL? PLANNING / REVITALISATION RELATIONSHIPS EXPLORED

Significant though it is, future-use designation is only the initial step in the planning process. Once this step has been taken there remain many opportunities for conflict or collaboration between the planning system and financial interests pursuing specific revitalisation proposals. It is at this stage that the interface between planners, developers and other interest groups is likely to sharpen rapidly, placing the onus on the planning system to lead towards an optimum outcome. It is therefore important that this phase is examined in some depth.

When this examination is conducted for the industrial estates⁵ at Heysham and Kingsnorth, the results are as uncontentious as those relating to land-use designation. Businesses proposing to move to these prepared sites were widely perceived by interest groups to be uncontroversial, and therefore found themselves entering an essentially welcoming environment. This was the case even though, as Chapter 3 has stressed, the eventual environmental consequences of estate-generated traffic may be of considerable significance. This finding, however, is based on only one of the two forms of revitalisation identified in Chapter 5, and it is important that it is compared with results arising from regeneration based on corporate

investment. What have been the planning/capital relationships associated with this pathway which, with its emphasis on large projects, has an obvious capacity for conflict? The following section explores this question through a case study of developments at the BP Isle of Grain site which, it will be recalled, provides a concentrated example of corporate investment in the coastal zone.

6.31 After BP: Planning and Revitalisation on the Isle of Grain

In common with most sites, when the BP Isle of Grain land was zoned for general industrial use in the local plan there was no controversy and therefore no need for a strong planning response. In the words of a planning authority representative:

"At the time of the inquiry for the local plan there was very little debate about the site. Agencies did not make any comments on the local plan process - they were quite happy with it. British Gas [the major site owners at the time] were also happy with the local plan designation."

(Rochester Upon Medway District Council, Local Planning Officer, 1994, pers. comm.)

What may also be noted is that, although planners had no specific strategy for the site, they nonetheless saw its possible redevelopment in the context of a broader environmental setting deserving protection. Thus:

"the [surrounding] area was a no go area as far as protected status went and the coastal environment [of the old BP site] was already ruined so developments would not have made the situation any

worse than it was before."

(Planning Officer, Rochester Upon Medway District Council, 1994, pers. comm.)

Further, although most of the planning processes referred to in this section took place before 1993, that year marked the publication of the Thames Corridor Initiative (Department of the Environment, 1993). This initiative attempts to take a strategic approach to the economic regeneration of a large area to the east of London, and its geographical scope includes the Isle of Grain. Although predominantly an economic revitalisation initiative, conservation bodies are now becoming involved and any new planning in the Grain area will thus take place under the influence of this increasingly comprehensive and holistic perspective. In a similar vein, an Estuary Management Plan for the Medway has been proposed (English Nature Conservation Officer, 1994, pers. comm.) This should also encourage a more strategic view of the area. Already, a Medway Industrial Users Groups has been set up to represent the interests of industrial developers around the estuary (British Gas Environmental Planner, 1994, pers. comm.)

Despite these recent plan-based initiatives however, there are clear indications that market forces have been the dominant factor in the redevelopment of the Grain site so far. For example, planners had little involvement in the very first stage of redevelopment, the sale of parcels of

land by BP to British Gas in 1985 and then to Thames Estuary Terminals (the original Thamesport developers) in 1988. This was highlighted by the District Council Economic Development Officer:

"Well, the council attempted to take the initiative by talking to BP and then when BP sold the land on to British Gas and to Thames Estuary Terminals, talking to them. But the initiative was really with the land owners, and so the council influenced hopefully, rather than actually taking the initiative."

And,

"I don't think it was a question of long-term planning, and I don't think that in the Local Authority we had much say in it."

(Economic Development Officer, Rochester Upon Medway District Council, 1994 pers. comm.)

In the same vein:

"The area has been recognised as an area for employment in the local plan, but the actual activities that occurred there depended on the private sector. Planning has been undertaken by land-owners rather than the council, the council just gave the appropriate permissions."

(Rochester Upon Medway District Council, Local Planning Authority, 1994, pers. comm.)

Beyond this there is evidence that planners had difficulty in using their development control functions in order to achieve their preferred outcomes, to the extent that they could be overruled by stronger pro-development forces. This is illustrated partly by the example of the Foster Yeoman aggregate terminal which was originally sited at Grain with temporary planning permission to serve the Channel Tunnel project (Chapter 5). Because in the late 1980s and early

1990s this terminal generated around 200 lorry movements a day, when the company applied to make their permission permanent the local authority refused on the grounds of the effect on road traffic levels. However, Foster Yeoman then appealed and ultimately had the local decision overturned by the Secretary of State. Admittedly, in granting permission, the transport secretary also imposed a restriction on the numbers of lorry movements arising from Foster Yeoman operations. But the number was set at 400 a day, allowing a considerable increase on existing traffic flows (Kent County Council Senior Engineer, 1994, pers. comm). The perceived strength of the business community is also revealed by the attitudes of a range of developers, who commonly implied that planning permission was almost a given right so far as their respective projects were concerned. Thus, when the manager of Medway Power was asked why he thought his company had been given permission to build a CCGT power plant at Grain, he replied that:

"the company asked for it and did the things it was required to do."

When British Gas were asked the same question, a representative replied:

"There were no valid reasons for refusal. They can't do anything else if you meet the requirements. There are no valid grounds against you ... [And] down there [Kent] re-use of old land [and] generation of employment is important so these were factors in its favour."

(British Gas, Environmental Planner, 1994, pers.comm).

The idea that there could be no significant, *justified* objections to development proposals was stated even more forcefully by a Thamesport manager:

"Objections came from environmentalists over the fact that we were going to despoil a piece of countryside which quite frankly we were able to show was a complete and utter load of tosh."

And:

"Really the objections [to increased road traffic levels] were lodged by people who live along the road because they foresaw that we were about to increase the traffic markedly. We were able to show that we were really not going to put any more traffic on the road than was there when the refinery was in full operation."

(Thamesport manager, 1994, pers. comm.)

What may be added is that the Grain example also demonstrates how, once planning permission has been gained by a developer, the planning authority may be in a weak position to ensure that a locality achieves the anticipated gains. This is well illustrated by the case of British Gas which, 7 years after its first planning application, has yet to begin construction of its LNG terminal (Chapter 5). Although the company has had to renew its outline planning consent this was in effect a legal formality, and the lack of action is a concern for the local Economic Development Officer:

"I feel that we could have done more with that, with British Gas. We've tried to persuade them once or twice to release some chunks of the land, but for a number of reasons that hasn't happened".

(Economic Development Officer, Rochester Upon Medway District Council, 1994 pers. comm.)

From these examples it is evident that the local planning authorities appear to have had relatively little control over the types of individual development that have occurred at Grain. This recalls an observation by Rydin (1993, 337), regarding UK planning generally, that

"Development control is a negative, reactive policy tool, responding to development pressures emanating from elsewhere in the private and public sectors."

As will be shown below, however, despite this lack of power to control initial events, there is evidence that the planning system has performed at Grain a mediating role that has enabled it to modify revitalisation projects in various ways. These modifications have been achieved primarily through the administrative procedures of consultation, strengthened by the implementation of EC-based Environmental Impact Assessment legislation. Together, these influences paved the way for planning action which imposed additional significant conditions on the various applications.

6.32 Consultation processes

In the case of Medway Power 48 conditions were attached to the planning permission ultimately granted. Although these were formally imposed by the Department of Energy, the body at that time ultimately responsible for approving power stations, from interviews with key actors it was clear that 33 of them arose from consultation processes conducted at

the local level (tables 37 to 40). These processes were coordinated by the local district planning authority which, in addition to attempting to ameliorate its own concerns, became the focus for consultation between pressure groups, statutory agencies and the developers. Against this background, several features of the consultation process, and its outcomes, are noteworthy.

First, a factor which helped to extend the consultation process - at least as far as environmental concerns were involved - was the project's Environmental Impact Assessment undertaken in accordance with European law. As chapter 2 has indicated, since 1988 developers of certain types of large projects have been required to undertake an environmental assessment and produce a statement of the expected environmental impacts to be considered at the planning stage. This environmental statement has to be sent to a number of statutory consultees, as well as to the local planning authority. Additionally, the consultees may be asked to contribute their ideas regarding the types and extent of environmental impact a development is likely to cause.

With the Medway Power development, the Environmental Assessment process took place in 1992 and resulted in several additional measures. So, for example, the Kent Trust for Nature Conservation and English Nature were both

Table 37

The Medway Power project: conditions to be effected prior to construction

- * Rochester upon Medway City Council must be notified at least four weeks in advance of any work so that an archaeological investigation can be made.
- * a contamination survey must be published and considered by the Department of Energy, Rochester upon Medway City Council and HMIP before any works are carried out.
- * a report must be submitted and approved by Department of Energy, MAFF and Rochester Upon Medway City Council, regarding the effect of the heated water discharge in relation to other existing discharges before work commences.
- * further studies of the combined effects of atmospheric emissions from existing and proposed plants in Thames Basin must be approved by Rochester upon Medway City Council and Department of Energy prior to the commencement of works.

Source: Rochester Upon Medway City Council, 1991

**Table 38 The Medway Power project: Conditions to
 minimise disruption from construction
 processes**

<p>Department of Energy and Rochester upon Medway City Council to approve the following:</p> <ul style="list-style-type: none">* dust suppression techniques* noise suppression techniques* times and hours of piling works (to be between April-Oct)* any extension of times of construction work (otherwise only within hours of 0700-1900)* scheme of operation relating to sources, storage and transport of building materials and plant* wheel washing facilities* parking provision for construction workers
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Source: Rochester Upon Medway City Council, 1991

Table 39

**The Medway Power project: conditions to
minimise disruption from operational
processes**

* Need for Section 106 Agreement regarding financial contribution towards road improvements for A228

Department of Energy and Rochester upon Medway City Council to approve the following:

- * noise levels not to be exceeded during operation
- * any proposed changes in the use of natural gas with low Sulphur content
- * details of foul and surface water drainage
- * scheme for the disposal of excavated material from river
- * siting of heated water discharge (also in conjunction with MAFF)
- * scheme for disposal of screenings from water abstraction system
- * details of mitigating measures to reduce entrainment of marine animals in water intake system
- * details of chemicals handling and storage methods
- * details of low NOX burners to be installed and continued monitoring of NOX levels (also in conjunction with HMIP)
- * details of all sound power levels
- * levels of contaminants to be discharged into Medway (also in conjunction with HMIP, NRA); discharge must be continuously monitored.

Source:

Rochester Upon Medway City Council, 1991

Table 40

The Medway Power project: conditions relating to the physical structure and appearance of the plant

- * car parking facilities must accord with KCC standards
- * turning facilities shall be provided
- * no surface water to discharge onto public highway
- * all temporary structures to be removed within 12 months

Department of Energy and Rochester upon Medway City Council to approve the following:

- * detailed plans of all buildings and structures
- * detailed plans of water intake and discharge buildings and structures
- * proposals for landscaped screening of development
- * details of any external lighting or floodlighting
- * details of surfacing and draining of all parking areas
- * details of scheme of fencing/boundary treatment

Source: Rochester Upon Medway City Council, 1991

concerned that certain ecological information was lacking in the Environmental Statement. Medway Power responded to these worries by providing extra information, for example on the size of the water discharge pipeline and structure; its likely effects on the potential Special Protection Area; and the impacts of the water intake and heated water discharge and processes. Medway Power was able to reassure the conservation bodies on some of these issues while further mitigation measures were proposed to ameliorate others. These included steps to prevent the entrainment of marine animals in the water intake mechanism. These measures were then incorporated into some of the 33 initial conditions (Table 39).

Second, in seeking to contain the impact of this major development, the planning authority recognised the importance of potential environmental damage in the short term. Thus representations to the authority from the RSPB, English Nature and the Kent Trust for Nature Conservation (KTNC) led to constraints on the timing of noisy construction work. This was an attempt to limit the project's interference with breeding birds. Similarly the planners requested that details of dust and noise suppression measures to be implemented during the construction period should be explained and agreed upon before any work was begun (Table 37). These types of condition, ie. ones which aim to ameliorate the short-term

but intensive disruption caused by construction activities, are a common element of planning permissions.

Thirdly, however, consultation also produced significant permanent restrictions on the station's impact. For example, input from the National Rivers Authority resulted in the imposition of conditions to limit the heating effects of cooling water discharges into the Medway and - because of the danger of accidental spillage - to control the storage of chemicals at the site (Table 39). In the case of air pollution, a similar major requirement was that Medway Power should monitor emissions continually once the plant was operating in order to ensure that predicted levels were correct. This is a particularly interesting condition because Government policy has previously been that:

"planning conditions should not be used to deal with problems that are the subject of controls under separate environmental legislation"

(Bell and Ball, 1994, p215).

And it could be argued that Her Majesty's Inspectorate of Pollution (HMIP) would be the expected body to deal with such issues, under the Environmental Protection Act 1990.

Fourthly, two conditions to be effected before any work on the development began involved the need for reports to assess the impact of both aqueous discharges and atmospheric emissions in terms of the combined effects with other

developments in the area (Table 37). The concern with the overall air quality in the region arose in part from work by Kent County Council which was responsible for developing a computer model designed to assess the likely air quality impacts of new developments throughout the county (Technica, 1993)⁶.

Lastly, from many of the conditions imposed it is evident that the consultation process achieved the involvement of a wide range of organisations. As might be anticipated, these included independent sectional interests acting as environmental pressure groups, such as the RSPB and the KTNC. But what is also apparent is that significant modifications to the project were brought about by various official bodies. This arose primarily because of the statutory duty of local planning authorities to request advice on planning applications from such organisations. However, as has been shown, this duty was strengthened in the Medway Power case because of the use of Environmental Impact Assessment. Thus the case highlights the opportunities present in the UK planning system for official bodies to function as pressure groups pursuing their individual sectional interests; and it demonstrates that productive consultation is by no means limited to a dialogue between the planning system and independent groups in the community or society at large.

While these conclusions are based on the example of Medway Power, they are also supported by evidence relating to the influence of consultation on the Thamesport and British Gas LNG projects. In the case of the LNG proposal, both the KTNC and the Nature Conservancy Council (now English Nature) raised concerns regarding the lack of attention to wildlife in the project's original Environmental Statement which was published in 1988⁷. This led British Gas to instigate an additional ecological survey, as a result of which the company designated, and agreed to manage, five wildlife reserves on the site (English Nature, 1992; British Gas Environmental Planner, 1994, pers comm). Moreover, British Gas also undertook a study of the likely environmental impacts that the proposed LNG terminal, and associated vaporizers, would have on the Medway estuary. They were not required to do this under any planning legislation (British Gas Environmental Planner, 1994, pers. comm.), but chose to do so for their own information and found that the survey enabled the company to confirm the design of the cooled seawater outfall. This was necessary to ensure that environmental effects would be minimal and acceptable (British Gas, 1991). Indeed, the general willingness of British Gas to discuss and accept advice on the environmental impacts of the proposed LNG terminal appears to have been acknowledged by English Nature. The latter organisation wrote, in a letter to the city council planners that:

"We appreciate the applicant's commitment to continuing dialogue and consultation as the project progresses"

(English Nature, 1992).

With respect to Thamesport, RSPB concerns over the effect of the disposal of long-term river dredgings on the adjacent SSSI led to a condition in the planning permission which specified that:

"All surplus excavated material dredged from the river [is] to be disposed of off site, shall only be transported by river and shall be disposed of in accordance with a scheme to be agreed in writing with the Local Planning Authority."

(Rochester Upon Medway City Council, 1988).

This discussion strongly suggests that consultation procedures played a discernable role in modifying the likely impacts of proposed major investments at Grain. However, it should be noted that the initial approval for the LNG terminal and the Thamesport approval did not contain a substantial number of conditions relating to the amelioration of environmental pressures. Indeed, although the above condition was placed because of RSPB concerns, a number of other issues that the conservation organisation raised about the port's effects on the SSSI and proposed Special Protection Area were not addressed. And, despite the willingness of British Gas to consult with environmental bodies, most of these discussions came after the initial planning approval had been made in 1988, and many were centred around the company's second application - for a

renewal of the original consent - in 1992.

It appears then that the planning procedures became more able to incorporate environmental issues as time went on, and indeed that there was a strong move towards more environmentally conscious planning in the very short period of time between 1988 and the early 1990s. This may have been simply because planning authorities and conservation bodies were more familiar with the idea of Environmental Assessment by this time. But what may also be noted is that the period in question also corresponds with the shift away from the extreme New Right market-led attitude which infected planning in the 1980s, back to one in which planning regained some of its lost influence.

Overall, then, although the planning authority could not aspire to have development preferences and impose them on the site, once the market had created revitalisation proposals significant adjustments to developers' projects certainly proved possible. As an officer of Medway Council summarised the situation:

"[consultative procedures] didn't influence the overall principle of development on the site, [but they] certainly influenced the finer points of development."

(Rochester Upon Medway City Council, Local Planning Officer, 1994, pers. comm.)

Moreover, consultation also took place regarding issues associated with the river itself, even though by definition these were outside the town and country planning system. As has already been indicated, for example, British Gas undertook hydrological studies into the likely effects of its proposed cold water discharge. In addition, a manager of the Sheerness Port Authority reported that consultations between the port authority and the various Isle of Grain developers had been extensive:

"Yes...there was a considerable amount of work done. There was (*sic*) all sorts of studies, consultants were in here by the bucketful, doing various studies on the river, the depth of water, the traffic movement, incident/risk assessment...a lot of studies done, significant studies done".

(Sheerness Port Authority Ltd., Deputy Harbour Master, 1994, pers. comm).

6.33 Inter-authority conflict

The redevelopment of BP's Grain site also provides insights into an important potential source of conflict in the planning system identified by Rydin (1993, 145), namely the scope for tension inherent in England and Wales' two-tier system of local Government. In Rydin's view, conflict may arise

"not only from the existence of two tiers with organisational boundaries, but also due to different professional and political judgements about policy and priorities".

She also notes that intraorganisational and interorganisational communications are essential for resolving any such conflict.

At Grain the outstanding example of discord between the District and County Council levels related to the Thamesport development and its effects on road traffic levels. Despite the comments by a Thamesport representative quoted above, as Chapter 3 has demonstrated the traffic-generating potential of this project has long been a concern. At an early stage the Highway Surveyor for Kent objected to Thamesport's proposals for a new container terminal on the basis that the

"approach roads serving the site are unsuitable, in terms of alignment, width and structural strength, to cope with the high volume of heavy goods vehicles likely to be generated by the proposals."

(Kent County Council, 1988a, item D13).

Despite this, official support for the proposal came from Rochester Upon Medway City Council, the County Planning Officer and the head of Economic Development, all of whom considered that the economic benefits of the port would outweigh the environmental costs.

The County Highways Department, meanwhile, felt that the development should only be allowed to go ahead if Thamesport provided £13 million towards the upgrading of the A228 road. Thamesport flatly refused to pay such a high sum, and eventually - in a joint members meeting of District and County councillors - the proposal was given permission with the condition that the developers provided just £2.5 million towards the cost of road improvements. A report of this

meeting (Kent County Council, 1988b, Item F1) indicates that county members certainly supported their Officers by stressing the Highways Department's concerns. But although the District councillors accepted this, they were clearly still prepared to support the proposals in view of what they saw as the overriding benefits to be gained from the development. Eventually, faced with this inflexibility, the County councillors agreed to withdraw the direction of refusal which the Highways Department wished to impose. Conflict resolution, therefore, was essentially achieved through a process of political confrontation which set aside the professional advice of a senior group of county-level Officers. The "severe reservations from officers in the County Council" did not sway a decision-making process dominated by local political considerations (KCC Highways Dept, 1994, pers. comm). This aptly illustrates Rydin's warning that inadequate planning gain agreements may be made by local authorities because of their concern to secure new development.

6.34 Local perceptions and outcome assessment

While the study of planning processes is important, it is equally necessary to recognise that how these processes are judged will in the long run be heavily dependent on their outcomes. When assessing these outcomes external perceptions, such as those of the researcher, can be valuable, but they will not necessarily represent local

views accurately. These local views are of great importance since it is local actors and communities who must live with the outcomes of planning processes. Consequently, to end this Grain case study, it is appropriate to approach this topic through the eyes of those directly affected by change.

Given that the developers have managed to obtain the planning permissions that they required, it may be assumed that they are satisfied with the planning process - it has served them well. Further, they appear to believe that the planning process has included full and extensive discussion with all interested parties. For example, when asked whether he felt that consultation procedures for the Medway Power development had been adequate, the project manager replied:

"Yes, as far as I know, these were adequate. Everything was voiced openly"

(Project Manager, Medway Power, 1994, pers. comm).

Similarly, when asked the same question, a Thamesport manager replied:

"As far as I'm concerned, we would always say that everybody had their full say and it was adequate"

(Thamesport manager, 1994, pers. comm).

Similarly, the Sheerness Port Authority Ltd., a major financial beneficiary of the Thamesport and Foster Yeoman developments, and potentially of the LNG terminal, is

satisfied simply because these developments are seen as providing relatively secure income for the port:

"We'd like some more [new developments] but...apart from that, yes very satisfied. The infrastructure [of Thamesport] is marvellous, and that's from a port authority point of view...to be honest, we wouldn't worry if they ceased trading tomorrow because the facilities are so superb that someone would walk in and take it over."

(Sheerness Port Authority, Deputy Harbour Master, 1994, pers. comm).

Echoing the idea that the redevelopment so far has been beneficial, when asked 'Is the Economic Development Unit currently satisfied with the new developments?' the Economic Development Officer of the District Council replied:

"I think the port development is super in the sense that it provides something we did not have. It provides a container terminal and it is providing jobs, and it has been built in a very cost efficient, cost effective way. So it is likely to be, therefore, a very cost effective port, which is obviously to the advantage of the area."

(Economic Development Officer, Rochester Upon Medway District Council, 1994 pers. comm).

Despite such comments, however, it is equally evident that these key actors in the planning system also harboured significant reservations about outcomes. To quote the Economic development Officer once more:

"To the extent that British Gas' land has tended to just sit there and little or nothing has happened on it, and it's large chunk of land, then no; not terribly happy,"

(Economic Development Officer, Rochester Upon

Medway District Council, 1994 pers. comm.)

Similarly a local planning officer questioned the employment benefit of the developments:

"The numbers employed are marginal compared to before. They have brought some employment in, but often the employment is not of immediate benefit to Grain village"

(Rochester Upon Medway District Council, Local Planning Officer, 1994, pers. comm.)

As will later become apparent, this view echoes that of the local communities themselves when asked about their perceptions of the employment benefits of the Grain developments.

In addition, despite the general views of developers, there is substantial evidence that Thamesport's operators are disgruntled by lack of progress with respect to road improvements. Although in reality their contribution was inadequate and work has been delayed because the county council has been unable to obtain the necessary additional money from Central Government, in commercial quarters the assumption is that the planning system has seriously dragged its feet:

"We've had to stump up £2.5 million for non-existent road improvements. They've been sitting on our money for four years."

(Thamesport manager, 1994, pers. comm).

And, over the same issue, an analysis of a wide range of

interest groups reveals that awareness of local benefits is sharply juxtaposed with one overriding reservation: traffic congestion (Table 41). This, moreover, is re-echoed when community attitudes to development are examined. Only half of the Grain community survey respondents believed that the existing developments provided significant numbers of local jobs, yet over 90 per cent were unhappy about the scale of HGV movements on the A228. Thus there is now disquiet on this issue on all sides - the Highways Department, who need to build a better road; the developers, who have provided funds but do not yet have the benefit of a better road; and the local people, who have to live close to a busy, dangerous road. So great has been the concern among the community that 1994 witnessed protest demonstrations at accident blackspots, (*Medway News*, 04/03/94, p5).

Similarly, the survey results indicate that the community tends to value the environment over the creation of new jobs and investment. For example, when asked how much environmental decline they would be prepared to accept in order to see new employment and investment created on the old refinery site, 52 per cent replied "absolutely no decline"; 35 per cent "a small decline"; and only 4 per cent were prepared to see a large decline⁸. Also, when asked what sort of development local residents would most like to see on the large quantity of refinery land which is still derelict, i.e. the land owned by British Gas but not yet

Table 41

Main benefits and problems for the local area arising from the developments at Grain as perceived by representatives of organisations, Feb/March 1994.

Organisat- ion	Main Benefits	Main Problems
Medway Power	UK need for industries like power generation	Road traffic
Thames- Port	Benefits of port to wider area, some employment, contributions to road	
British Gas	Employment (esp. in construction), redevelopment of land (appearance), income generation	Reconciling development on major estuary.
District Council planner	Marginal employment, road contributions, redevelopment of land (appearance)	Road traffic
Port Authority	Jobs for locals income for port authority	Extra shipping to control - possible effects on SSSI, pollution, road traffic.
County Council Highways Officer	Job creation road contributions	Road traffic
Economic Dev. Officer	Benefits of port to local area, indirect and direct job creation	Road traffic, until road built.
English Nature		Impact on estuary

Source: Author's survey; semi-structured interviews.

developed, the most popular options were for it to be managed for nature conservation, recreation/tourism or light industry. Development for heavy industry, in contrast, was particularly unpopular (Table 42).

To an extent, community-based results such as these naturally reflect the prevalence of the NIMBY culture. Yet they are also indicative of widespread concern produced by the consequences of revitalisation. In addition, key actors' responses demonstrate that significant reservations are held within the planning community; and while many of the conservationists concerns have been met through the consultation process, clearly these can only be seen as limiting the damage that large developments will inevitably produce in an area of such high ecological value. In combination, these views strongly suggest that - at least for those living in and concerned for this locality - planning has produced a suboptimal outcome. Regeneration has occurred, but at a price that is readily identified in almost all quarters.

6.4 CONCLUSION

From this exploration of the relationships between planning and development, it is evident that the planning system's strongest influence has been achieved at two quite separate points in the revitalisation process. At a very early stage, the planners' widely held belief that this form of derelict

Table 42 Community's desired uses for remaining derelict land at Grain

Per cent replying, n=136

Use Options	Would like very much	Would like a little	Would like 'not at all'
Port-related industry	11	40	37
Heavy Industry	7	20	61
Light Industry	31	41	17
Recreation/ tourism	33	40	17
Nature Conservation	40	42	8
Left as it is	5	16	66
Other	14	7	28

Source: Author's community survey questionnaire.

land is best recycled for further industrial and commercial uses received wide acceptance. Only at Milford Haven, where local circumstances were hardly typical, did the land-use designation issue produce controversy. Much later in the process, on the evidence derived from BP's former Isle of Grain site, it can be concluded that the planning system was quite frequently effective in modifying development proposals, especially in the most recent cases. In general, the result of this was to ameliorate the environmental impact of investments.

Conversely, however, it is equally clear that the planning system had little influence over the precise character of revitalisation projects, especially with respect to corporate investment initiatives. Developers' expectations that projects would be approved were well founded, and in no case was opposition from within the planning system instrumental in achieving fundamental changes in investors' plans. This partly reflected the attitude of central government to the appropriate role of planning, as Foster Yeomans' successful appeal to the Secretary of State demonstrated. But it was also a consequence of the planning system's capacity for internal conflict, as revealed by the dispute over Thamesport between politicians and planners at the County and District levels.

While these are revealing observations on the operation of

the planning system, they must also be related to the ICZM issue raised in the introduction to this chapter. In addition to shedding light on the practicalities of planning, to what extent do the processes observed represent movement towards the ICZM ideal? In turning to this question it is appropriate to review briefly the nature of ICZM as set out earlier in this thesis.

In Chapter 2 it was argued that ICZM policies entail approaches that are flexible, yet at the same time possess a long-term strategic thrust. Also intrinsic is the notion that co-ordination should be central to these policies, between different sectoral interests, between different levels of government and between different disciplines. In its turn, this co-ordination is considered necessary in order to achieve integrated planning which balances the interests of the various facets of the ecosystem with those of social and economic development in the coastal zone. This balancing process should take into account the interests of land, sea and air, and should also allow scope for public involvement. And, in order to operationalise the planned guidance of these interrelationships, there is a strong body of opinion that systems theory can be a valuable framework for effective management.

Reviewing the evidence presented above, it is clear that at least *some* elements of a strategic systems-based approach

can be identified. For example, although no development has yet occurred at Milford Haven, the Tibbalds Colbourne Strategic Study was influential in committing both the District Council and the National Park Authority to site preservation for strategic industrial uses. Further, the National Park boundary review can be interpreted as a strategic attempt to achieve a solution to the long-term problem of balancing economic and environmental / landscape interests. Since this involved a public inquiry, a major opportunity was also created for consultation between interested parties.

Outside the public inquiry system, but still significantly, the evidence from Grain on consultation procedures is once again relevant. Consultation structured by the planning system allowed a range of sectional interests - both independent pressure groups and official organisations - to impose on developers modifications designed to protect the environment in various ways. And in a number of respects there are signs that planners with responsibilities in and around Grain adopted stances with strategic and integrative overtones. This, for example, is indicated by recognition of opportunities to protect surrounding SSSIs by concentrating growth on the "ruined" BP site. It is also evident in the view that proposed air pollution should not be assessed in isolation but in the context of cumulative pollution in the area as a whole. And, in employing a model to achieve this,

the County Council took a significant step towards demonstrating the benefits of a systems approach. Additionally, there have been a number of recent measures such as the Thames Corridor Initiative and a proposed Medway Estuary Plan which should ensure a more comprehensive, holistic perspective in any future plans at the site.

In other respects, however, it is clear that the planning practices observed have fallen well short of the ICZM target. One concern is that, even where approaches are reminiscent of those anticipated by ICZM, there is no guarantee that they are sufficiently well established to become permanent and develop further. This problem, for example, has been highlighted by English Nature. While commending progress with air pollution assessment in the Medway area, one respondent from this organisation signalled an obvious concern that one swallow does not make a summer:

"three other power station applications are in the pipeline, plus other developments. The question is whether these are given approval in an integrated way."

(English Nature, Conservation Officer, 1994, pers. comm).

Similarly, despite the third planning condition listed in Table 37, the same officer, and a National Rivers Authority representative, argued that there was no sign that progress with cumulative air pollution assessment would be paralleled by work on cumulative water pollution in the Medway. And the

English Nature officer also indicated a continuing concern that administrative structures will remain a substantial obstacle to effective co-ordination:

"The Medway Estuary is divided between four borough areas and the county council and the Medway ports authority so there is a worry that all will be unco-ordinated."

(English Nature, Conservation Officer, 1994, pers. comm).

Further evidence illustrating the shortfall between current practices and ICZM ideals is provided by the 'solution' adopted to Thamesport's traffic problems. This revealed conflict rather than co-ordination in the planning system, and was essentially a political contrivance which went against strongly held professional planning views. These were based on an analytical approach of the type strongly recommended by advocates of ICZM, an approach which had clearly signalled that changes in one element of the system (the BP site) would produce undesirable environmental and safety consequences elsewhere. In retrospect it is widely accepted that this has proved to be the case, as Table 41 and the reported community responses demonstrate all too clearly. Moreover, while the resultant problems are in theory resolvable by further planning action, progress is prevented by a mismatch between local needs and the government's capital expenditure policy.

This discussion has suggested that the planning system is

effective in preparing the way for revitalisation through the land-use redesignation process and is also able to modify major investment projects to a significant degree. Conversely, however, the system's ability to prevent developments considered undesirable has been weak and, despite some evidence of movement towards the principles of ICZM, the latter's ideals have by no means been realised. Admittedly, to a very great extent these conclusions arise from experience at only a single site, BP Isle of Grain. Yet they are consistent with wider commentaries on the British planning system (Rydin, 1993, pp 335-366) and, at the very least, they provide an initial interpretation which may be tested if large-scale revitalisation spreads to other sites.

NOTES

- 1 For a more extensive analysis of planning processes at the BP Isle of Grain site see Pinder and Harcombe (1995).
- 2 Special Protection Areas have to be designated to protect the habitats of listed rare or vulnerable species of birds under the EC Wild Birds Directive 79/409. The Ramsar Convention imposes duties on its signatories (including the UK) to designate and protect wetlands considered to be of international importance.
- 3 The Countryside Council for Wales (CCW) is the result of the merger of the Nature Conservancy Council for Wales and the Countryside Commission for Wales under the Environmental Protection Act, 1990.
- 4 The National Park Authority's position was that only the narrow stretch of land immediately adjacent to the cliff edge should be retained with national park status.
- 5 This refers only to businesses located within the three industrial estates. Individually located businesses, such as SOLREC (the solvent recovery plant) are therefore excluded from the discussion.
- 6 However, in 1979, Cheshire County Council was criticised by central Government for taking a similar holistic approach to air quality standards (Miller and Garside, 1991). In this case, Cheshire County Council had wanted to include policies in their structure plan which would require planners to take account of any resulting addition to existing concentrations of air pollution when issuing consents.
- 7 British Gas applied for outline planning permission in 1988, and under current regulations, they had to re-apply for a renewal of the consent four years later.
- 8 The remaining 9 per cent of respondents were uncertain. Further evidence in a similar vein comes from responses to the statement that "The creation of jobs in the Grain area is more important than the preservation of the environment". Only 6 per cent strongly agreed with this, a further 24 per cent agreed, 26 per cent were neutral while 21 and 19 per cent respectively disagreed and strongly disagreed.

CHAPTER 7

DECLINE AND REVITALISATION IN THE COASTAL ZONE:

A MODEL-BASED APPROACH

7.1 INTRODUCTION

Much of this thesis has been concerned with exploring diversity, as expressed in the contrasts between the sites; in the environmental economic and social consequences of closure; and in experiences in the post-closure period. While this diversity has provided a recurring theme, however, it is important that it should not dominate entirely. Given that oil industry restructuring has been a major force in the UK's coastal zone, it is necessary to stand back from the processes explored above to ask whether useful generalisations can be made. This chapter attempts this through a model-building approach designed to complement the earlier model of waterfront change produced by Pinder, Hoyle and Husain (1988).

7.2 STRUCTURAL CHANGE AND DECLINE IN THE COASTAL ZONE

Early chapters have demonstrated that the closure of numerous refinery sites around the coasts of Europe and the UK was not a reaction to technological change, as was normally the case when the older parts of ports were abandoned. In contrast to older docklands, oil terminals remained as accessible to tankers as in the past, and on-shore facilities were just as capable of handling

throughput. Refinery abandonment instead reflected structural change in the energy market. The collapse of demand for heavy refined products, and increasing competition in some markets from natural gas, produced a major over-capacity crisis which led inevitably to refinery shutdowns. At the outset, therefore, the proposed model highlights economic restructuring as the driving force behind the emergence of redundant space, especially in coastal zones outside urban areas (Figure 26).

While the part played by structural change is clearly underlined by the example of oil refining, it is arguable that the role of this factor in coastal zone evolution is also demonstrated by other major economic activities. Moreover, in some instances these activities demonstrate that economic restructuring has been an important force creating decline in traditional port areas, and not simply in the broader coastal zone. For example, continuing the energy sector theme, the South Wales coal ports - which in the late nineteenth century formed the most important energy port system in the world - went into swift decline after World War II as the market restructured to use oil. From Newport in the east to Swansea in the west, this generated one of the most impressive concentrations of redundant port land to be found anywhere in Europe. In the same period the steel industry closed a significant number of coastal zone sites, such as the Llanelli tinsplate works and the plant at

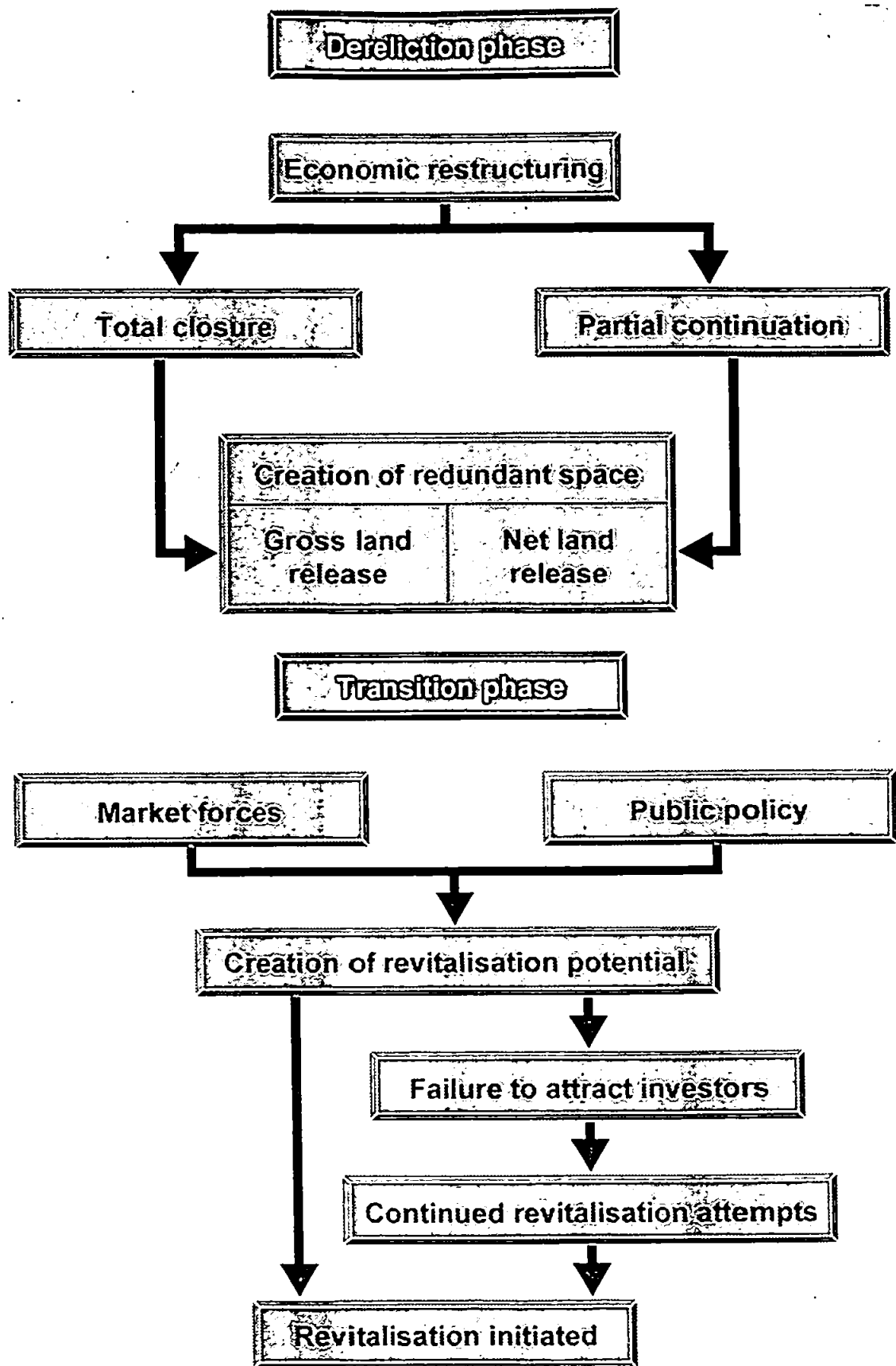


Figure 26

Model a: Dereliction and transition in the coastal zone

Barrow, in response to more efficient competition elsewhere in Europe and the world. And in the late twentieth century continuing pressure to curtail defence expenditure is similarly generating redundant space in increasing quantities. At coastal sites this is naturally associated most closely with naval cutbacks, such as the release of Chatham Dockyard and the Portland naval base by the UK's Ministry of Defence.

While strong emphasis is placed on structural change, the model also argues that decline may not be total. The general view in waterfront studies is that rundown industry will affect an entire facility, such as a single dock or a group of docks, and in many instances this may be correct. Certainly, this is an assumption implicit in the model advanced by Pinder, Hoyle and Husain. However, Charlier (1992) has highlighted a growing trend for port authorities to 'recycle' outmoded facilities for continued port use, and the present research reveals that users themselves may also see total abandonment as a solution that is too extreme. The evidence is that this may occur when an activity is restructuring in order to maintain a major market, such as transport fuels. It is also evident that it may result in the retention of either selected production facilities (as with the Kingsnorth bitumen plant) or distribution depots (such as those at Belfast and the Isle of Grain). This observation clearly requires inclusion in the model, and

underpins its introduction of the concept of net, rather than gross, land release.

7.3 ACHIEVING TRANSITION

As Pinder, Hoyle and Husain (1988) emphasised, the emergence of redundant space is only an initial step in the process of waterfront change which does not in itself guarantee that revitalisation will occur. Their model therefore recognises the importance of a transition process, in which the image of redundant space is revolutionised from one of useless dereliction to that of an exploitable asset. The results of the present study not only reinforce the importance of incorporating this transition process into the model, but also suggest that it should be conceptualised as being driven both by market forces and public policy (Figure 26). These factors, it may be noted, have also been stressed by Rydin (1993, 159).

Market forces are emphasised primarily because oil companies have found it economic to clear redundant sites, usually disposing of the installations for their scrap value, but sometimes selling parts of a plant for use elsewhere. While this is financially attractive to the company in the short-term, it also has a longer-term purpose in that it enables potential new users to envisage the possibility of a reasonably swift and economic start-up. Developing the argument on this basis, the role of the previous land user

in the model can be said to be the pursuit of economic self-interest in a manner which encourages the conditions for transition to revitalisation. This, it may be argued, is very different to the function of previous users in the model proposed by Pinder, Hoyle and Husain (1988), in which their active role was limited to the generation of redundant land.

Public policy requires inclusion in the model at this stage partly because public bodies may be connected with site preparation. The best example of this process identified by the research was industrial estate infrastructure provision at the Ellesmere Port site. More important than this, however, has been the contribution planning authorities have made to deciding the future-use designation of redundant space. Here a key point influencing the proposed model is that the emergence of vacant land on a large scale stimulated virtually no debate as to appropriate future usage, despite the fact that by the mid-1980s the fragility and importance of coastal zone environments was recognised.

As the discussion in Chapters 5 and 6 has suggested, this virtually automatic process of redesignation for industrial and commercial uses may well reflect several influences: pressure exerted by site owners on local authorities to ensure that the potential value of derelict sites could be maximised; the expectation that local authorities should

take every opportunity to promote economic development in a time of recession; and an understandable and no doubt widespread scepticism that sites might revert successfully to a 'natural' state. Whatever the factors involved, however, it is clear that to a great extent the role of planning authorities in the transition phase from dereliction to revitalisation was to perpetuate attitudes to land use carried over from the past.

Although it emphasises factors cultivating transition, the model also proposes that revitalisation through the introduction of new economic activity is by no means guaranteed. Despite the impressive changes that have occurred at the Isle of Grain, and the less spectacular developments at Kingsnorth, Heysham, Teesport and Ellesmere port, the study has revealed a widespread inability to generate new activity. Action which it is hoped will revolutionise perceptions of derelict land may well be ineffective.

Given the state of the British economy in the late 1980s and early 1990s it is perhaps tempting to attribute this simply to the impact of recession, and there is no doubt that this has played a part. For example, the failure of the Ellesmere Port industrial estate to attract business may well be a recessional difficulty. However, as Chapter 5 has underlined, in reality the need to include the inability to

revitalise as a substantial feature of the model reflects the influence of a more complex cluster of factors. These include a site's location *vis-à-vis* the national leader region and Europe; competition from other industrial sites able to offer investors financial incentives; company strategy which, as in the case of Esso Milford Haven, may raise suspicions that a firm may not in reality wish to dispose of a redundant site; and environmental factors, such as ground contamination, not dealt with through simple site clearance.

7.4 REVITALISATION ACHIEVED

Where investment is forthcoming, new economic activity must in all instances pass through the planning control filter (Figure 27). In addition, major development proposals must negotiate a second filter, environmental impact assessment (EIA) introduced in the UK as a result of EC Directive (85/337). Both these filters therefore require inclusion in the model, although it can be argued that EIA is a more severe hurdle than planning control. Because land was already designated for industrial use, obtaining planning permission appears to have been a straightforward exercise for small businesses and developers of industrial estates. In contrast, as Chapter 6 has demonstrated, the EIA process has strengthened existing planning consultation procedures and thereby helped to bring about significant modifications in two of the three cases studied.

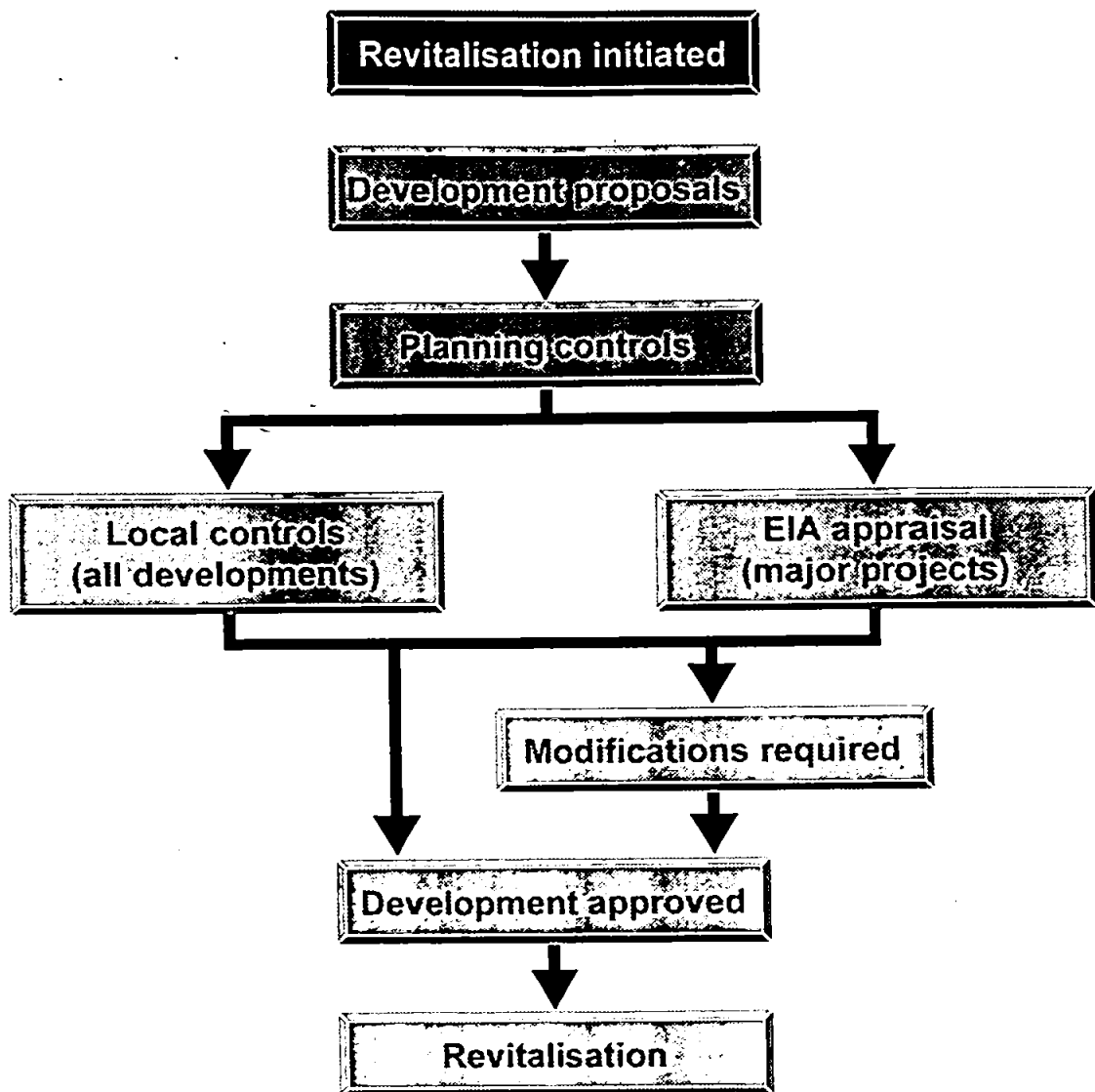


Figure 27

Model b: The first stages of revitalisation

Although all activity involved in revitalisation must negotiate one or both of these filters, the results suggest that subsequent change on the waterfront should be conceptualised in terms of two distinct processes: estate development and corporate investment. Because these differ fundamentally from each other, the model incorporates them as essentially separate development pathways (Figure 28).

Industrial estates and revitalisation

The emergence of the estate development pathway (as at Heysham, Kingsnorth and Ellesmere Port) reflects a variety of considerations. No EIA is required for projects of this type, and their development is therefore comparatively easy. In the early stages investment may be minimised by the reuse of refinery buildings as workshops and offices. Occasionally refinery facilities are themselves attractive, as in the case of a waste oil storage business at Kingsnorth. And, when construction is undertaken, the extension of facilities can usually be undertaken incrementally at relatively low cost. Moreover, the emphasis placed on small business by Conservative governments in the 1980s encouraged developers and local authorities to give greater attention to this form of industrial expansion (Hart and Harrison, 1993, 176).

However, as earlier discussion of the model has highlighted, revitalisation through the construction of industrial estates does not necessarily lead to sustained economic

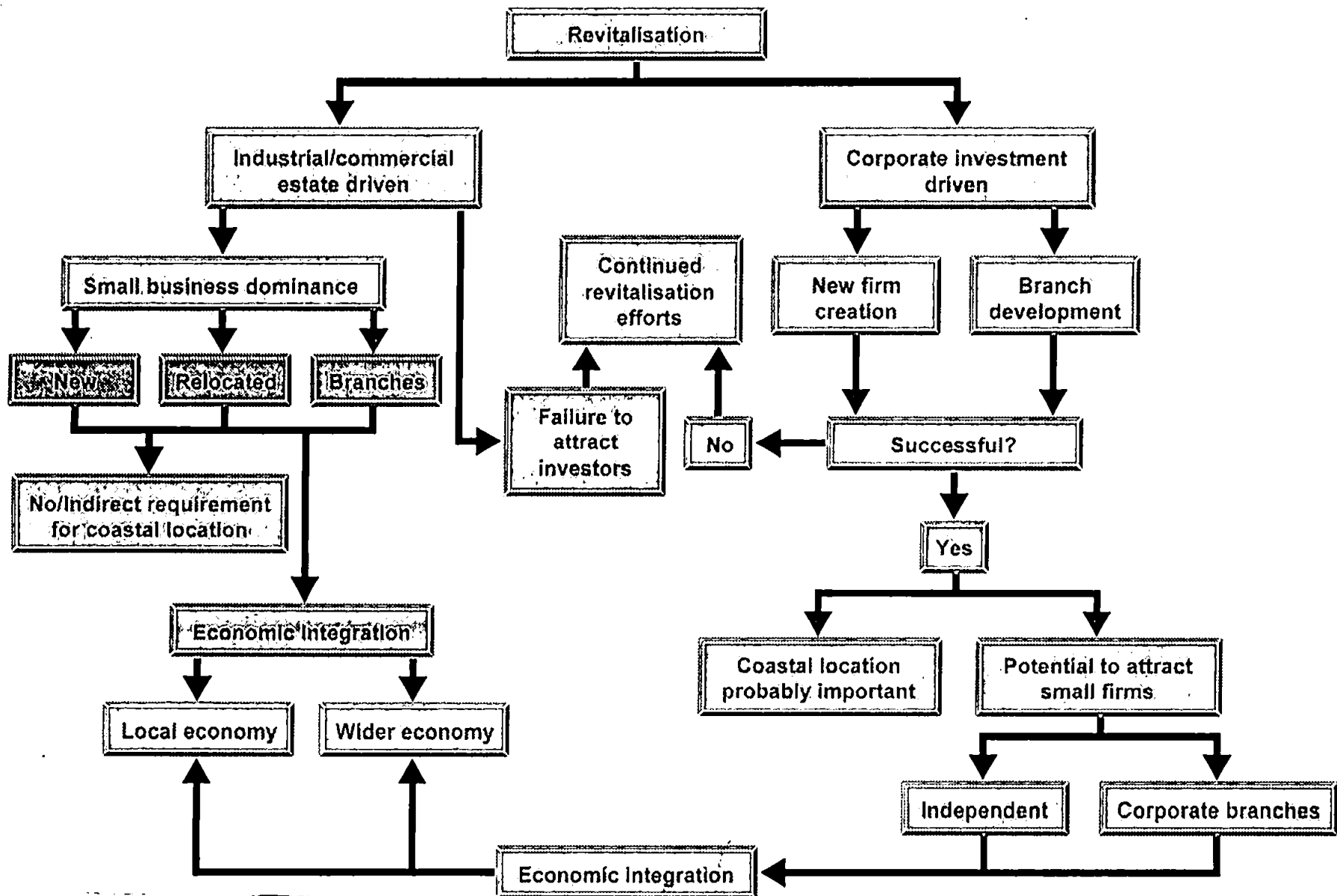


Figure 28 Model c: Revitalisation achieved; major pathways of revitalisation

development. The case of Ellesmere Port, involving substantial public expenditure that has failed to attract firms, demonstrates this possibility. In addition, as was mentioned in Chapter 5, at least one of the three industrial estates at Heysham has gone into receivership. This in turn signals the need for this pathway to divide in the model, allowing one avenue to loop back to the failure to revitalise. Despite this example, however, the dominant avenue should be seen as that leading to successful estate development, which in the main has proved to be a positive force producing a distinctive form of revitalisation.

In addition to identifying this process of change, the results presented earlier also allow the 'model' business attracted to such sites to be conceptualised. This model firm is likely to be either a relocation or a new branch plant, since the creation of new firms by this process has been shown to be a relatively rare occurrence (Table 30). An incoming business may be commercial or industrial, but in its choice of location it is unlikely to be influenced primarily by incentives or the nature of the local labour market (Table 31). Similarly, the proximity of local suppliers is not likely to have been an important factor in the decision to locate at the old refinery sites, although proximity to markets was important for approximately one half of respondents (Tables 32 and 33). Instead the firm's chief concerns are likely to be low-cost sites (a goal often

served by conversion from dereliction); adequate space (again likely to be associated with extensive land availability); and easy entry to a site as a result of a blanket designation for industrial and commercial use. Thus it can be argued that - once clearance has been undertaken and the appropriate designation granted - the intrinsic qualities of sites such as those studied are likely to be of basic significance for this revitalisation process.

Finally, however, we must also note that - although a coastal location is (indirectly) important for some of the businesses at Heysham - only one quarter stated that they had located there because of access to the sea, and a similar proportion was found at the Kingsnorth industrial estate (Table 31). The conceptual implication of this is that, while the influx of firms undoubtedly revivifies this type of redundant space, the process does not produce revitalisation with a dominantly maritime orientation. Consequently, whereas in the refining era a genuine reason existed for coastal zone development, the revitalisation process significantly undermines that *raison d'être*. Paradoxically, therefore, the model must propose that this form of revitalisation may 'deal' with coastal zone dereliction, while in most instances the economic activity has no need for a location in this type of environment.

Corporate investment and the model

The second major process leading to revitalisation is driven by corporate investment. In part it may be illustrated by developments at Teesport, such as those by MTM and (briefly) Nissan, but it has progressed furthest at BP's Isle of Grain site.

Diversity within this type of investment leads the model to distinguish between two variants on the corporate development theme. The first, found most frequently in this research, is achieved through branch investment and is illustrated by the involvement of Foster Yeoman and British Gas at Grain, and MTM and Nissan at Teesport. The second is reliant on the creation of new subsidiaries by existing corporations such as the Maritime Transport Services group (the owners of Thamesport) and AES Electrical and Seaward and Southern (in the case of Medway Power). Whatever the ownership structure, however, corporate investment implies that this form of revitalisation is reliant on capital that is external to the locality, region or nation. As with the original development by the oil industry, therefore, this form of revitalisation typically produces externally induced and controlled change in the coastal zone¹. On occasion, moreover, this change may be facilitated by state assistance. Although it was not typical in the study, the case of MTM, with £8.5 million of public support, is a revealing exception to the rule.

What is also proposed, however, is that the outcome of corporate investment is not certain and may ultimately prove to be either more or less positive than originally anticipated. Thus the possibility that revitalisation may exceed initial expectations is illustrated by Foster Yeoman's conversion of its temporary development at Grain into a permanent aggregate depot serving the South East market. Conversely, however, two other examples from Chapter 5 underline the need to recognise that permanent change is not assured simply by initiating major investment programmes. One is the case of Thamesport. While this is now regarded as a successful venture, the difficulties experienced in its early years, including serious financial problems as late as 1993, should not be overlooked. The other example, which illustrates this point even more clearly, is that provided by Nissan. Although this corporation's conversion of part of the Teesport site into a car export facility initially appeared secure, the transference of shipments to Sunderland in 1994 - only five years after operations began - clearly exposed the dangers of mobile capital for this form of revitalisation. In order to allow for setbacks of this type, the model again envisages the possibility of land reverting to redundancy.

Five further elements of the corporate investment model may be highlighted. First, in sharp contrast to estate-based revitalisation, it is envisaged that sites revitalised by

this second process tend to maintain a strong maritime orientation. Developments such as Thamesport, the proposed British Gas LNG terminal, the Medway Power plant, and - short-lived though it was - the Nissan export facility all point to this conclusion. In contrast to the conclusions relating to estate development therefore, it is arguable that this form of revitalisation produces development that needs to be located in the coastal zone.

Second, the model views corporate investment as a stimulating factor generating linkages and attracting other firms to the locality. Linked activities are typically shipping lines, port agencies warehousing contractors, etc, so that the revitalisation process results in a complex of associated activities. On the one hand this perpetuates features of the port function that have been characteristic for centuries (Turnbull *et. al*, 1992); on the other it strengthens still further the maritime orientation of this type of revitalisation.

Third, the linked activities that are attracted to a developing complex of this type enhance the importance of corporate investment in the regeneration process. At first sight this may not be apparent, since the linked activities may superficially have much in common with independent SMEs. Their average employment at Grain, for example, was only nine. As the results presented in Chapter 5 have shown,

however, this small scale is misleading; ownership investigations reveal an overwhelming tendency for linked activities to be newly established branches of national or international businesses.

Fourth the model envisages that, because of its dependency on corporate investment, this form of revitalisation reintegrates abandoned sites into the economic system at the national and international scales. In doing so, it essentially recreates a locality-economy relationship very similar to that which existed in the era of active refining. Thamesport, for example, is one element in a global transport network; British Gas is likely to import LNG from the Middle East and North Africa; and MTM claimed to have links with many other countries (*Hartlepool Mail*, 1989). But, fifthly, it is also proposed that this high level of integration with the national and international economies may occur in association with strong local dependency. Foster Yeoman and Medway Power, for example, illustrate the importance of regional markets for corporate investment, while the former car exports through Teesport were based entirely on a local production function.

7.5 CONCLUSION

This chapter has summarised the major processes of economic decline and revitalisation that can be identified in coastal locations outside inner-urban harbour areas. The use of

models in this way to clarify complex processes is well known and is indeed a major tool of systems analysis. Model-building attempts to simplify the real world to make it more understandable, yet also aims to mirror reality as closely as possible by identifying essential links between phenomena and events.

Given that the model proposed is a synthesis of much that has gone before in the thesis, it is in many ways a conclusion in its own right. Thus an extensive further discussion summarising the results of the present chapter is unnecessary. Nonetheless it is helpful to emphasise a number of points in order to place the model-building process in context.

First, it has provided a useful extension of the work of Pinder, Hoyle and Husain (1988). What has been proposed has challenged a number of the assertions made by their model, and has also provided a complementary conceptualisation which should assist future researchers to extend waterfront studies further into the coastal zone. Second, while the process of abstraction has been important as an academic exercise, through its links with systems theory (Chapter 2) the outcome is also a conceptualisation relevant to those seeking to advance coastal zone planning. The perception of the decline and revitalisation of derelict waterfront areas in this way allows an acknowledgement that these systems are

part of wider local coastal zones. This, in its turn, signals that changes occurring within them, and affecting their output, will also have ramifications for these wider areas.

Lastly, while the value of the modelling process may justifiably be emphasised, it should also be stressed that the version presented here is not seen as the final step possible in this direction. The model constructed in this chapter has concentrated on the economic aspects of regeneration, and it can be argued that the technique could usefully be extended to encompass other aspects of these types of decline and growth on the waterfront. In particular, the work on environmental issues presented in Chapter 3 has not been subject to the modelling approach, and it might well be argued that this should be seen as a priority target for future work. Adding an environmental dimension to this interim representation of change would simultaneously enhance the model's realism and emphasise the value of interrelated perspectives to our conceptualisation of the coastal zone.

NOTES

1. One exception to this is the partial relocation of the Tees and Hartlepool Port Authority on to part of the Shell Teesport site, but contrary examples - such as Thamesport, MTM and Nissan - are far more numerous.

CHAPTER 8

CONCLUSIONS

8.1 INTRODUCTION

The overall aim of this thesis has been to examine the impacts of refinery closures and the subsequent redevelopment of sites, together with the processes involved in the sites' regeneration. One rationale for this has been that waterfront decline and regeneration outside inner-urban harbour areas is a largely neglected research topic, fully deserving considerably more attention. The second has been the increasing interest that has been shown in recent years in the way in which the coastal zone is managed. Substantial studies of redundant space on the coast are needed in order to inform the general discussions currently taking place concerning the importance, attractions and difficulties of pursuing Integrated Coastal Zone Management.

Within this framework, many of the more conceptual findings of the thesis - of the type perhaps most relevant in the academic context - have already been crystalised through the modelling approach adopted in Chapter 7. Consequently this final chapter is primarily designed to draw together many of the practical findings likely to be of significance in, for example, the planning context. Initially the discussion focuses on the lessons to be drawn from the disinvestment

phase, before turning to examine regeneration and relationships between redevelopment and ICZM. In addition, however, the discussion also offers a critique of the research undertaken and, of equal importance, identifies further research opportunities which emerge from the investigation.

8.2 KEY FINDINGS - DECLINE AT THE WATERFRONT

One early finding relating to decline was that research in this field is liable to be hampered by a lack of historical information. As Chapters 3 and 4 demonstrated, large gaps exist in the data relating to the period of operations before closure. Very little concrete information is available to shed light on factors such as pollution emissions and control, traffic generation, employment structures and local economic linkage. This problem partly reflects the fact that, once plants have closed, there is a tendency to consider information relating to them to be equally redundant; as a result, many records are simply destroyed. In addition, however, there is also the problem that companies often show great reluctance to provide information on past activities. Instead, and perhaps understandably, there is a preference for focusing attention on current operations. In the words of a representative of Shell:

"You will appreciate, I know, that as an organisation, we are geared toward running our current business, and as such do not support any resource to provide historical data to exterior

enquiries."

(Shell, Public Relations Officer, 1992, pers. comm.)

But what has also been demonstrated by the research is that this data availability limitation is not an insuperable obstacle. Although they may only be fragmentary, relevant data may be gathered from an extremely wide variety of sources, and some items of information - limited though they may be - are able to serve as the basis for extrapolation. To quote only one example, data on SO₂ emissions at just one refinery enabled the research to shed light on the probable air pollution potential of all eight plants. Working with these types of data, the research has succeeded in constructing a picture of the consequences of decline that is considerably clearer than appeared possible in the initial stages of the investigation.

Although it has proved possible to model the process of decline in Chapter 7, a major finding is that the various impacts (social, economic and environmental) of the refinery closure movement have varied substantially from case to case. From this it may be suggested that planners in a coastal area facing the withdrawal of a major industry should exercise great care when predicting the likely effects - these will depend very much on the individual circumstances of the area in question.

For example, it was demonstrated that the effects of job

losses were influenced by a number of factors. Firstly, of course, the size of the refinery workforce was important regarding the overall economic impact felt by the local community. In general, the bigger the workforce, the greater the number forced onto the local labour market. But other highly relevant influences were the general economic environment at each locality and the disinvestment strategies preferred by individual companies. Consequently at Milford Haven - an area in which local unemployment rates were so endemically high that the locality had Enterprise Zone status - the paradox was that in general redundancy did not present a large problem for the 290-strong workforce. This was because Esso was able to offer many employees alternative jobs elsewhere. In contrast in Kent, in a region not normally associated with high unemployment levels, many of the redundant workers from the Grain and Kingsnorth plants faced potentially lengthy periods out of work. This was partly because of other large job cutbacks in the area at the time, but it also reflected the inability of BP and Berry Wiggins to match the types of relocation offered by Esso. For BP the problem was the scale of its stringent restructuring programme in the UK and Europe; this precluded the relocation solution. For Berry Wiggins the insuperable difficulty was its very limited size.

One extension of this argument is that the consequences of plant closure for an area can depend not just on the

circumstances prevailing when disinvestment is undertaken; in addition a company's approach to the earlier *investment* phase can also be highly significant. BP, for example, was forced to undertake stringent cutbacks throughout its refining system because its strategy during the 1950s and 1960s created many inflexible - and therefore vulnerable - refineries. This left little scope for employee redeployment. Esso, in contrast, had more room to manoeuvre because it had invested systematically in more expensive, yet less economically exposed plants (Pinder, 1986).

Variability of experience is also an identifiable theme with respect to the immediate consequences of closure for local councils and port authorities. In some instances, and particularly at Grain, the immediate prospect was disconcerting. Grain's BP refinery had accounted for a substantial proportion of the local authority's rate income and, at least in the short term, the end of refining resulted in significant unforeseen financial difficulties. Similarly the Medway Port Authority initially suffered severe financial hardship from the closure of the Isle of Grain refinery. In this case the authority had relied heavily for income on BP's regular large-scale oil movements, the vast majority of which ceased abruptly following refinery closure.

While the variability theme is important, however, the

evidence from port authorities and local authorities also highlights the importance of recognising the similarity of experiences. For most ports the impact was by no means disastrous, while the majority of local authorities also survived the damage to their budgets without great difficulty. This finding was somewhat unexpected, but its basis becomes clearer when it is related to general port operating environments, to company strategies and to government approaches to local authority funding.

Very few ports proved to be exceptionally dependent on a single refinery's traffic and consequently in most cases they were able to adjust to a revenue loss that was not catastrophic. Moreover, in several instances the blow caused by the demise of refining was also cushioned because company strategies required continued use of part of the site, either for limited specialist processing or for the distribution of products refined elsewhere. This factor highlights an important difference between the likely consequences of coastal zone restructuring by an industry that perceives its markets to be exhausted and one - such as oil refining - which believes a significant market can be retained. So far as the impact on local authority income is concerned, it was demonstrated that the link between local business taxation and council income should not be oversimplified. At the time of the closure movement various national government mechanisms could be - and in several

cases were - brought into play to compensate for local income losses. Thus difficulties experienced by the Grain local authority were not typical of all areas. In addition, this is an appropriate point to note that subsequent changes to local authority funding procedures have effectively insulated localities from the direct impact that the closure of a plant such as a refinery might otherwise have. In this sense the severance of the direct link between business taxation payments in an area and its receipts from the exchequer can be seen as a positive step.

While there are certainly exceptions, these findings suggest that the external economic impact of large-scale disinvestment was less than might be anticipated at first sight. This view is strengthened by the work undertaken into the impact of closures on local business communities. Direct evidence relating to the extent of local economic linkages was largely lost as records disappeared in the post-closure phase, but data presented in relation to a typical surviving refinery (Amoco Milford Haven) supported a view which many within the industry would confirm. This was that local linkages are usually not numerous and are responsible for only restricted numbers of dependent jobs.

The idea that the consequences of closure may in some respects be overestimated is echoed when attention turns to the environmental effects of disinvestment. Intuitively it

might be assumed - at least by the public at large - that refineries are sources of serious pollution and that their demise would therefore produce substantial gains. However, the majority of the admittedly fragmentary information available in this field indicates that this assumption should be challenged. For example, the ecosystem effects of process water effluent were shown to be spatially very restricted. Similarly, through calculations relating to SO₂ emissions, it was demonstrated that the air pollution gains made by the closure of all eight refineries are likely to have been modest compared with continuing emissions from major sources such as power stations and other industries. Here it is appropriate to return once more to the fact that in some instances restructuring was linked with continuing, though limited, oil-related processing. This tendency, it can now be suggested, is unlikely to have contributed to the maintenance of major air and water pollution in most cases.

At the same time, however, the results also indicated that in some respects the environmental benefits of closure could be undervalued. It is in this context that the value of community survey work on attitudes to pollution can be underlined. It is true that survey investigations revealed low levels of hazard awareness, despite officially acknowledged dangers (Health and Safety Executive, 1981); and it is also the case that local communities were not especially sensitive to the visual impacts of plants. In

line with the results of other research (Nassauer and Benner, 1984), many respondents recalled that the closed refineries were visually pleasant - especially at night. Yet the community survey work also demonstrated that plant closures brought relief from intrusive and often pervading pollution that had come to form a backdrop to life in a locality. Although noise pollution (for example the low-frequency rumble produced by distillation units and cracking plants) had not been a major irritation, large numbers of respondents had been aware of its negative effects. Most importantly of all, a general reduction in air pollution was identified by many respondents, with a decline in odours being reported as especially noticeable. Here it is important to note a mismatch between the sparse official information available and the results of the community survey work. Official sources (such as responses from Environmental Health Officers) failed to identify air or noise pollution as significant local matters, suggesting that this source of information may be less realistic than that gathered at the community level.

Quite apart from the community survey results, the findings indicate it is important not to overlook two other forms of environmental gain. One is essentially episodic. Although great care may be taken when cargoes of crude oil and oil products are being transshipped, and although the general level of water pollution from this source has decreased

markedly as a result of tighter controls, the work has shown that waters in the vicinity of refineries are at risk from substantial spillages which cannot be predicted. Closure consequently eliminates this hazard, or reduces it significantly if a locality has more than one refinery. Secondly, the work has demonstrated that shutdowns have the capacity to benefit the local environment through substantial reductions in traffic-related pollution. To some extent this arises from less local commuting by workers, but it is also related to the cessation of product distribution by large numbers of road tankers. At this point, however, reference must again be made to the importance of the precise nature of company disinvestment strategies. If a site is retained as a distribution depot the continued - and perhaps increased - movements of oil products may completely offset any gain from the cessation of refining. This is true both with respect to road tanker movements and to spillage hazards in adjacent waters. Additionally, where sites are used for continued oil-processing activity, environmental costs associated with both transport and manufacturing activities are likely to continue, although in this case on a more limited scale.

8.3 KEY FINDINGS - REVITALISATION AND REDEVELOPMENT PROCESSES

Whatever the variability associated with the precise consequences of specific closures, the research has shown

that redevelopment processes have to date tended to follow discernible patterns. This is implicit in the revitalisation model presented in Chapter 7, and it is unnecessary to rehearse that model in detail here. Nonetheless, it is appropriate to highlight a number of major findings arising from this aspect of the work.

At the outset it is essential to re-emphasise that the transition to revitalisation is not a guaranteed process. The reasons for this may vary from case to case. To cite just a selection of possibilities, the local economic environment may be insufficiently dynamic; a locality may already have a substantial unused stock of derelict land; landowners may be reluctant to release land they consider strategic; incoming company investment plans may be retarded, as in the case of British Gas; and the costs of dealing with ground contamination may deter investors. Whatever the precise nature of causality, however, the study has shown that these large-scale derelict sites have a high probability of remaining idle for an indefinite length of time. By 1993 four sites had experienced no significant redevelopment since closure, while the remainder all had stretches of land that were still derelict up to 12 years after refining ceased.

Secondly the research has demonstrated that, even when revitalisation has been initiated, those involved should be

prepared for it to be unsuccessful. This may not be a typical outcome, but the decision by Nissan to move its car terminal from Teesport to Sunderland underlines the fact that apparently showpiece redevelopment can prove vulnerable.

Thirdly, although some projects may fail, it is clear that revitalisation is typically market-led and follows one of two pathways: (1) the construction of business estates for small firms or (2) large-scale corporate investment schemes. On the positive side an important feature of these is that - at least to date - there is evidence that the types of employment created by both pathways are relatively well matched to the labour forces made redundant by the closures. Although incoming jobs have not necessarily gone to ex-refinery employees, in the main they have been full time and have offered skilled and semi-skilled positions filled by male workers. In addition it is clear that, at least with the corporate investment pathway, revitalisation may bring benefits for local port authorities, as well as for the local workforce. Indeed, a development such as Thamesport, the growth of oil products through a distribution terminal, or a car terminal (if it can be retained) may mean that port earnings eventually exceed what would have been possible if refining had continued. Also in the context of local economic impact, it has been shown that, while many firms have dealings with suppliers and customers well outside

their localities, local linkages are common. While it has not been possible to quantify this feature in detail, it seems unlikely that the incoming businesses make proportionately less contribution in this respect than did the original refineries. What may also be added is that, although corporate projects such as power station development obviously require careful control, it does not appear that revitalisation brings with it air and water pollution problems that are more serious than those associated with the original refineries. This partly reflects the nature of the developments themselves, and partly the influence of improved environmental legislation. In various ways, therefore, these forms of regeneration can be interpreted as positive developments for the coastal zone and its communities.

Equally, however, other results have pointed to the conclusion that revitalisation does not produce unhindered progress. One reason for this is that total employment in incoming firms tends to fall below the numbers of jobs lost during restructuring. In addition, especially with the business estate revitalisation pathway, the jobs which appear are more likely to be relocated rather than new. Small firms are not created in large numbers by the revitalisation process, and the evidence is that firms move to the new estates in search of low-cost extra space, rather than to expand their labour forces substantially. Industrial

estate development may therefore re-arrange the deckchairs, rather than manufacture new ones.

What must also be highlighted is that there is strong evidence that revitalisation brings with it a significant environmental penalty in the form of traffic-related environmental damage. This is partly as a result of commuting by workers, but it is most obviously associated with commodity movements. Although industrial estates have an obvious capacity to generate goods traffic, chiefly through the Grain example the study has shown that this environmental problem is likely to be particularly important when the space and waterside attractions of ex-refinery sites lead to seaport terminal development. Linked with this the work has similarly exposed the problem that necessary infrastructure investments, such as basic road improvements, may well lag well behind developments generating this type of environmental cost. While in physical planning an observable lag between economic development and infrastructure improvement is nothing new, in this case it has probably been exacerbated by the fact that revitalisation has had to occur in a period of monetarist restraint and public expenditure cuts.

8.4 REDEVELOPMENT AND COASTAL ZONE MANAGEMENT

Just as the ascendancy of the New Right market-oriented policies noted above should come as no surprise, given the

political ethos of the time, neither should the finding that the planning system showed little ability to restrain private initiatives even when they were considered undesirable. The 1980s witnessed great changes in the UK planning system that have severely circumscribed the authorities. What is perhaps more surprising is that, despite this weakening of the system, it at least succeeded in moderating coastal zone developments through the use of consultation procedures. This too is an important finding, and it can be related to an additional aim of the project - to assess revitalisation in terms of the ideas underpinning coastal zone management.

Clearly, the emphasis on the role of market forces noted above indicates that many of the ideas inherent in ICZM (such as long-term, strategic and ecologically sensitive planning) could not dominate in the redevelopment process. However, the role of the planning system as a mediator between different agencies was an important factor in bringing about a degree of coordination and holistic thinking that should not be overlooked. At Grain this came about through the development control process, and at Milford Haven through the public inquiry procedure. Grain demonstrates that consultation procedures inherent in the development control process are able to lead to the imposition of conditions which will ameliorate environmental impacts on the seaward and landward sides of projects. This

example also suggests that the successful introduction of environmental safeguards has been assisted by the emergence of stronger environmental legislation, in particular that provided by the EU Directive on EIA. Meanwhile at Milford Haven, a valuable function of the public inquiry system was to focus attention on the fact that - despite the dissent of the Countryside Council for Wales - the weight of economic, planning and environmental opinion considered realignment of the National Park boundary to be in the best interests of conservation.

What may also be suggested, however, is that the planning system's ability to perform a mediating role may on occasion be aided by the nature of the developers themselves. In this study this possibility has been signalled most clearly by the attitudes adopted by British Gas in relation to development at Grain. As a large company in the energy sector, British Gas is keen to establish and maintain a good reputation for high environmental standards. This, it may be argued, was influential in the company's decision to undertake a hydrological survey of the Medway estuary in order to understand more completely the likely impacts of its proposals. And the same train of thought may similarly have lain behind the company's readiness to accept requests from conservation organisations for an additional ecological survey on the landward side of the proposed site.

It is possible to argue, therefore, that there are some signs that - in this environmentally aware age - the ability of planners to undertake a mediating role may be actively assisted by some developers. However, it must also be recognised that this falls far short of ICZM and is open to far-reaching criticism. On the whole the research has demonstrated that the planning system may tinker usefully at the edges, but is unable to make large policy changes if they are deemed unsuitable by powerful commercial interests. Companies' willingness to compromise tends to extend only so far as their major requirements are not threatened. Moreover, the signs are that current trends will not bring about a substantial change in this situation. For example, local authorities generally are coming under increasing pressure to be cost effective, with the result that the resources needed to work towards ICZM are most unlikely to be available. No new resources are likely to be available for such an extension of duties, and it seems more probable that local authorities wishing to take on coastal zone initiatives will be have to contemplate doing so with *reduced* budgets.

8.5 TOWARDS A RESEARCH AGENDA

Although this research has made substantial progress with a variety of issues relating to decline and revitalisation in the coastal zone, it cannot be argued that it provides an exhaustive analysis of the subject. Like most major

projects, it has left various unanswered questions and has also identified a wide range of findings which ideally require verification. Not least, this need for verification is dependent on the problems of data availability noted earlier in this chapter. This has not been a project that has been able to exploit the availability of substantial, comprehensive and reliable data sets. Instead, throughout much of the thesis it has been necessary to assemble diverse fragments of evidence into a coherent interpretation.

An appropriate starting point for an attempt to outline a research agenda is provided by one outstanding limitation of the research. This is that experience of revitalisation could be gained at very few sites, while work on the planning processes involved was limited to just two locations. As a first step, it is arguable that research into the planning of revitalisation should be extended to other sites. What would also be constructive, however, would be to explore in greater depth the factors retarding revitalisation at most of the sites. In this thesis it has been possible to suggest a mixture of influences which may have been significant, but any attempt to establish their relative importance in specific cases has been beyond the scope of the research. Clearly, if local economic development is to be encouraged more effectively, it would be helpful to consider *for specific localities* why there are apparent failures in the market-based approach to

revitalisation.

What may also be advocated is that the social research methods employed in this work should be adopted and developed in future investigations. Although qualitative research with major actors in the planning and revitalisation processes was valuable, there is scope for it to be conducted on a greater scale in order to establish a more comprehensive spectrum of attitudes. Similarly, the systematic use of proposition sets on a greater scale, following the approach of Hoyle (1994) in his study of traditional waterfront revitalisation, might well aid comparability. While it is important to research the roles and attitudes of key actors, however, this investigation has also demonstrated the value of quantitative research amongst communities. Various significant data gaps were at least partly filled by this type of survey work, and in some instances the results were highly influential in determining the interpretation to be placed on the available evidence. It can, however, be suggested that this work would have been even more effective if time had been available to conduct it on a one-to-one interview basis. Also, it would undoubtedly have been advantageous if steps had been taken to target ex-refinery employees in the social research. Although inferences relating to the social effects of redundancies have been possible, a specific study of post-closure experiences would have been extremely valuable.

Further research into workers' experiences is only one example of many opportunities which exist to explore specific themes in greater depth. As the discussion in Chapter 1 established, at the start of the investigation a deliberate decision was made to take an holistic approach to the work, examining broadly the economic and environmental consequences of decline and revitalisation. Without this holistic perspective, it was felt, the research would lack the appropriate balance which would come with breadth. Having achieved this, however, the scene has now been set for further in-depth investigations into subjects such as the environmental consequences of restructuring, the economic benefits of revitalisation and the role of planning as a moderating force in coastal zone redevelopment.

Finally, however, although there is scope for thematic studies such as these it is not proposed that the more holistic approach to research should be abandoned. Instead it is suggested that the work presented here could usefully be extended in three related ways. First, as was stressed in Chapter 1, the decision to limit this research to the UK was taken for pragmatic reasons. What should not be forgotten is that around mainland Europe there are many other examples of refinery abandonment and that, on an admittedly less substantial scale, the closure movement has affected other major world refining regions. In these other areas there are therefore many opportunities to undertake comparative

research, testing the basic findings relating to economic and environmental impacts, but also studying the influence of different planning systems and attitudes to the coastal zone. For example, how are redundant refinery sites valued and revitalised in Japan, a country well known for its chronic shortage of coastal land in economically key areas?

Second, there are opportunities for comparative research between coastal and inland refineries. In the European context, especially, these opportunities are numerous. Because they were usually small and technologically unsophisticated, in the 1980s Western Europe's inland refineries were shut down even more commonly than those on the coast. To what extent have the consequences been essentially the same, and how does the answer to this question vary from one national planning regime to another?

Third, it must be emphasised that redundant space in the coastal zone is not simply generated by the oil industry. Other activities, such as petrochemicals, shipbuilding, rigbuilding, steel and defence have all released or are in the process of releasing substantial tracts of surplus land. This again raises many questions concerning the findings from this research. Above all, perhaps, it is important to explore the extent to which the consequences of restructuring by other sectors mirror those that have been identified by this investigation. Are the lessons to be

learned from oil refining sectorally transferable, or should each sector be seen as a separate entity surrounded by quite different sets of circumstances and outcomes?

In brief, therefore, the results of this research are presented as much in the spirit of a beginning as of an end. Some issues have been clarified, new ones have emerged and much remains to be done along the lines indicated. If these opportunities are taken up by other researchers, the coming years will witness an important advance: the large-scale extension of waterfront studies away from their current urban focus in favour of the broader perspectives of the coastal zone.

Appendix 1 Covering letter and questionnaire for
economic survey

Contact: Sarah Harcombe (0752) 232974

Dear Sir/Madam,

I am a researcher at the University of Plymouth and I am investigating the ways in which redundant industrial land in the coastal zone is now used. In particular I am looking at new uses for old refinery sites in the UK and for this reason I am writing to all businesses now located on such sites. I would therefore be very grateful if you could spare a few minutes to complete the questionnaire that I am sending you. It consists of a number of questions about [firm name] - the answers to which are essential for me to assess the extent of economic regeneration that has occurred on the site of the old [oil company name] refinery. I have tried to keep the questions as straightforward as possible so that they will be easily answered by someone with a knowledge of the business matters of this organisation. I do appreciate that your time is very valuable.

All replies will be treated in the strictest confidence and I am enclosing an s.a.e. for your reply, I really would be very grateful for any help that you can give me,

yours faithfully,

SARAH HARCOTBE (Miss).

QUESTIONNAIRE

1~

1. Firstly, could you please briefly state the nature of the business undertaken by 6~?

2. Would you describe 6~ as: (please tick)

- an independent small firm?
 - an independent medium-size firm?
 - an independent large firm?
 - a branch/subsidiary of a national firm?
 - a branch/subsidiary of a multi-national firm?
 - a government office?
 - other? (please specify) -----
-

3. Approximately when did 6~ become established at 2~? (please give year if possible)

19--

4. Before opening at 2~ was 6~ already operating elsewhere? (delete as applicable)

Yes/No

IF YOU ANSWERED YES TO QUESTION 4 PLEASE ANSWER QUESTIONS 5 AND 6; IF YOU ANSWERED NO PLEASE GO ON TO QUESTION 7.

5. Where was 6~ operating before the move to 2~?

6. Why did 6~ move to 2~? (please tick)

- to re-locate an existing business unit?
 - to create an additional site for the existing business?
 - to extend the existing business on to adjacent land?
 - other? (please specify) -----
-

7a. How many men are currently employed full time, by this business, at this site?

7b. How many women are currently employed full time, by this business, at this site?

7c. How many men are currently employed part-time, by this business, at this site?

7d. How many women are currently employed part-time, by this business, at this site?

8. Of the total number of current employees could you please give me an idea of the numbers that are employed in the following categories of work? (please enter approximate numbers)

<u>Categories</u>	<u>Nos.</u>
Management/Supervisory posts	----
Skilled work	----
Semi-skilled work	----
Unskilled work	----
Other	----

9. If possible could you provide an idea of the numbers employed in the following categories of work when this business first became established at 2-? (please enter approximate numbers)

<u>Categories</u>	<u>Nos.</u>
Management/Supervisory posts	----
Skilled work	----
Semi-skilled work	----
Unskilled work	----
Other	----

9a. If your firm re-located here from elsewhere - can you tell me how many of the jobs listed in number 9 (above) were new and how many were already in existence prior to the move to 2-? (please enter approximate numbers):

Number of new jobs created at time of move	----
Number of jobs already in existence at time of move	----

10. I would like to establish the reasons why your firm chose this site as a base for its operations. Can you indicate (by ticking the appropriate box below) how important each of the following factors was in the decision to set up at 2-?

- availability of financial grants, incentives, etc. was:
very important quite important unimportant
- cheapness of site and/or buildings was:
very important quite important not important
- availability of appropriate labour pool was:
very important quite important not important
- proximity to markets was:
very important quite important not important
- proximity to suppliers was:
very important quite important not important
- need for harbour/jetty facilities was:
very important quite important not important
- need for adequate space was:
very important quite important not important
- need for land on which industrial use is permitted was:
very important quite important not important

10a. Were there any other factors which were important in the decision to set up 6- at 2-? (delete as applicable)

Yes/No

10b If you answered yes to 10a, can you please briefly explain what these other factors were?

11. I would also like to know if you perceive there to be any disadvantages associated with this particular site. Can you indicate (by ticking the appropriate boxes below), the extent to which your business has experienced problems associated with the following factors?

withdrawal of financial grants, incentives, etc. has caused:
a major problem a moderate problem no problems

lack of appropriate labour pool has caused:
a major problem a moderate problem no problems

poor road access to/from site has caused:
a major problem a moderate problem no problems

poor rail access to/from site has caused:
a major problem a moderate problem no problems

poor sea access to/from site has caused:
a major problem a moderate problem no problems

the land itself (eg the presence of old refinery infrastructure, or contamination) has caused:
a major problem a moderate problem no problems

controversy over your operations (eg from the public or the planning authorities) has caused:
a major problem a moderate problem no problems

11a. Has 6- experienced any other problems that are associated with this particular site? (delete as applicable)
Yes/No

11b. If you answered yes to 11a, can you please briefly explain what these other problems are

12a. Finally, in order to understand the extent of economic regeneration at the site of the 5- refinery, I need to have some idea of the impact that the setting up of 6- has had on other businesses in the local area. Could you please indicate the proportion of your purchases that are supplied from firms which reside within an approximate 40 mile radius of this site (local firms)? (please tick as appropriate)

- 0-25% of purchases are supplied by local firms
- 26-50% of purchases are supplied by local firms
- 51-75% of purchases are supplied by local firms
- 76-100% of purchases are supplied by local firms

12b. What are the names of your major local suppliers?

12c. Could you also indicate the proportion of your turnover accounted for by customers who reside within an approximate 40 mile radius of this site (local firms)? (please tick as appropriate)

- 0-25% of turnover is to local firms
- 26-50% of turnover is to local firms
- 51-75% of turnover is to local firms
- 76-100% of turnover is to local firms

12d. What are the names of your major local customers?

Thank you very much for your help, it really is greatly appreciated.

Appendix 2 Covering letter and questionnaire for
community survey (Grain)

ISLE OF GRAIN REFINERY SITE
SURVEY



INTRODUCTION

The Department of Geographical Sciences at the University of Plymouth is undertaking a survey to investigate people's attitudes to old, industrial land, and new and proposed uses for it. As you are probably aware, there was previously a large oil refinery on the Isle of Grain, and for this reason a number of people from Grain village are being asked about their feelings regarding the site of the old Kent (BP) refinery and its possible future uses.

Your name was chosen randomly from the electoral register for the area. I should be extremely grateful if you could spend just a few minutes completing the enclosed questionnaire. Please rest assured that any answers you give will be of great importance for the research and will be treated in the strictest confidence.

If you need clarification concerning anything about this survey please contact the Department of Geographical Sciences at the University of Plymouth on (0752) 233053.

THANK YOU VERY MUCH FOR YOUR HELP
- IT WILL BE EXTREMELY USEFUL

RESEARCH SURVEY: ATTITUDES TO LAND PREVIOUSLY OCCUPIED BY BP (KENT) REFINERY

Sarah Harcombe, Department of Geographical Sciences,
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Plymouth,
Devon, PL4 8AA.
Tel. (0752) 232974.

QUESTIONNAIRE

1. Firstly, I would like to discover your general feelings about the area in which you live. Could you indicate how much you agree or disagree with the following statements, please tick boxes as appropriate.

- a) Unemployment is a major problem in and around Grain
Strongly agree Agree Neutral Disagree Strongly disagree Don't know
- b) The area in and around Grain is, economically, rather poor
Strongly agree Agree Neutral Disagree Strongly disagree Don't know
- c) The creation of jobs in the Grain area is more important than the preservation of the environment
Strongly agree Agree Neutral Disagree Strongly disagree Don't know
- d) There are currently too many cars on the roads around Grain
Strongly agree Agree Neutral Disagree Strongly disagree Don't know
- e) There are currently too many lorries on the roads around Grain
Strongly agree Agree Neutral Disagree Strongly disagree Don't know
- f) These days the air around here is generally very clean
Strongly agree Agree Neutral Disagree Strongly disagree Don't know
- g) These days the sea and estuary water around here is generally very clean
Strongly agree Agree Neutral Disagree Strongly disagree Don't know

2. Much of the site of the old BP refinery here at the Isle of Grain has been bought by British Gas, though it is still undeveloped. If you could choose, what uses would you like to see for this land (or for parts of it)? Please tick as appropriate:

Would you like to see this land (or parts of it):

a) developed for port-related industry?

very much a little not at all

b) developed for heavy industry?

very much a little not at all

c) developed for light industry?

very much a little not at all

d) made more accessible for recreation and tourism?

very much a little not at all

e) managed for nature conservation?

very much a little not at all

f) just left as it is?

very much a little not at all

g) Used for some other purpose? (please specify below)

very much a little not at all

3a) British Gas has plans to build a Liquid Natural Gas (LNG) import terminal on this land, Do you know anything about these plans, please tick as applicable:

Yes No

3b) If you answered yes to 3a (above), could you indicate the extent to which you approve of the proposal? (Please tick)

very much a little not at all

3c) Also, if you have any other thoughts on the LNG proposal, could you please briefly state them below:

4. Could you now please indicate (by ticking the appropriate box below) the level of environmental decline that you would be prepared to accept in order to see a development which creates new jobs and investment on this site?

Would you accept:

- a large decline in environmental quality
- a small decline in environmental quality
- absolutely no decline in environmental quality
- don't know

5. Thamesport, Foster Yeoman's and the new power station being built by Medway Power are all located on the old BP refinery site. I would like to know how you feel about these new developments. Could you please say (by ticking the appropriate boxes below) whether you agree or disagree with the following statements?

- a) Thamesport is a useful provider of jobs for local people
Strongly agree Agree Neutral Disagree Strongly disagree Don't know
- b) Foster Yeoman is a useful provider of jobs for local people
Strongly agree Agree Neutral Disagree Strongly disagree Don't know
- c) Medway Power is a useful provider of jobs for local people
Strongly agree Agree Neutral Disagree Strongly disagree Don't know

6. Do you think that activities in the area now occupied by Thamesport, Foster Yeomans and Medway Power cause any of the following? (Please tick as appropriate)

- a) too much noise Yes No
- b) too much dust Yes No
- c) too much road traffic Yes No
- d) too much shipping traffic Yes No
- e) some other nuisance (please specify below) Yes No

7. To help me identify the views which different types of people hold, it would help a great deal if you would answer some general questions about yourself. Please let me reassure you that all your answers will be confidential. Could you please tell me:

7a) How long you have been living ^{on the Isle of Grain} ~~at your present address~~

Please give the approximate number of years -----

7b) Are you:

Male?

Female?

7c) Could you briefly state what your occupation is?

7d) Which age range do you fall within (please tick)

17-24?

25-34?

35-44?

45-54?

55-64?

65+?

Thank you very much for completing the questionnaire so far, The remaining questions are about the old BP oil refinery that was shut down in 1982. If you can remember the refinery when it was operating, I would be very grateful if you could go on to answer these questions.

8. I would like to get some idea of the numbers of local people who were employed at the refinery, so can you tell me:

8a) Did you ever work at the BP oil refinery in any capacity? (please tick)

Yes No

8b) If yes, can you please briefly say what your job was?

9a) Did any one else living in your household at the time the BP refinery was open, work there in any capacity? (Please tick as applicable)

Yes No

9b) If yes, can you please briefly say what jobs this person (these people) had

10. I would also like to know the effects that you feel the refinery had on local people and the surrounding environment. So, can you please indicate (by ticking the appropriate boxes) which of the options for the following statements you feel to be appropriate

When the refinery was operating:

a) the noise from it affected the communities around here:

a lot slightly not at all don't know

b) smells from it affected the communities around here:

a lot slightly not at all don't know

c) air pollution (eg. dust, smoke, eye irritants) affected the communities around here:

a lot slightly not at all don't know

d) oil pollution incidents occurred in the sea around here:

often occasionally not at all don't know

e) traffic on the roads around here was:

very heavy moderately heavy quite light don't know

f) shipping traffic in the Medway was

very heavy moderately heavy quite light don't know

11a) Did you ever feel that the presence of the Kent refinery had an adverse effect on local house prices: (Please tick as applicable),

Yes No

11b) If you answered Yes to qu 10a (above), can you say whether the adverse effect on local house prices was; (Please tick as appropriate)

very severe quite severe only slight

12. Please read the following statements and tick the one which corresponds most closely with your views:

The refinery was always ugly to look at

The refinery was always nice to look at

The refinery only looked nice at night

I didn't really think about how the refinery looked

I can't remember and/or don't know

13a) Were you ever worried about living close to a refinery? (Please tick as applicable)

Yes No

13b) If you answered yes to 10a (above), can you say, briefly, what worried you?

Thank you very much for completing this questionnaire, I can assure you that the information you have given will be of great use to me.

Appendix 3

Sample of questions asked at semi-structured interviews

Economic Development Officer, County Council

1a. Did the closure of the refinery by Esso create any problems for the locality?

If so, what were they?

1b. Did the closure create any particular opportunities for the locality:

If so, what were they?

2. What, if any, was the immediate response of the Economic Development Department to the closure?

3. With respect to the closure, what type of strategy did this department eventually follow; for example,

was the redevelopment of the Esso site itself seen as vital or

was the emphasis put on the general regeneration of the Milford Haven area or

was the closure never seen as a particular problem?

4. Are you satisfied with the current strategies (for the site) which are stated in the Local Plans of the District Council and the National Park Authority?

If not, why not?

5. The Pembrokeshire National Park boundary currently runs through the old Esso refinery site. Where would the Economic Development Department ideally like to see the boundary drawn?

What are the reasons for this?

6. Was the Economic development Department involved in the public inquiry process that was held to decide where the boundary should be drawn?

If so, do you feel that your department had a sufficient 'say'?

If not, do you feel that this was a problem?

7a. What, in the opinion of the Economic Development Department, would be the best future uses for the old Esso refinery site?

Why?

7b. Do you believe that the actual uses to which the site is eventually put will cause problems?

If so, what might these problems be?

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