Seaports and development in the Persian gulf

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SEAPORTS AND DEVELOPMENT

IN THE PERSIAN GULF

THESIS SUBMITTED FOR THE DEGREE OF DOCTOR OF PHILOSOPHY
IN THE UNIVERSITY OF DURHAM

by

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1981

ABSTRACT

SEAPORTS AND DEVELOPMENT IN THE PERSIAN GULF

The practical and theoretical relationship between transport and development is examined in relation to the evolution and operation of maritime transport systems which focus on the major seaports of the Persian Gulf. Concentrating on the ports of Kuwait, Bahrain and Dubai, and using a 'systems' methodology, the negative, as well as positive issues which have emanated from the post-war era of unparalleled economic development and expansion are extracted for analysis.

Confirmation of the hypothesis that since the late nineteenth century the intrusion of modern systems of transport into Gulf society has dismembered, but not destroyed, a former pattern of life based on trading in dhows, leads to the conclusion that a spatial 'dualism' exists in the Gulf, differentiated by the extent to which modern technology has percolated traditional social and economic life.

In practical terms, the research focuses on three areas: it measures the spatial extent of the existing dhow trading network; it comments on the inter-relationship between port expansion projects and the general pattern of economic development within the Gulf ; and it highlights problems relating to the overtonnaging of shipping services and port congestion in the Gulf.

Theoretically, the relationship between seaports and development is assessed in the context of the significance of behavioural aspects of decision-making in port development and operation. Secondly, the social impact of the modernisation of transport services, measured in terms of the concentration of investment at the major points of linkage with the world economy - the port cities - is perceived as exacerbating spatially unbalanced growth to the detriment of groups living in peripheral towns and villages.

"In 1498 Vasco da Gama was at Malindi in East Africa looking for a pilot to take him to India. There he found none other than Ahmed ibn-Majid, and persuaded him to conduct the Portuguese squadron across to Calicut. Thus, by one of the ironies of history, a great Arab seaman helped bring about the undoing of Arab navigation, for the Arabs could neither drive out nor compete with the Portuguese and other European nations which followed them."

(Hourani, 1963, p83-84).

PERSIAN GULF/ARABIAN GULF

Throughout this thesis the term 'Persian Gulf' is generally used to denote the study region. It is appreciated that the term 'Arabian Gulf' is in common usage in the contemporary Gulf. However, rather than use the clumsy term 'Arab-Persian Gulf' the label 'Persian Gulf' has been adopted for convenience within the text as it appears to be the most commonly used alternative throughout the world. Its use implies no disrespect to the Arab community.

ACKNOWLEDGEMENTS

I should like to place on record my gratitude to the many people who have both helped and influenced me during the period of this research. In general terms I wish to thank the members of staff in the Department of Geography at Durham University, who stimulated me as an undergraduate to the extent that I became interested in pursuing post-graduate research. In particular I owe a sincere debt to Mr. B.D. Clark, Professor H. Bowen Jones and Professor W.B. Fisher (my research supervisor) who fashioned my interest in Middle East affairs. On location, I would like to thank the many Arabs and non-Arabs not mentioned personally, but who nonetheless, contributed greatly to my fieldwork in the Gulf, all of whom suffered my persistent quest for data and general information. Without their co-operation I would not have ventured very far.

Specifically, I wish to thank the following people for their generous hospitality and the significant degree to which they contributed to my research programme: In Kuwait - Dr. M. Mitwalli and the University of Kuwait; Dr. Mohammad A. El-Farra; Abdullah Mohammad Amin; Khalid Bouday; Sa'ad Al Abdullah; Fouad Mulla Houssain; Amad Al Awadi; Majid Badr Jamal El-Din; Captain G.K. Haider; M.M. Derhalli; Sa'ad Al-Jamel; Khaleb. A. Khaleb; Captain Khudadad Khan; Radwan M. Termanini: In Bahrain - His Highness, Shaikh Daij Al Khalifa; Youssef Mohammad Saleh; Hamad Abdullah Abul; M.D. Kyrle-Pope; Mr. and Mrs J. Shouten; Abdu Bushara; Mohammad Al-Kazi: In Qatar - Captain M.B. Mandour: In the United Arab Emirates - His Highness, Shaikh Rashid Bin Said Al Maktoum; Mr. and Mrs B. Kendall; Mr Neville Allan; Mr. W.R. Duff; Mr and Mrs Neil G. McNeill; Captain A.J. Jarman; M.A. Kadar; Abdul Rahim Galadari and Mr C.H.W. Selby-Lowndes.

INDEX

CHAPTER 5 TECHNOLOGICAL CHANGE AND BEHAVIOURAL RESPONSE II: INTERNATIONAL SHIPPING AND PORT DEVELOPMENT

LIST OF FIGURES

LIST OF TABLES

STATISTICAL APPENDIX

Tables

CHAPTER 1.

THE NATURE OF PROBLEMS ASSOCIATED WITH THE DEVELOPMENT OF SEAPORTS IN THE PERSIAN GULF

The first chapter represents an attempt to clarify the nature of problems which relate to the rapid build up of foreign trade and levels of national income in the Gulf during the 1960's and 1970's in so far as they impinge on ports and shipping. The aim is to isolate the major conceptual themes which derive from an era of rapid change in which traditional as well as modern modes of maritime transport have adapted, or have had to adapt, to changing economic circumstances.

Throughout the thesis the general cut-off point for the analysis is the beginning of 1980. Detailed analysis is curtailed at the end of 1978 for the 'modern' sector of ports and shipping, while the close analysis of the 'traditional' dhow sector relates to field work carried out up to the end of 1973.

1.1. SEAPORTS, TRADE AND DEVELOPMENT

In an era of rapid change, both the adequacy of the Gulf's seaports and the efficiency of the sea transport systems serving the region are of critical importance if the development process occurring in the wake of accumulating oil revenues is not to be undermined by congested harbours and choked warehouses. Seaports are particularly crucial to the region's economic health because the Gulf states are heavily dependent on imports to sustain their development objectives, over ninety percent (by weight) of which arrive by sea. The majority of consumer goods and items of capital equipment arrive through the ports: these include basic foodstuffs, construction equipment to build roads and other items of infrastructure, cement to erect houses, pipes for sewers, cable for electrical systems, equipment to treat water, and machinery to establish the industrial base of the Gulf states. As a whole, the Gulf states imported close to 40 million tons of such items by sea at the end of the 1970's (see Smith, 1978, p65), most of which arrived through port facilities originally designed to handle no more than a ten percent annual growth in trade (El Zein, 1977, 30-31).

The reality of the 1970's has been that the trade levels at the end of the decade bear no resemblance to those experienced at its beginning, or in previous decades. The root cause of this sharp upturn in the absolute and relative levels of trade lies in the steep rise in the price of oil in 1973, 1974 and subsequent years which led to a sudden jump in national expenditure levels in the Gulf after 1974. At the beginning of the decade imports from the U.K. to the Gulf states rose 14% by value from 1970 to 1971 (Middle East Economic Digest, 1972, 16/6, p.167). Following the large oil price rises of 1973, 1974, O.E.C.D. statistics show that the value of sales from Western Europe, Japan, the United States and Canada to Arab Middle Eastern states rose by 57% in 1974, 65% in 1975 and 22% in the first half of 1976 (calculated in f.o.b. terms). These trade levels represent figures approximately four times greater than the world average at the time. In 1977, exports from the U.K. to Middle Eastern states rose by 28% from the previous year. Inevitably, these rapid annual increases in the level of trade, particularly to the Gulf, although receding in the late 1970's from the 'boom' levels of the middle decade, translated themselves into rapid increases in the level of cargo tonnages handled in the ports. Dubai is an example of this trend, experiencing a rise in imports (dwt) handled from 514761 tons in 1971 to 3351081 tons in 1978.

A number of themes emerge as a result of the interplay between trade levels, development objectives and seaport capacities. First, the general rise in the level of imports in the Gulf through the 1950's, 1960's, and particularly post 1973-74 has led at various times to serious, sometimes severe, port congestion, leading to the delay of urgently needed cargoes whose costs were increased by the addition of surcharges levied by shipping conferences. A realisation of the negative implications of congested ports has led the governments of the Gulf states into certain courses of action to alleviate national circumstances. A common response has been to develop or expand harbour facilities so that the number of wharves matches the demand for berthing space in the immediate and longer terms. Hence the Gulf has witnessed in the 1950's and 1960's, and dramatically in the second half of the 1970's, a spate of development projects. Allied to this response has been a parallel effort to improve vessel turn-around-time either by investing in new technology to speed discharge times (e.g. container cranes, Ro-Ro berths or L.A.S.H. Systems), or by introducing new port management schemes (sometimes run by overseas companies), or both.

Many of the Gulf states have in the same time period sought to diversify their national economies away from a narrow reliance on oil and oil product exports. A number of capital-intensive industrialization schemes have formed the backbone of this drive to diversify, and because many of these projects are based on imported raw materials together with an aim of marketing the major proportion of manufactured output overseas, several Gulf states have sought to base some of their industrial plant on sites adjacent to port facilities. Whereas, the result of concerted efforts at port development has been the diminuation since 1977 of widespread port congestion within the Gulf, the scale of these projects has inevitably led to a number of implications which follow from such investments.

Firstly, the cost of the plethora of port development schemes either recently completed or presently under construction is very high in financial terms. The published costs of such port development projects within the Gulf (including Oman) add up to approximately £4,000 Million at 1978 prices and involves the use of considerable quantities of foreign labour and construction equipment. Assuming all these projects are completed they will raise the total berthing capacity of the Gulf from 121 existing berths in April, 1978 (Civil Engineering, April 1978, p.20), to a total of 370 in the early 1980's. Such an increase has led to speculation that the Gulf will move from under-capacity of berths in the mid 1970's to over-capacity by the early 1980's, representing a consequent waste of resources especially as so many of the berths presently under construction are of the traditional type, whereas the trend in world shipping and port development has moved towards a relative increase in the use of containerized cargo handling methods.

Secondly, as a result of the policies of all the Gulf states, to industrialize and broaden the base of their national economies, a number of them have sought either individually, or in co-operation, to develop indigenous shipping companies, the majority of which link the Gulf to overseas markets in direct competition with long-established overseas carriers. These investments involve financial risks not least because they have been taking place in the atmosphere of a down-turn in the world economy which initially hit the tanker and bulk shipping trades and subsequently affected liner operations in the second half of the 1970's (O'Byrne, 1978, p.20)

In contrast to the modern ports and shipping sectors of the Gulf economy the informal maritime transport systems which utilise so-called 'intermediate' technology have suffered from both neglect and competition from other transport modes. Those trades which utilize the traditional dhow transport have not only been deprived of the investment in shipping services and port facilities accorded to liner trades, but have also had to adapt their markets in the face of competition from new technology in shipping (i.e. unitized methods) and from developing road and air trades along the Gulf littoral and beyond. There are exceptions, for example the buoyant dhow-based trade routes which focus on Dubai, but in general the traditional socio-economic pattern of life along the shores of the Gulf is threatened with a sharp contraction in both the intensity and spatial reach of its operations.

The spatial implications of the pattern of port development have become more pronounced during the 1970's, operating on two levels. Firstly, the early 1980's reveal a distinct change in the hierarchial pattern of ports in the Gulf compared with the beginning of the previous decade. Secondly, the rush to build and expand harbours inevitably implies that port hinterlands and forelands will in some cases overlap to a degree not previously experienced. The phenominon of port competition appears at the beginning of the 1980's to be most acute in the United Arab Emirates.

Before proceeding further, the remaining sections of this chapter will discuss in greater depth each of the major themes that have emerged in this section. These themes will in turn constitute the backdrop against which the subsequent analysis presented in this thesis will be set.

1.2. PORT CONGESTION

During the mid 1970's a number of the Governments of the Gulf states received a shock. In each case the diagnosis was chronic, import indigestion. The years 1975, 1976 and 1977 were a sharp, painful reminder that the capacity of their respective seaports must bear a direct relationship to actual levels of trade. During these years a tidal flood of imports caused serious problems associated with acute port congestion.

The inadequacy of port facilities is not simply a problem that arose in the 1970's. selective port congestion has bedevilled certain ports during the previous two decades with a characteristic symptom of ships lying at anchor off shore either waiting for a berth, or discharging cargoes slowly into barges where deep-water harbours were lacking. As levels of trade built up steadily in the 1950's and 1960's some Governments found that their ports suffered from port congestion because of the absense of deep-water berths, aggravated in some cases by slow methods of cargo handling on shore. The Iranian ports of Khorramshahr and Bandar Shahpour, the Iraqi port of Basra, the Saudi port of Dammam and the port of Kuwait had all found difficulty in coping with an increasing annual level of imports associated with ambitions programmes of economic and social development. The port of Bahrain operated close to capacity in response to its healthy transit and re-export trades to mainland ports, hampered by the perpetual use of one of its six berths by military craft. In the late 1960's and early 1970's the ports of the Trucial States (United Arab Emirates after 1971), in particular Abu Dhabi and Dubai, and the Omani port of Muscat, found that they could not sustain their respective development programmes without recourse to the construction of deep-water harbours. Port development and expansion schemes were therefore part of a continuous process of response to perceived levels of port inadequacy. The difference in the mid 1970's was that the condition of port congestion became simultaneously widespread throughout the Gulf.

Theoretically, the critical relationship between seaports and development programmes in the LDC's (Less Developed Countries) has been established in a number of studies. In general, it appears that maritime connections and ports have a far greater impact on the economies of LDC's than is the case in the majority of more advanced, industrial states (Nagorski 1968, p.36). Hoyle and Hilling (1970) emphasise that seaports in LDC's are nodes through which almost all external trades passes and, as such, are well placed to act as either a growth point, or as a restrictive influence upon development Hilling's (1970) study of the ports of Ghana (and other studies of Tropical African ports - White, Khogali, Hance and Schultz - all 1970) concludes that a seaport is a major determinant of both the rate of growth, and the stage of economic development attained in its hinterland. Ultimately this growth is related to the capacity and degree of sophistication of port facilities (p.126). Optimum port capacity in this context is defined as the point at which a port increases its traffic only at the expense of congestion, delays to shipping and a general increase in costs. Whereas a number of Gulf ports had reached optimum capacity at various points during the previous twenty years, it seems that in the mid 1970's virtually all the Gulf ports reached optimum capacity simultaneously.

The causes of port congestion in the Gulf in the mid 1970's have been attributed largely to the spending boom following the quadrupling of the price of a barrel of oil in the wake of the Middle East War of 1973 (Middle East Econimic Digest, 25 March 1977). The resulting torrent of cargoes arriving at Gulf ports proved far in excess of the tonnage that the traditional (i.e. non-containerized) handling systems could cope with. Further, this volume of tonnage was aggravated by the fact that initially the ports continued to be serviced mostly by conventional break-bulk ships which used relatively slow and labour-intensive handling methods. However, this essentially self-inflicted cause of congestion was not the sole factor though it did serve to inflate other underlying pressures.

The 1973 War curtailed the vital over-land transit trade routes linking Europe and the Levant with the Gulf states with the result that ports such as Shuwaikh in Kuwait became over-loaded as ships unable to discharge at the congested ports of Dammam, Jeddah and Aqaba (in Jordan) began off-loading cargoes destined for Saudi Arabia (Smith 1978, p.45). The later outbreak of fighting in Beruit resulted in the closure of its port and further aggravated the transit trade situation. In the eastern Mediterranean, Tartous and Latakia became congested due to Beruit's closure, followed by moves by the Syrian Government to reduce transit traffic and reserve berthing space for its own growing level of imports. In banning Iraqi over-land cargoes from transiting its territory until relations were eased in 1978, the Syrian Government added to the level of port congestion in the Gulf. The Syrian action not only hit the Iraqi port of Basra where ships were obliged to wait up to 90 days for a berth during 1977, but also the ports of Kuwait, Jordan and Eastern Turkey where arrangements had been made to help with transit problems.

Within the Gulf, congestion was helped along by two further factors. Firstly vessel turn-around times were lengthened in some cases by slowness in unloading cargoes. Once ashore cargoes were again sometimes slow to be cleared from warehouses and open storage areas, leading ultimately to some jetties becoming choked with unclaimed cargoes. The problem of accumulating, unclaimed cargoes was particularly acute in Bahrain and Dubai. In the case of Bahrain a survey by the Bahrain Society of Engineers (Shipping World and Shipbuilder, January 1976) suggested that the indiscipline of local consignees, who treated transit sheds as cheap warehouses and who refused to take delivery of their goods until a long period of time had elapsed, had been the main cause of congestion in the port of Mina Sulman.

Secondly, the sheer volume of imports shipped to the Gulf was accompanied by a rush of both large and small shipping companies to open new services to the region. This process led to a situation where many of the Gulf trade routes with the rest of the world were clearly over tonnaged (O'Byrne, 1978, p.20) as represented by a situation in which more ships were servicing the Gulf ports than was justified in terms of the gross volume of cargoes that required to be carried.

The severity of port congestion measured in terms of the average waiting time for vessels requesting a berth at each of the Gulf's major ports is illustrated in Table 1.1. It is less easy to obtain data concerning congestion on-shore. In most cases there was a dramatic rise in average vessel waiting times through 1974 and 1975, rising to a peak in 1976 and early 1977. Equally sharply, waiting time fell away steeply in 1978. In the upper Gulf, the Iranian ports of Khorramshahr and Bandar Shahpour experienced the worst levels of congestion in the region rising to a peak waiting time of approximately 200 and 100 days respectively in mid 1976. In general, the total capacity of the Iranian ports which, in 1973, stood at 3.8 million tons per annum, could not cope with the four fold increase in the level of imports in the two year period 1974-1975, which led to a situation where, in 1975, Iran's ports handled 9.8 million tons, three times their capacity (Barnard, 1976). However, by the beginning of 1978 delay times had dropped precipitously to 3 - 6 days in the case of Khorramshahr, and 5-10 at Bandar Shahpour. Bulk (non-conference) cargoes tended to experience longer delays at Bandar Shahpour (7-35 days), as well as at Bandar Abbas, Bushire, Kuwait and Basra. In the Iraqi port of Basra waiting times were consistently high (around 60 days) throughout 1974-76, rising to a peak of 90 days in 1977 and falling back to 7-8 days by early 1978. Kuwait reported no delays in early 1978, but the port had experienced delays of around 50 days throughout 1976 and 1977. Unfortunately, at the time of writing (1980) the ports of Basra and Khorramshahr are now closed in the wake of the military conflict between Iraq and Iran, once again aggravating the situation in other ports in the region.

In the mid-Gulf, the port of Dammam was the most congested Gulf port prior to the Middle East War of 1973. Delays of between 20 and 30 days during 1973 and 1974 were reduced for a time in 1975 when new berths came into operation but ultimately the spectacular rise in imports (Saudi Arabia imported 27,594,000 tons in 1977, a 65% increase on 1976) forced up delay times to 90 days in 1976, before they were cut again to nil by the beginning of 1978. Bahrain's delay rates, though not as high as some rose to a peak of 30 days in 1976 and 1977. The smaller, Qatari port of Doha (four deep water berths) was seriously overloaded by transit cargoes en route to Saudi Arabia which pushed up its delay times to a peak of 130 days in 1976.

Across the Gulf, the low level of trade passing through the port of Bushire meant that congestion was not a serious problem. However, lower down the Gulf the enhanced role of Bandar Abbas in the development of South West Iran, together with conditions in Khorramshahr and Bandar Shahpour, forced up delay times to 120 days in 1976, before they dropped again in 1977 and 1978. Dubai was the least congested and largest port in the Gulf in the early 1970's but even it experienced very long delay times of 70-80 days in 1977, twice the level of neighbouring Abu Dhabi. In the Gulf of Oman, the port of Matrah in general escaped the serious congestion experienced in the Persian Gulf.

The financial costs of this mid-decade congestion were high, both for shippers and for Governments. Faced with the escalating operating costs for vessels lying idle in Gulf waters (which increased from $5000 to $8000 a day between 1976 and 1977), shipping conferences elected to post high congestion surcharges on congested ports. In general surcharges averaged 10-25% in 1975 (with the exception of Basra at 100%), rose to levels of 50-100% in 1976, and fell back to 0-30% in 1977 (Middle East Economic Digest, March, 1977; Smith, 1978; Arab Economist, July 1975). A second form of action taken by shippers was to increase the number of container and roll on-roll off (Ro - Ro) services to the Gulf in an attempt to counteract slow turn-around times.

TABLE 1.1

PORT CONGESTION IN THE GULF, 1972 -1978

(Average waiting time for vessels in days)

Year	1972				1973				1974				1975				1976				1977				1978		
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3
PORT																											
BASRA										60				60-70					60			90			7-8		
KHORRAMSHAHR		5-12				6-15											150		200		5-12				3-6		
BANDAR SHAHPOUR		2-10				4-9											90		70-100		10-20				5-10		
KUWAIT		0-2				1-2				4-5								40-60			50-55		45	0			
BUSHIRE		0				0															0-15				3-7		
BANDAR ABBAS		0				0											50	120			5-15						
DAMMAM		0-5				14-22				25-30				5-6			80	90			22-34						
BAHRAIN		0-2				0				17-19				6-8				30			30			0-1	0		
DOHA														10-15				80-110	130		40-45			14			
ABU DHABI		0				1-2				10-15											29-33						
DUBAI		0				0				6				2-3							70-78		50-55	0			
MATRAH		0				0															1						

Sources: Middle East Economic Digest: 22 Nov 1974; 27 Feb 1976; 25 March 1977; April 1977.
Smith, 1978
Middle East Construction, June 1978
Arab Economist, July 1975
Barnard, 1976
Gray, Mackenzie, Bulletin, May 1972; April 1973.

The response by Governments to port congestion was to retaliate against shippers, as well as setting about curing their own problems of port congestion. A severe example of the types of problem involved is the case of Iran which at the beginning of 1976 had the dubious distinction of possessing the most congested ports in the Gulf. Demurrage charges alone were costing the state more than $ 1 billion a year (Smith 1978, p.49). Waiting times at Khorramshahr reached five months with queues sometimes in excess of 200 vessels. The result was that the rate of inflation in Iran was sent even higher, motor vehicles became a black market commodity, cement fetched five or ten times the official price, and the pace of industrial development was threatened. A shipper cites the case of a vessel carrying 31,000 tons of Australian wheat which waited outside Bandar Shahpour for 104 days in 1976. The contract allowed for only 8 days for off-loading and the Iranian Government had to pay for 96 days delay at a daily penalty rate of $7,250 - which led to a final bill of $696,000 (Barnard, 1976 p.41).

In some cases action was taken against shippers. For example, Qatar banned ships which were more than 15 years old, and Kuwait barred ships with under 400 tons of cargo to discharge (Barnard, 1976, p.42), but the main thrust of Government responses was to put their own house in order by improving rates of discharge and increasing the number of conventional, container and Ro-Ro berths. A number of Governments responded by re-organizing their port administration and port services, sometimes with the use of expatriate labour. One example was the employment of Gulf Port Management Services (a joint venture by Scruttons, U.K., and the Mersey Docks and Harbour Board) at Dammam which was responsible for cutting the waiting time for vessels from 96 days to nil in the period 1976-1977. Throughout the Gulf docksides and warehouses were gradually cleared with the use of various measures including the use of shift systems, the employment of foreign hired labourers, the simplification of paper work, and the installation of new port technology (e.g. container cranes.) For some ports matters were improved considerably by tightening up on conditions for port storage. In Kuwait, a years grace was allowed before uncleared goods were auctioned, in Dubai it was six months, in Saudi Arabia, fifteen days (Whelan, 1977).

However, although many of the Governments of the Gulf states differed precisely in the options adopted to clear docksides of cluttered cargoes, one option was embraced almost universally as the panacea towards the prevention of a future recurrence of the problem. This was the costly decision to develop or expand harbour facilities, and as such deserves more detailed attention.

1.3 INVESTMENT IN PORT FACILITIES

Port construction projects presently underway in the Persian Gulf constitute one of the largest regional programmes of port development ever seen in the so-called less developed world. The rush to develop harbours is so earnest that the Gulf faces the real possibility of moving from a position of net under-provision of berths to net over-provision in the decade 1973-1982. The Gulf states now recognise that if their national economies are to develop into anything like their projected scenarios there has to be an efficient, unimpeded flow of cargoes into the region. However, it now seems that although some schemes are realistic in terms of the likely future demand for port capacity, others may be over-ambitions.

The scale and speed of the port development process is indicative of the strength of reaction to port congestion. Table 1.2 lists the current and projected number of berths in the Gulf up to 1982. The increase in the total number of berths is almost exponential rising from 30 conventional berths in 1970, to 75 in 1973, 157 (of which 12 were container or Ro - Ro berths) in 1977 to 292 in 1979 (of which 41 were container or Ro - Ro berths), with a projected level of 465 (55 container or Ro- Ro) by 1983 (Owens, 1978; Gomer 1977). Nearly all the major deep-water ports, with the exception of Bushire, Basra and Matrah, have significant port expansion proj ects under construction in the period 1978 - 1982. Some are modest, for example expansion at Bahrain and Doha, but others are major ventures such as the projects based on Bandar Abbas, Bandar Shahpour, Dammam, Dubai and Jebel Ali (U.A.E.). The overall trend seems to be for the contained dominance of conventional berths,

TABLE 1.2

PERSIAN GULF PORT DEVELOPMENT

(General Cargo Facilities)

tate / Port		Existing Facilities, 1977						Future Expansion 1978 - 1982						
		Berths				Cranes		Berths					Cranes	
		C	*	R	L	C	*	C	*	R	L	P	C	*
AHRAIN	- Sulman	11						2	2	1				2
RAN	- Abadan	3				3		1						
	- Bandar Abbas	6				6		14	4	2	1			4
	- Bandar Shahpour	6	3		1		2	24	1					2
	- Bushire	2				1								
	- Khorramshahr	9				2		4						
RAQ	- Basra	15				68			1					1
	- Umm Qasr	4				11	1	2				14		
	- Zubair											5		
UWAIT	- Shuaiba	3				5		6	4					1
	- Shuwaikh	18				69			2			24		2
MAN	- Matrah	8				4						1		
ATAR	- Doha	4						2				3		
	- Umm Said							4						
	- Jazirat Alyah											50		
AUDI	- Dammam	15	3	1			2	19	2					2
RABIA	- Jubail	2						12	2					7
	- Ras AlGhar											7		
	- Ras Al Mishab	1						2						
U.A.E.	- Abu Dhabi	12						1	3	1		8		
	- Jebel Ali							14	5			40		
	- Dubai	20	1				2	16	2					
	- Fujairah											10		
	- Sharjah	6	2	1			2					7		
	- Khor Fakkan								2					2
	- Ras Al Khaimah	1						3	2	1				
	- Umm Al Qaiwan							1						

Key C = Conventional; * = Container; R = Ro-Ro; L = LASH; P = Planned

after P.G. Owen, Dock and Harbour Authority, October, 1978, P. 167.

but with an increasing proportion of specialized quays for container, Ro-Ro, and LASH craft at selected ports.

Three different, though related processes, seem to present themselves as justification for port development schemes. First, the level of trade in the mid-1970's exceeded the capacity of many Gulf ports. Whereas investigations have shown that a well-equiped, efficiently operated general cargo berth can comfortably achieve a throughput of 120,000 tons per annum under normal circumstances (Owens, 1978, p.164), levels as high as 400,000 tons a berth were achieved in some ports at the height of the congestion period in 1976, levelling out to an average throughput of around 250,000 in 1977 with the arrival of frequent containerized and Ro-Ro shipping services. Secondly, the handling advantages offered by container, Ro-Ro and LASH shipping systems in terms of faster turn-around time seemed to justify investment in new, specialized berths and container gantries, at least in the short term battle against congestion. Third, an increase in the demand for berths was clearly part and parcel of the efforts of all the Gulf states to diversify their unbalanced, petroleum-dominated economies in the direction of major industrialization projects many of which are located in coastal locations adjacent to specialised port facilities.

Considerable skeptism has, however, been levelled at some of the projects in hand, particularly by commentators outside the states concerned. Uppermost are doubts as to whether the levels of trade in the Gulf in the 1980's will grow as fast as they did in the 1970's. Owens (1978) expressed the view that the future prospects for ports are likely to be influenced by an atmosphere of moderated traffic growth and excessive shipping capacity (p.164). It seems likely that the period 1978-1983 will witness a process of progressive port over-capacity as traffic growth falls behind that rate at which new berths are opened. Set against this process is the possibility that another sharp rise in oil prices may again set off an import boom, or that continued political instability in the Middle East will precipitate the closure of some trade routes (e.g. the Iraq-Iran War which began in 1980). It is however apparent that the pattern of imports into the Gulf is unbalanced in favour of large quantities of construction materials, and that as such the level of imports is closely associated with the number, type and intensity of development projects under way. Hughes(1979) has noted that construction materials, particularly bagged cement, make up a high proportion of the tonnage imported into the Gulf, and that decline in the construction boom, together with efforts to manufacture some of the products locally, would seriously threaten the levels of trade in some ports, notably Doha, Dubai and Bahrain.

Changes in the use of transport technology in the Gulf have also given rise to doubts about the wisdom of building so many new berths. It seems likely that penetration in the use of container, Ro-Ro and other modern handling equipment will continue in the short term, eroding the dominance of conventional handling methods. If this trend continues it is possible that the considerable expansion in conventional facilities will lead to a situation where the vast investment required will be waisted in an atmosphere of unwanted berths (Smith, 1978, p.45). The evidence in Table 1.2 suggests that over-capacity is likely to be most apparent in the United Arab Emirates. Balanced against this possibility is the fact that given the mainly one-way nature of seaborne traffic in the Gulf it is difficult to justify long-term investment in container and Ro-Ro terminals, specialized container vessels, and the range of required back-up services. Containerization certainly played a major role in clearing the back-log of cargoes in the mid-1970's. However, this was essentially a short term problem: in the longer term many of the cargoes required for the 1980's, especially heavy construction equipment, may not be so easily containerized. A specialized, versatile type of vessel which can carry Ro-Ro or heavy lift cargoes may therefore be developed for use on Persian Gulf trades (O'Byrne 1978).

The position is further complicated by the increasing of the road network along the eastern Arabian coast, linking Europe with Kuwait, Saudi Arabia, Qatar, the United Emirates and Oman, together with the causeway between Bahrain and the Saudi mainland. These projects will affect ports such as Bahrain which have traditionally conducted sizeable transit and re-export trades.

Overseas companies fighting to secure lucrative development contracts naturally see no advantage in slowing the regions rapid expansion of port facilities, since shipments associated with these projects and their supplementary cargoes have not only kept International construction companies operating profitably, but also promise to provide ship owners and ship operators with business for some time to come (Middle East Economic Digest, April 1978). However, within the Gulf states the implications of port over-capacity are sometimes viewed differently. The Gulf-based consultant engineers, Sir William Halcrow and Partners have had the opinion that too many berths are being built in the Gulf for some years, and have responded by turning their energies to what they consider to be the next stage in the development of the Gulf, namely the installation of more desalinization and irrigation plants, and power stations. A conference on Arab Ports, held in London in July 1978, expressed fears that the level of port expansion in the Gulf was not justified by the (then) present rate of growth in demand for such services, or by rational justification despite the possibility of future fluctuations (Arab Economist, Oct, 1978).

As a group, the governments of the Gulf states are, in general, aware of the significance of seaports to the regional economy, and some of them have gone some way towards co-ordinating their development proposals. The Arab Gulf Union of Ports was set up in 1977, based in Dammam (Gower, 1977) and in 1978 the Arab Union of Ports was set up under the auspices of the Arab League in an effort to coordinate all Arab ports under one umbrella by functioning as a central information point for the collection of statistics such as those relating to cargo turnover and port expansion plans. However, at a meeting in Basra to elect a general manager for AUP, only 9 out of 22 Arab League Members attended, two of which - Kuwait and Iraq - represented the Gulf (The Middle East, August 1978).

Hitherto however, cooperation in concrete terms has been limited, with serious implications for the Gulf. Whereas on the one hand fears have been voiced that individual states will find it difficult to cover the capital and operating costs of their new berths in a situation of low utilization without recourse to the subsidization of tariffs, on the other there is the basic underlying problem of the location of the Gulf ports. As in other parts of the world, government projections of national economic development and trade growth are some times over-optimistic, reflected at another level by individual port authorities who have formed over-optimistic views on the competitive ness and traffic prospects for individual ports (Owens, 1978). Such competitiveness is crucial in the Gulf where a number of micro-states and federated shaikhdoms compete with each other as well as with the larger states. It is therefore the spatial implications of port development in the Gulf that are the basis for concern as to the nature and extent of new construction projects.

1.4 SPATIAL AND LOCATIONAL IMPLICATIONS OF PORT DEVELOPMENT

The spatial implications of the extensive development of ports in the Gulf centre on the fact that the competitive hinterlands of nearly all the major seaports of the region overlap to a greater or lesser extent on either landward or seaward margins, or both. Although some ports are 'national ports' in the sense that their primary role is to serve the inland urban and rural communities of the state (for example, Dammam, Basra, Khorramshahr, Bandar Shahpour, Bushire, Bandar Abbas and Matrah), others have a dual function in which a significant proportion of imported cargoes are ultimately re-exported or shipped in transit to ports and port hinterlands elsewhere in the Gulf. This latter group includes the ports of Kuwait, Bahrain, Doha, Abu Dhabi, Dubai and Sharjah. In practice this means that parts of the territorial space of a number of Gulf states are served regularly by ports other than their national ports.

Given the configuration of the Gulf as a maritime cul-de-sac it is reasonable to consider the ports to be members of an inter-related group in which they exhibit certain levels of functional association and inter dependence between each other. Ogundana (1970) has defined such a regional group of ports as a 'port complex' which, based on his Nigerian case study, may be viewed as being a set of ports which individually may be in a complimentary or competitive relationship to each other. Broadly, two particular ports may be considered to be in a complimentary relationship if they each develop separate, specialist trading functions which together serve a common hinterland; while a competitive relationship will develop when two ports compete against each other to serve a common hinterland with the same functions.

Viewed in time, the process of changing competitive or complimentary associations between ports in a 'port complex' leads to the development of a hierarchy of major and minor ports, and coastal villages, measured variously according to different indices of traffic flow (Rimmer 1966 A and B, 1967 A; Carter 1962; Nai-Chung Sun and Bunamo 1974; Shaeffer 1965; Kenyon 1970). In the context of the Gulf the instability of the port hierarchy is typified by the demise of the ports of Siraf, Hormuz, Lingeh and Muscat to contemporary positions of relative insignificance.

The key, therefore, to the success of a port at any period of time lies in its ability to command sufficient trade from its surrounding hinterland (Boerman , 1951). Theoretically, the notions of a 'port complex', 'port hierarchy' and 'port hinterland' were put together in a 'third world' context by Taaffe, Morrill and Gould (1963) in their study of the development of transport networks in Ghana and Nigeria. The explanatory model derived from this study depicts a so-called 'ideal-typical' sequence of processes whereby the success of one port at the expense of others in a 'port complex' is derived from the gradual hinterland penetration of a port in concert with the development of inland transport networks. If such a model is to be applied to the Gulf one would expect a regular spacing out of major and minor ports servingthe inland urban and rural communities of Arabia, Iraq and Iran. The theory explains that in reality two major, competitive ports serving the same hinterland would be unlikely to develop simultaneously, adjacent to each other. Ultimately one would dominate the other.

A direct application of this model to the Gulf is complicated by its shape and the fact that for the entrepôt group of ports a significant proportion of their respective hinterlands includes ports and villages across the waters of the Gulf in a form of 'seaward hinterland', or foreland. Rimmer's (1967) study of Australian seaports which in part attempted to adapt Taaffe, Morrill and Gould's model, also found difficulty in its direct application because the original model laid emphasis on land communication (i.e. the hinterland) and neglected the organization of maritime space (ie the foreland). In reality the maritime space of the Gulf is criss-crossed by a network of dhow, barge, Ro-Ro and LASH routes which link the ports and villages of the Gulf together in a manner less rigid and confined than the inland penetration of road and rail routes. Nevertheless, one would expect that in general terms the model would fit the Gulf context in the sense that over time an ordered hierarchy of ports would emerge based on competition for hinterlands and forelands.

Blending this theory with the reality of port development in the Gulf brings one up against the observation that most states appear to have taken little account of port development plans in neighbouring countries (Owens, 1978, p.164), and in one case, the United Arab Emirates, little cognisance seems to have been paid to development schemes in member Emirates. Some projects seem well planned to compliment one another in terms of overall national development programmes, namely the construction of separate commercial and industrial harbours as in the case of Kuwait (Shuwaikh and Shuaiba), Qatar (Doha and

Umm Said), Saudi Arabia (Dammam and Jubail) and Dubai (Port Rashid and Jebel Ali), and in the case of Sharjah's development of two linked container ports at Port Khalid and Khor Fakkan. Some schemes, however, seem destined to intensify competition for trade in broadly overlapping hinterlands. In this context the development of the port of Dammam in Saudi Arabia would appear to threaten transit trade from Bahrain and Doha, while in the United Arab Emirates the scale of port development at the ports of Sharjah, Ras Al Khaimah, Fujaraih and Abu Dhabi seem questionable in the face of Dubai's dominance as the state's leading entrepot. On the Iranian coast it seems less likely that the expansion of Iranian harbours will seriously affect trade levels in Arabian entrepots whose main function is to supply the smaller Iranian coastal towns and villages.

The locational implications seem more favourable than some of the spatial manifestations. The development of commercial and particularly industrial harbours are providing the region with a number of 'growth poles' for industrial development in furtherance of the common aim of the Gulf states to diversify their economies. The development of heavy and light industrial enterprises such as those located at Bandar Shahpour, Shuaiba, Dammam, Sitra (Bahrain), Umm Said, Jebel Ali and Bandar Abbas are providing the states concerned with opportunities for down-stream industrialization through the investment in such export-earning projects as the manufacture of fertilisers and the dry docking of oil tankers. Further, the general policy of industrialization, linked to the development of seaports, inevitably open up the question as to whether the Gulf states should invest in their own shipping fleets as a general adjunct to the drive towards diversification.

1.5 INVESTMENT IN SHIPPING

The events of the mid-1970's have confirmed the Gulf as one of the busiest shipping markets in the world, both for dry cargo and tanker trades. By 1980, an average of one ship passed through the straits of Hormuz in every twelve hours of each day (Hughes, 1979).

TABLE 1.3

GROWTH OF TANKER AND DRY CARGO FLEETS IN THE GULF STATES

1970 - 1978

TANKER FLEETS

	Number of Vessels		Gross Tonnage	
	1970	1978	1970	1978
Bahrain	1	2	954	913
Iraq	2	29	560	1141120
Kuwait	6	17	423740	1218912
Oman	0	0	0	0
Qatar	1	2	200	75570
Saudi Arabia	0	47	0	1021656
U.A.E.	2	10	1455	
Iran *	N/A	26	N/A	1154026
DRY CARGO FLEETS				
Bahrain	2	7	847	1943
Iraq	5	15	9270	80898
Kuwait	26	89	145679	897666
Oman	0	5	0	3456
Qatar	0	2	0	884
Saudi Arabia	24	45	36707	114950
U.A.E.	4	40	4	60021
Iran *	N/A	74	N/A	374671

Source: Seatrade Publications (1979, p.33)

* Figures for Iran relate to 1977, obtained from Lloyds Registry of Shipping.

However, this density of shipping conceals a number of inter-related problems facing the industry at the end of the last decade. Firstly, international shipping has been hit badly by a slackening in world economic activity (O'Byrne, 1977). In this depressed atmosphere the anti-cyclical character of merchant shipping resulted in an over-capacity of vessels as ships ordered earlier came into service at a time when there was no real need for them. Consequently, world wide freight rates dropped and forced 'tramp' operators to transfer ships to liner-type 'ad hoc' ventures to explore the few remaining profitable trades, which in the late 1970's included the Gulf cargoes. The net result of the attractiveness of Gulf markets in an era of world economic slump was to channel an increasing number of vessels into the region's seaports, thereby contributing further to the situation of over-tonnaging that existed in the Gulf well before the rise of trade levels after the 1973-74 oil price rises.

In such an atmosphere of crisis in world shipping it is, on the surface, surprising that some of the Gulf States should have chosen the period 1975-1980 as the moment to intensify their participation in the international shipping industry by expanding their national fleets and entering into a number of joint shipping ventures. Table 1.3 illustrates the sharp rise in the size of the individual and joint fleets of a number of the Gulf states in the 1970's. Kuwait, in the late 1960's, emerged as a front runner by investing in significant tanker and dry cargo fleets operated by K.O.T.C. (Kuwait Oil Tanker Company) and K.S.C. (Kuwait Shipping Company) respectively, but she has since been joined by Iran, Iraq and Saudi Arabia who have latterly strengthened the size of their fleets. In general, plans laid by the Arab and Iranian shipping lines to capture a larger share of bulk and dry cargo markets yielded unspectacular results up until 1977 - even less so in the oil and gas trades. By the end of 1977 the Arab dry cargo fleet, including fleets from outside the Gulf, accounted for less than 2.5% of the worlds dry cargo fleet (Smith, 1978 p.67). However, from 1978-1980 there were signs that this slow progress was about to end. In 1977, Middle Eastern countries placed orders for 740 dry cargo vessels totalling 7 million dwt, more than one third of the total tonnage ordered during the year (Smith 1978, p67), of which the Gulf states of Kuwait, Iraq, Iran and Saudi Arabia contributed 747,659 dwt. During the same year these four states also had 2,509,720 dwt. of tanker tonnage on order (Middle East Economic Digest, 25 March, 1977 p. xviii). By October 1977, the major Gulf dry cargo carriers (the United Arab Shipping Company, Iraqi Line and Arya Line) were together estimated to be carrying almost a quarter of the total seabourne freight into the Gulf (North, 1977, p.9).

The rationale underlying the decision of some of the Gulf states to attempt to carry an increasing proportion of their own trade in their own vessels rests upon a number of local factors which seem to favour such a policy. The key linkage involves industrial development with investment in shipping. Whereas it is clearly a more urgent priority for the states concerned to invest in the short term in the development of port facilities to alleviate trading bottlenecks, in the longer term attempts by Governments to broaden national economies via programmes of industrialization are bound to involve additional commitments to shipping (Couper, 1978, p.107). Investment in shipping is also going ahead, despite the world shipping crisis of late 1970's, because although parts of the so-called 'Developed World' are experiencing economic recession, the Gulf states are still expanding economically with a resultant high level of demand for manufactured goods.

In reality, the range of alternative industrial diversification projects available to the Gulf states are limited. The region is, in general, relatively well endowed with local capital and energy resources but poorly supplied with a number of critical physical and human (especially managerial and technical expertise) resources. In theory, investment in international shipping provides a suitable form of down-stream industrialization because it is at the same time both capitally intensive, and, has relatively low manpower requirements. It has the further advantage of being an international activity which can not only supply, in the short term, the necessary imported manpower to administer and operate new shipping ventures, but also offers possibilities of a large market in contrast to the problems which sometimes beset industrialization schemes in so-called 'Less Developed Countries' which suffer from the disadvantage of limited market size. It is also an enterprise that can expand quickly by the purchase of new or second-hand vessels (Couper, 1978).

Strategic considerations can also be added to the economic benefits which derive from a viable international earnings base. Firstly, given that the Gulf states will remain a substantial importer of general cargo into the foreseeable future, the development of local fleets permits these companies to apply for membership of international shipping conferences wherein they are free to influence the determination of conference rates. Secondly, the move by O.A.P.E.C. countries to develop an indigenous, heavy industrial base (including petrochemical, fertiliser and steel manufacturing plant) would be better served by the development of local shipping fleets than can provide spatial linkages between plants, markets and resource supplies (Couper, 1978).

However, balanced against the positive arguments in favour of shipping investment are a number of issues which cast doubt of the wisdom of large-scale participation in the industry. It is arguable that an adequate service is already being provided by foreign-flag liners operating in the Gulf and that the addition of Gulf owned vessels will only add to problems of over-tonnaging. Equally, significant involvement in the tanker trades in a period of shipping recession with its attendent relatively low freight rates does not bode well for a high rate of return on capital invested. A further critical factor involves the problem of attracting sufficient locally trained Arabs and Iranians to man and operate new vessels, without which Gulf-based companies will have to rely on the employment of foreign personnel. A study by H.P. Drewry (Shipping Consultants) of the involvement of oil-exporting countries in international shipping has concluded that the current training schemes for maritime personnel will not provide sufficient manpower to meet the demands of the Arab states until well into the 1980's, and possibly into the 1990's (Middle East Economic Digest, 25 March, 1977 p.ii).

The Gulf states would be unwise to invest heavily in international shipping unless they can guarantee its commercial viability. In the uncertain world trading regime of the second half of the 1970's governments have reached cautiously towards plans for major state investment projects. Against this back drop of economic uncertainty and man power shortages, some governments have attempted to offset these problems by entering into joint ventures with foreign shipping lines and business men. This policy of risk minimization contrasts with the late 1960's and early 1970's when individual states preferred to develop their own independent shipping lines (e.g. Kuwait Shipping Company; Arya Lines, Iran). Throughout the 1970's an increasing number of governments and private business men have formed joint shipping ventures, ranging from the establishment of major companies such as the Arab Maritime Petroleum Tanker Company (A.M.P.T.C., formed in 1973) and the United Arab Shipping Company (U.A.S.C., formed in 1976), through to smaller-scale ventures such as plans advanced in January 1978 by Saudi business man Akram Ojjeh to form the Compagnie Maritime France-Saudi Arabia under a joint venture with France's state controlled Compagnie Generale Maritime (Smith, 1978, p.30). This trend broadly represents ' a logical compromise between owning and chartering' (Couper, 1978, p.110) and gives local Arabs and Iranians the opportunity to graft the intertia of a long history of maritime trading into the modern age of shipping. Unfortunately the traditional dhow trading sector of the Gulf's economy has been comparatively neglected in the recent past.

1.6 DHOW TRANSPORT - THE RESPONSE OF THE INFORMAL SECTOR

The history of steamship services to the Gulf stretches back 120 years but it is only in the last 30 years that a general policy of constructing deep-water berths has been adopted. Set against this comparatively short history, the peoples of the Gulf littoral have created through the centuries (dating back into the third millenium B.C.), a society based on trading in sailing ships which nowadays have become loosely known as 'dhows'. In the 1980's, these craft and the men who operate and sail them are faced with an overall trend of decline in the demand for their services. On the one hand, they face competition on certain routes and in some trades from steamships, motor vehicles and air craft; on the other, the vast amounts of investment capital that has been spent on the purchase of modern fleets of steamships and the development of deep-water harbours is matched in most cases by the neglect of dhow transport. Transport development has threatened the traditional social and economic life of a number of societies in the so-called 'Third World ' (e.g. the construction of a highway system across the territory of Amazonian Indian societies), but it is ironic that in the Gulf a society whose existence was based on operating a transport system is itself eroded by its own decisions involving the replacement of indigenous modes of transport by new imported technologies.

Historically, the Gulf acted as the 'middle-man' lying across one of the world's oldest maritime trade routes linking the Mesopotamian and Indus civilizations. Trade was established through a network of entrepots distributed along a 2000 mile corridor between the civilizations. Subsequently the trading system was expanded along the littoral of the Western Indian Ocean, and into the Red Sea and beyond. The hierarchial centre of gravity of these entrepots has changed through history with the ports of Basra, Siraf, Hormuz, Muscat, Bahrain, Kuwait and Dubai among those which have achieved pre-eminence. Broadly, timber , metals, building stone, spices and textiles flowed into the Gulf, while dates, tobacco, drugs, dried fruit, cotton and certain manufactured items were shipped out of the Gulf. The two major trading sub-systems (the Gulf-Indian subcontinent trades; and the internal redistributive trades of the Gulf itself) were supplemented by three further systems - the Yemeni trades (e.g. coffee); the African trades (e.g. mangrove poles); and the European trades (eg manufactured goods) which were brought by steamship to East African and Indian ports. Elements of these five trading sub-systems still provide the basis of the modern spatial organization of maritime trade in the Gulf.

However, all these trading systems have found themselves challenged by a widening network of local and foreign steamship services. The most serious consequence has been the eclipse of the dhow by the steamship as the major carrier of cargoes in and out of the Gulf. In relative terms the proportion of trade carried by dhows to and from South Arabia, the Red Sea, East Africa and the Indian Sub-Continent has now dwindled to a very minor amount. During the poast three decades the construction of roads and the adoption of modern maritime technology in the Gulf (Ro-Ro; LASH) threaten to contract further the spatial extent of the dhow trading network.

In such circumstances the last three decades have been notable for the extent to which the relevant decision-making bodies (merchants, sailors, boat builders) have succeeded in adapting craft and routes to a new function which increasingly revolves around the task of supplying the remoter corners of the Gulf which have hitherto been least touched by the process of modernization. Essentially, this function involves maintaining trading contact between the smaller towns and villages of the Gulf and the major entrepots.

CHAPTER 2.

THE PROCESS OF CHANGE IN THE PERSIAN GULF MARITIME TRADING SYSTEM

The problems discussed in Chapter One emphasize that during the last three decades the Gulf states have been involved in an accelerating process of change in which traditional institutions, attitudes and patterns of social and economic life have been challenged, and in some cases swept away, by a tide of new ideas and new technologies. In this atmosphere of change it is apparent that seaports and shipping services play a critical role in this process and, as such, contribute significantly to the economic health of the region (see Hoyle, 1973.)

Whereas it is possible to treat each seaport as an individual unit, it is the case that the general nature of technological change affects all the ports of the region in much the same way, though with variation in the scale of impact. In a functional sense the seaports of the Gulf may be conceptualised as a unity, or 'whole', which incorporates an integrated set of ports bound together in an interdependent economy, and served essentially by a common network of shipping services, both local and international. The inter-relatedness of many of the ports in terms of their competitive or complimentary position within the region's economy often means that change experienced in one port will have a supplementary affect on others in the region.

As such, the ports of the Gulf constitute the nodes in a regional trading system which is made up of a set of components (comprising a hierarchy of seaports linked together, and to the outside world, by a network of sea routes) whose function it is to work together to serve the general economy of the Gulf by supplying its society with the resources it lacks in exchange for resources in local surplus. It is therefore appropriate, in the context of this study of the affect of change on a set of ports within a trading system, to utilise the methodology of the so-called 'systems approach' in order to frame a research hypothesis which is directed towards a causal analysis of change and its spatial implications.

2.1 THE SYSTEMS APPROACH

The systems approach is presently a popular concept. The reason for its impact as a methodology lies in the growing realization that the specialist sciences, social and behavioural, as well as physical, cannot on their own provide the answers to many of the problems that bedevil mankind. As such, it has become the major synthesizing academic approach of the late twentieth century. Those who advocate efficiency (i.e. who seek to identify problem areas and bring about their rectification or improvement) and those who favour the use of scientific method (i.e. the construction of orderly, objective models of reality) naturally champion the systems approach as one which is "unique in providing an integrated framework for the analysis of change which can give form to process studies and, at the same time, direct enquiry towards a search for causal explanation" (Langton, 1972, p.170). However, within the ranks of so-called humanists and 'anti-planners' there is a considerable body of opinion which is fundamentally against the beaurocratic methods of organized systems planning (Churchman, 1968, p.14).

Nor is the systems approach wholly accepted in Geography. Its use can be criticized on several grounds. Protagonists of systems theory in Geography have been challenged for empty use of terminology "which is typified by the use of the term feedback as an explanatory device rather than as a description of a fundamental research problem" (Langton, 1972, p.158). Feedback has in fact entered into Geography's jargon hall of fame (Floyd, 1973). Much of that jargon is itself of questionable validity. For example, the concepts of 'entropy' and 'homeostasis' have been called into question on the grounds that systems, as devised in geographical research are not real things, but abstractions from people's observed behaviour (Eliot Hurst, 1974, p.37). Further the use of the term 'equilibrium' flies in the face of reality. The assumption that all social systems are, or should be, in a state of equilibrium is rarely, if ever, the case in an open system. Society is not static, or stable, in a functionalist sense, but is constantly changing in response to a cobweb of stimuli. In practical terms, the use of a systems approach in Geography, unlike its use in mechanistic science, is often not amenable to the statistical quantification of observed human behaviour patterns, but has to fall back on the conceptual modelling of reality. This apparent concern for empiracism is considered by Langton ,(1972, p.132) as a methodological weakness typified by the modelling of real world systems which ultimately "will contribute little to abstract 'syntactical' theory which is currently seen as the central objective of the subject (of Geography) by some of its practitioners" (Harvey, 1969).

Despite its flaws the approach has its positive attributes as shown by its increasing use in geographical and environmental research (Chorley and Kennedy, 1971; Berry and Horton, 1970; Bourne, 1975, Toyne 1974; Eliot Hurst 1974). Langton (1972, p.72) has argued that the "orderly presentation of evidence and the explicitness of conclusions" derived from the use of the systems approach may be the gain which justifies the method. In the field of development studies the systems approach is a useful vehicle upon which to study the processes underpinning social, economic and political change. As such, the approach emphasises that change occurring in one part of a system will have repercussions in other parts of the system, particularly those most closely linked to the part where change has occurred. An important merit is that the approach sets up a line of enquiry which focuses on the causal analysis of change.

It is probable however, that the most important single contribution of systems theory to geographical method lies in its pursuit of 'holism', a task which some believe to be the core concept of Geography (Simmons, 1976, p.82). In this sense, perhaps the most fundamental contribution which the adoption of a systems approach makes to the study of change in human geography is that it forces the discipline to consider even more carefully the analytical entity which it most frequently defines as a 'whole' - that is, a region.

2.2 THE PERSIAN GULF MARITIME TRADING SYSTEM

2.2.1 SYSTEM BOUNDARY

An areal definition of the Persian Gulf Maritime Trading System is depicted in Figure 2.1. Broadly its boundary is defined by the seaports, coastline and sea routes which were formely bound together in an integrated trading system based on short and long distance dhow routes. As such it is representative of the era 1850-1950 during which it suffered increasing competition from other forms of transport technology, notably the steamship. The basic outline of the system follows the one portrayed by Jewel (1969, p.1), entitled "The Dhow Season". It is representative of the maximum operational range of dhow routes which emanated from home ports in the Persian Gulf during this era. The term, Persian Gulf Maritime Trading System is perhaps clumsy, since geographically it formed a trading area which focused on the western Indian Ocean. However, the choice of the title is derived from the fact that ports within the Gulf were the common terminals for dhow routes linking the Gulf with either ports on the south Arabian/east African Coast, or, ports on the western coast of the Indian Sub-Continent. Figure 2.2 depicts the location of all the seaports of the Persian Gulf. The boundary therefore, encloses all the dhow-based trading activity which was focused on the base ports of the Gulf.

2.2.2 SUB-SYSTEMS

Trading activity within the contemporary Gulf has seven district sub activities which together make up the total system of trade movement by sea. Figure 2.3 is a model which depicts each of these sub-systems, defined according to the function it performs in the context of the overall trading system. Sub systems A1, B1, C,D and E involve the conveyance of cargoes by the indigenous mode of maritime transport (i.e. the dhow). Sub systems A2, B2, and C are served by modern modes of sea transport including conventional

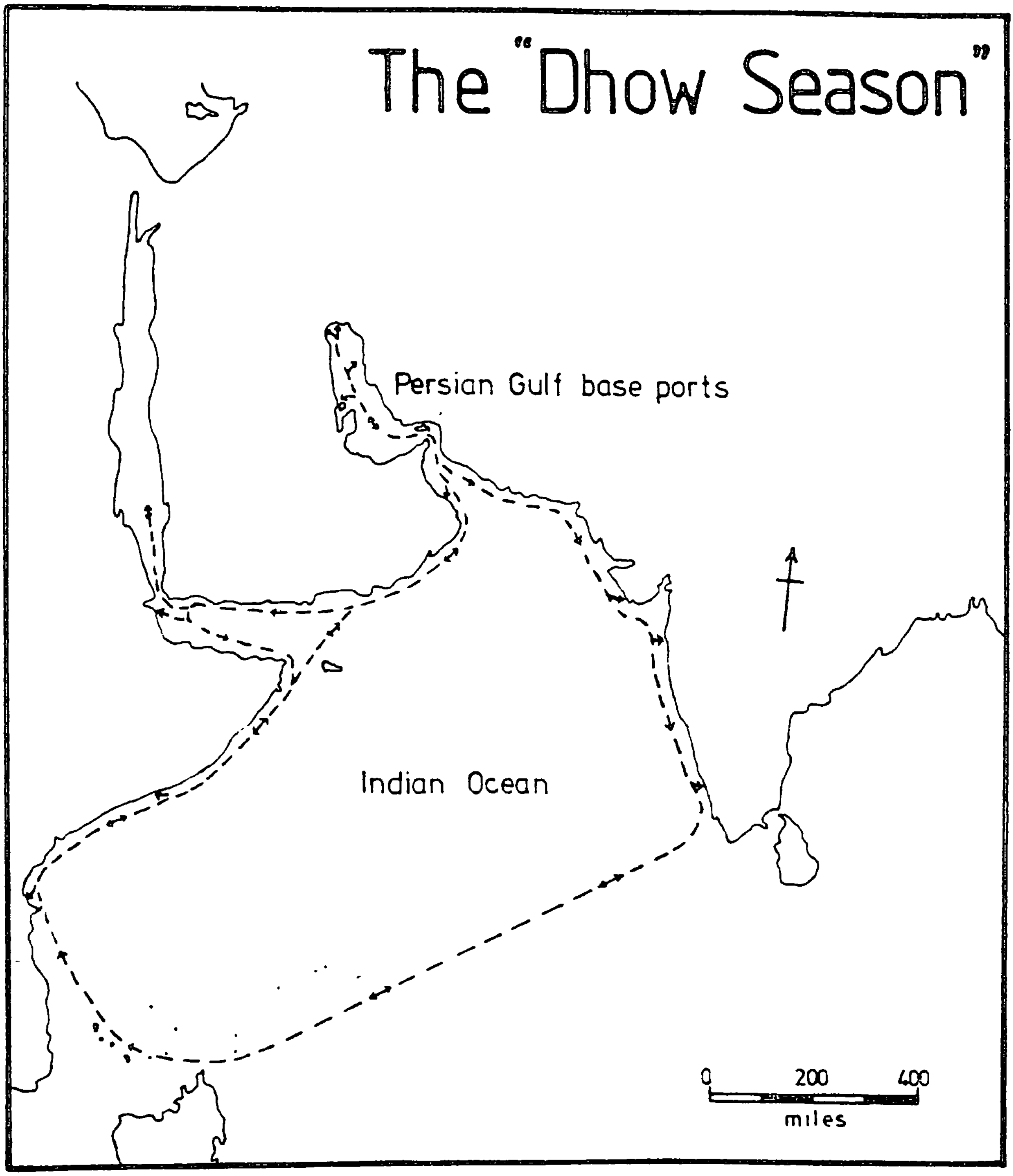

The "Dhow Season"
Persian Gulf base ports
Indian Ocean
0 200 400
miles

FIGURE 2.1

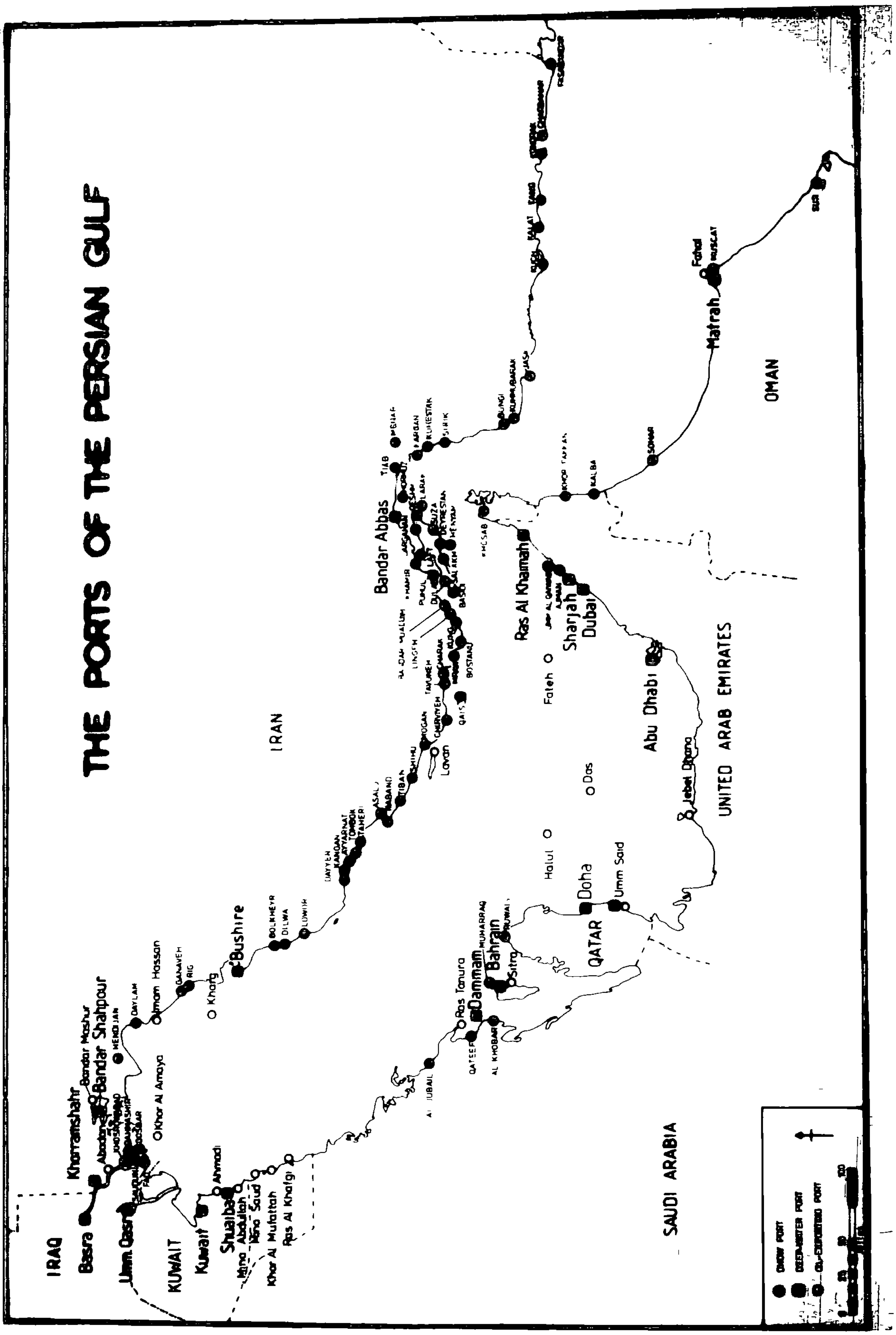
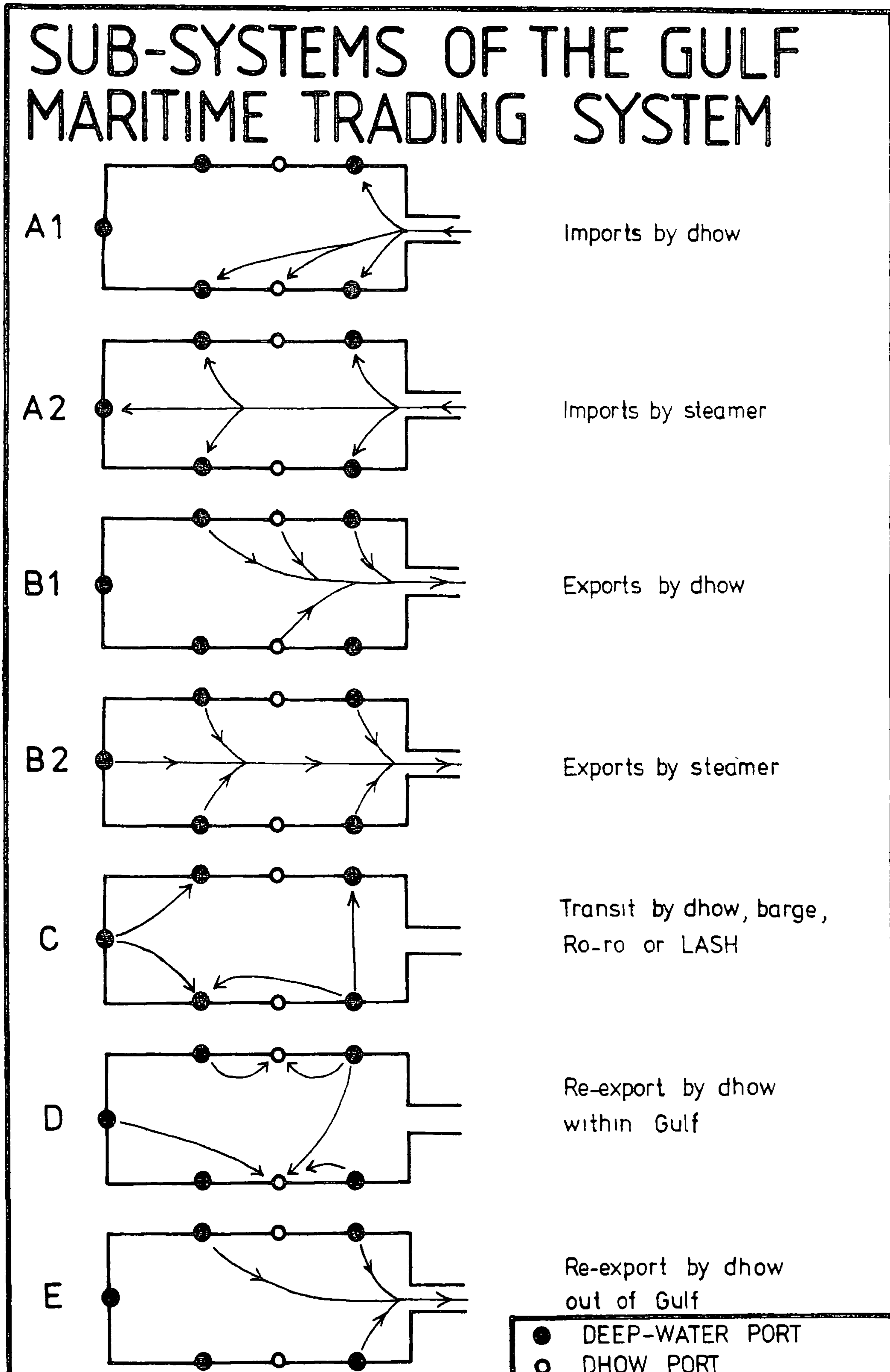

THE PORTS OF THE PERSIAN GULF
IRAQ
IRAN
KUWAIT
SAUDI ARABIA
QATAR
UNITED ARAB EMIRATES
OMAN
Basra
Khorramshahr
Bandar Mashur
Bandar Shahpour
Umm Qasr
Kuwait
Shuaiba
Ahmadi
Mina Abdullah
Mina Saud
Khor Al Mufattah
Ras Al Khafgi
Khor Al Amaya
Daylam
Imam Hassan
Ganaveh
Rig
Khārg
Bushire
Bolkheyr
Dilwa
Asalu
Tiban
Lavān
Qais
Bostanu
Lingeh
Bandar Abbas
Tiab
Sirik
Jask
Ras Al Khamah
Sharjah
Dubai
Fateh
Abu Dhabi
Jebel Dhana
Das
Halul
Doha
Umm Said
Bahrain
Sitra
Muharraq
Dammam
Ras Tanura
Qateef
Al Khobar
Al Jubail
Matrah
Fahal
Muscat
Kalba
Sohar

FIG 2·2

FIGURE 2.3


SUB-SYSTEMS OF THE GULF MARITIME TRADING SYSTEM
A1
Imports by dhow
A2
Imports by steamer
B1
Exports by dhow
B2
Exports by steamer
C
Transit by dhow, barge, Ro-ro or LASH
D
Re-export by dhow within Gulf
E
Re-export by dhow out of Gulf
DEEP-WATER PORT
DHOW PORT

liners, tramp vessels, bulk carriers, container ships, Roll on - Roll off ships and LASH craft, together with feeder vessels which compliment the larger unitized ships.

Over the past 120 years the import and export trades by dhow between the Gulf and markets overseas (A1 and B1) have been challenged and curtailed by competition from steamer services (A2 and B2) . The redistribution of cargoes within the Gulf either as transit, transhipment or re-export trades (C and D) is to a large extent still carried on with the use of dhows. However, developments in LASH and Ro-Ro feeder systems, together with the construction of hard-surfaced roads, have also had the effect of contracting the amount of trade carried in dhows. The re-export of cargoes by dhow from the Gulf to markets in the Indian sub-continent and southern Arabia is still a significant form of trading activity in some ports.

2.2.3 SYSTEM COMPONENTS

The trading system and its sub systems are composed of three major types of components. The first type of component consists of the different kinds of port facilities including the deep-water commercial harbours (operating conventional, container or Ro-Ro berths), industrial ports (usually incorporating specialized technology for handling bulk cargoes), oil terminals, and dhow harbours, all of which operate handling and storage facilities. The second type includes the craft employed to carry the cargoes, both traditional and modern. Finally, the cargoes carried make up the third element, ranging in type from bulk cargoes of oil, cement and ore, through to small consignments of textiles or matches.

At any point in time the 'state' of the components and sub-components is determined by a trade-off between the age and type characteristics of the port and shipping components, and the demand and supply characteristics of the cargoes carried. All the components exhibit a hierarchial arrangement at any point in time; that is, some ports are busier than others, some shipping operators carry more cargoes than others, and some cargoes are more important (in volume and value terms) than others.

2.2.4 SYSTEM CONTROL

Each component and sub-component is controlled by one or a number of human controlling agents who we may term decision-makers, whose task it is to ensure that each component operates to a level appropriate to achieve certain pre-selected economic, social or political goals. The major decision-making groups involved in the operation and development of harbours are national governments, port authorities and construction companies; shipping is controlled by shipping conferences and shipping companies in the case of steamers, and merchants, dhow owners and dhow crew in the case of dhows; the ordering and selling of cargoes is controlled by national governments, multi-national companies, national firms (both public and private) and private citizens.

2.2.5 SYSTEM'S ENVIRONMENT

The operation of the trading system is affected by its system's environment which constitutes those activities outside the system which affect the system's level of operation but which controlling decision-makers can do little about (Churchman, 1968, p. 35). In the Gulf context this includes both human and physical elements. In human terms, the rise and fall in the level of demand for cargoes, shipping, and port services within the hinterland and foreland of each port sometime occurs as a result of decisions made by personnel who are not overtly concerned with the operation of a port or the provision of shipping services. Secondly, political changes and events within the region may occur in such a way as to affect the level of trade of ports and shipping. Finally, natural phenomina such as adverse weather conditions may interfere with the conveyance of cargoes between ports, particularly with respect to dhow transport.

2.3 CHANGE IN THE MARITIME TRADING SYSTEM

2.3.1 THE MEASUREMENT OF CHANGE IN THE SYSTEM

It is possible to measure the behaviour of the trading system over time by assessing the performance of its key components. The equilibrium state of each component can be guaged by measuring whether it is in decline (i.e. the degree to which the process of entropy has set in) or whether it is managing to arrest the entropic process (i.e. by acquiring negative entropy). It is necessary to determine whether, for instance, the level of trade passing through a port is maintaining its previous level, or not. If the total system, or any component, is behaving in a manner which maintains its previous state it is describable as 'morphostatic'. If however the nature of change exerted on a system is of such a magnitude as to change the structure of the system (in both a functional and spatial sense in the context of the Gulf trading system) it is then to be classified as being in a 'morphogenetic' state.

2.3.2 THE MEASUREMENT OF THE RESPONSE TO CHANGE BY DECISION-MAKERS

Broadly, contemporary society in the Gulf is in the position of responding to change. Particularly technological change generated from outside the region. An understanding of the nature of the processes involved in change within the trading system can best be appreciated by analysing the response to change by the key decision-making bodies in each of the main types of component. This approach involves a detailed consideration of the responses of governments, shipping lines, shipping conferences, merchants, and the operators of dhows to the process of change. These responses will take the form of adaptations either successful or unsuccessful, to change introduced from 'outside'.

2.3.3. DUAL SYSTEMS

Section 2.2.2 has differentiated between modern and traditional forms of maritime transport in the Gulf. The existence of 'dualisms' both social and spatial, is a well-known phenominon in both the less developed (Friedmann and Alonso, 1964; Friedmann 1966; Hamilton 1974; Odell 1974; Keeble 1976) and more developed countries. Brookfield and Hart (1971) working in a Melanesian context have commented on the fact that the economies of a large number of the so-called "developed countries" are organised into two parts - one traditional and one modern. These two parts are structurally and behaviourially discrete, dealing with each other as though each formed a distinct type of social and economic organization. Brookfield (1975, p. 54) distinguishes between a 'traditional' society which is loosely structured, organised in small units, employing a high degree of interpersonal relationships, and a 'modern' society which is sharply contrasted because of its tendancy to be finely structured into large units and organised on the basis of impersonal control vested in a few hands which operate on the basis of contractual relationships. Brookfield's research reinforces the earlier work of J.H. Boeke in Indonesia (1953) who also acknowledged the existence of a societal dualism by distinguishing between the fatalist, labour intensive, non profit-orientated traditional sector, and the modern, capitally intensive, materialist ethic. In the context of the Gulf such a distinction might prove helpful in analysing the contrasting operation and fortunes of the dhow shipping and international liner shipping sectors.

2.4 AN HYPOTHESIS

In spatial terms a societal dualism translates itself into a differentiation between a 'core' and a 'periphery', in which a vibrant, expanding core region of a spatial system expands in contrast to a declining periphery. In the case of the Gulf the overall function of this thesis is to examine the veracity of core-periphery theory (Friedmann 1966) when applied to its maritime trading system which is currently beset by a series of changes in which modern transport technology is being adopted at the expense of traditional forms. The following study considers initially the overall effect of technological change on the spatial structure of the maritime trading system. It is proceeded by an analysis of the behavioural response to change by decision-makers in both the traditional and modern sectors of maritime transport. As such this thesis is directed to testing the following hypothesis :

> That since 1865, the intrusion of non-indigenous transport technology has resulted in the spatial dismemberment of a former maritime trading system based on dhow transport, and the formation of two systems, one traditional and one modern, that are structurally and behaviourally discrete.

CHAPTER 3.

TECHNOLOGICAL CHANGE AND SPATIAL STRUCTURE

> "He denied for instance the world was round, and he had no conception of geography away from the seas he knew."
>
> (Villiers, 1940 P. 222)

3.1 SYSTEM EQUILIBRIUM : INTRODUCTION

Human and physical systems rarely, if ever, achieve absolute stability. Instead, they survive by maintaining a form of balance, or 'equilibrium'. To measure the health or vibrancy of a system at a particular point in time, the condition of the system must be compared with a range of possible equilibrium states which are representative of 'indexes of balance'. Chorley and Kennedy (1971, P. 203) define three basic types of equilibrium - 'steady state' , 'thermodynamic' and 'dynamic ' .

It remains a controversial issue whether or not social systems (such as the Persian Gulf Maritime Trading System) can ever really attain 'steady state' equilibrium. Such a condition has been defined as a state of an open system wherein properties are invariant when considered with reference to a given time scale, but within which its instantaneous condition may oscillate due to the presence of interacting variables (Chorley and Kennedy, 1971 p. 203). In social systems, the balance attained rarely depends on a fixed point or level (homeostasis), but may give the illusion of approximating that condition. With reference to change, steady state equilibrium is synonymous with gentle, orderly change, maintaining the balance between the components of the system.

In contrast, 'thermodynamic' and'dynamic' equilibrium are representative of more radical displacement of the previous balance between components. Thermodynamic equilibrium is synonymous with the concept of 'entropy'. Certain types of change may be disruptive in character, precipitating the accumulation, rather than the arrestation of entropy within a system, and moving towards a condition of maximum entropy, which can be measured in terms of the degree of breakdown in hierarchical organization in a spatial system.

'Dynamic' equilibrium, defined as "a trajectory of unrepeated average states through time" (Chorley and Kennedy, 1971 p. 203), is linked to processes involved in growth rather than decline. A variation of this form of equilibrium is "dynamic metastable equilibrium", where, at a few points in time, a particularly large fluctuation initiates a new regime of dynamic equilibrium on a higher level than previously experienced.

In the following sections, the nature of steady state equilibrium is discussed via an appreciation of the level of man's adaptation of sail-powered sailingcraft to regional, physical environmental conditions over a long period from the pre-Islamic era until the twentieth century. Secondly, the onset of thermodynamic equilibrium is measured with regard to the damaging effect that the introduction of steamships had on the level of dhow traffic. Thirdly, the nature of dynamic equilibrium is measured in respect of the contemporary rapid growth in the level of steamship traffic. Finally, the nature of change in the spatial structure of the Gulf Maritime Trading System is considered via an analysis of trade flows.

3.2 STEADY STATE EQUILIBRIUM: SAIL POWERED TRANSPORT

3.2.1 The Impact of the Physical Environment

The Sea

"Trust it little, fear it much, man at sea is an insect on a splinter, now engulfed, now scared to death." (Muir, 1924 p. 205). These are the words of the Caliph Omar when consulted as to the feasibility of a naval expedition in the Mediterranean in the 7th century A.D. His dislike and trepidation for adventure across the high seas in those pre-Islamic days applied equally to the very earliest pioneers of sea travel along the fickle and sometimes tempestuous waters of the Persian Gulf. Early voyages up and down the Persian Gulf must have been precarious adventures. G.F. Hourani (1963, p. 113) notes that, "on the ocean, storms, reefs and shallows were ever present perils", while J. Hornell (1946, p. 230) surprisingly reminds us that even after perhaps three and a half thousand years of sailing in the Gulf, the Arab followers of Mohammed possessed an inherent and, "profound mistrust of an unfamiliar sea". Apparently, by 600 A.D. man had not yet developed a type of maritime technology to permit him to sail on the waters of the Gulf with any degree of confidence for his safety. Although perhaps Hornell is guilty here of citing the words of the land-based, desert folk of the interior of Arabia who naturally were afraid of the sea, as they were of several other types of unexplained and unfamiliar phenomena. The mysteries of nature persist, for as Villiers relates in 1939 (1940, p. 233), when after witnessing an eclipse on board a dhow off the coast of South Africa he found, "it was not an easy matter to explain an eclipse to those simple superstitious men with their background of belief in jinns and the superstitious basis of so much of their religion."

The Climate of the Persian Gulf and Indian Ocean

Shallows, sandbanks and coral reefs excepted, the physical environment of the Persian Gulf would be the perfect setting for maritime activity were it not for one distinctive element - the wind regime. Paradoxically, the disposition of the wind systems in the Persian Gulf and Indian Ocean has had both positive, and negative, effects on the conduct of maritime trade and navigation. At once, the directional symmetry of the wind systems had been both the raison d'etre for the establishment of long distance commercial route networks, and, by virtue of the strength and direction of the winds, the explanation for the difficulties and losses encountered in the business of navigation to and from the Gulf.

Both the Gulf and the Indian Ocean are subjected to strong wind patterns at particular times, termed the "Shamal" and "Monsoon" winds respectively. One can only guess at the extreme difficulties into which sailing craft, both in the ancient and recent past, must have got into while negotiating high winds and rough seas. Countless dhows must have been lost over the centuries, sinking in bad weather or breaking apart because of their inadequate construction, resulting in the loss of thousands of lives. Even in 1957, at the demise of the era of the sailing dhow, A. H.J. Prins suggests that, "usually one in ten dhows fail to reach their destinations." (1966, p.3), a figure with which one would possibly dispute, but which one would reckon to be at least an indication of the fair proportion of losses due to bad weather. Villiers (1940) vividly recalls the traumatic experiences he had on board the boom "Triumph of Righteousness" while it was attempting to negotiate stormy seas off the coast of Kenya, while fully laden. The ship appeared on the brink of foundering. "One trouble with the big dhows", recalled Villiers, "was that they could not stand up to anything like a heavy sea ..... Their one huge sail, though a glorious puller in ideal conditions of continuous trade winds without squalls, is a definite source of danger under any other conditions." (p.219).

Climate in the Persian Gulf can be subdivided into three periods of approximately four months each. December to March is the cold season, when the wind blows from the north-west and the west. The months of April, May, October and November have the most equable climate, while the period June to the end of September is characterized by extremely hot and humid conditions which have their own distinctive effects on maritime activity in that during the day time most forms of physical activity on the quayside of a harbour are precluded. In the hot summer months, the dhow captains and their crew spend the greater part of the daylight periods conducting verbal business beneath canvas shrouds that have been erected on deck; the business of unloading or loading a dhow with cargo by gangs of coolies or seamen being left until the cool of the early evening, unless there is some great hurry. On an annual evaluation, the prevailing wind in the Gulf is the "Shamal", a damp wind from the north-west which during the winter has been known to reach a velocity of 50 m.p.h. Another common wind is the "Qaws", a hot, dry airflow which blows from the south-west and is often sand-laden, obscuring visibility. The net effect of these winds is that the influence of the "Shamal" makes the return journey "up-Gulf" for a sailing dhow an often frustrating and slow journey either against the prevailing north-west wind or else making little progress at all in a flat calm that can beset these waters. Hurrying home from Zanzibar to Kuwait, Villiers (1940, p.256) recalls the exasperation of the dhow captain as he exclaimed after the eleventh day of steadily adverse calm conditions, "None of my wives wants me (home)" and muttered that he "admitted for the first time that perhaps a new mainmast might be an improvement to his vessel."

If the wind systems within the Gulf at least posed some minor problems to dhow navigation, the wind reversals of the Indian Ocean were far more violent in nature, effectively curtailing all sailing traffic through Straits of Hormuz, down the Gulf of Oman and across the Indian Ocean at certain times of the year. The wind regime in the Indian Ocean is dominated by the alternate North-East and South-West monsoons, an annual transformation which proved to be very much a causal element conditioning the evolution and operation of the trans-ocean dhow networks. The weather system is characterized by the seasonal dominance of these two major wind patterns, each of which is affected by the relative disposition and unequal pressure attributes of land masses and sea expanses. Furthermore, as D.N. McMaster (1966, p. 16) notes, "the wind reversal is sufficiently decisive to be accompanied by a reversal of currents in the north-eastern basin of the Indian Ocean." On an annual basis, the north-east monsoon dominates the wind system from November to March; April is a month of flux culminating at the beginning of May with the reversal of the winds with the South-West monsoon which blows in that direction until September; October is again a month of indistinctive though shifting winds. In terms of the strength of the wind, the South-West monsoon is dominant. McMaster confirms (1966, p.17) that for the North-East monsoon, "over 90 per cent of all marine wind observations are of force 0 – 4 on the Beaufort Scale and winds of gale force (7 and above) are generally under 1 per cent of readings"; while for the south-west monsoon, "at least 20 per cent of all observations recorded above force 4 .... and in July winds of gale force make up over 5 per cent of the observations over most of the area .... and attain 50 per cent east of Socotra Island."

The Coastline

The sea and the wind combined together to constrain, direct and hamper the progress of generations of Arab and Persian sailors on the high seas. While this may superficially appear to be somewhat of a "deterministic" approach, one is aware that in the idea of the man-environment relationship, criticism can be levelled at "determinists" who regarded the physical environment as the moving cause (in this relationship) and neglected interaction of feedback effects" (Harvey, 1969 p.115). In deference to this criticism, the view is taken here that 'man' acts as the 'moving cause' in a more balanced view which considers the Gulf more in terms of a "human ecosystem" in which generations of Arabs and Persians have sought to adjust and harmonize their living relationship with its physical environment. The length and breadth of the Gulf's coast, its contours both in depth of water and height of land can therefore be thought of in this context, where man at various times has sought to exploit to his advantage those harbours, or anchorages, which possessed some economic or political utility by virtue of their site or situation. "Fixed" and "moving" elements are both present in the structure of the Gulf coastline. The Persian Gulf had only a 'fixed' number of suitable harbours that could be exploited as such in the thousands of years before man developed the technology to radically alter the configuration of natural shore lines. Sheltered mainland anchorages or bays denote the first class of a five-fold classification of natural harbours in the Gulf (e.g. Kuwait Bay, Bushire and Jask); island harbours affording a degree of security against mainland interference, a second (e.g. Bahrain, Qais, Hormuz, Qeshm); a third group is represented by harbours sited behind the protective barrier of a lagoon coast in sheltered creeks (e.g. Dubai, Sharjah, and Ras Al-Khaimah); fourthly, there are the riverine ports (e.g. Basra, Uballah); and finally there are the non-natural harbours and anchorages, without any particular attributes of shelter and suitability, but which nevertheless have assumed an importance as a seaport at some time in history by virtue of their nodality with reference to their political and economic systems (e.g. Qatif, Al-Khobar, Doha, Abu Dhabi).

"Moving" elements in the configuration of the Gulf coast are a reflection of the long-term processes of change in a physical environmental system. The process of change is slow, often undetectable in the life of a single generation, and affects not only the configuration of a shore line but also, most significantly, the depth of water in a harbour or harbour approach channel. The physical manifestation of this change is the sand or shingle bar, formed by two processes: long-shore drift, and deltaic siltation. An example of the former process is given by the direction of the south-west current, or long-shore drift, along the coast of what is now known as the United Arab Emirates: the creek harbours of Dubai, Sharjah and Ras Al-Khaimah have been afflicted by the pushing of a sandbar across the mouths of their creek harbours, effectively blocking off dhow traffic. The classic example of deltaic siltation in the history of the Gulf is the silting up of the mouth of the Euphrates-Tigres-Karkeh estuary and the gradual displacement of Ur and subsequent entrepots as a terminus for trade (de Morgan, 1959). Fisher (1963, p. 366) describes the process as a "platform of alluvial material .... pushed southwards across the head of the Persian Gulf, ultimately forming a barrier behind which the waters of the Tigres and Euphrates were ponded back in a series of enormous lagoons and swamps."

3.2.2. Man's Adaptation to the Physical Environment

Navigation

"Hostility" sums up the oppressive physical environment with which early and modern inhabitants of the Persian Gulf littoral have had to contend. In time men learned to cope with, or at least adapt to a dangerous sea, an oppressive and limiting climate, a tortuous coastline and a barren interior. This adaptation is no more vividly represented than in sphere of maritime venture and commercial activity. Despite an acquired knowledge of the reversal of the Monsoon winds, early sailing in local craft of various sizes and designs must have been a risky and haphazard business, the dangers of which we can only guess at because of the paucity of data available as to the sturdiness and operational radius of these vessels.

Navigation is one field where a healthy respect for the elements seems to have shaped the actions of generations of sailors. Hourani (1963, p. 105) comments that primitive mariners "never sailed out of sight of coast", a technique to which the more sophisticated latter day sailors of the 1940's and 1950's resorted, at least in so far as the trans-oceanic trade from the Persian Gulf to East Africa was concerned. This modern irony is implicit in the fact that early astronomical science was developed by the Babylonians and was subsequently adopted by Phoenicians, Greeks and Arabs alike for laying sea passages with the aid of the stars. Hourani puts forward the reasonable thesis that, "it was probably on camel-back that the Arabs first learned to take guidance from the signs of the sky, for want of land marks." (1963, p.106), and reminds us that the desert is almost as featureless as the sea. However, Tibbetts (1961, p. 325) comments that (in the context of the Red Sea) 'real' nakhodas sailed up the middle of the sea. A certain knowledge of astro-navigation seems to have been employed well before the arrival of Islam for the "Koran" mentions that, "he (Allah) it is who hath appointed for you the stars that ye guide yourself thereby in the darkness of land and sea; we have made signs distinct for a people who have knowledge." (Hourani, 1963 p. 106). The heavens are but one of the guide posts required for competent maritime navigation: In addition to the development of scientific astronomy by the Abbasid caliphs in the eighth and ninth centuries A.D., the latitude of every port and headland was recorded in the books of nautical instructions known as "rahmanis" (a Persian term). Besides astronomical tables and latitudes, the rahmani contained information about winds, coasts, reefs and other general information that a captain would need to know. The initiation of the use of the magnetic needle, or compass, was a later addition to navigation in the Gulf, not, according to Hourani, arriving until the end of the eleventh century, "when it was mentioned as being used on Arab and Persian ships trading between Canton, Sumatra and India." (1963 p. 108), though there seem to have been some technical problems with early prototypes of this instrument.

Referring to the inertia of early navigational adaptations to the physical environment, in the modern situation it appears to be the human, rather than the technological adjustments that have remained as fundamental. Gulf sailors trust their experience and local knowledge first, navigational aids second. A form of social inertia is founded upon the handing down through generations of grandfathers, fathers and sons of sailors, of expertise in coastal navigation, where every reef and sandbank and every headland is intimately known. On board a dhow in 1939, Alan Villiers noted that when its captain spoke of navigation, "he was not speaking of a theoretical ability to make a voyage with the help of astronomical observations, wind and current data, the latest admiralty charts, headlines, paten logs, and all the rest of a long list of ordinary paraphernalia. Nejdi coaxed his ship along by his knowledge of local conditions, and the coasts of South Arabia (and the coasts of the Persian Gulf, Baluchistan and all Western India) were an open book to him." (1940 p.62). Later, when referring specifically to the Persian Gulf Villiers comments that, "every man in the ship knew those waters: there was none among them who had not been sailing for at least ten years. Nejdi knew every bank, every overflow, every low sanded point". (1940 p.270). Yet in this case in 1939, the dhow captain had no knowledge of astronomical navigation; at some point in history, succeeding generations had failed to transmit this knowledge to their sons. The very idea of sailing from Zanzibar direct across the Indian Ocean direct to Muscat was nonsense to the particular dhow master. He himself, and all his contemporaries knew only of the coasting route, though they regretted the decline in the art in Arab navigation, blaming it on the influence of the Europeans who, with their cut-throat competition had left the Arabs only the coasting trades.

3.3 THERMODYNAMIC EQUILIBRIUM : DECLINE OF DHOW TRANSPORT

It is difficult to find statistical evidence to support the assertion that the dhow and the dhow-based trading system has been in decline since the infusion of steamship technology into the Gulf in 1862. However, certain sources do exist.

Oman was the centre of gravity of the trading system in the mid nineteenth century because of the political control and sea power it exercised in both the eastern Gulf and the east African coast. It is natural, therefore, to look first for evidence of a down-turn in dhow traffic in the port of Muscat. Figures produced by R.G. Landen (1968, p. 219-21) taken from Precis Commerce provide the first concrete evidence supporting the hypothesis that the steamship had a damaging effect on dhow trade (see Table 3.1) . The data records movements of vessels entering and leaving Muscat 1874-1894. The figures, which appear to have been somewhat rounded, show that during this period there is evidence for a decline in dhow traffic from a peak of 910 movements in 1875 - 6 to a low of 268 movements in 1893-94. This decline coincides with the gradual introduction of new shipping routes into the Gulf during the 1870's, 80's and 90's. Taking individual routes there are considerable fluctuations within each row of data. However, the most dramatic rate of decline appears on the India route which was most directly affected by the introduction of the India-Gulf steamship service; a less dramatic decline can also be detected on the Zanzibar and Yemen routes, and on the Persian Gulf route after 1885-86. The nature of the data fluctuation is illustrated by the calculated coefficients of variation tabulated below which reveal greater annual fluctuations on the Persian Gulf and Yemen routes and lower fluctuations on the India and Zanzibar routes:

<u>Muscat Dhow Traffic 1874-1894</u>

$$\text{Coefficient of Variation} : V = \frac{\text{Standard Deviation (S)}}{\text{Mean (x)}} \times 100$$

TABLE 3.1 : VESSELS ENTERING AND LEAVING MUSCAT 1874 - 1894

ROUTE	1874–75	1875–76	1876–77	1877–78	1878–79	1879–80	1880–81	1881–82	1882–83	1883–84	1884–85	1885–86	1886–87	1887–88	1888–89	1889–90	1890–91	1891–92	1892–93	1893–94
1. Steamships																				
U.S.A.	4	5	5	5	4	3	3	3	3	5	3	1	1	–	–	–	–	–	–	1
Coal Ships	1	–	–	3	1	1	1	1	–	3	–	1	3	1	–	2	3	1	2	–
India	18	12	18	22	17	27	20	22	11	7	7	9	10	15	16	13	12	13	11	13
London Steamers	–	–	–	–	–	–	–	–	–	3	–	–	–	3	2	1	–	1	2	2
B.I.S.N.Steamers	81	81	54	52	58	73	73	81	84	72	79	74	74	74	77	60	61	62	65	65
French Steamers	–	–	–	–	–	–	–	–	–	11	14	8	2	1	–	–	–	–	1	–
Mauritius	5	3	8	12	5	5	3	4	1	3	6	3	2	2	1	4	4	1	2	2
Persian Gulf	5	7	13	15	13	6	4	6	4	7	5	4	4	6	10	8	10	6	9	16
Red Sea	–	1	4	7	3	3	1	1	1	1	3	5	2	2	3	3	3	3	4	5
Singapore	1	3	3	2	3	5	1	2	–	–	–	–	–	–	–	–	–	–	–	–
Zanzibar	–	–	1	3	4	1	2	3	2	5	4	1	2	4	2	3	3	3	3	2
Other Steamers	13	4	3	26	15	12	13	12	9	–	1	–	–	–	–	–	–	–	–	–
TOTAL :	128	89	107	153	138	136	130	138	99	121	117	107	103	108	111	94	96	90	99	106
2. Local Craft																				
India	400	300	450	500	300	250	200	215	141	141	132	148	170	180	190	150	170	150	160	99
Persian Gulf	100	200	95	140	200	200	180	200	150	150	148	125	45	40	50	50	45	40	44	40
Makran	50	150	120	100	200	100	60	55	84	84	80	110	102	90	75	86	85	80	70	75
Yaman	60	200	50	20	40	40	40	40	46	46	37	25	25	30	22	21	20	18	20	34
Zanzibar	40	60	25	30	40	35	20	22	22	22	28	35	30	25	20	18	20	24	20	20
TOTAL :	650	910	740	790	780	625	500	532	443	443	423	358	371	365	365	325	340	312	318	268
GRAND TOTAL :	778	999	847	943	918	716	630	670	542	544	560	465	475	473	476	419	436	402	413	374

SOURCE : Precis Commerce.

Reproduced in R.G. Landen (1968 p219).

TABLE 3.2 : NUMBER AND TONNAGE OF SAILING CRAFT AND STEAMSHIPS ENTERING AND LEAVING THE PORT OF BOMBAY 1873-1908

Sailing Craft

	IN		OUT	
	Vessels	Tonnage (millions)	Vessels	Tonnage (millions)
1873-78	213662	4.17	195180	4.35
1878-83	233106	4.28	180405	4.09
1883-88	271863	4.52	204570	4.21
1888-93	257820	4.20	199573	3.79
1893-98	211155	3.42	174406	3.30
98-1903	222389	3.48	165055	3.15
03-1908	252958	3.04	165982	3.17

Steamships

	IN		OUT	
	Vessels	Tonnage (millions)	Vessels	Tonnage (millions)
1873-78	1597	0.80	1645	0.83
1878-83	2623	1.49	2739	1.57
1883-88	5067	2.28	5173	2.37
1888-93	5439	2.84	5828	3.45
1893-98	6421	4.23	6761	5.13
98-1903	7229	5.93	7843	7.09
03-1908	9287	7.46	9779	8.57

SOURCE : Wilson (1909).

TABLE 3.3 : OWNERSHIP OF DHOWS AND LEVEL OF STEAMSHIP TRAFFIC IN PERSIAN GULF PORTS, 1908

	Baglahs	Smaller Dhows	Total Dhows	Number of Steamships calling in 1908
Manama	2	107	109	65
Muharraq	0	14	14	-
Abu Dhabi	0	10	10	-
Dubai	0	20	20	34
Khor Fakkan	0	5	5	-
Lingeh	19	84	103	67
Kung	14	43	57	-
Doha	0	60	68	-
Kalba	0	10	10	-
Ras Al-Khaimah	7	8	15	-
Kuwait	11	75	86	52
Qeshm	5	104	109	-
Laft	0	34	34	-
Basidu	0	18	18	-
Dargwan	0	18	18	-
Sharjah	5	13	18	-
Sur	50	44	94	-
Umm Al-Qaiwain	1	0	1	-
Rams	0	1	1	-
Bandar Abbas	3	53	56	158
Matrah	7	20	27	-
Muscat	1	0	1	302
Bushire	24	50	74	158
Basra	NR	NR	NR	169

NR - Not recorded

SOURCE : Lorimer (1915).

	Aggregate Change (%)	Absolute Change (%)
India Route	28.34	26.67
Persian Gulf "	55.71	49.05
Makran "	35.79	31.07
Yemen "	91.43	46.66
Zanzibar "	35.79	25.32

Across the Arabian Sea, Wilson and Edwards (1909) report on the movement of steam and sailing craft in and out of the Port of Bombay. These figures (see Table 3.2) are less conclusive, disguising local Indian coastal craft amongst those craft voyaging to Arabia or East Africa. The table reveals a fall in the tonnage of sailing craft leaving Bombay from a level of 4.35 million tons in the period 1873/78 to 3.17 million tons in 1903/08, and a corresponding rise in the tonnage of departing steamship tonnage from 0.83 million tons to 8.57 million tons suring the same time period.

Lorimer's work (1908) provides clues as to the nature of the dhow trading system at the end of the first decade in the twentieth century. Table 3.3. lists the ownership of large and small sea-going dhows at each of the dhow ports for which Lorimer acquired data. Generally, the ownership of Baghlas (large ocean-going dhows) can be construed as meaning that the port concerned was participating, or had the capacity to participate, in the long distance dhow traffic to India and East Africa. The smaller vessels were probably used in the coasting trade along the Arabian and Iranian coasts. In terms of the port hierarchy, Sur (in Oman), Bushire, Lingeh, Kung and Kuwait appear to be the centres of the long distance trade, with Ras Al-Khaimah, Sharjah, Qeshem and Matrah (Muscat) as lesser ports. Figures for the number of steamers calling at these ports in 1908 are an indication both of those ports which experienced direct competition from the steamship, and, of the development of an embryonic future port hierarchy based on the steamship.

The port and customs authority at Bahrain have been keeping records of the movement of dhows since the 1930's. Figure 3.1 illustrates dramatically the rapid decline in the registration of sailing-dhows and a commensurate increase in motor-powered dhows during

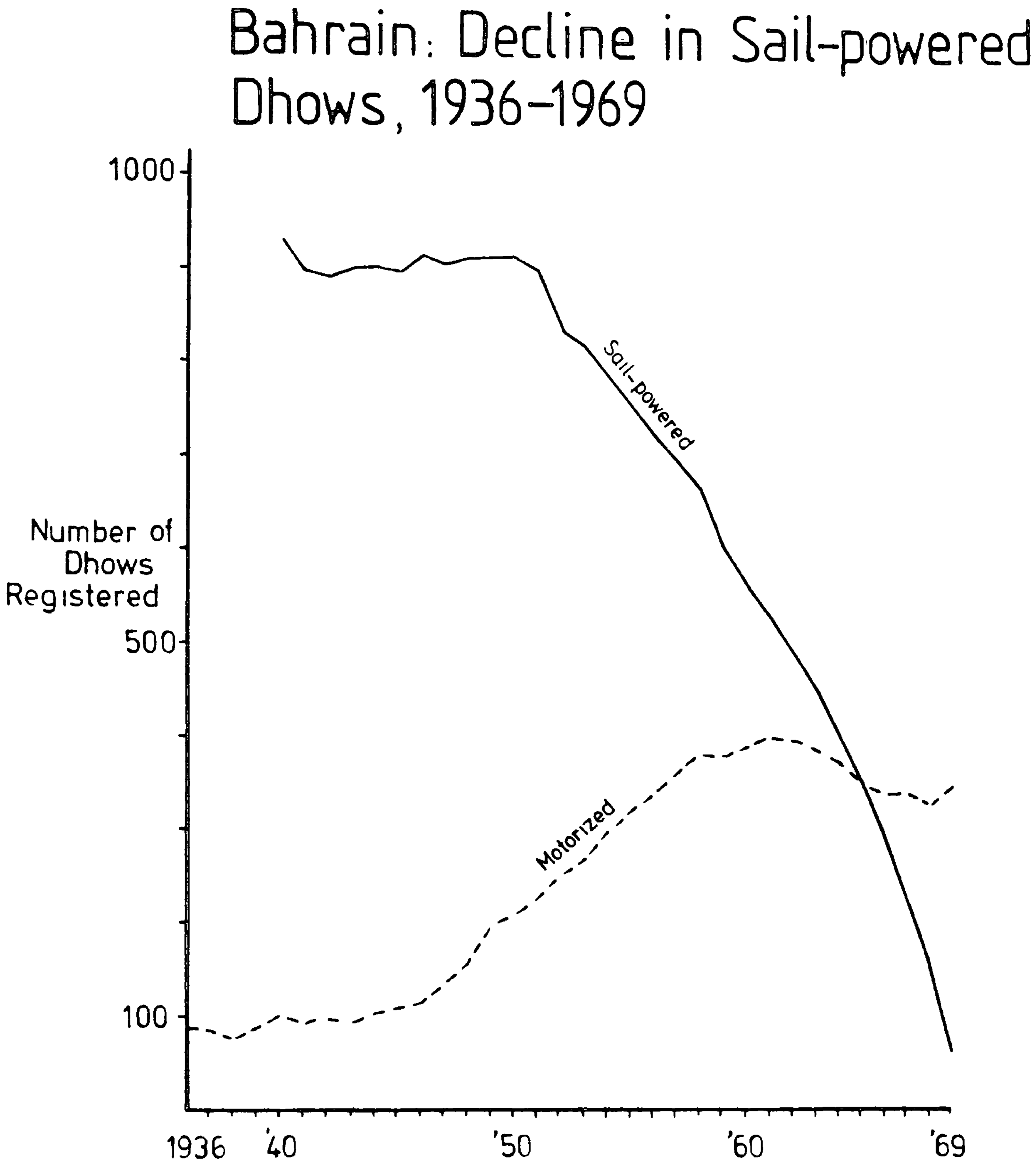

Bahrain: Decline in Sail-powered
Dhows, 1936-1969
1000
Number of
Dhows
Registered
500
100
Sail-powered
Motorized
1936
'40
'50
'60
'69

FIGURE 3.1

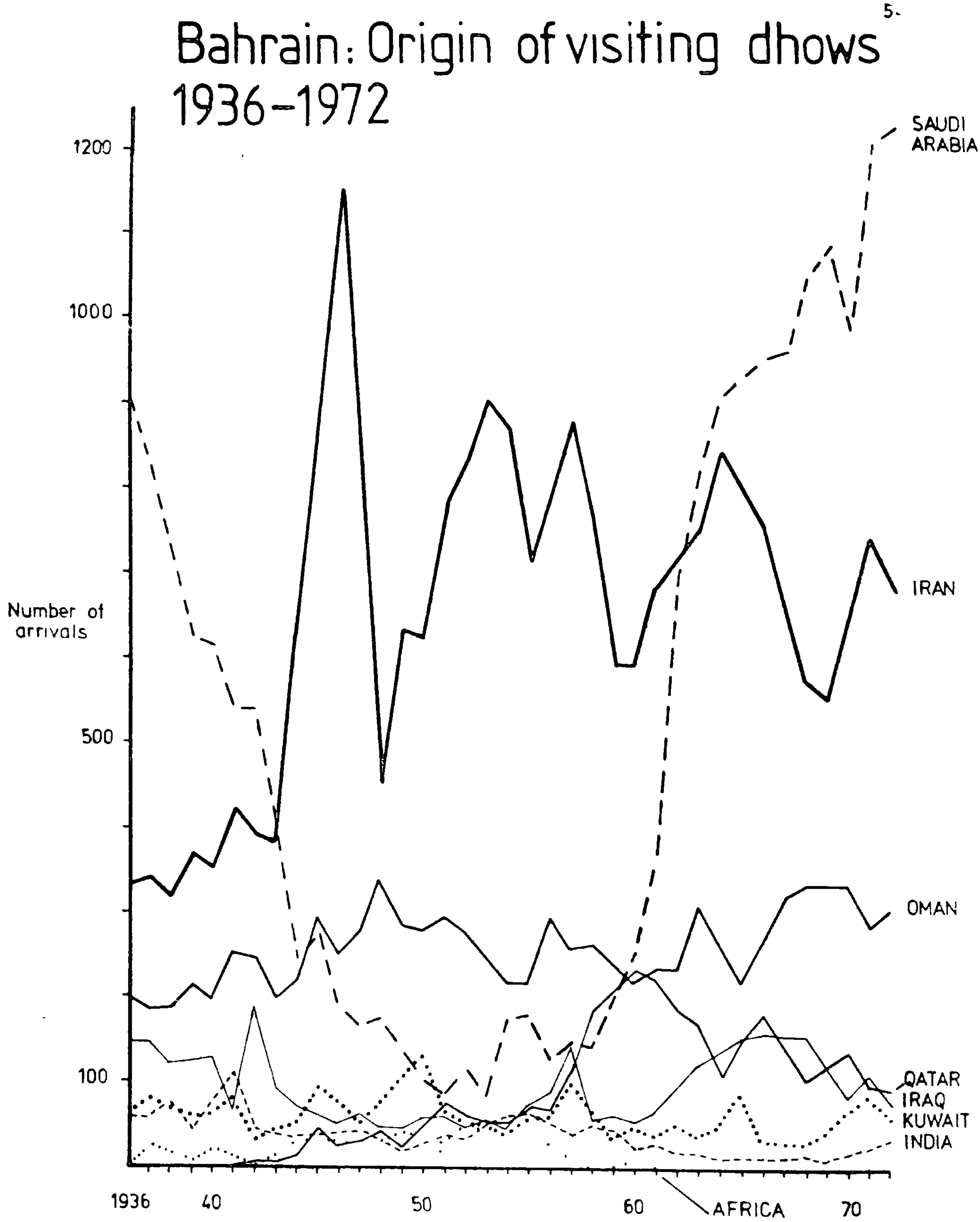

Bahrain: Origin of visiting dhows
1936–1972
1200
1000
500
100
Number of
arrivals
SAUDI
ARABIA
IRAN
OMAN
QATAR
IRAQ
KUWAIT
INDIA
AFRICA
1936
40
50
60
70

FIGURE 3.2

the period 1936–1969 (see appendix Table A). From the 1950's onwards, as far as Bahrain was concerned, the technology of the sail was eclipsed by the motor engine, symbolizing the demise of the long-distance dhow trading system which was based on sail power. During this period the total number of dhows registered was also cut by one half.

Figure 3.2 also illustrates Bahrain's local position with regard to the origin of visiting dhows for the same period 1936–1969 (see appendix Table B). Dhows arriving from East Africa died out in 1951, about the same time that the numbers of sailing dhows began to fall sharply. All routes display mild annual fluctuations with the exception of the Iranian route which displays a marked increase in the level of activity during the period, suggesting a switch from the 'trans-oceanic' to the 'coastal' trade, and the Saudi Arabian route whose sharp fall and rise in numbers is explained by the fall-off after the completion of the Saudi port of Ras Tanura, and the post 1950's oil-led rise in trade with the mainland.

However, it is dangerous to base the evidence for the demise of the long-distance dhow trade on Bahrain's figures alone, since dhows voyaging to East Africa or India had different home ports, and ports of call. Data from the 'other end' of the system which had fewer terminal points (i.e. Mombasa, Zanzibar and the Rufiji Delta in East Africa) would provide more concrete evidence. McMaster (1966) and Jewell (1969) provide conclusive evidence for the demise of the Africa trade. Table 3.4 lists the total number of Arabian and Indian dhows calling at Mombasa in the period 1947–1968. The figures are graphed in Figure 3.3. The least squares trend line has been computed for the period 1947–1968 in Figure 3.4 and it shows clearly that the trading system was in an entropic state during this era.

On the evidence of dhow flow data presented it appears that the traditional long-distance dhow trade linking the Gulf with East Africa and India declined post 1862 to a point where it had contracted to a coastal trade along the Arabian, Iranian and West Indian littorals.

TABLE 3.4 : NUMBER OF OCEAN-GOING DHOWS CALLING AT THE PORT OF MOMBASA 1947-1968

Year	Number
1947	315
1948	321
1949	235
1950	185
1951	101
1952	149
1953	260
1954	182
1955	225
1956	110
1957	97
1958	74
1959	59
1960	51
1961	17
1962	28
1963	41
1964	43
1965	43
1966	34
1967	41
1968	58

SOURCES : (i) 1947-1961 D.N. McMaster (1966 p20).

(ii) 1962-1968 J.H.A. Jewell (1969).

Arrivals of dhows at Mombasa 1937-68

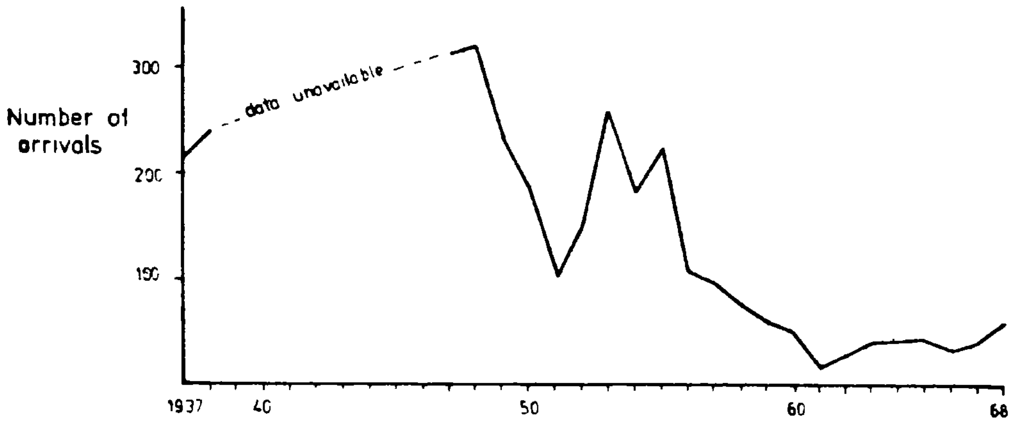


FIGURE 3.3

Arrival trend 1947-68

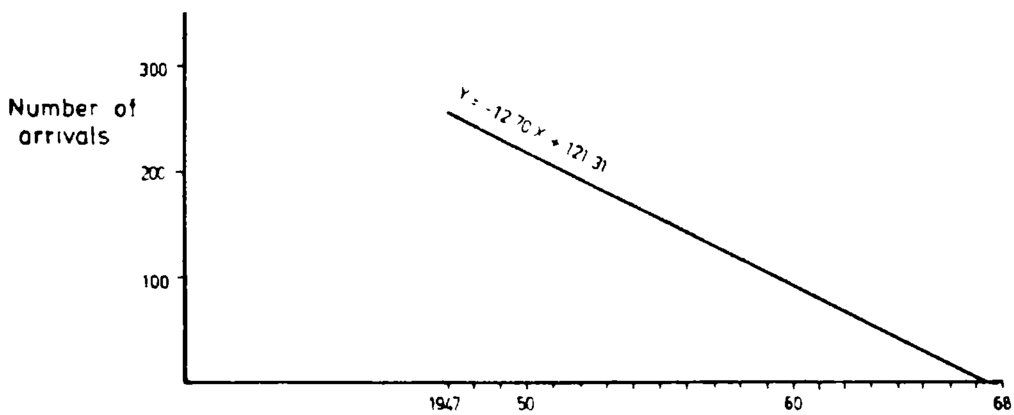


FIGURE 3.4

At this point the research now turns to trade data to see if any corroboration exists that might suggest the realignment or contraction of a trading nexus.

3.4 DYNAMIC EQUILIBRIUM : INTRUSION OF MODERN MARITIME TRANSPORT SYSTEMS

3.4.1 Growth of Steamship Services

The disturbing effect that the introduction of the steamship was to have on the Gulf trading system was really an accident. The Gulf route became inexorably bound up with the obsession of the British Government of the mid 19th Century to strengthen its communications with its Empire in India. The Gulf's geographical position vis a vis the continental United Kingdom - India land/sea route opened it to the influence of early technological and economic modernization which affected its own indigenous transport system.

British commercial links with India were improved in stages, in two areas. Firstly, a series of improvements in transport links improved to speed and frequency of connection with India. These included the inauguration of the Peninsula and Orient Line Service from the U.K. to Alexandria in 1840, and from Suez to India in 1844; the completion of the Alexandria - Suez Railway link in 1858, and the opening of the Suez Canal in 1869. Secondly, the Governor Generals of India, Lord Dalhousie (1848 - 56) and Sir Bartle Frere, presided over the modernization of the internal Indian transport system, the lynch pin of which were improvements to Karachi Harbour in 1850 and the construction of the Punjab-Karachi Railway in 1861.

However, within this second series of innovations it was developments in Indian shipping services that were to have direct influence upon the economy of the Persian Gulf. Landen (1968 p. 88) attributes this influence largely to the work of one man - William MacKinnon - who "inadvertently sparked off a revolution in the Persian Gulf". He was responsible, with Robert Mackenzie, for developing India's shipping services beginning on the east coast with the establishment of a Calcutta-Rangoon route in 1854, and forming a "Calcutta and Burma Navigation Company" in 1856.

TABLE 3.5 : DEVELOPMENT OF PERSIAN GULF STEAMER SERVICES 1862-1939

	1862	British India	British	8 voyages per annum	Bombay
	1866	" "	"	Twice a month	"
	1868	" "	"	Fortnightly	"
	1869-79	Persian Mail	"	Irregular	"
	1870	Bombay and Persian	"	Irregular	"
	1870	Oman & Ottamar	Ottomen	Irregular	Instanbul
	1870	Anglo/Arabian & P.G.	British	Monthly by 1879	London
	1874	British India	"	Weekly	Bombay
	1883-5	Messageris Maritime	French	Irregular	Marsailles
	1896-97	" "	"	Monthly	Bombay
	1901	Russian & Persian Gulf.	Russian	Monthly	Odessa
	1904	British India	British	Weekly, fast & slow	Bombay
*	1914	Hamburg-Amerika	German	Irregular	Bremen
*	1925	Hansa	German	Irregular	Bremen
*	1934	Yamashita	Japanese	Monthly	Jap.Ports
*	1936	Mitsui	Japanese	Monthly	" "
*	1938	Hansa	German	Irregular	New York
*	1938	Isthmian	U.S.	Irregular	Los Angeles

SOURCES : (i) Admin. Reports 1876:1901, Lorimer 2468-69.

* (ii) Annual reports, Bahraini Government.

In 1862, utilising a subsidy from the British Government, MacKinnon founded the "British India Steam Navigation Company" and initiated a route to the head of the Persian Gulf where he linked up with the river steamer service run by the Lynch Brothers along the Tigres and Euphrates rivers. In integrating the two services the port of Basra was linked to Bombay and Karachi and services to Europe. The significance of the Gulf link to India was enhanced in 1874 by the construction of the Europe - India telegraph link running along the northern shore of the Gulf through Persia. Soon after the opening of the Suez Canal in 1869, the first direct sailing from Europe to the Gulf anchored off Bushire in 1870.

From 1862 onwards saw the gradual introduction of steamship services into the Gulf (see Table 3.5). The period until the end of the nineteenth century saw two trends: Firstly the dominance of British freight and passenger services, despite some government subsidized French and Russian competition; and secondly, the degree to which the Gulf-India route became impregnated by steamer services in direct competition to native dhows who formerly carried the cargoes of foodstuffs, spices and building materials. Cut price freight rates were to prove the problem for native dhows. Landen concludes that "after 1865, local shipping could no longer compete seriously against the steamers on the ancient and vital India-Gulf trade routes, and increasingly the dhows were relegated to minor coastal operations, including irregular ocean voyages, or illicit trade including smuggling" (1968 p.98). This statement is not verifiable statistically but is deducted from Lorimer's (1915) analysis of the level of trade in 1908. Landen's overall thesis is that the impact of the introduction of steamships into the waters of the Gulf was a destructive influence in that it undermined the Gulf maritime economy and enfeebled many of those functions associated with established commercial and maritime enterprises. This conclusion is too simplistic: total destruction never occurred. This implies extinction. In fact, dhows continue and still continue to visit India, though on a lower level of frequency and carrying different cargoes. A more accurate conclusion would be to note that the traditional dhow economy was forced to adapt to changed circumstances - an adaptation which was to have spatial consequences since it represented a contraction of the spatial system into a 'high level' activity system based on the Persian and Omani Gulfs and a 'low level' activity system along the Asian and African coasts.

The net result of the gradual increase in the number of steamship services to present levels was the construction of an array of deep-water harbours along the coast of the Persian Gulf. Data for the early build-up of port traffic (i.e. pre 1950) is unobtainable in a comprehensive form for comparative purposes. However, the following section (3.4.2) measures the pattern of increase in deep water harbour traffic for the period 1962-1971, whereas the recent levels of dhow traffic flows are recorded in section 4.5.

3.4.2 Growth in Port Traffic

Gulf Ports - Comparative Growth in Trade 1962-1971

An underlying element in the decision to invest in the construction of new or expanded deep water port facilities is the trend in the growth of trade, particularly of imports, at Gulf ports. Table 3.6 represents a compilation of the growth patterns of import tonnages discharged at each of eleven major seaports for the period 1962-71. No data was available for Muscat during this era.

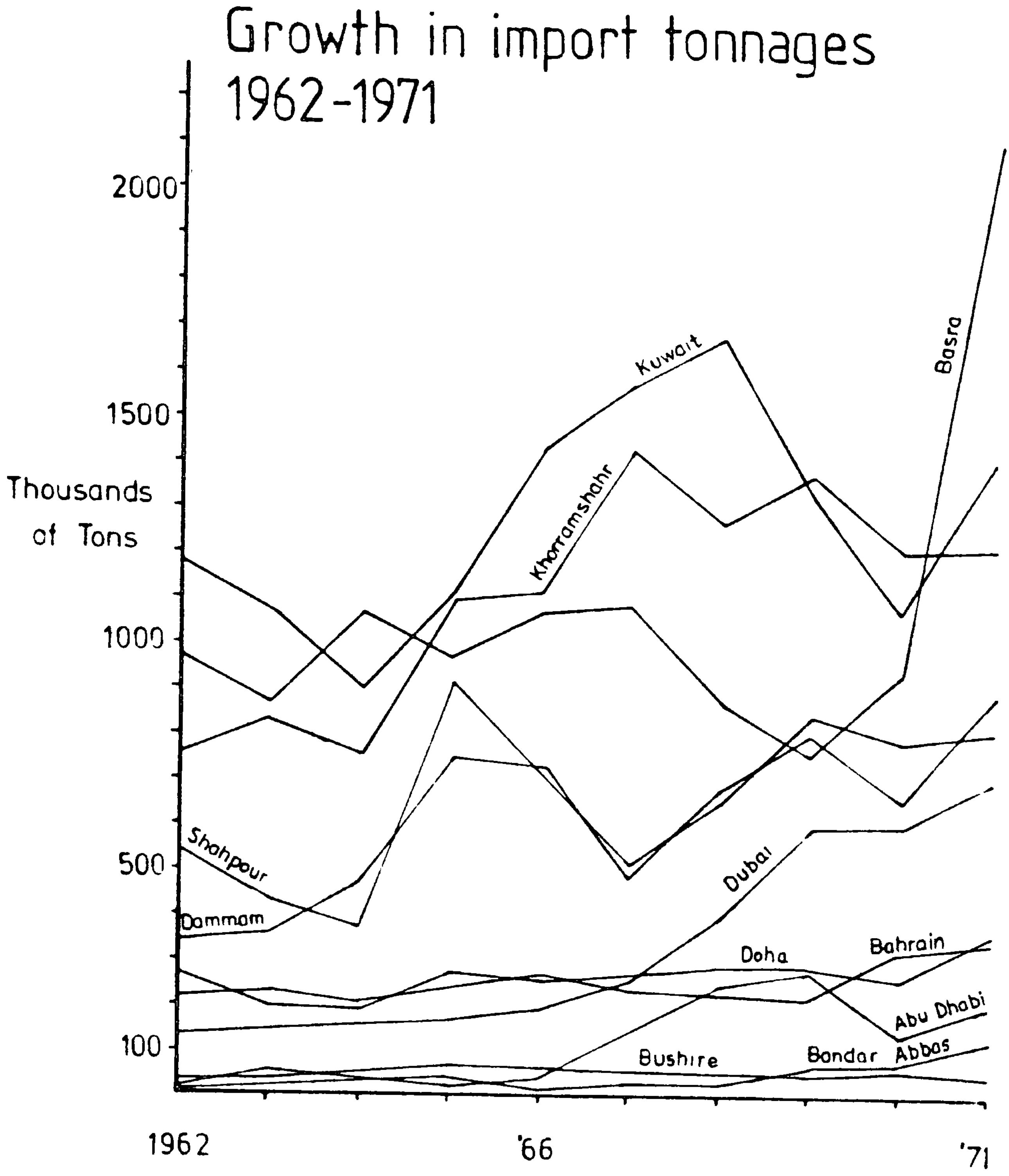
The statistics recorded in Table 3.6 are graphed in Figure 3.5 and illustrate the fluctuations in their respective levels of trade. In terms of a port hierarchy, six ports - Basra, Kuwait, Khorramshahr, Dammam, Bandar Shahpour and Dubai - can be termed 'major' in the sense that they handled greater than 500,000 tons of imports in 1971, and five 'minor' - Doha, Bahrain, Abu Dhabi, Bandar Abbas and Bushire, handling less than that amount. A static picture of the changing port hierarchy reveals the following pattern.

TABLE 3.6 : IMPORT TONNAGES HANDLED AT MAJOR PORTS OF THE PERSIAN GULF, 1953-1971 (THOUSANDS OF TONNES)

1953	50.0	NA	NA	80.8	-	-	NA	NA	NA	NA	-
1954	460.0	NA	NA	83.2	-	-	NA	NA	NA	NA	-
1955	410.0	NA	NA	98.0	-	-	NA	NA	NA	NA	-
1956	490.0	NA	NA	115.1	-	-	NA	NA	NA	NA	-
1957	575.0	NA	NA	115.7	-	32.7	NA	NA	NA	NA	-
1958	770.0	NA	NA	183.5	-	49.7	NA	NA	NA	NA	-
1959	1133.9	NA	417.8	225.8	-	68.5	NA	548.4	467.6	26.2	-
1960	1019.3	NA	399.9	250.7	-	100.3	NA	729.9	424.1	64.9	-
1961	732.0	NA	369.3	225.8	-	112.5	NA	890.7	587.4	99.0	12.5
1962	1180.5	220.0*	343.5	271.1	20.6	135.0*	971.5	760.8	541.3	31.6	9.6
1963	1073.2	223.4	361.1	199.1	59.7	145.0*	871.5	831.7	435.2	37.7	18.7
1964	906.7	207.9	477.5	191.1	30.6	155.0*	1071.7	757.3	374.2	56.2	32.6
1965	1112.5	246.3	758.1	276.7	20.4	168.0	937.5	1098.2	923.0	70.8	35.0
1966	1434.9	263.4	732.6	257.0	36.8	190.7	1069.9	1115.1	772.8	58.5	16.9
1967	1576.5	232.8	482.9	263.0	144.2	252.1	1088.5	1432.8	512.4	52.3	30.0
1968	1681.7	229.3	681.7	290.7	244.4	389.8	870.3	1272.3	652.3	49.7	25.2
1969	1333.6	217.4	803.7	288.2	272.3	595.7	761.0	1381.6	848.1	42.1	67.1
1970	1076.0	323.5	657.7	260.0	135.5	595.3	945.9	1212.7	787.6	52.1	67.9
1971	1414.5	354.2	886.5	357.0	198.0	701.5	2107.6	1228.4	814.1	42.5	120.7

SOURCES :
1. Kuwait. Government of Kuwait Customs and Ports, Annual Reports:1961-62,1965-66,1967-68,1969,1970,1971
2. Bahrain. Government of Bahrain,Annual Reports:Customs Reports:1963-1971. * = estimate.
3. Damman. Government of Saudi Arabia,Statistical Yearbook'1968'(1959-66);'1972'(1967-71).
4. Doha. Government of Qatar,Ministry of Commerce and Transport,Ports Department,"Statement on General Cargo imported into Qatar 1953-1972", 1973.
5. Abu Dhabi. Gray, MacKenzie and Company Ltd., Dubai.
6. Dubai. Gray MacKenzie and Co.Ltd.,Dubai,1957-1961;Government of Dubai,Annual Statistical Reports, 1965-1971; * = estimate.
7. Basrah. 1962-70.Statistical pocket book 1960-70,Central Statistical Organisation,Ministry of Planning, Baghdad 1972, 1971 Iraq Port Adm.,Annual Statistical Bulletin, 1971.
8. Khorramshahr.
9. Bandar Shalpour.
10. Bushire.
11. Bandar Abbas.

(8–11) Compiled from Bank MarKazi Iran Bulletin 5 (May-June 1966) pp136-37, and March-April 1968; pp946-47; and Majallah, Ordibehesht va Khordad 1350, Sal-i Dahom, Shamareh-i Sad va Shanzadahom va Sad va Hefdahom (Tenth Year, Nos. 116 and 117, [May-June 1971]), pp94-95.



Growth in import tonnages
1962-1971
2000
1500
1000
500
100
Thousands
of Tons
1962
'66
'71
Kuwait
Basra
Khorramshahr
Shahpour
Dammam
Dubai
Doha
Bahrain
Abu Dhabi
Bushire
Bandar Abbas

FIGURE 3.5

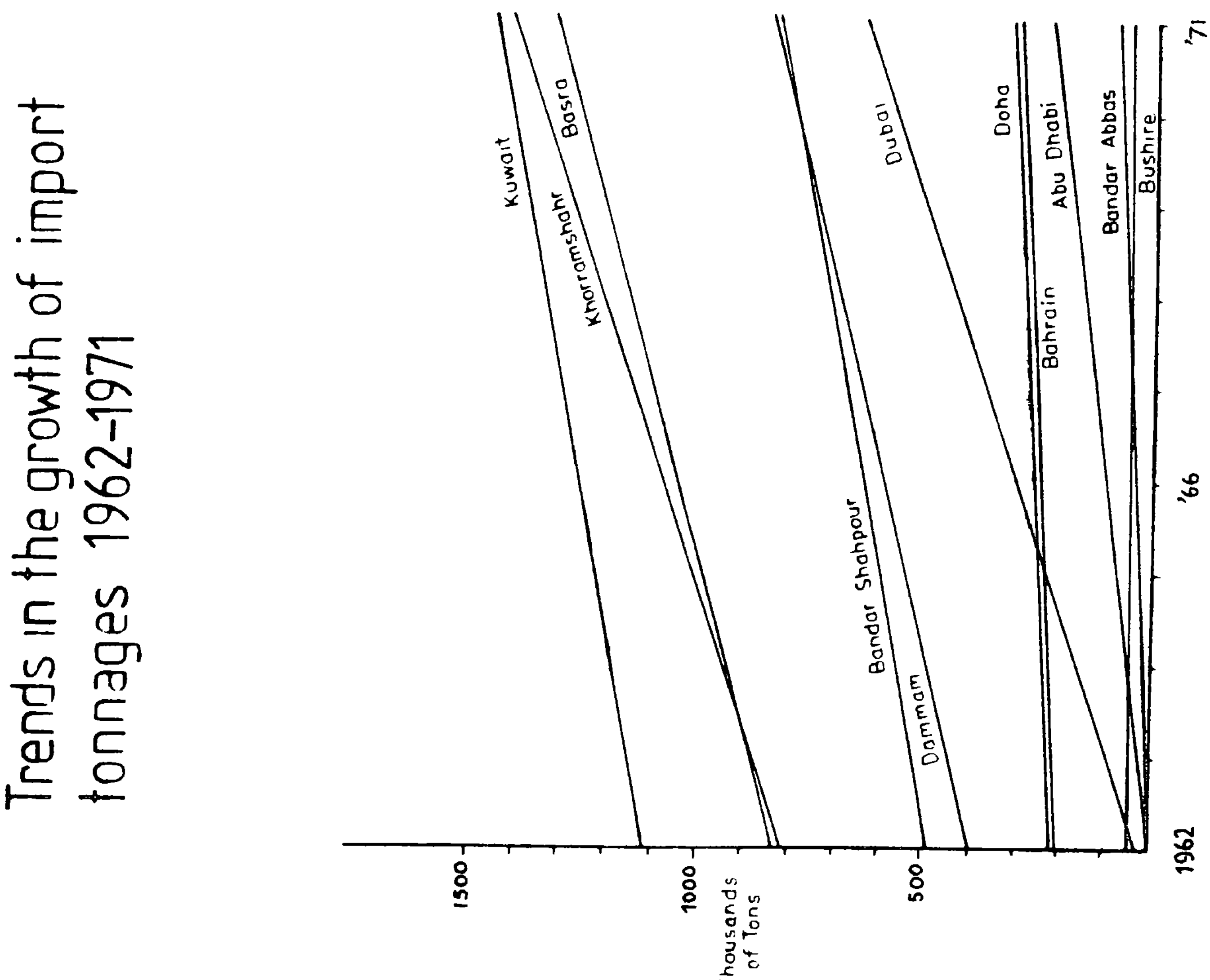

Trends in the growth of import tonnages 1962-1971
Kuwait
Khorramshahr
Basra
Dubai
Doha
Abu Dhabi
Bahrain
Bandar Abbas
Bushire
Bandar Shahpour
Dammam
1500
1000
500
Thousands of Tons
1962
'66
'71

FIGURE 3.6

TABLE 3.7

TREND IN GROWTH RATES OF THE PERSIAN GULF

DEEP-WATER PORTS, 1962-1971 : RANK ORDER

Rank	Port	Ø
1	Dubai	19°8'
2	Khorramshar	18°41'
3	Basrah	15°11'
4	Dammam	14°0'
5	Kuwait	11°13'
6	Bandar Shahpour	10°46'
7	Abu Dhabi	8°30'
8 =	Bandar Abbas	4°18'
=	Bahrain	4°18'
=	Doha	4°18'
11	Bushire	0°42'

	1962	1971	Rank Change 1962-71 in respect of 1971 Rank
1.	Kuwait	Basra	+1
2.	Basra	Kuwait	-1
3.	Khorramshahr	Khorramshar	0
4.	Bandar Shahpour	Dammam	+1
5.	Dammam	Bandar Shahpour	-1
6.	Doha	Dubai	+2
7.	Bahrain	Doha	-1
8.	Dubai	Bahrain	-1
9.	Bushire	Abu Dhabi	+1
10.	Abu Dhabi	Bandar Abbas	+1
11.	Bandar Abbas	Bushire	-2

Most significant in the changing pattern of rank order is the upward movement of Dubai by two places, and the downward movement of Bushire, also by two. However, Figure 3.6 illustrates more clearly the real pattern of growth in imports over the whole period. Leastsquares trend lines were computed for each of the eleven ports. The rate of growth for each port is ranked in Table 3.7. During the period under study, Dubai heads the list of ports that may be said to have grown at a 'dynamic' rate of increase, including Khorramshahr, Basra, Dammam, Kuwait, Bandar Shahpour and Abu Dhabi. Slower rates of growth are evident for Bandar Abbas, Bahrain and Doha, while Bushire's level of imports appears to be virtually static.

3.5 CHANGE IN SPATIAL STRUCTURE: THE PATTERN OF TRADE

3.5.1 Introduction

Two methods are tested in order to try and establish whether or not the modern nexus of trade interconnectivity fits the traditional dhow system pattern that had reached maturity in the mid-nineteenth century. In both cases international trade data for 1971 is used, covering published data for all the Gulf states for that year converted for comparative purposes into the Kuwaiti Dinar at international currency rates quoted on Page 203 of the Third Annual Report of the Central Bank of Kuwait, 1972:

Country	Currency	KD per unit
Saudi Arabia	Riyal	0.079365
Iraq	Dinar	1.000000
Bahrain	Dinar	0.749997
Qatar, Dubai	Riyal	0.0749997
Oman	Rial	0.856633
Iran	Rial	0.004342

3.5.2 Graph Theory Analysis

The dhow trading system was essentially a functional region consisting of a set of centres (ports) between which there was a high degree of association. Given the demise of the sailing dhow an important question now needs to be answered. Has the former functional region been dismembered?

Nystuen and Dacy (1961) have suggested an operational procedure for identifying hierarchical regions by graph-theoretical procedures. Using an origin-destination matrix of flows, the first stage consists of ranking the locations according to the total incoming flow. In the second stage, the dominant flow from each location is defined as the largest outgoing flow. If this dominant flow is to a lower order centre, the origin centre is termed 'independent' but if the dominant flow is the high order centre, the flow is termed 'nodal' (Hay 1973). The nodal flows may then be mapped, producing a range of patterns, from simple dominance of all centres by one centre, through an integrated hierarchy in which one centre dominates all other centres directly or indirectly, to an absence of hierarchy in which a large number of independent centres exist.

Hay and Smith (1970) applied this technique to flows of rail traffic between 27 major Nigerian towns and failed to identify a clear hierarchical pattern suggesting that the technique is not only able to identify hierarchies but also to demonstrate their absence from

TABLE 3.8 : TRADE BETWEEN THE STATES OF THE PERSIAN GULF AND OTHER STATES IN THE MIDDLE EAST, EAST AFRICA AND SOUTH ASIA (By Value 1971)

	Kuwait	Bahrain	Dubai	A.Dhabi	Oman	Qatar	S.Arabia	Iran	Iraq
Kuwait	-	1.13	1.24	1.21	0.40	1.07	7.36	6.55	6.72
Bahrain	1.13	-	1.60	0.55	0.39	1.43	11.10	2.26	0.50
Dubai	1.24	1.60	-	3.64	1.35	1.71	0.44	6.23	0.06
Abu Dhabi	1.21	0.55	3.64	-	0.55	0.54	1.72	0.65	0.15
Oman	0.40	0.39	1.35	0.55	-	0.14	0.00	2.62	0.06
Qatar	1.07	1.43	1.71	0.54	0.14	-	3.73	1.22	0.03
S. Arabia	7.36	11.10	0.44	1.72	0.00	3.73	-	1.47	0.89
Iran	6.55	2.26	6.23	0.65	2.62	1.22	1.47	-	1.02
Iraq	6.72	0.50	0.05	0.15	0.06	0.03	0.89	1.02	-
Lebanon	1.30	0.99	0.72	0.76	0.11	3.27	37.65	4.21	7.8
Egypt	1.58	0.04	0.07	0.09	0.00	0.07	1.72	0.00	6.72
Jordan	3.25	0.04	0.00	0.06	0.00	0.25	3.23	0.13	1.33
Sudan	0.58	0.00	0.00	0.00	0.00	0.00	2.67	0.05	0.21
Syria	2.01	0.04	0.00	0.01	0.00	0.19	0.48	0.10	3.63
Afghanistan	0.25	0.00	0.00	0.00	0.00	0.00	0.00	1.91	0.02
Ethiopia	0.12	0.02	0.00	0.00	0.00	0.00	3.28	0.00	0.04
Turkey	1.55	0.00	0.00	0.01	0.00	0.00	0.00	1.78	3.07
Yemen	0.09	0.00	0.00	0.00	0.00	0.00	0.48	0.00	0.05
Dem Yemen	0.06	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.15
Somalia	0.40	0.09	0.01	0.00	0.00	0.06	8.33	0.12	0.08
Kenya	0.68	0.20	0.54	0.07	0.14	0.09	0.00	0.41	0.35
Tanzania	0.92	0.11	0.14	0.06	0.02	0.04	0.00	0.00	0.43
Malagasy	0.43	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00
India	8.04	2.29	3.53	0.35	0.96	1.10	5.44	11.58	6.61
Pakistan	4.76	1.83	1.90	0.47	0.52	0.99	3.81	2.21	2.45
Sri Lanka	0.80	0.20	0.40	0.00	0.02	0.00	2.29	1.94	4.26

1. Figures are in million Kuwait dinars

2. Nodal flows are underlined.

Source : Appendix Table

some systems.

Applied to total trade flows by value (imports plus exports) between the Gulf states and surrounding states in the wider Middle East, East African and South Asian theatre (see appendix Table C) the technique produces the results in Table 3.8. The interpretation of results depends upon which period is compared to 1971. For example, comparing these results with the situation in the mid-nineteenth century when Muscat was the pivot of all Gulf trade, having strong links with East Africa and India, certain patterns are clearly apparent in 1971. The steamship era has seen a reorientation of the original trading system: Muscat has lost its nodality and its strong trade links with Africa and India. Kuwait now has the strongest links with East Africa; within the Gulf, Saudi Arabia has assumed a nodal position with strong links in the mid Gulf region with Bahrain, Qatar and Kuwait, as well as close ties with the Lebanon; in the lower Gulf, Iran now has close ties with the United Arab Emirates (Dubai) and Muscat.

However, the chief drawback of this method of analysis in this context is that it only represents a nodal hierarchy, and does not render a clear pattern of intra-system trade in order to judge whether or not, trading patterns in the post dhow era have changed fundamentally.

3.5.3. Location Quotient Method

This problem is overcome by applying the location quotient method in order to judge the spatial pattern of intra-regional trade in 1971. The measurement of a port's foreland in comparison with other ports in a regional system such as the Gulf is dependent upon data availability of the origins and destination of intra-system cargoes. The information is available for the level of the nation state, but it is not possible to break it down by port of entry and departure, particularly with regard to Iran's four major general cargo ports. However, using the data matrix in appendix (C) of total foreign trade by value between the nine major Gulf states within Gulf regional system, it is possible to gauge the level of internal inter-linkage.

The notion of a 'location quotient' is borrowed from work on industrial location by P. Sargent Florence in 1943. Underlying the idea of the location quotient is the principle of a relative comparison between the performance of an individual port, or state, with the average total performance of all the ports, or states, in the total regional system. Britton (1965) and Bird (1969) used similar adaptations of Florence's benchmark idea to consider the traffic flows of individual ports, at Melbourne in the former study, and all the major British ports in the latter. An earlier application of the benchmark principle was in the study of the direction of world trade at the nation state level by Alexandersson and Norstrom (1963, pp 17-29). Bird (1971) p. 141, neatly summarises Alexandersson's and Norstrom's "trade distribution index" as follows :

> "In simple terms their trade distribution index works on the principle that if Country 'A' has seaborne trading connections with other nations such that the trade mix perfectly matches the composition of world trade, the foreland indices of Country 'A' would work out a 100 for every other country, each of which would constitute a foreland at this level and aggregation of statistics. But if the trade between Country 1 and 2 is twice the hypothetical situation (where the share of Country 1's trade going to Country 2 is twice that of 2's share of world trade) then the index is 200 and so on pro rata"

(with half the average presented by 50).

This index has been adapted to consider trade between member states within the Gulf Maritime Trading System, the data being an aggregate of imports and exports, and, all modes of transport. The index is stated mathematically as follows :

$$I = \frac{\dfrac{T_{GS1-GS2}}{T_{GS1}}}{\dfrac{T_{GS2}}{T_{PGS}}} \times 100 = \frac{T_{GS1-GS2} \times T_{PGS}}{T_{GS1} \times T_{GS2}} \times 100$$

TABLE 3.9 : LOCATION QUOTIENTS WITHIN THE ORIGINAL (LONG DISTANCE) GULF MARITIME TRADING SYSTEM, 1971

	Kuwait	Bahrain	Dubai	A.Dhabi	Oman	Qatar	S.Arabia	Iran	Iraq
Kenya	141	142	272	255	287	133	-	84	82
Malagasy	443	22	156	-	-	-	-	-	2
Somalia	22	17	1	2	-	23	375	6	4
Tanzania	273	110	102	323	70	93	-	-	145
India	103	101	111	76	119	100	55	148	96
Pakistan	129	170	126	214	139	190	82	59	75
Sri Lanka	41	34	51	1	10	1	94	100	249
Yemen	69	6	0	9	-	12	312	7	45
Dem Yemen	121	67	74	2	29	-	-	23	356

TABLE 3.10 : LOCATION QUOTATIONS WITHIN THE MODERN (SHORT DISTANCE, REDISTRIBUTIVE) DHOW TRADING SYSTEM, 1971

	Iraq	Kuwait	Qatar	S.Arabia	A.Dhabi	Oman	Bahrain	Iran	Dubai
Iraq	-	397	4	44	38	14	52	68	4
Kuwait		-	68	153	132	40	50	185	47
Qatar			-	200	152	36	163	89	168
Saudi Arabia				-	92	1	411	34	14
Abu Dhabi					-	243	106	80	610
Oman						-	75	300	209
Bahrain							-	113	108
Iran								-	274
Dubai									-

where I = Trade distribution index

$T_{GS1-GS2}$ = Total trade between Gulf State '1' and Gulf state '2'

T_{GS1} = The total foreign trade of Gulf State '1'

T_{GS2} = The total foreign trade of Gulf State '2'

T_{PGS} = The sum of all imports and exports in the Persian Gulf Maritime Trading System.

The results are assembled in symmetrical matrices in Table 3.9 and Table 3.10. A total of '100' represents the system average, 200 twice the average, 50 half the average andso on. The non-publication of foreign trade statistics for the smaller Gulf States of Sharjah, Ajman, Umm Al-Qaiwain, Ras al Khaimah and Fujairah precludes them from analysis, though were data available, high above average scores would probably be linked with Dubai. The technique is useful in highlighting the more significant links in a regional system, indicating the tightness of economic bonds within a system and how many of them are marine in character.

Table 3.9 is a compilation of the location quotients for those states which formed the original dhow-based Gulf maritime trading system as it existed, for example, in the early nineteenth century, and between which trade is now carried on using mainly steamer transport. The pattern of results reveals that much of the original pattern of inter-connection survives: Kenya maintains above average quotients with the Gulf Shaikhdoms, as does Tanzania, which also maintains strong links with Iraq; India and Pakistan still have strong trade connections with the Gulf Shaikhdoms; Saudi Arabia has close connections with Yemen and Somalia, and Iraq close ties with democratic Yemen. Overall, however, this pattern is deceptive as the general proportional level of trade between the Gulf and the states of the Indian Ocean Basin is much lower than in the nineteenth century.

In the era of steamships, the dhow trade routes have contracted from their former trans-oceanic routes to regional redistributive trades, principally within the Gulf.

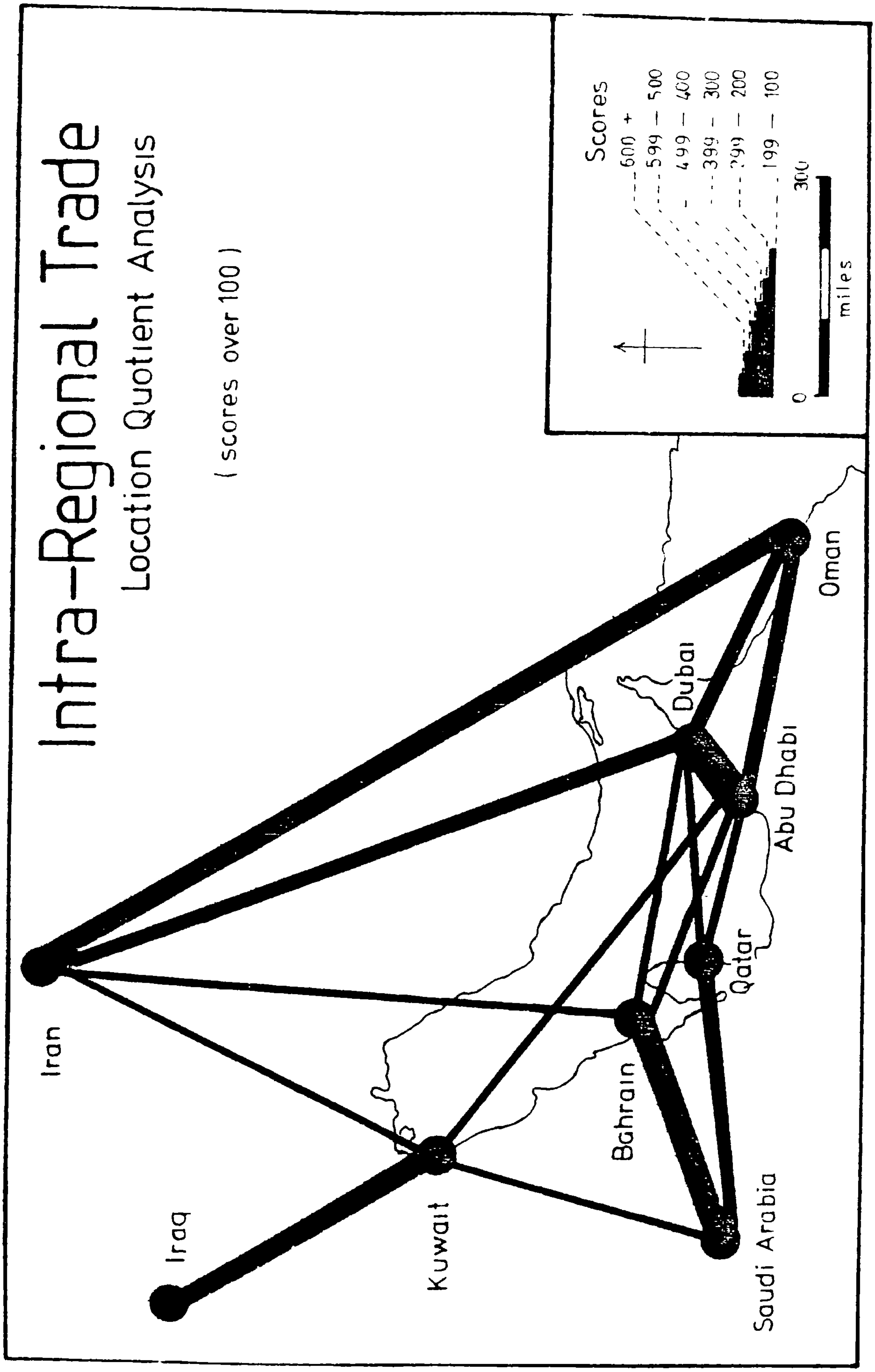

Intra-Regional Trade
Location Quotient Analysis
(scores over 100)
Scores
600 +
599 — 500
499 — 400
399 — 300
299 — 200
199 — 100
0
300
miles
Iran
Iraq
Kuwait
Bahrain
Saudi Arabia
Qatar
Abu Dhabi
Dubai
Oman

FIGURE 3.7

Location quotients indicated in Table 3.10 and Figure 3.7 are significant in that they represent the modern pattern (1971) of intra- Gulf trading relationships. Focusing on the survival of the dhow, major 'above average' quotients - Kuwait-Iraq, Saudi Arabia-Qatar, Abu Dhabi - Oman, Abu Dhabi-Dubai, Oman-Dubai - are all indicative of routes subject to the development of road transport either now, or in the near future. Bearing in mind development in road transport along the Gulf only four interconnections offer themselves as strong dhow routes, assuming pattern of trade continues:

		Location Quotient
1.	Bahrain-Saudi Arabia	411
2.	Oman-Iran	300
3.	Dubai-Iran	274
4.	Kuwait-Iran	185

CHAPTER 4

TECHNOLOGICAL CHANGE AND BEHAVIOURAL RESPONSE I : DHOW TRANSPORT

"I should hate to see Diesel engines put in fine booms ...."

(Villiers, 1940 p.328).

4.1 INTRODUCTION

The position of the Persian or Arabian dhow and the men who sail them is very much akin to the malaise of any endangered living species. In Darwinian terms, the long process of evolution has led to the adaptation of physical designs and spatial spheres of influence linked to the precise environmental circumstances in operation at a particular point in time. Dhows, and their sailors, have to adapt to survive. Their plight is ecological and adaptive, and as such, dhows and dhow life may be regarded as a persecuted species in a biological (ecological) sense. Essentially, the dhow is competing for space on the economic ocean, in which 'stronger' forms of transport threaten to eliminate dhows as a contemporary mode of transport. The dhow is thus involved in a continuous 'search' process to find a spatial and economic 'niche' within the Gulf Maritime Trading System, with the result that competitive pressures on the dhow are forcing increasing specialization of routes and trades.

This section seeks to substantiate whether this 'fight for survival' is a reality, by testing the hypothesis that adaptation and survival take place on two fronts. Firstly, through the mechanism of technology via an adaptive design and re-design of craft to suit changing environmental circumstances. Secondly, via the spatial process of 'search' for appropriate routes and commodity trades geared to providing sufficient financial return to ensure the survival of the socio-economic system.

In both cases, man as sailor, boatbuilder and merchant, practices 'feedback control' by responding to changing environmental circumstances. The range and manner of his response is conditioned by a number of elements; the availability of resources, both material and human, in sufficient quantity and quality to permit adjustment, the availability of information, both speedy and accurate enough to produce an appropriate response, and the perceptive ability to adjust spatially and technologically in the right way.

4.2 ADAPTATION OF A SPECIES

4.2.1 Technological Adaptation

The development of the dhow as a mode of transport falls into two distinctive eras. The first era is represented by conception, evolution and adaptation of maritime craft in response to the climatic and general environmental conditions found in the Persian Gulf, Red Sea and the Western Indian Ocean maritime space. This man-environment relationship forms the basis for the genesis and general design of the dhow. The second era belongs to the phase of adaptation and refinement brought about by the introduction of largely European sailing and motor craft external to the Gulf Maritime Trading System, via the introduction of square-rig design, the motor engine, the steamship and other twentieth century modes of transport.

Given this neat split in design terms, it is debatable whether explanation should then proceed on a chronological basis. The history of the evolution of ship design in the Middle East is incomplete and any attempt to show the evolution of shipping at each period in chronological order would leave too many gaps. Further, explanation on a 'closed geographical system' basis is again inappropriate. To speak of the Gulf dhows in a 'closed' sense in inaccurate. Section 2.2.1 has already defined the wide spatial organisation of the dhow transport system stretching in a vast triangle from Arabia to East Africa, across to the West Indian subcontinent. Hourani (1963, p.88) is sympathetic to the view that the treatment of the dhow cannot be limited in spatial extent to the Arab world, commenting that, "the western half of the Indian Ocean from Ceylon round to East Africa, forms a cultural unity which has to be treated as a whole." As such, ship designs do not always take account of national boundaries and there is considerable evidence of the diffusion of innovation both between points within the Indian Ocean, and from beyond.

Faced with chronological gaps and overlapping spatial boundaries, the explanation of the technological adaptation of dhow transport is more acceptable if it is focused on the detail of design construction as representative of general adaptation to environmental inputs, set within each of the two defined eras. Such explanation concentrates on the use of building materials, methods of construction and refinements in motive power, shape and design features.

4.2.2 Early Dhows

Hourani (1963) considers that: "the outstanding features of medieval Arab ships of the Indian Ocean are two: the manner in which the planks are sewn together, not nailed, and the fore and aft set of the sails" (p.88). Such distinguishing design features are the result of over 1,000 years of adaptation. Unfortunately, there is a paucity of pictorial evidence to confirm the design of early Indian Ocean shipping, and such data as exists relies heavily on scattered literary volumes of all periods down to latter medieval times. Early sources suggest that the people of the Gulf lacked both the building materials and the expertise to build seagoing vessels. Early evidence points to a Mediterranean-Gulf link in design and construction, as distinct from the latter links with India and Europe. Hourani (p.10) speculates that Assyrian naval enterprise in the Gulf, hampered by lack of suitable timber in Mesopotamia, solved the problem by importing timber from what is now Lebanon, to Nineveh. Hornell (1946) amplifies this link by speculating that the Arabs of the Byzantine Empire, anxious to create a powerful fleet, but lacking in 'know-how', took Syrian (Phoenician) and Greek shipwrights into their service (p. 231).

The first definitive information on design dates back to the first century A.D., when a Greek merchant from Alexandria systematically related an account of the existing commercial conditions along the Red Sea and East African coast (in "Periplus of the Erythraean Sea", translated by W.H. Schloff, 1912). The Periplus relates the first salient design characteristics of the dhow - its "sewn construction". It appears that at that time vessels had been constructed which were capable of sailing from Arabia to East Africa (Dar es Salaam). Periplus relates the siting of vessels unfamiliar to the Greeks and Romans, with the planking of the hulls being sewn, instead of being nailed together, to an inner framework of ribs, edge to edge. In another passage, Periplus notes that Ommana, a trading centre on the south coast of the Persian Gulf, was a shipbuilding centre, exporting completed vessels called 'madarata' to the Hadhramaut and Yemen. Glaser (1890) derived a link between those vessels found at Rhapta and those of Arabia by deriving 'madarata' from the Arabic term muddara'at, meaning "fastened with palm fibre".

Records of constructional methods are largely absent from the second to the ninth centuries (Hornell, 1946, p. 234), but the association between the Gulf and the construction of 'sewn' craft is confirmed by Abu Zayd in the tenth century (G. Ferrand 1922) who vouches for the 'fact' that the system of ship construction with planks sewn together is a speciality of the shipwright of Siraf, on the south Persian coast. The same writer adds that oil, mixed with other materials, was used to finish the hulls of ocean-going ships to close the holes drilled for the sewing twine, and for caulking the seams. Recent archeological evidence would appear to confirm these facts. S.A. Matheson (1973) has reported the discovery of a 'blubber factory' of large storage vats, lined with a thick black oily deposit, in excavations on the site of Siraf, which was probably used to waterproof the bottoms of the dhows in a manner akin to the modern method using dammar and lime.

The method of propulsion was by a sailing rig of a particular type - the 'lateen'. The shape of the lateen rig was ideally suited to sailing 'with' the strong wind of the

Indian Ocean Monsoon systems, but not 'against' it. The harnessing of this wind system made voyages between the Indian subcontinent and Arabia possible. These voyages must have led to the discovery of teak and coconut wood on the coasts of S.W. India (Calicut) and henceforth, the boatbuilders of the Persian Gulf, who suffered from a lack of suitable, durable hardwoods, transported teak and coconut wood to the Gulf for boatbuilding purposes, a practice that is perpetuated today. Hourani (1963) notes that teak has been found in Babylonian, Achaemenid, and Sassanian remains. A native species of south India, Burma Thailand and Indonesian (p. 90), its value in boatbuilding lies in its great strength and elasticity. It is soft enough to be worked easily, and its durability means that once seasoned it does not split, crack or alter its shape.

Ocean- going vessels, prior to the incursion of European technology post 1507, were of a general style directly adapted to the limitations and opportunities imposed by the physical environment. The lateen rig was adapted to climatic control, the sewn planks of teak and coconut wood to the availability of planks for hulls and palm fibre for stitching. Nails were not used. Such craft were designed for the transportation of resources within the trading system, and were constructed with the resources of that system.

The type of 'dhow' sighted by the Portuguese sailor, Alfonso de Alberqueque, when he sailed into Hormuz Harbour in 1507, would have been similar to those sighted by Marco Polo in Hormuz in the thirteenth century. An unchanging design, described by Marco Polo condescendingly as: "wretched affairs ... many of which got lost ... for they have no iron fastenings and are only stitched together with twine made from the husk of the India nut. They beat this husk until it becomes horse - hair, and from this they spin twine and with it stitch the planks of the ship together. It keeps well and is not corroded by sea-water but it will not stand up to a storm. The ships are not pitched, but are rubbed with fish oil." (Yule, 1871, p. 102).

4.2.3 Surviving European Maritime Influences

When Vasco da Gama first viewed strange carvel-built (edge-to-edge) ships off Mozambique in 1498 (Hornell, p. 235) from his clinker-built square-sterned, square-rigged Portuguese galleon, it began an unresolved era of competitive ecology, for the dominance of either local, or extra-regional modes of vessel design within the Indian Ocean. This is represented by a 480 year process in which the native craft of the Gulf and Western Indian Ocean have been ousted from a position of total control of intra-system trade to one of decreasing spatial control of such trade in which the survival of the species has only been assured by considerable adaptation in the design of craft.

"The most important consequence from the contact of Arab and Indian mariners and shipwrights with the western intruders was the substitution of nailing for sewing in the building of hulls of their ships; nails took the place of pegs, and twine sewing. Rapid advance was made in the art of shipbuilding; the square-rigged design was introduced in the place of sharp two-ended ones previously characteristic of Persian Gulf and Indian shipping ...." (Hornell, p.237). The adoption of nailed designs was a process of imitation. Hourani (1963, p.93) comments that soon after 1500, ships of the Malabar coast of India were already being built with iron nails, possibly due to a desperate attempt to imitate the new Portuguese enemy, or possibly copying the example of Chinese junks, which had long been visiting Calicut.

The influence of the Portuguese, and later European design for sailing ships and steamships, has been largely responsible for the designs of the contemporary family of dhows, which are adapted in terms of their construction, design and size to the new competitive situation brought about by the use of expatriate craft within the original dhow system.

Modern dhows have certain common features. They are built of teak wood on the shores of the Gulf, India, Pakistan, South Arabia and East Africa, using the same simple tools used at the time of the Portuguese supremacy - a 'bow drill' and 'adze'. Boat builders now use nails and 'clinker' construction, but work from memory, without formal plans for design. Dhows group into two 'families': those with (square) transom sterns which derive from European influence; and those with double-ended hulls, which represent traditional 'pre-European' design. Most are now fitted with diesel engines as the main mode of propulsion. Masts are still fitted, in most cases, though sails are rarely used.

The 'sewn-hull' boat has not been entirely eclipsed by the 1970's. The 'mtepe-daw' of the Lamu archipalego has disappeared, but small numbers of carvel-built, sewn canoes and fishing boats have survived in niches along the South Arabian coast. Villiers (1940) spotted sewn fishing boats on the Hadramaut coast at Shihr, and a few of these 'surf' boats still survive on that same coastline between Hadramaut and Dhofar (Kaplan, 1974).

A fine distinction clearly needs to be made between a slight balance of superiority in favour of the nailed method of construction, which in itself is insufficient to have hastened the decline of dhow transport, and the influence of European commerce which changed the entire commercial structure of the Indian Ocean, bringing about the rapid disappearance of the sewn dhow.

4.2.4 Modern Dhows - Adaptations

Arriving at an adaptive typology of dhows is not a straightforward process. The word 'dhow' itself is a popularized term describing a variety of craft not described as such by Arabs, Persians, Indians or Africans. English writers have been largely responsible for the incorrect word 'dhow'. The label 'dhow' or 'daw' is, in fact, Swahili in origin; the peoples of the Gulf having their own generic word for ship ('safinah') or use the modern term 'launch'. Expatriate controllers of dhow transport now rejoice under the even less

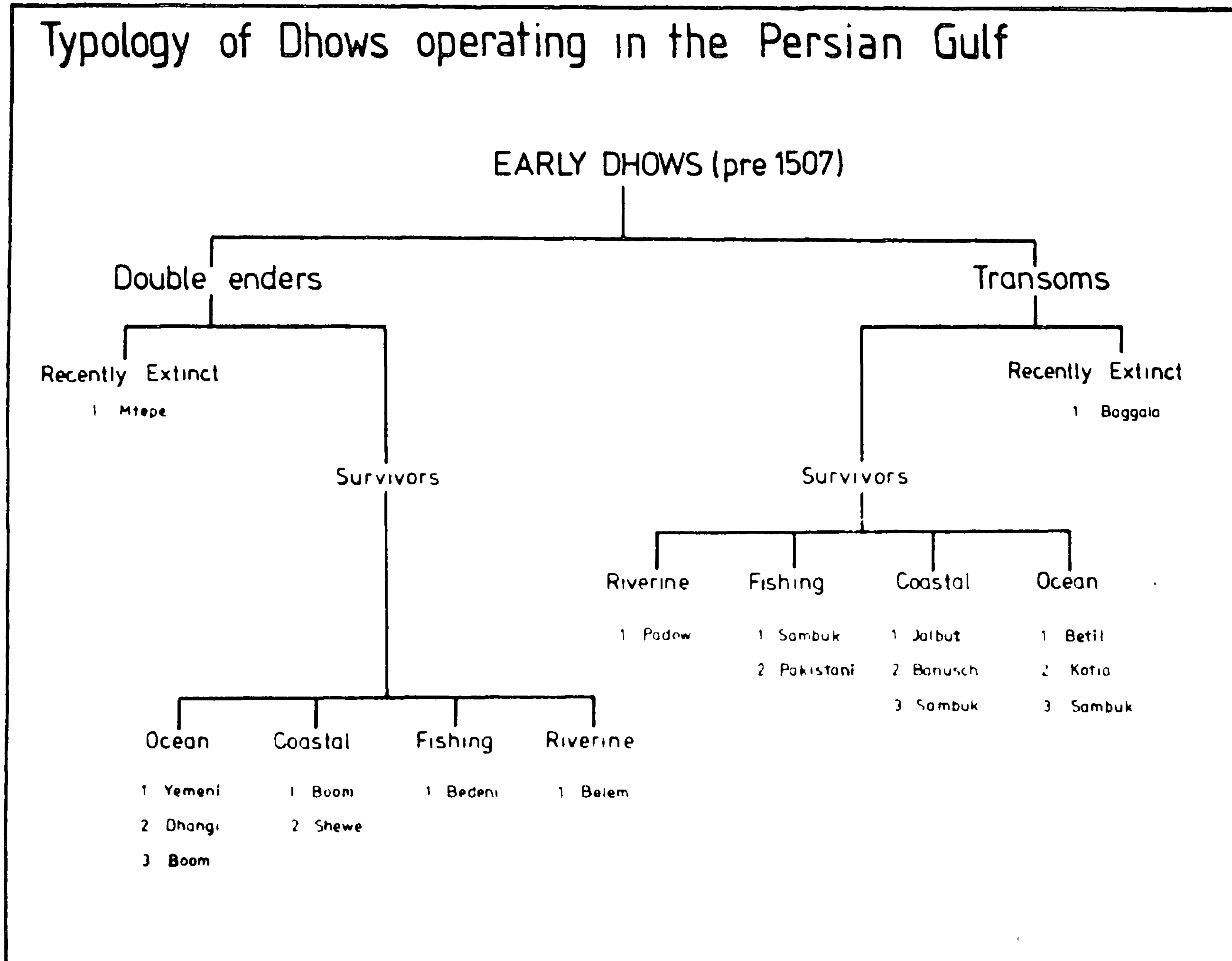

Typology of Dhows operating in the Persian Gulf
EARLY DHOWS (pre 1507)
Double enders
Recently Extinct
1 Mtepe
Survivors
Ocean
1 Yemeni
2 Dhangi
3 Boom
Coastal
1 Boom
2 Shewe
Fishing
1 Bedeni
Riverine
1 Belem
Transoms
Recently Extinct
1 Baggala
Survivors
Riverine
1 Padow
Fishing
1 Sambuk
2 Pakistani
Coastal
1 Jalbut
2 Banusch
3 Sambuk
Ocean
1 Betil
2 Kotia
3 Sambuk

FIGURE 4.1

appropriate term 'country craft'.

Because of the wide spatial reach of operation of these craft, classifications are difficult unless the writer has a well-travelled knowledge; the main problem being to distinguish regional terminology for the same craft in different parts of the system. Hornell's (1942) 'tentative' classification of Arab seacraft sets the pattern for other formal, and less formal, statements about craft typology present in specific locations (Villiers, 1940; Bowen, 1951; Gildemeister, 1882; Kindermann, 1934; Hourani, 1963; Jewel, 1969; Kaplan, 1974; Prins, 1966; McMaster, 1966; Wilson and Edwards, 1909; Omani Government, 1973; Walker, 1975). Varying in emphasis and range, these attempts do have a common denominator: that of distinctions derived from the shape of the hull.

Adaptive designs fall into 2 families based on the shape of the hull; firstly, the square, or transom-sterned family, subject to minor modification of shape, size and decoration, derived mainly from the European influence since the sixteenth century; and secondly, the 'double-ended' family, coming to a point at both bow and stern, of older vintage. Figure 4.1 is an attempt to subdivide, functional terms those dhows presently operating within the Persian Gulf Maritime Trading System, together with those that have recently become extinct. Figures 4.2, 3, 4, and 5 are sketches of the twelve most commonly found dhows in the contemporary Persian Gulf. They are not drawn exactly to scale but are intended to denote the shape and style of the hulls. Vessels '1', '3' and '10' are survivors of the double-ended species; the others are square-sterners.

DOUBLE-ENDERS

Mtepe

The Mtepe dhow of the Lamu archipelago on the East African coast is the most recent example of the extinction of a double-ender. The disappearance of this dhow, however,

FIGURE 4.2

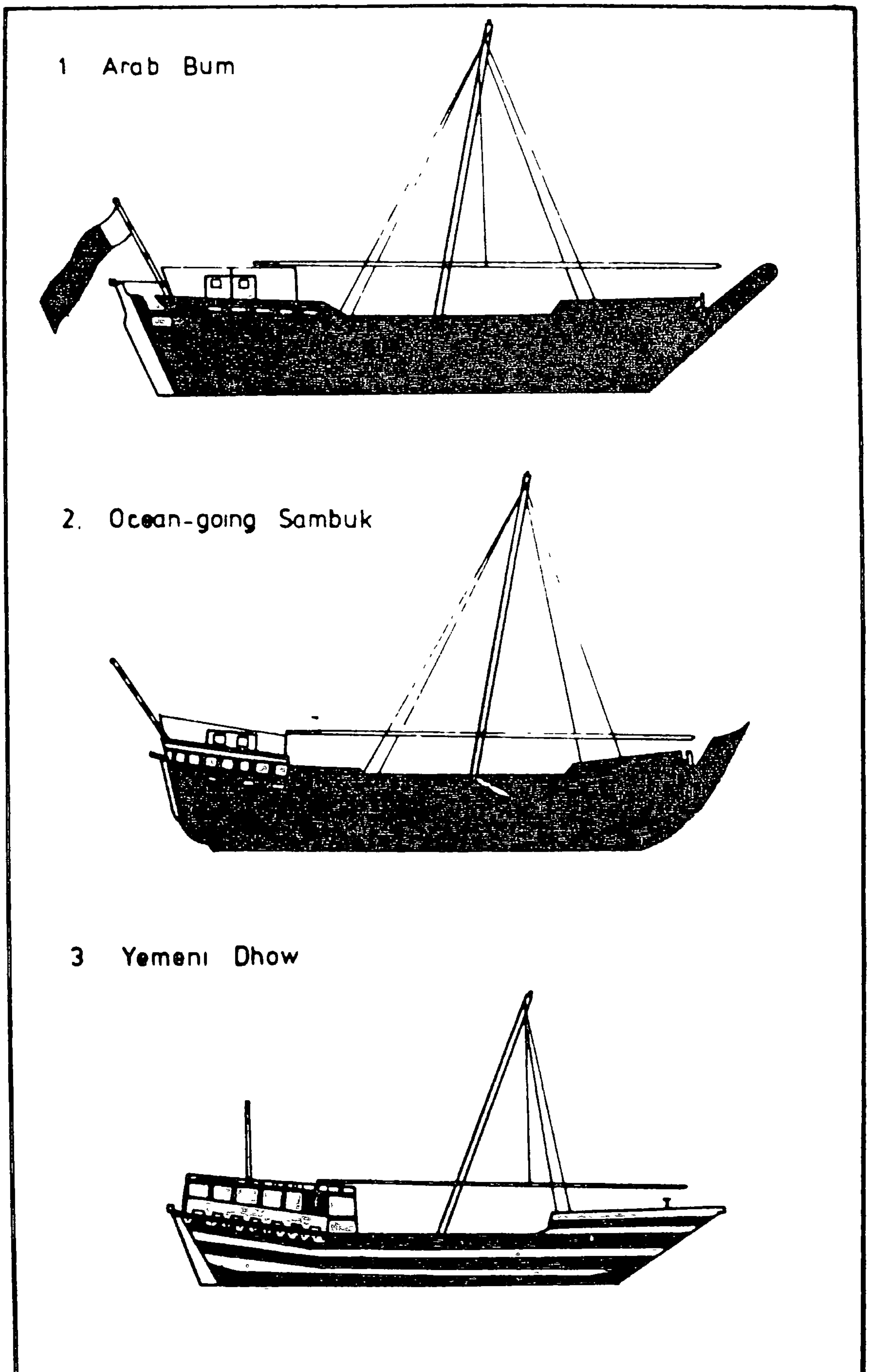
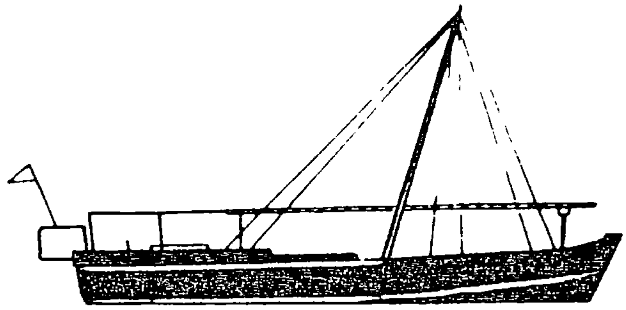
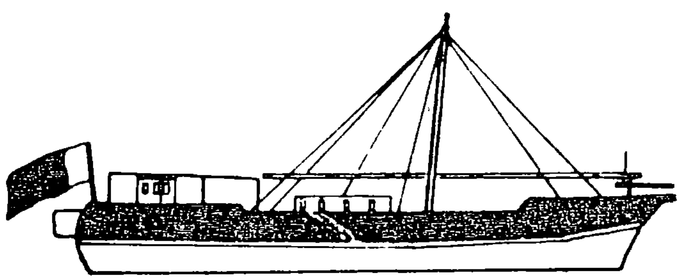


FIGURE 4.3

4 Pakistani Fishing Dhow



5 Purpose-built Smuggler



6 Indian Kotia

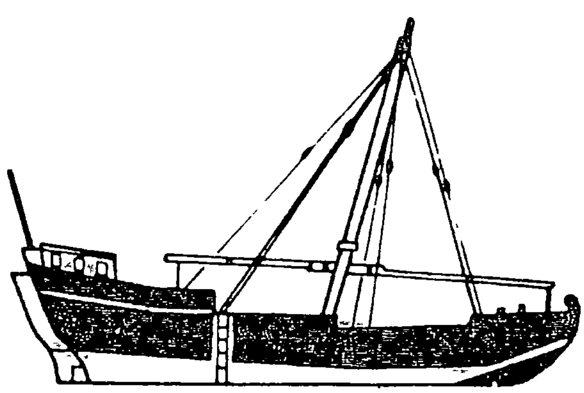
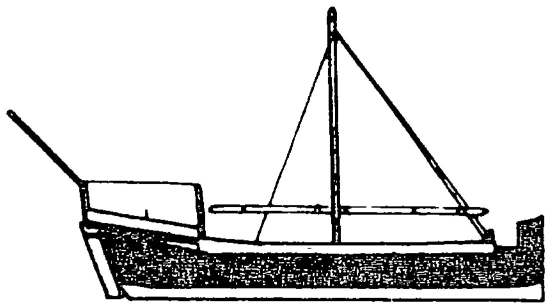
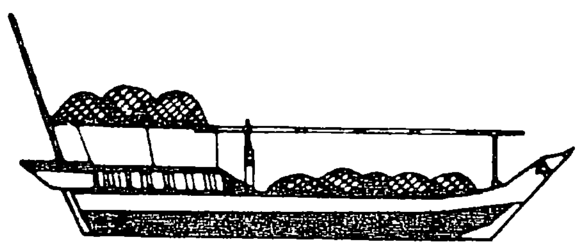


FIGURE 4.4

7 Jalbut or Banush



8 Fishing Sambuk



9 Indian Batil

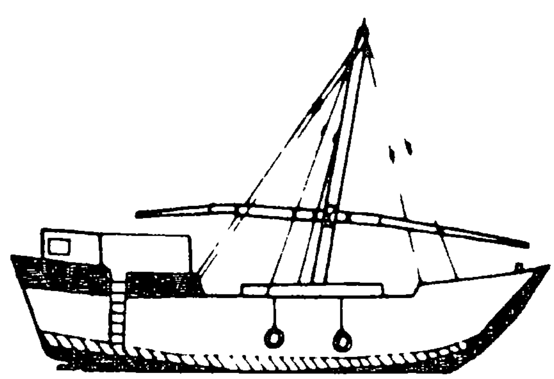
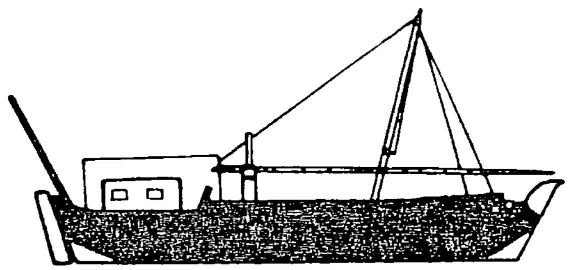
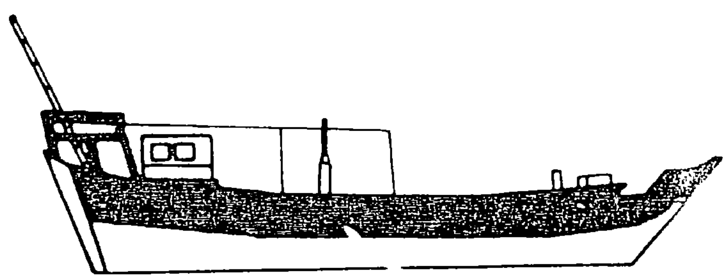


FIGURE 4.5

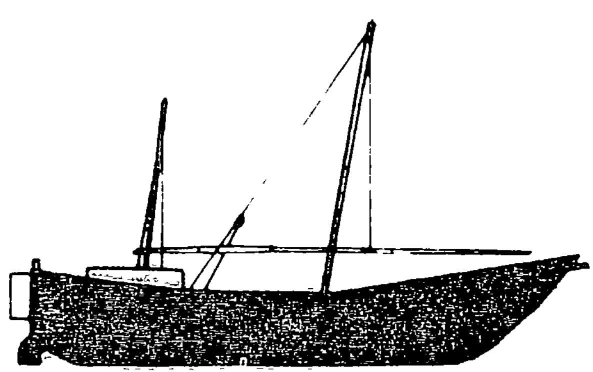
10 Ballam . River Craft



11 Gulf Sambuk



12 Indian Padow



in the early years of the twentieth century was not precipitated by hull shape, but by construction technique. The Mtepe is the last example of the disappearance of a carvel-built, sewn dhow from the system. Their hulls were built up of strakes sewn together with coir twine, and were caulked with coir fibre hammered into the seams from within. The mode of construction, like similar craft in Western India and Sri Lanka made them susceptible to leaks and general deterioration of the sewing in heavy seas. Ultimately, the Mtepe befell the same fate as other dhows within the trading system, rendered obsolete by the introduction of nailed dhows permitting greater safety and size, and larger operational trading areas. Mtepes ceased their short-sea trading of mangrove poles and firewood between Rufigi and Zanzibar over 60 years ago.

The extinction of the Mtepe also represented the elimination of the double-enders for the East African corner of the system. However, in the Gulf, Red Sea and Western Indian subcontinent, regional varieties of this mode of craft adapted to nailed construction and survive within the contemporary system.

Boom

The Arab Boom (or Būm) is one of the most representative and symbolic of all Persian Gulf dhows. It is a ubiquitous craft. Villiers' description of a boom (1940) praises the design: "An upstanding, handsome thoroughbred of a ship .... she was massive without being heavy; strong with no hint of sluggishness; stout though sweetly lined. She sat on the blue water of Ma'alla Bay like some handsome sea-bird, and her beak like bow added to the illusion. She was low in the bow and high aft, in the manner of Arab deep-sea dhows, though as in all Kuwait booms, her cutwater was straight and carried up into a short built-up bowsprit, which reached out twenty feet before her, more as a symbol than for use ...." (p.11). "Her teak mainmast stood ninety feet above the sea and her tremendous lateen yard was made of the trunks of three trees lashed stoutly end to end with many seizings of canvas-bound-rope. She stank abominably of fish-oil, as do all dhows... and other queer odours which rise from the main hatch." (p.12).

Villiers was aptly describing a thoroughbred dhow closely associated with the rise of Kuwait as a port state in the late nineteenth and twentieth centuries, linked to the transoceanic trade of dates, mangrove poles and other commodities around the system, between the Gulf and East Africa. The Boom slotted into the niche left by the demise of the Baggala in the transoceanic trades. In the Gulf of the 1970's, the Boom (along with the Sambuk) is the most common dhow of the Gulf, trading chiefly on intra-Gulf routes.

Booms vary in size from 90 to 300 tons displacement, normal dimensions averaging 100 ft. long x 20 ft. broad x 10 ft. deep. As double-enders, they have distinctive bows and sterns. The long bowsprit, or stem-head is raked forward at an angle of about 45°, giving the craft greater speed, particularly in a following sea. The cutwater is made of planks, and reaches well above the hull, rounded off at its extremity. The extreme tip is painted black, and behind this is a white band separating the black from the brownish unpainted wood. In general, Gulf dhows lack colour, in contrast to the way that Indian and Pakistani, Yemeni dhows display it. The stern is distinguished by the yoke steering attachments. Rising upward and backwards, the pointed stem carries a long rudder which has a yoke set athwartships, through the upper part of the outboard rudder. The rudder is often colourfully decorated and is activated by ropes and chains secured to its extremities. These pass forward along the ship's quarter and then by a system of pullies turn inboard to the wheel.

Cargo is stored in a hold (in former times built to house a specific storage capacity of Basra dates) beneath the main deck, as well as on deck. Most Booms still 'carry' a main mast raked forward at an angle, though some have now dispensed with the mast, since all Booms now carry an inboard engine (one or two) usually of American or Japanese manufacture. The stern houses an optional wheelhouse on the 'poop', together with two compulsory 'zulies', or outboard 'privies'.

Dhangi

The Indian subcontinent's equivalent of the Boom is the Dhangi, a double-ender ranging from 50 - 200 tons. The word Dhangi is "Baluchi" and the craft are built on the coasts of Sind and Kutch. Their design is essentially similar to the Boom with the exception of the stemhead projection which is cut off just above the hull, with the addition of a short bowsprit-like projection, a modified rudder, and the use of coloured bands on the hull. These craft rarely venture into the Gulf, but usually run between Pakistan and India, or Pakistan and East Africa (Jewell, 1969). At the beginning of the twentieth century, Wilson and Edwards (1909) reported rare runs from Kuwait and Muscat, to Bombay. A small number of these craft were present in Dubai harbour during 1972-73.

Yemeni Dhows - Zarouk

The Red Sea or Yemeni dhow is also double-ended and the equivalent of the Boom. Two such dhows visited Dubai in 1973, distinguished by their multi-coloured bands and ornamental 'poops'.

Belem

The river craft known as the Belem, trades on the route between the ports of the Shatt al Arab (Basra, Abadan, Khorramshahr, Gosbar, Khosrowabad, Bahmashir, Sauduni), and Kuwait. They are small craft, under 50 tons, lacking the long bowsprit of the Booms, and usually carry a small mainmast. They have a small wheelhouse, aft, and a small inboard engine.

TRANSOME STERNERS

Numerically, the wider variety of square-stemmed vessels present with the modern system is perhaps indicative of the success of European influences on design in the last 450 years. However, there are examples of adaptive failures.

The Baggala

The Baggala is now an extinct type of dhow, probably because in the adaptive evolution although the closest Arab cousin to Portuguese men'o'war, it was too large a craft to survive the down-turn in trading conditions throughout the system subsequent to the arrival of the steamship. The Baggalas were the largest dhows in contemporary Arab maritime history, and were built mainly at the port of Sur in Oman, where in modern times they are still portrayed as a symbolic reminder of the past. The English translation of 'mule' from 'Baggala" is unkind, for its sturdiness is surpassed by its appearance. This largest of all Arab dhows (some were over 500 tons, but most were between 200 and 400 tons) were (with regard to their size and the shape of their hulls) the closest in adaptation to European design. These long distance dhows were built and sailed out of the major ports of the Persian Gulf in the Nineteenth and early twentieth centuries - Sur, Muscat, Lingeh, Kuwait, Bahrain, Bandar Abbas, Bushire - carrying crews of between 40 and 50 men (Wilson and Edwards, 1909). Wilson and Edwards report the dimensions of two Baggalas, the "Mahmoodi" (516 tons) and the "Salamati" (396 tons), which visited Bombay at the turn of the century, as 140ft. long x 29' broad x 18' deep and 133' x 28' x 15' respectively. At the bow, a Baggala had a stem head projection, bollard-like, surmounted by a peg design, her stern pitched high and square, in the manner of a sixteenth century Portuguese caravel, emblazoned with ornamental carvings and 5 stern windows. In 1940, Villiers believed there to be less than 50 in existence; his description of one such Baggala he boarded is a fine descriptive obituary to a craft which became too costly, both to build and to run, by the twentieth century: "She was a craft of the Middle Ages ...... She was beautiful from the outside and she was beautiful on board. Her windowed stern was especially lovely. Its elliptical erea of ancient teak was covered with intricate pattern of excellent carving and her curved bow swept up from the sea as gracefully as the breast of a swan. She was big, for an Arab. Her oiled teak sat prettily in the water with a grace and strength and sweetness of line that sung of sea-kindliness despite all Nejdis comments on the vulnerability of her stern. I wondered how, if her stern was so vulnerable, she had managed to survive so long, for she dated back to slaving days. She was very old - more than half a century, like so many Arab vessels, every line of her flowered and blended perfectly into a harmonious and lovely whole, though she had been put together on the beach at Sur by carpenters who could not understand the most elementary plan." (p.87).

Ghanjah

Pronounced 'Ranja' the Ghanjah is the surviving, smaller cousin of the Baggala. It has survived because its smaller size (averaging between 100 - 200 tons, Wilson and Edwards, 1909) which puts it in the same class as the Boom, although few remain today. Kaplan (1974) has recently sighted one off the coast of Dhofar, but few if any trade in the Gulf. It has an Indian-Omani design ancestry. Originally they were built on the coast of Kutch (Kutch Mandvi) but they were later purchased by, and then copied, by the Arabs of Sur and Muscat as a form of Arab 'Kotia'. Like the Baggala, it has a high, arched transom stern, embellished with vine meander carving and five carvel windows. Its distinctive bow has a circular stem head carving; possibly alluding to a backward-looking Parrot's head (Jewell, 1969) or more like a rosebud (Wilson and Edwards, 1909).

Kotia

The Indian Kotia is not a native carft of the Gulf, but is a frequent trader in its waters, particularly to the ports of Muscat and Dubai and occasionally to Kuwait and Bahrain. She is similar in size and style to the Ghanjah, without possessing the distinctive stemhead, bearing witness to her close geographical and design heritage, built on the coast of Kutch. They are built chiefly at Kutch Mandvi, Mangalore and Calicut (up to 200 tons) and have an operational radius ranging from Basra in the west, Chittagong and the Nicobar Islands in the east, Malagasy in the south, and up the Red Sea to Jeddah (Wilson and Edwards, 1909). Their main route in 1973 was to visit Dubai (where they were easily distinguishable by their square sterns and multicoloured bands running fore and aft on the forefoot) to load cargo for Western India.

Betil

Accompanying the Kotia on voyages between Dubai and India in the early 1970's is the Indian Betil. They are smaller (50 - 100 tons) coastal craft of European design origin, without the embellishment of the stern . They are built at the ports of the Kattiawar Coast and the Gulf of Kutch (e.g. at Kutch Mandvi, Newanger, Verawal and Jaffrabad).

Padow

A distinctive visitor to Dubai on the same route to the Indian subcontinent is the smaller, essentially riverine Padow, normally associated with the coasting trade from Bombay, north as far as Broach. Normally up to 60 tons, the vessels are built in the Gulf of Cambay (Bassein, Surat).

Associated with the smuggling trade between Dubai and Indian/Pakistani coasts are two untypical vessels, not associated with the traditional trading system, but adapted successfully, with the use of powerful inboard motors, to high speed sorties on the ocean:

The Purpose-built Smuggler

The "purpose-built" smuggler is a long, lean craft, built mainly on the Indian coast, possessing a raked bow and a square stern, one or two masts raked forward, a prominent deckhouse, usually surmounted by an awning draped overall. The sleek style is augmented by the power of up to three inboard engines, permitting the attainment of speeds up to 18 - 20 knots.

Pakistani Fishing Dhow

This lower, flatter craft, ostensibly and functionally a fishing craft, is used in trades similar to the purpose-built smuggler.

Sambuk

Along with the Arab Boom, the Sambuk is the most ubiquitous dhow within the Gulf. There are three distinctive types of Sambuk used in the Gulf: Firstly, the ocean-going Sambuk; secondly, the coasting Sambuk on the internal Gulf trade routes; and finally, the fishing Sambuk, which along with the Bedeni and the smaller Houri are representative of the Gulf fishing dhows.

The link between Portuguese design and Arab shipbuilding is most pronounced in the transom stern of the ocean-going Sambuk, which at the zenith of the Persian Gulf Trading System in the nineteenth and twentieth centuries were common along the Gulf coast, south Arabian, Red Sea and East African coasts. Built formerly at Sur in South Arabia, the Red Sea and at Ras Ahila, their displacement varies from 75 - 150 tons (with average dimensions of 80 ft. long 20 ft. broad and 10 ft. deep). Meaning 'fast' in Arabic, the reason for their disappearance (there were few visiting the Gulf in the early 1970's), is probably a function of the demise of the large-sized ocean-going dhows on the Gulf-Africa route, associated with the eclipse of the Baggala and Ghanjah. The style is distinctive: Her bow curves upwards from the waterline in a graceful sweep to end just above the hull, and can be likened to a barred scimitar. The ocean-going Sambuk has a shorter, steeper bow piece in comparison with the longer, shallower angle of the Gulf Sambuk. In both cases, the stern is a transom, raked backwards, ornamented in blue and white on ocean-going craft. The Gulf Sambuk is still built along the Arabian coast of Muharraq, Dubai, Ajman, Sur) and is used either as a small coasting craft or as a fisherman, having been adapted from their original use as pearlers adept at manoeuvring the shallow pearl banks of the Gulf because of their short keels.

Jalbut

The final square-sterned Arab coasting craft of the Gulf is the Jalbut ('jolly boat') or its Iranian cousin, the Banush. They are distinguished by their bolt upright bow and transom stern, reminiscent of the old English naval jolly boat from which its name is probably derived. They are generally of less than 50 tons displacement and 50 ft. in length. They are not ocean-seacraft and have been adapted from their original use of pearlers on the Gulf pearl banks, into (with the addition of an engine) coasting craft in those areas where they were formerly used as pearlers (around the Bahraini archipelago) between Bahrain, Saudi Arabia and Iran, and along the Trucial (United Arab Emirates) and Omani coasts.

4.3 OPERATION OF THE DHOW TRADING SYSTEM

The operation of the dhow trading system involves two basic groups of participants: firstly it includes the services of those people who actually go to sea and sailed the vessels, the so-called 'sea people' whose activity is voyaging and whose skills in navigation are widely valued (Couper, 1973, p. 232); and secondly the organization of trade is conducted through a network of merchants and owners of dhows. As such the operation of the trading system depends on a close, symbiotic relationship between the interests and roles of the sailors, and those of the merchants and owners (who often formed a part of the ruling elite). The navigators who command the dhows occupy an important position in the social hierarchy of the Gulf littoral, as do the craftsmen who build the ships. The sailors tend to view their craft partly as a medium of social contact interwoven in a network of inter-port kinship relations and social interactions, contrasting with the owners and merchants who view a dhow primarily as a linkage factor in the regional economy.

4.3.1 OWNERS

It is not the case that dhows are usually operated in commercial fleets. In the contemporary Gulf it is more usual for a single dhow to be operated (often on a specific trade route) by an individual private owner or group of owners. The cost of constructing a new dhow in the 1970's was so expensive (with prices ranging according to size from \$15,000 - \$30,000, plus a further \$7,500 - \$20,000 for the price of an engine - Martin and Martin, 1978) that few citizens other than the more successful merchants, well organized 'smugglers', and members of ruling families can afford to own more than one vessel. In the recent past, however, when the dhow was a more prominent mode of transport in the 1930's and 1940's, wealthy merchant families such as the ruling Al Sabah family of Kuwait would have a finger in a score or more of large dhows. Villiers (1948, p. 401) relates how in the late 1930's Kuwaiti merchants used their wealth which was derived from their ownership of date plantations along the Shatt Al Arab to finance the construction of dhows (built in Kuwait) for participation in the deep-sea trades to Africa and India. Owners minimised the risk on their capital investment (in the form of money advanced to a dhow captain to enable him to commission the construction of a new dhow) by ensuring that the dhow captains (nakhodas) were left as nominal owners of their dhows, so as to provide a form of insurance whereby in the event of a loss of a dhow at sea a surviving nakhoda would pay for the dhow plus its lost cargo.

In the 1970's wealthy merchants and ruling families were less inclined to own numbers of dhows, preferring to invest their capital elsewhere. Those private citizens who do own dhows are faced with high purchase prices together with a dwindling number of yards where new craft are constructed. Kuwait (Dawha), Bahrain (Manama and Muharraq), Doha, Dubai and Kung (in Iran) were significant centres for dhow construction in the 1970's.

In such cases merchants and nakhodas 'shop around' for the best price quoted for a new dhow and it is not uncommon for a Kuwaiti merchant to commission the construction of a new dhow in, for example, the Qatari port of Doha (Kaplan, 1974, p. 334), or for a Dubai merchant to have his built in Kung before it is towed back to Dubai's creek. In the latter case a merchant takes advantage of the superior skills and speed of construction in the Iranian port together with a cheaper final cost as a result of the relative cheapness of labour costs in south east Iran (Martin and Martin, 1978, p.211).

Ultimately citizens own dhows for profit rather than pleasure. The proportion of profit after a voyage which accrues to an owner after payment of all expenses, including food for the crew, fuel costs and harbour dues, varies from 10% to 50%. The earning capacity of a dhow working in Gulf waters depends on the size of the dhow and its crew, the location of its base port, and the nature of its trade (i.e. 'normal' or 'smuggling'). An indication of the earning power and cost involved for a Bahraini merchant engaged in trading on the short sea route from Manama to the Saudi port of Al Khobar in 1973 is set out below :

		Bahraini Dinars
Gross earnings of a 90 ton dhow (per round trip)		220
(a)	Costs: Food	20
	: 2 drums of fuel	11
	sub total	33
(b)	Total amount for distribution	189
	of which : (1) Owner takes 50%	94.500
	(11) Nakhoda receives 20%	37.800
	(111) Balance is distributed among 8 crew members for 2 days work.	56.700

Which leaves BD 7.087 per crew member.

This earnings level of 50% confirms the rate for owners related by Villiers in 1939. However, elsewhere in the Gulf Martin and Martin (1978), also researching in 1973, have reported lower levels of profit. For example, a dhow which transported 1500 bags of stone chips (used for making mosaic floors) from Abadan to Kuwait earned the owner 10% of the cargoe's value which was $2,340 (p.157); while a 'boom' operating from Khorramshahr to Kuwait earned the owner $4700 for a cargo of ghee worth $18,700.

4.3.2. CREW

Each trading dhow is operated by a crew consisting of a captain (nakhoda) and between 5 and 15 men depending on the size of the vessel. Larger crews do exist but were more common earlier in this century when there were a greater number of large dhows and long distance voyages than in the 1970's. Nakhodas have considerable social prestige in Gulf society based on their skill and knowledge of ports and trade conditions over a wide area. They usually come from families of high social standing in their home communities; if they do not they will be unlikely to receive any financial backing or employment from dhow owners. In hierarchical terms, however, the role of a nakhoda is fixed: a nakhoda can never become an important merchant, and visa versa. The head of a nakhoda family could however attain the status of a lesser merchant, usually confined to trade in shipbuilding materials such as Malabar teak.

The Arab bedu are not by nature seafaring men. Hence, a majority of the nakhodas and dhow crews employed by owners in Arabian ports are 'foreigners', often of Iranian nationality, though of Arab descent, confined to certain tribes (e,g, Bani Tamin, Bani Kab, Al Hola) and certain Iranian ports (e.g. Henyam, Qeshm). A number of coastal villages on the Iranian coast have a tradition of supplying Arab and Iranian dhows with crews. These villages include Ganaveh, Rig, Kangan, Tombok, Kung and Taheri. Prins (1966) found that in such villages as Kangan, Tombok and Taheri there was a very high rate of employment in maritime occupations, with ratios as high as 8 out of 9 male villagers employed as sailors. As such, the crews of dhows were away from home for a considerable period each year unless they were working in home based trades which was often not the case.

Mates are distinguished from ordinary deck hands by virtue of their superior seamanship which occasionally places them in charge of a vessel. However, in the past the overall social hierarchy of owners, nakhodas and crews was fused together into a unified structure based on the principle in indebtedness described by Villiers in 1940 (p.297): "Debt was the accepted thing and to spend a lifetime owing money was apparently usual. The sailors owed money to the nakhodas, the nakhodas to the merchants, the merchants to other merchants, or to the Shaikh. Working without a banking system, with insurance, usury, and even interest forbidden - at any rate in theory - by the Islamic Law, the economic side of the port of Kuwait (in 1939) was a dark maze. It was obvious however that the whole industry rested on a structure of debt. It was equally obvious that nakhodas, though they imagined themselves to be the owners of their booms were not the real owners at all. It suited the merchants apparently to finance the nakhodas rather than run the ships themselves and for this there were many excellent reasons. The nakhoda perhaps paid more for the financing they received than the ship could be expected to earn. In other words the money advanced to nakhodas to run the ships for themselves, brought larger dividends than the same money would have done if the merchants had invested directly in the ships."

4.3.3. AGENTS

No trading system as complex as the Gulf's could exist without the availability of agencies operating in ports distant from a dhow's base. In the past successful merchant families established agencies usually run by sons or trusted local agents in the major ports in the trading system, both in the Gulf, and beyond in Aden, Bombay, Mukhalla, Muscat, Zanzibar and Dar es Salaam. This legacy of merchant households persisted throughout the 1970's as a vital link in the chain of trading operations. The function of each agency consists of buying and selling cargoes from incoming dhows, collecting debts, supervising the exchange of foreign-currency, arranging the transhipment of cargoes from ship to shore, and providing interpreters where necessary. Many of the agents are wholesalers themselves and hence are able to supply a dhow directly with specialist cargoes.

4.3.4 SHIPPERS

By 1980 the number of speculative dhow voyages (common in the past) on which nakhodas and crews load cargoes in the hope, rather than the certainty, that they will be able to sell them in the Gulf or western Indian Ocean are very rare. Cargoes are nearly always consigned to a specific destination on behalf of a specific party, either as 'whole' cargoes such as cement, or as 'part' cargoes made up of individual consignments such as iron bars, motor cycles, clothing and foodstuffs.

Broadly, four types of shipper utilise the services of dhows in the Gulf, Firstly, cargoes are shipped in fulfilment of orders placed by governments or commercial companies, or of orders placed by firms operating branch retailing or wholesaling outlets in different Gulf States. In this manner contracts for cement, steel, sheep, etc., are arranged between two parties, of which the seller, or his agent, arranges for the transportation of the cargo by dhow between two ports. In some cases, firms such as 'Kewelram' and 'Danawella' (wholesalers and retailers of clothing and textiles) supply their branch outlets in the United Arab Emirates from their main warehouses in Bahrain.

Secondly, private individuals, shop keepers or representatives of firms will visit a Gulf port with the intention of purchasing certain items, after which they will arrange for the transportation of their purchases by dhow to a specified destination. For example, shopkeepers and merchants from small Iranian coastal villages and towns such as Charak, Lingeh, Puhul and Minab, and Iranian islands such as Hormuz, Larak and Qais visit Dubai at certain times during each year to stock up with items such as turmeric, tamarid and rice.

Thirdly, private individuals who visit some of the higher-order Gulf ports such as Kuwait, Bahrain and Dubai sometimes arrange the transportation of particular items purchased (such as motor vehicles and household electrical equipment) back to their home port or country.

Finally, 'smugglers' (either individuals or well-organised groups) either arrange for the carriage by dhow of cargoes destined for specific ports or a relatively remote coastal rendezvous in the Gulf, or beyond, or arrange for the elaborate concealment of smuggled items amid 'normally' manifested cargoes.

4.3.5 BASE PORTS

During the 1970's the 'base ports' of the Gulf can be classified into two types according to their function. The first group includes the major deep-water ports of the Gulf which by virtue of their domination of imports and re-exports in the region support a significant number of cargo dhows to perform the 'feeder' redistributive function of serving smaller, spatially dispersed coastal communities, as well as the other major ports. The ports include Basra, Khorramshahr, Abadan, Bushire, Bandar Abbas, Kuwait, Bahrain, Doha Dubai and Muscat-Matrah (in the Gulf of Oman). In this context the modern deep-water ports of Bandar Shahpour, Dammam, Abu Dhabi and Sharjah do not possess large numbers of home-based dhows.

The second group includes a large number of Iranian and Arabian coastal towns and villages (see Figure 2.2) which support a number of operational trading dhows (usually between 5 and 20, though in some cases more) because they constitute the most important mode of transport with links to the higher-order ports of the Gulf. This set includes Gosbar, Hendijan, Daylam, Rig, Ganaveh, Bolkheyr, Dilwa, Dayyer, Kangan, Kung, Puhul, Khamir, Basidu, Qeshm, Tiab, and Jask (all of which are Iranian and are base ports for dhows whose primary function is to export surplus, locally-produced cargoes - agricultural produce and manufactured items - and import what foreign goods the villagers and townspeople require), Al Khobar and Qateef (Saudi Arabia), Sharjah, Ras Al Khaimah and Khor Fakkan (U.A.E.).

4.3.6 CONDUCT OF TRADE

The dhow trading system is not a highly organized and regularized component of the overall Gulf trading system. Although there are some regular 'runs' for dhows on certain routes (e.g. Manama - Al Khobar, Manama-Bushire, Dubai - Bandar Abbas) more often than not the operation of dhows is irregular, fluctuating with the whims of nakhodas, cargo availability season and prevailing weather conditions. It is an essentially slow moving part of the Gulf's economy. However, it is not an inefficient service. Dhows make their voyages at any time of the year (weather permitting) and are able to move in and out of small creeks, shallow channels and natural harbours which do not have the facilities to handle larger vessels. Further, merchants and crew alike regard their dhows as floating, low-cost warehouses as well as a means of transport. It suits merchants to have 10,000 packages of dates divided among the holds of a number of dhows rather than in the hold of a steamer which could unload and flood a market in a single day.

Chapter 3 has provided evidence of the demise of regular trans-oceanic dhow trades which formerly linked the Gulf with ports in the western Indian Ocean littoral. During the last three decades the risky business of peddling cargoes to their best advantage on long-sea trades (e.g. Kuwait - Zanzibar) has given way to the more stable short-sea markets within the Gulf. The contemporary function of the dhow is to redistribute cargoes imported into the Gulf by steamer, motor lorry and aircraft, supplemented by the conveyance of locally produced primary products and manufactured articles. Redistribution is carried on 'legally' between the Arab states of the Gulf, and between Iran and the Arab states, and 'illegally' via smuggling trades channeled principally from Arab entrepots into Iran. Apart from the occasional visiting dhow from East Africa, South Arabia and the Red Sea, the one exception to the prevailing short-sea function is the significant long distance trade with India and Pakistan into which a considerable volume of cargoes are smuggled, mostly from Dubai.

Despite its slow moving pattern, short-sea trades have been stimulated by the replacement of sail by the diesel engine. The speed at which dhows journey from point to point varies with the size of the engine and the nature of the weather conditions. A sailing dhow could attain speeds of 15 - 20 knots with a favourable wind, 8 - 10 knots against the wind and 3 - 5 knots in light wind conditions, but on average an engine-powered dhow is faster and less susceptible to bad weather. The following list records the approximate journey times for dhows travelling on selected routes (as supplied by nakhodas interviewed in 1973):

	Time in Hours	
	Motorized Dhow	Sailing Dhow
Kuwait - Bahrain	24	48
" - Abadan	10-20	24-26
" - Bushire	15-20	24
" - Al Khobar	24	24
" - Dubai	72	72

	Motorized dhow
Bahrain - Al Khobar	2
" - Doha	6-8
Dubai - Muscat	72
" - Sur	96
" - Khor Fakkan	24
" - Bushire	36
" - Charak	24
" - Qais	24
" - Dayyer	30
" - Bolkheyr	36

The freight rates charged by nakhodas vary according to the dimensions and weight of the cargo, the route and the speed of delivery. A small sample survey was conducted in the field to ascertain the general level of freight rates charged. Fifteen dhow captains were interviewed at random, five from each of three ports studied in depth (Kuwait, Bahrain and Dubai). Naturally, business involves individual quotations which vary from Nakhoda to Nakhoda, though it is doubtful whether the results obtained in Table 4.1 would have varied significantly if a larger sample had been taken, bearing in mind that only the general nature of freight rates was sought. Often unanimity appertained with regard to the rates quoted on specific routes. In cases where a range of rates was quoted, the maximum and minimum levels have been recorded, and the average level calculated.

Figure 4.6 (a, b and c) represents isohyet diagrams based on the quoted freight rate charges from Kuwait, Bahrain and Dubai. In each case, and for reasons of standardization, the rate quoted was for the conveyance of a cargo of one tonne of rice (10 'gunny' bags) between two points at the winter/spring of 1973 rates. Figures a, b and c are comparable by virtue of the conversion of rates into a common currency, namely the Kuwaiti Dinas at rates published by the National Bank of Kuwait in 1973 (K.D.1 = B.D. 0.749997 or

TABLE 4.1 : Comparative Dhow Freight Rates quoted for the Carriage of 1 ton of Rice between Two Ports, 1973

Destination Ports	Origin Ports					
	Kuwait (KD)		Bahrain (BD)		Dubai (QDR)	
	Max-Min*	Av.	Max-Min*	Av.	Max-Min*	Av.
Al Khobar	4.5- 5.0	4.75	-	1.5	3.5 -4.5	4.0
Doha	4.0- 6.0	5.0	2.0 -4.0	3.0	-	2.25
Dubai	4.0- 6.0	5.0	4.5 -5.25	4.875	-	-
Kuwait	-	-	4.5 -5.25	4.875	4.5 -5.0	4.75
Muscat	8.0-10.0	9.0	-	5.0	-	3.5
Bushire	4.5- 5.0	4.75	4.5 -5.25	4.875	-	4.5
Dayyer	-	-	4.5 -5.25	4.875	-	-
Ganaveh	-	4.0	5.25-6.0	5.625	-	4.5
Fao	2.0- 2.5	2.25	-	-	-	-
Gosbar	2.0- 2.5	2.25	-	-	-	5.25
Basra	-	2.5	-	-	-	-
Abadan	-	2.5	-	-	-	-
Khorramshahr	-	2.5	7.0 -8.0	7.5	-	-
Bahrain	3.5- 6.0	4.75	-	-	3.0 -3.25	3.125
Abu Dhabi	4.0- 6.0	5.0	-	-	1.25-2.0	1.625
Sharjah	-	5.0	-	-	-	-
Lingeh	5.0-10.0	7.5	-	-	-	2.25
Bandar Abbas	6.5-10.0	8.25	-	-	-	2.25
Jask	8.0-10.0	9.0	-	-	3.0 -3.25	3.125
Charbahar	-	10.0	-	-	-	3.5
Salala	-	12.5	-	-	-	7.5
Ras Al Khaimah	-	-	-	-	-	2.0
Khor Fakkan	-	-	-	-	-	2.0
Qeshm	-	-	-	-	-	2.25
Minab	-	-	-	-	-	2.25
Siriq	-	-	-	-	-	2.75
Charak	-	-	-	-	2.25-4.25	3.25
Gwadar	-	-	-	-	-	4.5
Bulkhair	-	-	-	-	-	4.5
Asalu	-	-	-	-	-	4.5
Rig	-	-	-	-	-	4.5
Masirah	-	-	-	-	-	7.5
Sur	-	-	-	-	3.5 -7.5	5.5
Qeshm	-	-	-	-	-	2.5

* If applicable

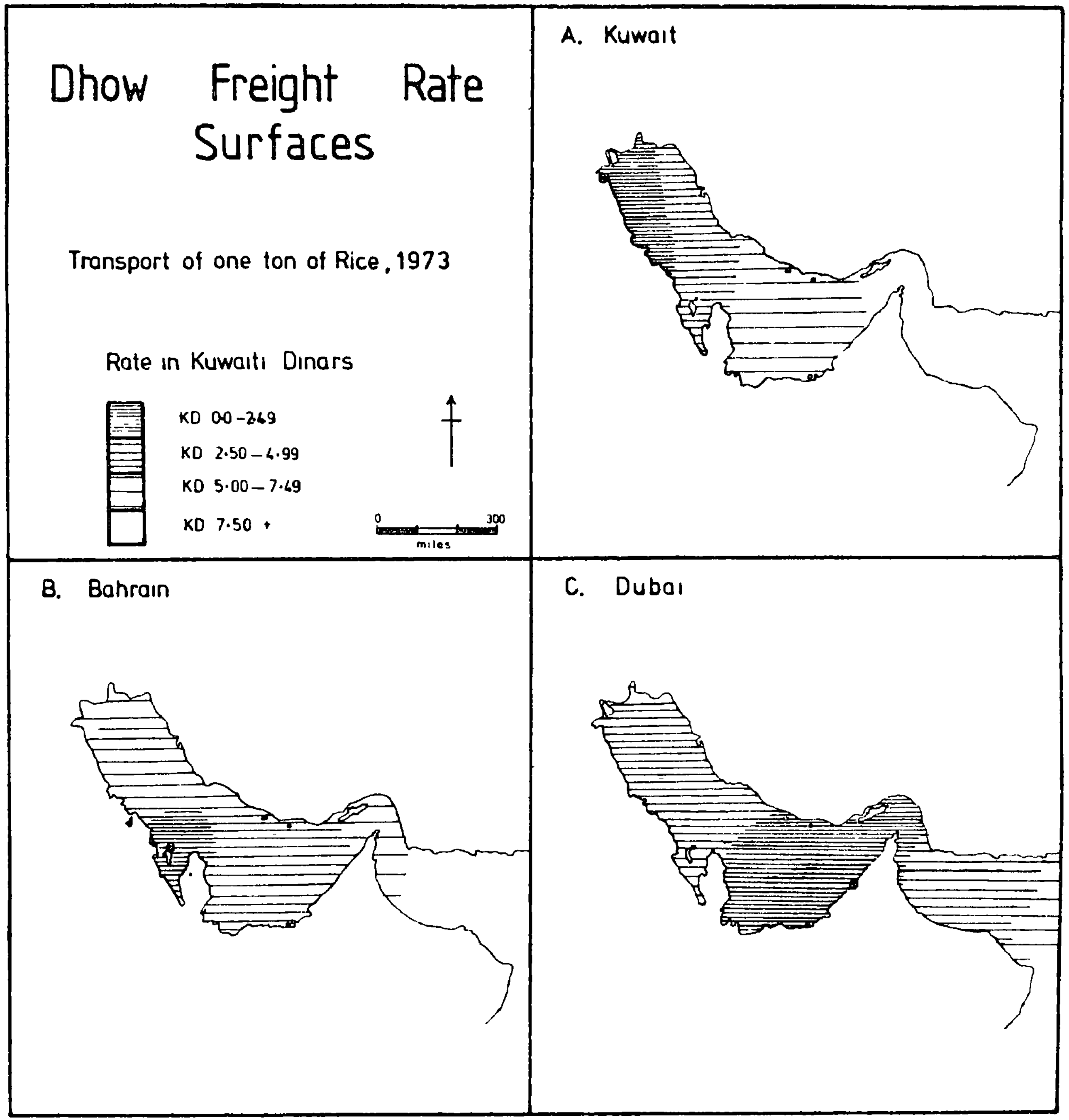

Dhow Freight Rate Surfaces
Transport of one ton of Rice, 1973
Rate in Kuwaiti Dinars
KD 0·0 - 2·49
KD 2·50 — 4·99
KD 5·00 — 7·49
KD 7·50 +
0
300
miles
A. Kuwait
B. Bahrain
C. Dubai

FIGURE 4.6

Q.D.R. 0.0749997, Annual Report, p. 203). In the resulting maps the pattern corresponds broadly to the 'spheres of influence' discernible in Figure 4.7. If the lowest rate surface is considered (i.e. the area where freight rates are less than K.D. 2.19) then Kuwait would appear to have an 'advantage' foreland along the Kuwaiti coast and the Iranian coast as far as Hendijan; Bahrain has an 'advantage' foreland which includes the Saudi coast and the north coast of Qatar; and Dubai has an 'advantage' foreland which includes the Iranian coast from Lavan island to Siriq, the U.A.E. coast and the Musandam peninsula. The Iranian coast between Daylam in the west and Chivu in the east appears to be open to competition from Kuwaiti and Bahraini dhows.

4.4. CARGOES CARRIED BY DHOWS

The survival of dhow transport within the Gulf ultimately depends on the ability of their operators to secure cargoes to carry. Cargo dhows literally carry any cargo that fits the size of their hulls, varying in type from dates to dynamite, ghee to gold bullion. In this context it is important to observe the continuity in the selection of cargoes carried over hundreds of years.

4.4.1 TRADITIONAL CARGOES

It appears likely that dhows have been carrying broadly similar cargoes for hundreds, even thousands of years. Archaelogists have revealed the antiquity of certain non-perishable cargoes such as clay jugs and other items of pottery (Whitehouse, 1971), but foodstuffs are probably the most basic type of cargo. Table 4.2. lists the major cargoes carried by dhows in the last 200 years (Abu-Hakima, 1965; Lorimer, 1915; Prins 1966) during which food items are a major component. The unfavourable rainfall regime along the Gulf littoral makes it an unfavourable region for growing vegetables and cereal grains, and for rearing livestock. However, the Tigris - Euphrates river basin, fertile soils within the valleys of

TABLE 4.2

TRADITIONAL CARGOES CARRIED BY DHOWS TRADING IN THE GULF

Dates	(Date and Palm Products)
Rice	
Coffee	
Sugar	
Cereals	(Wheat, Barley, Millet)
Salt	
Spices	(cardomons, ginger, cloves, pepper, nutmegs, turmeric, tamarund and sesame).
Tobacco	
Dried Fruits	
Dried Fish	
Fresh Vegetables	
Livestock	
Building Materials	(coir rope, stone, bamboo, teak, mangrove poles)
Semi-Precious Metals	(tin, lead, iron, copper)
Precious metals	(gold, silver)
Pearls	
Piece-goods	(Clothing and textiles)
Household items	(Clay pots, copper jugs)
Carpets	
Passengers	(Slaves, traders, journeyors)

Source: Lorimer (1915); Abu Hakuma (1965); Prins (1966)

TABLE 4.3

MAJOR CARGOES CARRIED BY DHOWS IN THE GULF IN THE 1970's

Dates
Rice
Tea
Coffee
Ghee
Spices
Animal Feedstuffs
Cereals
Fresh Fruit
Fresh Vegetables
Livestock
Rosewater
Nuts
Dry Lemon
Dry Fish
Household Goods
Cigarettes
Electrical Goods
Machinery
Ready made Garments and Shoes
Textiles
Timber
Cement
Steel
Stones
Carpets
Bullion
Oil field supply materials
Passengers.

Source: Foreign Trade Statistics (Bahrain, Kuwait, Qatar, U.A.E., Oman) the Zagros (Iran) and Omani Mountains, and isolated Arabian oases offered favourable environments for agriculture. Accordingly, the dhow formed part of a trading system which linked up with camel and mule routes which distributed foodstuff throughout the Gulf and further afield. Dhows transported local cargoes such as dates from Iraq, fresh and dried fruit and vegetables, livestock, wheat, barley, rice and tobacco from Iran and Oman, coffee imported from the Yemen, and ghee and spices from India.

Five other basic items have been carried by dhows for centuries - building materials, precious and semi-precious metals, household items, salt and passengers. India was a major source of cargoes of tin, lead, iron copper, teak, bamboo and items of pottery. East Africa supplied cargoes of mangrove poles and slaves. The people of the Gulf supplied cargoes of household utensils, crockery and carpets from interior 'Persia', while for centuries cargoes of cotton piece-goods, items of clothing and embroidery passed along the Gulf en route from sources of manufacture in Mesopotamia and India.

4.4.2 CONTEMPORARY CARGOES

A comparison between Table 4.2 and Table 4.3. reveals a striking similarity in the nature of cargoes carried in the 1970's and those transported a hundred years earlier. All those cargoes carried in Table 4.2 with the exception of slaves and bulk cargoes of semi-precious metals such as iron and lead are still carried by dhows. In fact, the carriage of locally produced cargoes such as fresh fruit and vegetables, and livestock, remains a major form of cargo particularly on the cross-trade routes which link Iran with the Arabian states. Traditional cargoes produced outside the Gulf such as Pakistani 'basmati' rice or Indian Teak and tamarind are still redistributed through the Gulf aboard dhows, though they may arrive aboard liners. In general, traditional cargoes remain the staple cargoes despite the incursion since World War Two of a number of 'new' cargoes.

These 'new' cargoes include oil field supply materials, liquid fuels, raw steel structures, motor vehicles, household electrical items such as radios, air conditioners, plastic goods, cigarettes, and various items of machinery. These 'general' cargoes are more commonly carried on dhow routes connecting the Arab Gulf States (except Iraq), rather than on routes between Iran and the Arabian coast.

The nature of cargoes carried in the modern Gulf is best examined via a detailed analysis of cargoes transported in specific routes. The following section focuses on cargoes carried in and out of the ports of Kuwait, Bahrain and Dubai in the early 1970's.

4.4.3 CASE STUDIES: CARGOES AT KUWAIT, BAHRAIN AND DUBAI

KUWAIT

The state of Kuwait looks to its northern neighbours for a large proportion of its daily food requirements as witnessed by long convoys of lorries loaded with fresh fruits and vegetables which arrive daily from Iraq and Lebanon through the Al Abdali customs post. However, Iran is also a major supplier of fresh foodstuffs, most of which arrives by dhow through the dhow harbour adjacent to the Sief Palace.

Iran supplies by far the greatest proportion of imported dhow cargoes (see Table 4.4) the majority of which originate from villages along the Shatt Al Arab and its delta. The villages (Sauduni, Gosbar, Bahmashir, Khosrowabad) supply Kuwait with seasonal cargoes of onions, dates, tomatoes, grapes, nuts, watermelon, raisins, vegetables, fresh fruits and alfalfa. Elsewhere, other Iranian towns and villages (including Hendijan, Daylam, Rig, Ginawar and Bushire) also supply Kuwait with fresh produce. A characteristic cargo which usually arrives aboard small banush dhows (see Figure 4.4.) consists of thousands of bags of mosaic stones and mosaic powder, together with large quantities of gravel, marble and gypsum, all of which is used in the Kuwaiti construction and building industries. The river ports of Abadan and Khorramshahr supply Kuwait with the necessary aggregate, along with heavy cargoes of ordinary, white and oil-well cement.

TABLE 4.4

KUWAIT: CARGOES ARRIVING BY DHOW, 1971

(by weight)

(A) Exceeding 3,000,000 Kg

6276488	Onions *
3865535	Fresh Vegetables (other)
4594585	Alfalfa
37984486	Mosaic Stones *
10618959	Mosaic Powder
22929550	Ordinary Cement
4370000	Oil Well Cement

* = Value exceeds K.D. 100,000

Source: Kuwait, Foreign Trade Statistics, 1971

(B) 1,500,000 - 2,999,999 Kg

2213993	Marble
2901500	Gypsum
1128675	Other Chemical Products
1959995	Dried Dates
2663062	Tomatoes
2032771	Cereal (Animal Feed)
2018584	Margarine and Vegetable Fat *

(C) 500,000 - 1,455,000 Kg

543908	Goats and Sheep
752993	Grapes
979428	Nuts *
1060113	Dates
559221	Watermelon
634925	Raisins
725731	Other Fresh Fruit
879841	Broad Beans
732972	Garlic
1264740	Palm leaves and Wood
774736	Table Salt
975435	Date Kernels
540282	Cotton fabrics *
518206	Persian Carpets *
730000	White Cement
778917	Falt Iron/Steel Bars
584792	Finished I/S Structures

<u>Other Significant Cargoes</u> (by weight)

Raw Cotton	490532	Kg
Gravel	422150	"
Earthenware	446575	"
	(by value)	
Bulk, artificial textiles KD	138207	
Buses	265319	
Clothing	115003	

TABLE 4.5

KUWAIT - EXPORT CARGOES BY DHOW, 1971

(by weight)

Exports and Re-exports (Kg)			Destination (Rounded %)							
			Iran	Iraq	Saudi	Bahr	Qat	UAE	Oman	DemYem.
* Rice		12050152	97			1		1	1	
Sand	E	76950000	32			2		66		
Iron/Steel scrap	E	6511488	95				5			
Diesel Fuel	E	4029240	35					21	44	
Oil Well Cement	E	2268000		1	99					
Shaped Wood	E	1639162	35					57	8	
Iron/Steel bars		1629272	5			36		36	23	
Iron/Steel pipes		1385590	26			32	14	21	7	
Non ferrous scrap	E	1336000	100							
Iron/Steel scrap		1107784	4			4		92		
Wheat Flour	E	984060	42			55			3	
White Cement		853450	82					18		
* Paints	E	840995	7			27	1	63	2	
Ordinary Cement		833350	17		75				8	
Kerosene	E	765100	7					57	36	
* Drilling machinery	E	714977	15		1	35		49		
Date Kernels		697750				91	9			
Apples		622385	95			1		4		
Sanitary goods		578979	52			1	3	44		
Insulation brick	E	548000	NA							
Porcelain		544788	100							
Dried Dates		544590					4	22	7	67
Sugar		481637	98				1		1	
Tea		497034	78			2	6	12	1	1
Synthetic animal feedstuff		469650				11		89		
* Cigarettes		293636	100							
* Prefrabricated buildings	E	466780	14			11		57	18	
* Air conditioners	E	123961	23			1	6	68	2	
* Cars		347408	79			6		7	7	1
* Lorries		151000	11			1		87	1	

E = Exports (all other cargoes are re-exports)

* = Value exceeds K.D. 100,000

Source: Kuwait Foreign Trade Statistics, 1971

Import cargoes from the Arab Gulf states tend to be very mixed in type, and low in both value and tonnage. The most significant cargoes are quantities of Japanese-made cotton fabrics, clothes and other textiles 'sent on' from the main agencies from warehouses in Bahrain, and seasonal supplies of Omani dried fish and tobacco.

The distribution of export and re-export cargoes from Kuwait shows a wider geographical distribution than for imports though the pattern also emphasises the dominance of Iran as a market. However, the 'official' figures in Table 4.5 do not record unaccounted quantities of smuggled cargoes of watches, transistors, televisions, cigarettes and other high tariff items which are landed at points along the Iranian coast from Khorramshahr to Bushire. Rice is the most significant re-exported cargo (usually Thai and Burmese varieties) and is sent to towns and villages along the Iranian coast together with regular supplies of tea, sugar and wheat flour.

Heavier cargoes leaving Kuwait include large quantities of scrap metal (much of which is in the form of wrecked motor vehicles) bound for the Iranian steel smelter at Ahwaz. Further down the Gulf, Kuwait played a key role in the early 1970's in supplying the lower Gulf (U.A.E.) with cargoes of building materials to support the intensive construction boom in the years before deep-water ports became fully operational. These cargoes included steel, building sand, timber, paints, pre-fabricated buildings, sanitary ware, air conditioners and oil field supply equipment.

<u>BAHRAIN</u>

Taken overall, Bahrain has a special dhow trading relationship with Saudi Arabia (ie. with the ports of Al Khobar, Qateef and Dammam) and Iran (i.e. coastal towns and villages from Bushire to Lavan Island). The nature and intensity of cargoes reflects this relationship - see Table 4.6 and 4.7.

TABLE 4.6

BAHRAIN: CARGOES ARRIVING BY DHOW AT THE PORT OF MANAMA, 1971-1972

(by packages)	1971	1972
Dates	21679	34025
Wheat bran	38323	63675
Dry Fish	55413	45360
Rice	16699	3211
Flour	9860	-
Sugar	1000	-
Wheat	3160	6399
Barley	1967	5590
Coffee	3548	8995
Gas cylinders	88238	102279
Concrete	44468	33846
Charcoal	4964	248
Fresh fruits	1104283	1136634
General cargo	694499	758758
(by numbers)		
Horses	17	8
Camels	109	287
Cows	7328	5282
Goats	56260	29528
Sheep	9459	6252
Cement (bags)	1806380	989595

Source: Bahrain : Customs Authority, Manama

TABLE 4.7

BAHRAIN - RE-EXPORTED AND TRANSIT CARGOES, BY DHOW, 1971

Exports and Transit Cargoes - 4 month study * (Rounded %)

	Kg	Destination					
		Saudi	Qatar	Kuwait	Iran	UAE	Oman
Household items	514478	77	1	3	11	8	
General Cargo	865550	43	3	5	4	37	8
Clothes and shoes	594321	81	7	6		6	
Textiles	342056	77		20	2	1	
Miscell. Food	804995	59	11	4	12	13	1
Dry Fish	110716	100					
Construction materials	85848	10	72			18	
Tobacco (local)	18680	100					
Spices	137633	64	3		14	19	
Rice	723508	5	2		70	12	11

Number of Packages - January and July 1971

	ORIGIN							
	Saudi	Qatar	Kuwait	Iran	UAE	Oman	Ihdi	P.D.R.Y.
General Cargo	19	12	20	21	28			
Fruit and vegetables	56	4	1	32	2		5	
Livestock	3			70	25			2
Rosewater				100				
Ghee		10		87		3		
Dates	97			3				
Dry Fish	26				74			
Rice	65					35		
Household Goods				100				
Building Materials (Bamboo)	13			3			84	
Gas Cylinders	20				75	5		
Tobacco					90	10		
Number of dhows in Sample	96	15	8	80	45	4	2	1

* These figures are an aggregate of manifests for first week in March, July, September, December, 1971.

Source : personel research, Bahrain, Customs Department.

In the early 1970's agents based in Manama re-exported to Saudi Arabia (shipped in transit, in small lots) large quantities of household items (suitcases, sewing machines, air conditioners, clothing, shoes and textiles - mostly of Japanese and Chinese origin) cargoes of Omani tobacco and dried fish, and Pakistani 'basmati' rice. In return the most important cargoes arriving from Saudi Arabia were locally produced fruits and vegetables.

By early 1980's the dhow trades with Saudi Arabia are threatened with obsolescence in the wake of the construction of the Bahrain - Saudi Arabian mainland causeway. Less threatened, however, is Bahrain's role as a foreign 'central place' supplying Bushire and other smaller Iranian towns and villages to the south (Bolkheyr, Dilwa, Lowar, Dayyer, Kangan, Ayyarnat, Tombok, Taheri, Asalu, Naband, Tiban, Shihu and Lavan) with Thai and Burmese rice, household items and general foodstuffs (ghee, spices, tea). In return these settlements send to Bahrain locally produced cargoes of fruit, vegetables and livestock. Elsewhere, cargoes arriving from and departing to other Gulf states are generally mixed in type.

DUBAI

Similarly, Dubai has a special trading relationship with two neighbouring states - Iran and Oman - see Tables 4.8 and 4.9. However, dhow cargoes to and from Oman have declined during the 1970's in response to road construction between the U.A.E. and Oman. It is not possible to differentiate cargoes carried by dhow (as opposed to those carried by road or air) in the official Dubai statistics tabulated in Table 4.9, but it is likely that most of the cargoes of building materials, machinery and household goods now journey by lorry or half-truck.

However, dhow links with Iran are still very important. Dubai plays a similar role to Bahrain in this respect supplying a different set of Iranian 'central places' with a similar set of 'central goods' The towns and villages supplied include Chirviyeh, Qais

TABLE 4.8

DUBAI - ONE MONTH SAMPLE OF IMPORTED DHOW CARGOES, JANUARY, 1971, BY VALUE

(Rounded %)

Import Cargoes	Q.D.R.	Kuw	Iran	Oma	Qat	Bahr	Saudi	Iraq	Ind	Pak	Sri L.
Fruit & Vegetables	367548	1	48		18	1			32		
General Cargo	903511	26	41		17	15			1		
Clothes and Shoes	428292				11	67					22
General food	368059	5	9		85	1					
Building Materials	85274	24	3		12	9			52		
Rice	7237	97			3						
Gas cylinder	76882					86	14				
Livestock	282100		99							1	
Dates	162950		72		1		26	1			
Fish	55560		68	32							
Tobacco	900		100								
Cotton	16000		100								
Rosewater	12500		100								
Salt	1000		100								
Bullion	355000								78		22

Source : personal research, Dubai Customs Department

TABLE 4.9

DUBAI - EXPORT AND RE-EXPORT CARGOES, BY DHOW, 1972

	Q.D.R.	Iraq	Oman	Qatar	Bahrain	Kuwait	Saudi Arabia	Iran	Far East	Somalia
Household goods	55360924		25	5	5	6	9	22	28	
Foodstuffs	72841893		8	4	2	2	2	80	2	
Textiles and piece goods	9431141		3	23	3	6	6	53	6	
Machinery	6925739		32	14	3	2	8	37	4	
Building materials	10153030		79	7	5			8		1
Electrical goods	3293326		6	6		15	37	36		
Stationary	229918			70	2	1	3	24		
Photographic goods	137759			5			6	89		
Cosmetics	437558		10	10	5	5		70		
Medical goods	472950		1					98		1
Fuels & oil	48805		11	2	20	54	10	3		
Arms etc.	1330000	2	7	15	54	7	14	1		
Oil field supplies	4442591			21	14	15	22	28		
Liquor & wine	5434960							100		

'Far East' = India, Sri Lanka and Pakistan

Source: Government of Dubai, Trade Statistics, Bulletin, January 1973

Tavuneh, Charak, Mraw, Bostanu, Kung, Basidu, Lingeh, Bandar Muallim, Puhul, Khamir, Bandar Abbas, Salakh, Laft, Henyam, Deyrestan, Susa, Larak, Qeshm, Hormuz, Tiab, Menab, Kargan, Kuhestak, Siriq, Bunji, Kuhmubarak and Jask. Re-exported cargoes include rice, tea, sugar, spices, flour and household items, while Dubai imports livestock (goats, sheep and camels,) dates, fresh fruit and vegetables, salt and rosewater.

Cargoes between Dubai and the other Gulf states, South Arabia, East Africa and the Indian sub-continent are less defined, though the smuggling trade with India and Pakistan is marked by cargoes of bullion, drugs, textiles and items such as watches. A similar set of smuggled cargoes make their way to Iranian destinations.

4.5 THE PERSIAN GULF DHOW NETWORK

The geographical pattern of the network of dhow routes which focus on the seaports of the Persian Gulf proved difficult to piece together, not least because of the scale of research that is required. Detailed origin-destination data was obtained by translating from the Arabic, hand-written customs ledgers housed in port authority premises in Kuwait, Bahrain and Dubai. This process is necessitated because details of dhow movements are not published but have to be extracted from various sources. The process was time consuming, bearing in mind that only a limited research time-budget was available and the large volume of dhow movements in and out of major dhow ports (e.g. the volume of incoming dhows at Kuwait for the years 1968, 1969 and 1970 was 10,961, 11,019 and 11,076 respectively).

Accordingly, with regard to Kuwait, the extent of the dhow network and its level of traffic flow is based on a two month sample (January and July 1971). However, in the cases of Bahrain and Dubai, where dhow transport forms a most significant element in the total trading performance of the State, a 100% sample was obtained in each case. The data obtained is tabulated in appendix 'D', together with some less detailed, published statistics of Saudi Arabian and Abu Dhabian dhow movements. As such, the Table depicts the total dhow network for the year 1971, with the exception of links between Iraq and Iran, Oman and Iran, and 'internal' flows between Iranian ports.

Ideally, a temporal analysis of the changing dhow network structure of the Gulf (using two indexes for the non-planar graph) :

$$= \frac{e}{v(v-1)} \; ; \quad \text{and} \quad \frac{c - v + 1}{v(v-1)-(v-1)}$$

Kansky, 1963, Haggett and Chorley, 1969), would have been of use in gauging the effects that modern steamships have had upon the Gulf's maritime economy. However, runs of data for anything but the most recent past do not exist, and such an analysis was therefore not possible.

4.5.1 <u>Pattern of Dhow Flows</u>

The complex pattern of dhow flows focusing on the Persian Gulf for the year 1971 is depicted in Figure 4.7, based on data tabulated in appendix Table 'D'. However, this pattern is <u>not</u> a complete picture of the total flow structure of dhow interconnections, and hence its interpretation must be related to those elements which are missing. The

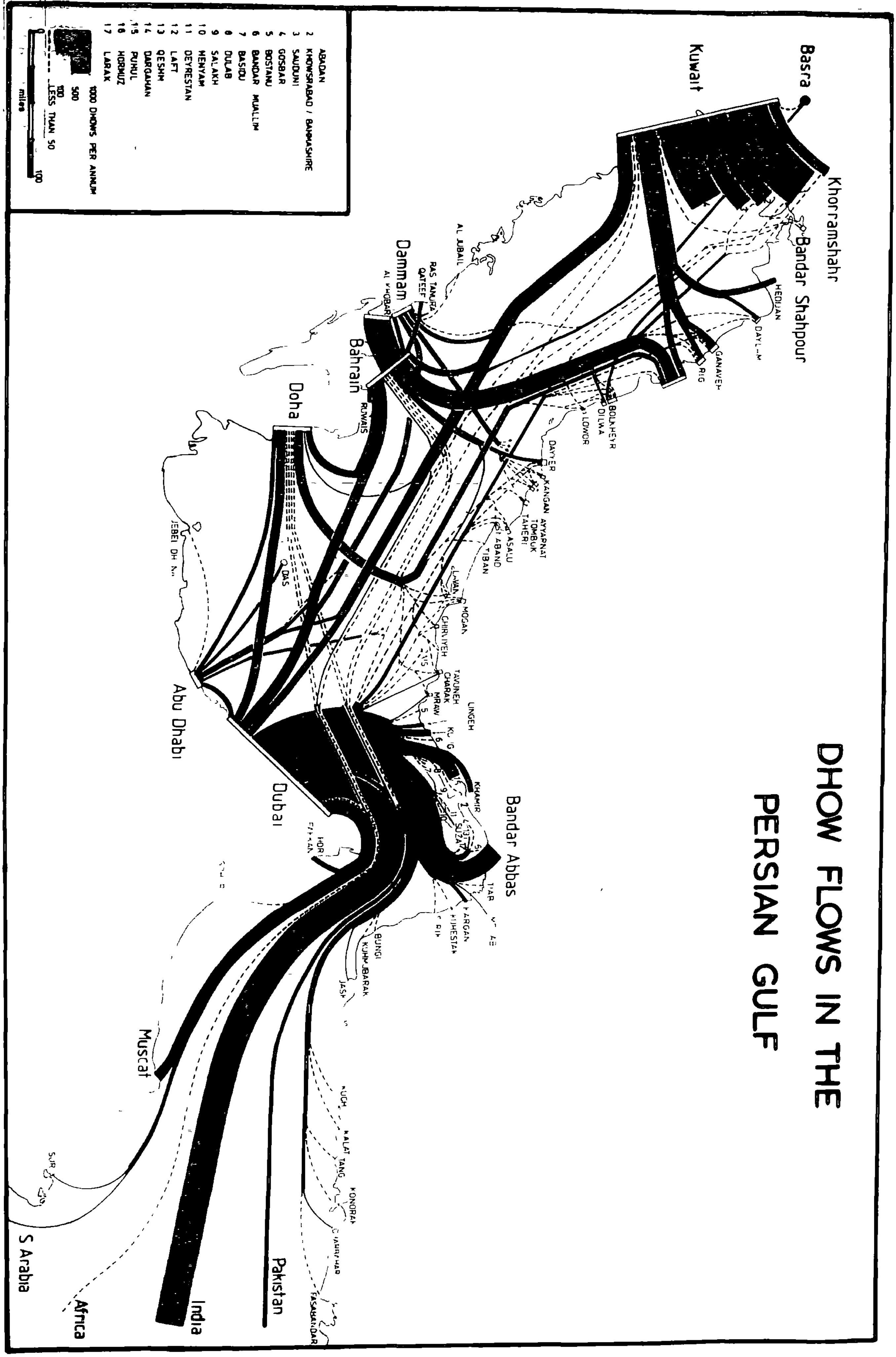

DHOW FLOWS IN THE PERSIAN GULF
Basra
Khorramshahr
Bandar Shahpour
Kuwait
Dammam
Bahrain
Doha
Abu Dhabi
Dubai
Bandar Abbas
Muscat
S Arabia
Africa
India
Pakistan
1 ABADAN
2 KHOWSRABAD / BAHMASHIRE
3 SAUDUNI
4 GOSBAR
5 BOSTANU
6 BANDAR MUALLIM
7 BASIDU
8 DULAB
9 SALAKH
10 MENYAM
11 DEYRESTAN
12 LAFT
13 QESHM
14 DARGAHAN
15 PUHUL
16 HORMUZ
17 LARAK
1000 DHOWS PER ANNUM
500
100
LESS THAN 50
miles
100
AL JUBAIL
RAS TANURA
QATEEF
AL KHOBAR
RUWAIS
HEDIJAN
DAYLAM
GANAVEH
RIG
BOLKHEYR
DILWA
LOWOR
DAYYER
KANGAN
AYYARNAT
TOMBUK
TAHERI
ASALU
ABAND
TIBAN
LAVAN
MOGAN
CHIRUYEH
TAVUNEH
CHARAK
MRAW
LINGEH
KHAMIR
SUZA
DAS
TIAR
FARGAN
BUNGI
KUHMUBARAK
JASK
KALAT
TANG
KONORAK
FASAMANDAR

FIG 4·7

pattern is necessarily incomplete because of the reasons discussed in Section 4.5: namely, that it is probably beyond the capacity of one research worker to assemble the entire flow pattern of Persian Gulf dhows, unless he or she has unlimited time; and secondly, even if this were possible, not all dhow flows are recorded, so the pattern would still be incomplete.

As such, therefore, any appraisal of Figure 4.7 should bear in mind the following aspects of the data on which it is based. Figure 4.7. is a composite of the following data sets :

1. The total pattern of dhow flows (incoming and outgoing) during 1971 focusing on the ports of Bahrain, Doha and Dubai.
2. The total pattern of 'incoming' dhow flows at the ports of Abu Dhabi and Al Khobar during 1971 .
3. An estimate of the total patterns of 'incoming' dhow flows for Kuwait during 1971 (based on the route 'means' x 12 of the two monthly sample survey - see Section 4.5).

However, Figure 4.7, lacks the following data, which were they available, would have permitted a cartographic representation of the total pattern of dhow flows.

1. Dhow flows between Iraqi and Irani ports
2. Dhow flows between Omani and Irani ports.
3. Dhow flows between Irani ports.
4. Outgoing dhow flows from Kuwait, Al Khobar and Abu Dhabi.
5. Dhows emanating from the smaller Arabian ports (e.g. Ruwais, Sharjah and Khosab).

TABLE 4.10 : Hierarchy of Dhow Routes - 1971

Rank	Route	Daily Interaction Index =	Total Number of Dhows per route per annum
1	Kuwait - Abadan	8.40	365
2	Kuwait - Gosbar	7.64	
3	Kuwait - Sauduni	6.33	
4	Bahrain - Al Khobar	5.19	
5	Dubai - Indian ports	4.89	
6	Dubai - Bandar Abbas	3.89	
7	Kuwait - Khowsrabad	3.58	
8	Kuwait - Bahmashir	3.25	
9	Dubai - Muscat	2.38	
10	Bahrain - Bushire	2.28	
11	Dubai - Puhul	2.14	
12	Kuwait - Khonamshar	1.64	
13	Dubai - Doha	1.39	
14	Dubai - Bahrain	1.22	
15	Kuwait - Ganaveh	1.14	
16	Dubai - Kung	1.08	
17	Dubai -- Ras al Kharmah	1.00	
18	Bahrain - Doha	0.99	
19	Kuwait - Dubai	0.77	
20	Dubai - Khamir	0.75	
21	Kuwait - Hendijan	0.72	
22	Kuwait - Rig	0.71	
23	Bahrain - Damman	0.68	
24	Kuwait - Bahrain	0.67	
25	Dubai - Pakistani ports	0.63	
26	Doha - Bushire	0.62	
27	Dubai - Al Khobar	0.61	
28	Bahrain - Ruwais	0.59	
29	Doha - Abu Dhabi	0.55	

Source : Appendix Table D

In spite of the limitations of the data, it is felt that Figure 4.7 is worthy of illustration because it undoubtedly portrays the major dhow routes in the Gulf and gives a visual impression of the relative patterns of flow with regard to those ports for which data was available. Subject to data limitations, the following major flow patterns are discernible. Firstly, Dubai, Kuwait and Bahrain are the dominant dhow ports within the Persian Gulf: Dubai appears to head the hierarchy of long-distance flows; the significance of Kuwait appears to be inflated by the heavy volume of short-distance flows, particularly with regard to links with ports along, and in the vicinity of the Shatt al Arab; Bahrain appears to function in a pivotal role and the major 'mid Gulf' entreport. Secondly, the pattern of 'cross-Gulf' flows between Arab States and Iran appears to be extensive (see Section 4.6.2 with reference to Tariff barriers.)

A hierarchy of dhow routes (subject to the data limitations already discussed) is outlined in Table 4.10, confirming the 'nodality' of Kuwait, Bahrain and Dubai. The hierarchy is calculated by use of a notional 'Daily Interaction Index', 'I' (I = Total Annual flow of dhows along one dhow route, in one direction, between two ports / 365), which gives an average annual 'daily' flow. The routes listed in the hierarchy are those with an index greater than 0.50 (i.e. average one dhow every two days), of which there are twenty nine.

The nature of the pattern of 'nodality' is explored further in Table 4.11. Using Nysteun and Dacey's (1961) method for the identification of nodal regions (explained in Section 3.5.2), Table 4.11 displays a 'matrix of dominant associations' in relation to dhow flows that focus on Kuwait, Bahrain, Doha and Dubai. In each case, the nodal (dominant) flow is identified. Broadly, the pattern reveals that the spatial structure of

TABLE 4.11 : Matrix of Dominant Associations : Dhow Flows, 1971

After J. Nystuen and M. Dacey.
"A Graph Theory Interpretation of Nodal Regions",
Papers of the Regional Science Association 7 (1961), pp29-42.

Origins	Destinations				
	Kuwait	Bahrain	Doha	Dubai	Total
Khorramshahr	* 600	53	21	0	684
Abadan	* 3066	45	21	40	3172
Khowsrabad	* 1308	9	0	0	1317
Bahmashir	* 1188	0	0	0	1188
Sauduni	* 2310	1	3	4	2318
Gosbar	* 2790	0	0	15	2805
Bandar Shahpour	* 24	2	0	11	37
Henijan	* 264	0	0	0	264
Daylam	* 156	6	1	1	164
Ganaveh	* 416	30	1	10	457
Rig	* 260	17	0	1	278
Kharg	* 12	1	0	0	13
Bushire	294	* 832	228	46	1400
Bolkheyer	12	* 51	3	24	90
Dilwa	104	* 134	3	0	241
Lowor	0	* 61	2	0	63
Dayyer	0	* 136	30	29	195
Kangoon	0	* 65	18	0	83
Ayyarnat	0	* 45	33	0	78
Tombok	0	* 5	3	0	8
Taheri	0	5	* 18	0	23
Asalu	0	0	* 15	2	17
Naband	0	0	* 1	* 1	2
Tiban	0	0	* 12	0	12
Lavan	0	2	* 21	13	36
Mogan	0	5	2	* 6	13
Chirviyeh	0	0	* 2	* 2	4
Qais	0	0	0	* 59	59
Tanaveh	0	* 1	0	0	1
Charak	6	4	9	* 71	90
Mraw	0	8	6	* 109	123
Bostanu	0	11	0	* 75	86
Kung	0	1	12	* 393	406
Lingeh	0	0	2	* 147	149
Bandar Muallim	0	0	0	* 63	63
Basidu	0	0	0	* 33	33
Dulab	0	0	1	* 32	33
Puhul	0	0	6	* 781	787
Khamir	0	0	0	* 272	272
Laft	0	1	0	* 51	52
Salakh	0	0	0	* 14	14
Henyam	0	0	0	* 36	36
Deyrestan	0	0	0	* 25	25
Suza	0	0	0	* 93	93
Larak	0	0	0	* 13	13
Qeshm	0	5	0	* 137	142
Dargahan	30	9	0	* 61	100

/Cont'd...

TABLE 4.11(Cont'd.)

Origins	Destinations				
	Kuwait	Bahrain	Doha	Dubai	Total
Hormuz	0	0	0	* 47	47
Bandar Abbas	0	14	6	*1421	1441
Tiab	0	0	0	* 17	17
Menab	0	0	0	* 110	110
Kargan	0	0	0	* 146	146
Kuhestak	0	0	0	* 10	10
Sirik	0	0	0	* 45	45
Bungi	0	0	0	* 38	38
Kuhmubarak	0	0	0	* 18	18
Jask	0	0	0	* 136	136
Kuch	0	0	0	* 35	35
Kalat	0	0	0	* 54	54
Tang	0	0	0	* 6	6
Konorak	0	0	0	* 71	71
Charbahar	0	0	0	* 93	93
Fasabandar	0	0	0	* 56	56
Dubai	283	446	* 507	–	1236
Kuwait	–	243	73	* 283	599
Bahrain	243	–	364	* 446	1053
Doha	73	364	–	* 507	944
Al Khobar	74	*1894	54	223	2245
Abu Dhabi	129	147	* 201	176	653
Ras al Khafgi	* 6	* 6	0	5	17
Das Island	18	* 47	0	4	69
Dammam	0	* 249	6	5	260
Qatif	0	* 164	0	0	164
Ruwais	0	* 215	0	0	215
Ras Tanura	0	* 118	0	2	120
Jubail	0	* 13	0	1	14
Sharjah	12	11	4	* 69	96
Ras al Khaimah	12	11	7	* 366	396
Jebel Dhana	0	* 1	0	0	1
Khosab	0	1	0	* 53	54
Umm Said	0	0	* 1	0	1
Pakistani ports	0	2	3	* 230	235
Indian ports	24	29	24	*1786	1863
African ports	0	2	7	* 9	18
Basra	6	2	13	* 115	136
Aden	0	8	0	* 53	61
Muscat	30	54	53	* 499	636
Khor Fakkan	6	23	0	* 134	163
Sohar	0	* 16	0	3	19
Kalba	0	* 3	0	0	3
Dibba	0	0	0	* 5	5
Sur	0	0	0	* 125	125
Seeb	0	0	0	* 12	12
Masirah	0	1	3	* 11	15
Salala	0	1	0	* 80	81

* = Dominant Flow

Source : Appendix Table D

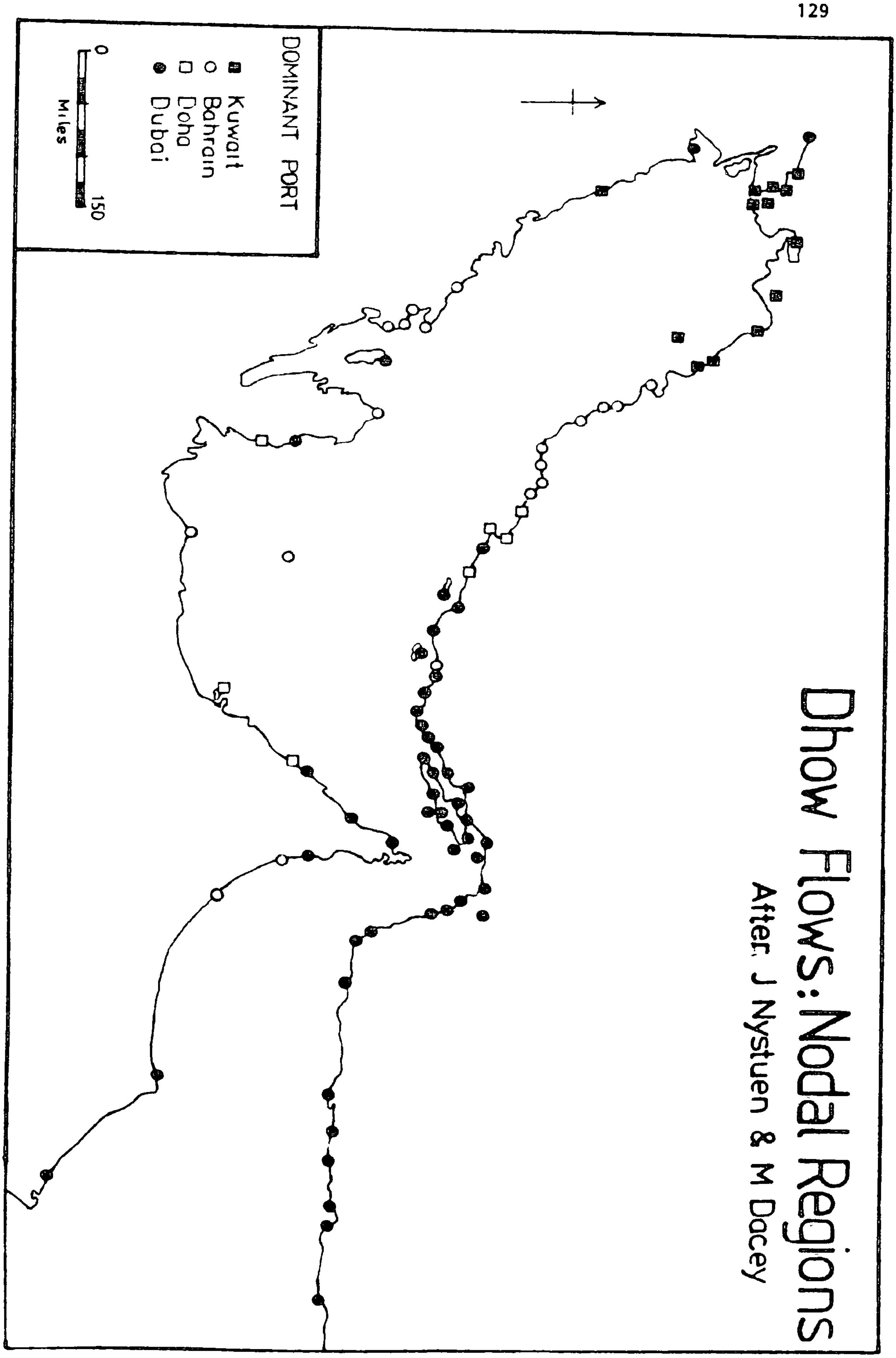

Dhow Flows: Nodal Regions
After. J Nystuen & M Dacey
DOMINANT PORT
Kuwait
Bahrain
Doha
Dubai
0
150
Miles

FIGURE 4.8

dhow flows is related to a factor of distance between origin and destination ports, moderated to a degree by the nature of port hierarchies. That is to say, the larger dhow ports of Kuwait, Bahrain and Dubai, appear to be characterized by nodal relationships that are virtually discrete, 'dividing up' the Gulf into upper Gulf ports focusing on Kuwait, middle-Gulf ports on Bahrain, and lower-Gulf ports on Dubai, respectively. Whereas, the lower order centre (i.e. dhow ports) of Doha appears to be 'nesting' within the general area of Bahraini dominance (see Figure 4.8).

4.5.2 <u>Cross Trades</u>

Sections 4.5 and 4.5.1 suggest that the spatial structure of the Persian Gulf dhow network may be at least partly explained by the frictional effect of geographical distance, modified by the hierarchical pattern of 'central places' (Christaller, 1966, transl.) In order to test this hypothesis, a series of Regression analyses was performed on the flow data of dhow movements through the ports of Kuwait, Bahrain, Doha and Dubai. The aim of the analyses was to test whether or not the flow pattern of dhows could be predicted by measuring the geographical distance between any two ports, moderated by a consideration of the respective population sizes of the ports concerned. The use of 'geographical distance' was preferred to 'time distance' because of the distortion caused by varying weather conditions upon journey times (see appendix Table 'F'). The analysis could only be performed on dhows interacting between Arabian ports and Iranian ports, because the absence of population census data for small Arab ports procluded the analysis of dhow flows between Arab ports. As such, population data taken from the Iranian Census of 1966, was used to measure the 'size' of Iranian ports (see appendix Table 'E').

The Regression analyses were performed to measure the 'predictability' of 'F' (the flows between two dhow ports) from the relationship P/D (Population of port, divided by

Kuwait–Iran Dhow Flows
Regression Analysis

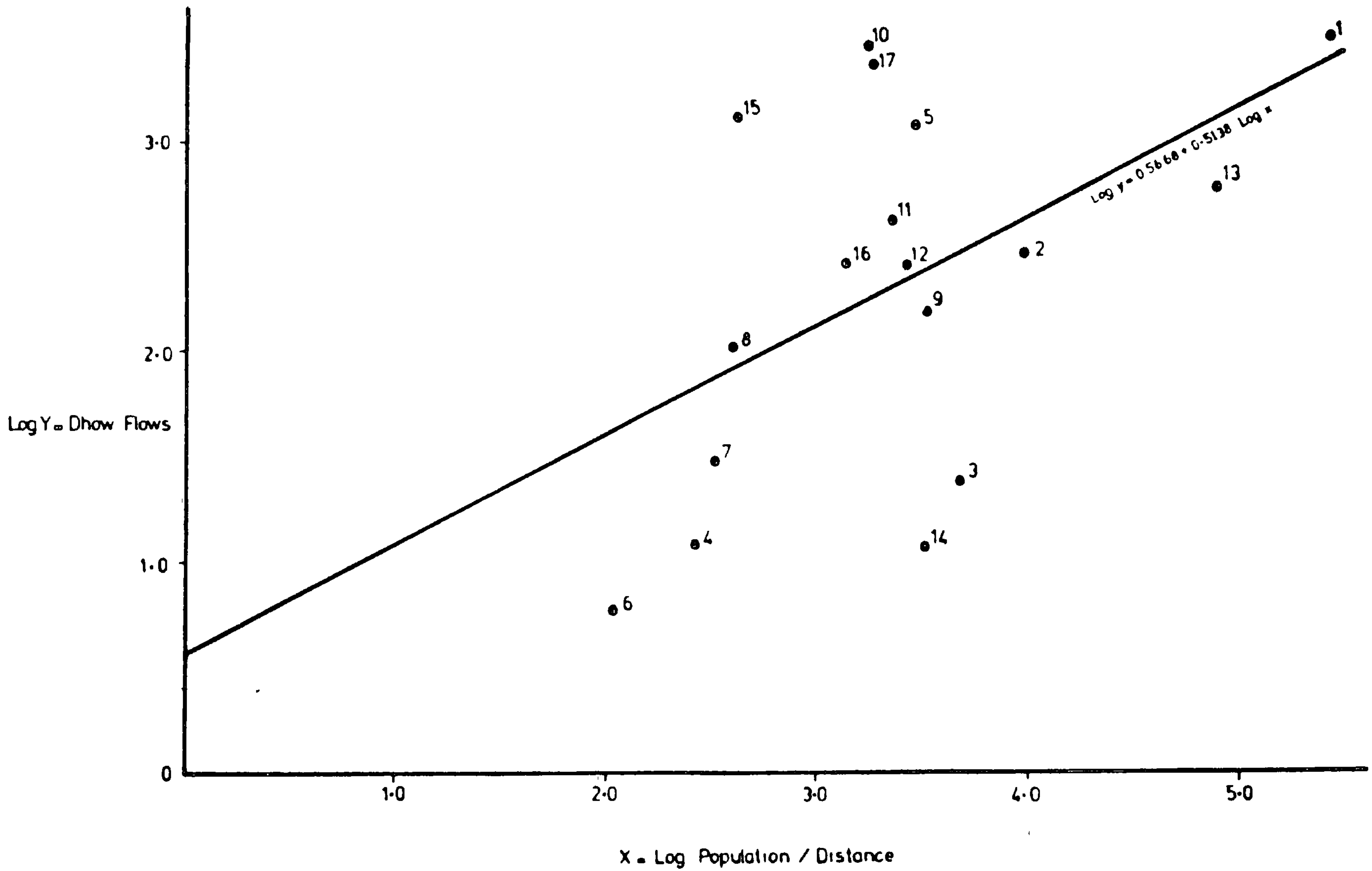


FIGURE 4.9

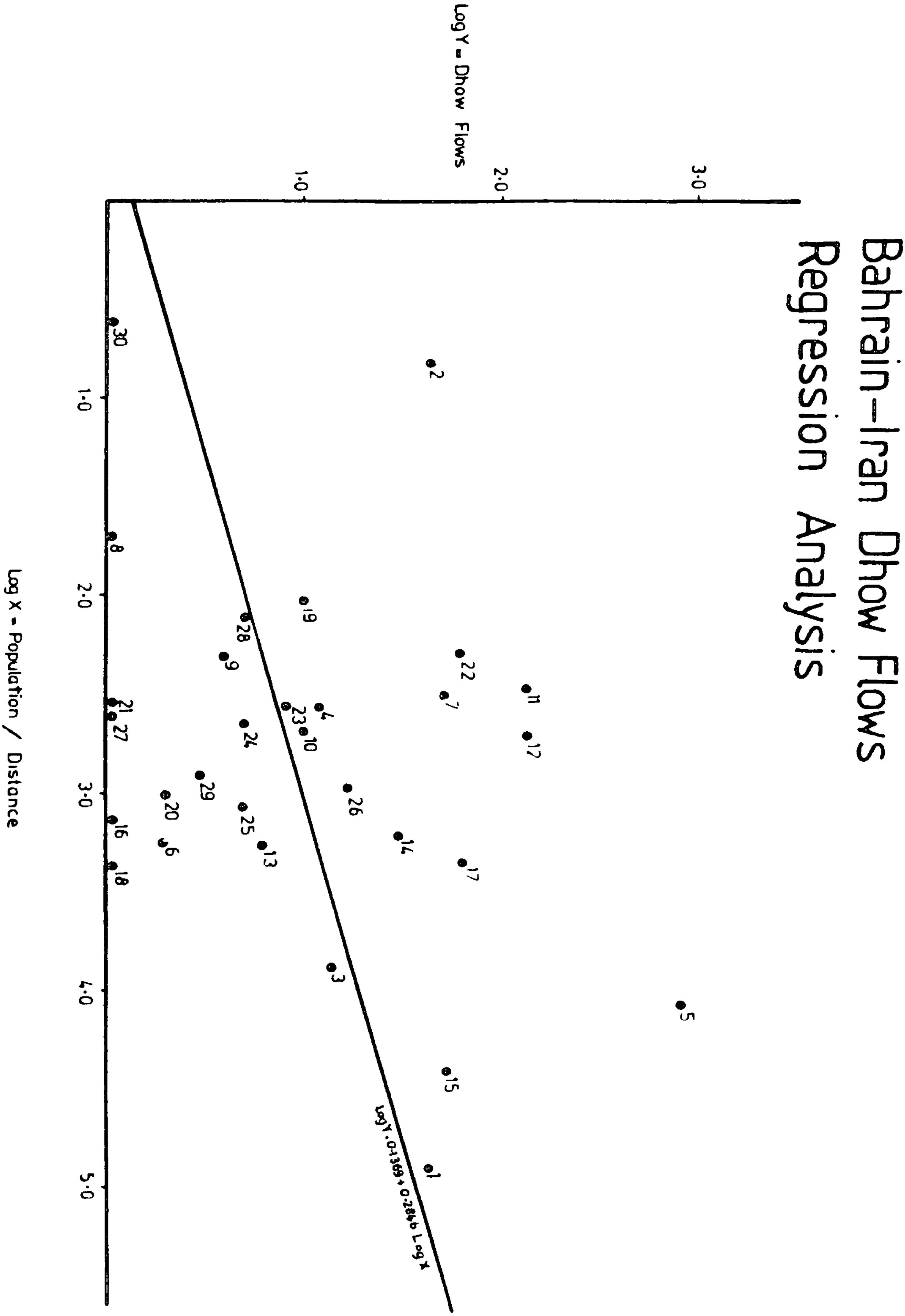

Bahrain–Iran Dhow Flows
Regression Analysis
Log Y = Dhow Flows
Log X = Population / Distance
1·0
2·0
3·0
4·0
5·0
LogY.0·1369+0·2866 LogX

FIGURE 4.10

Doha-Iran Dhow Flows
Regression Analysis

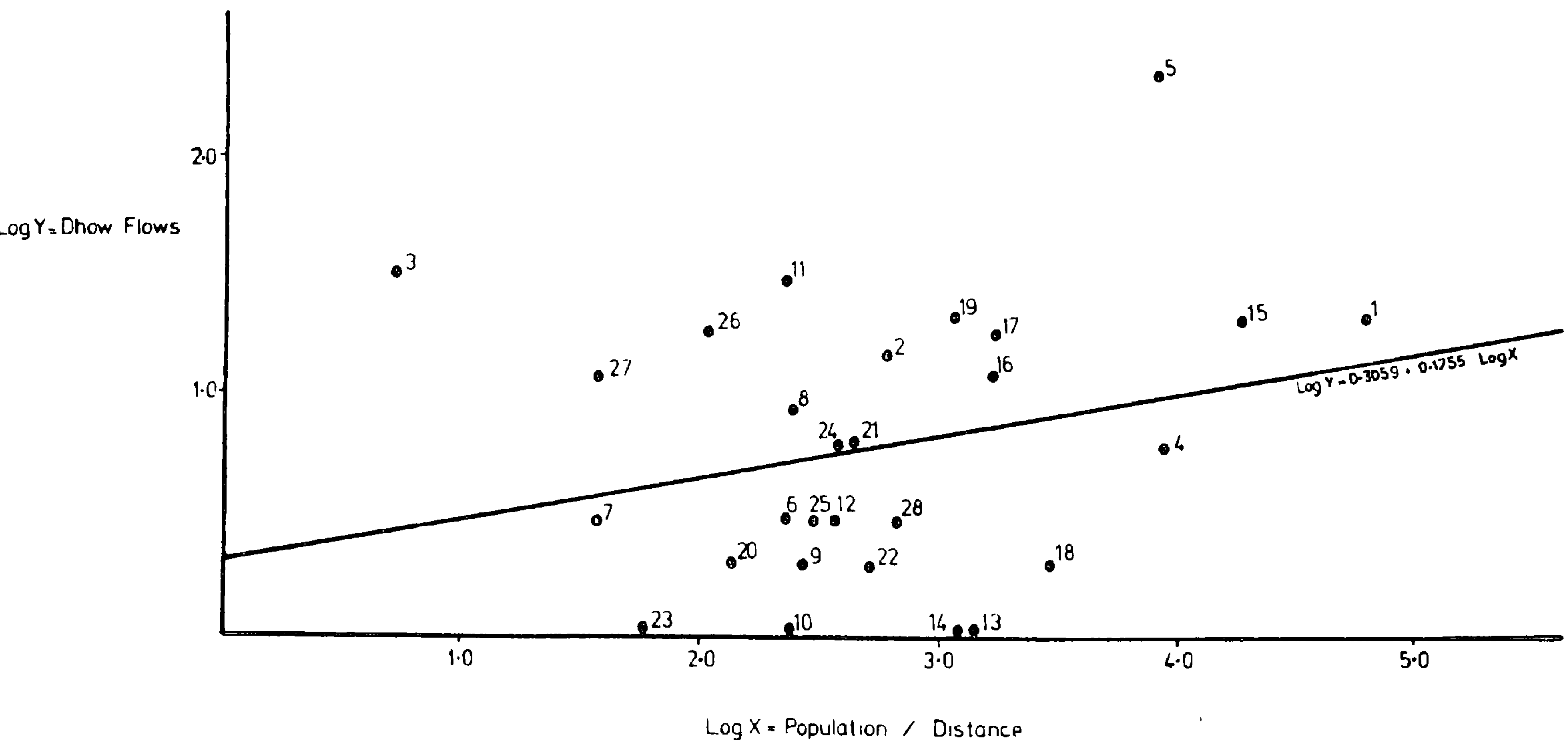


FIGURE 4.11

Dubai-Iran Dhow Flows Regression Analysis

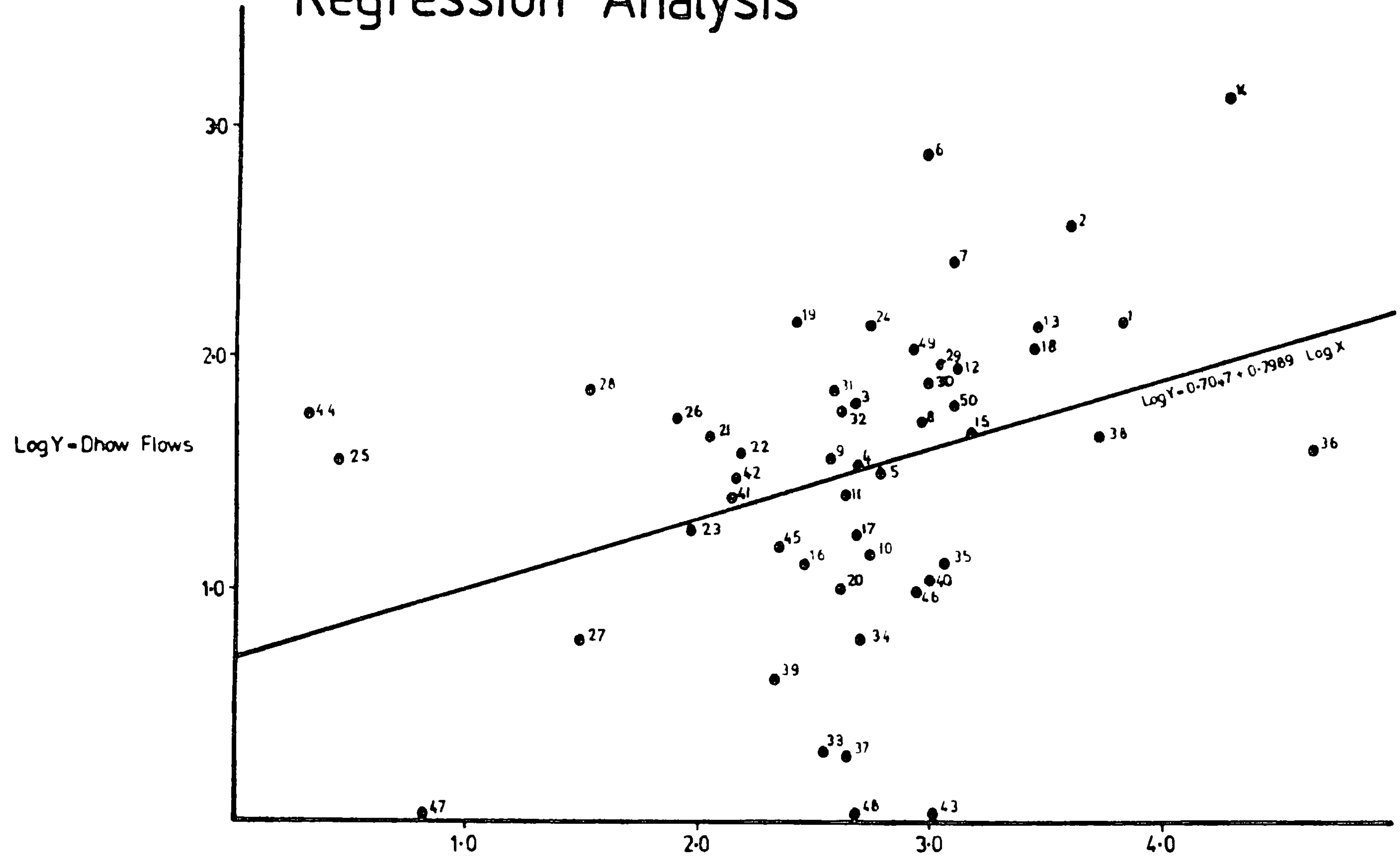


FIGURE 4.12

TABLE 4.12 : Kuwait Dhow Flows : Residuals from Regression Analysis

Abadan	+ 611
Bushire	- 133
Shahpour	- 278
Bulkheir	- 54
Bahmashir	+ 954
Charak	- 36
Dargwan	- 44
Dilwa	+ 21
Daylam	- 89
Gosbar	+ 2612
Ganaveh	+ 212
Hendijan	+ 40
Khorramshahr	- 659
Kharg	- 233
Khowsrabad	+ 1223
Rig	+ 65
Sauduni	+ 2128

TABLE 4.13 : Bahrain Dhow Flows : Residuals from Regression Analysis

Abadan	+ 10
Ayyanat	+ 43
Bandar Abbas	− 4
Bostanu	+ 4
Bushire	+ 812
Shapour	− 10
Bulkheir	+ 44
Challat	− 3
Dargwan	+ 1
Dayyer	+ 129
Dilwa	+ 126
Daylam	− 6
Ginawar	+ 19
Khorramshahr	+ 28
Kung	− 10
Kangoon	+ 52
Kharg	− 12
Khowsrabad	+ 4
Lavan	− 8
Laft	− 6
Lowar	+ 55
Mraw	+ 1
Mogam	− 3
Qeshm	− 5
Rig	+ 7
Sauduni	− 7
Taheeri	− 1
Tambok	− 7
Tanuzeh	− 1
Charak	− 2

TABLE 4.14 : Doha Dhow Flows : Residuals from Regression Analysis

Abadan	+ 7
Asalu	+ 9
Ayyanat	+ 30
Bandar Abbas	- 4
Bushire	+ 218
Bulkhair	- 2
Challat	- 1
Charak	+ 4
Chiru	- 4
Dulab	- 4
Dayyer	+ 25
Dilwa	- 3
Daylam	- 6
Ginawer	- 6
Khorramshahr	+ 10
Kung	+ 5
Kangoon	+ 10
Lingeh	- 6
Lavan	+ 14
Lowar	- 3
Mraw	+ 1
Mogan	- 4
Naband	- 3
Puhul	+ 1
Sauduni	- 3
Taheeri	+ 13
Tiban	+ 8
Tombok	- 3

TABLE 4.15 : Dubai Dhow Flows : Residuals from Regression Analysis

Lingeh	+	78
Kung	+	334
Bandar Muallim	+	32
Basidu	+	1
Dulub	-	1
Puhul	+	743
Khamir	+	230
Laft	+	13
Henyam	+	7
Salakh	-	18
Degrestan	-	5
Susa	+	51
Qesham	+	83
Bandar Abbas	+	1328
Hormuz	+	3
Larak	-	14
Tiab	-	13
Minab	+	58
Kargan	+	120
Kuhestak	-	20
Sirik	+	25
Bunji	+	16
Kuhmubarak	-	1
Jask	+	104
Kuch	+	28
Kalat	+	36
Tang	-	8
Kondrak	+	57
Chahbahar	+	52
Bostanu	+	37
Charak	+	42
Qais	+	29
Chiru	-	26
Mogan	-	26
Lavan	-	28
Abadan	-	80
Asalo	-	28
Bushire	-	19
Sauduni	-	27
Shapour	-	28
Bolkhegr	+	1
Dayyer	+	7
Dayam	-	38
Fasabandar	+	50
Gosbar	-	10
Ganaveh	-	27
Naband	-	8
Rig	-	31
Mraw	+	72
Dargwan	+	19

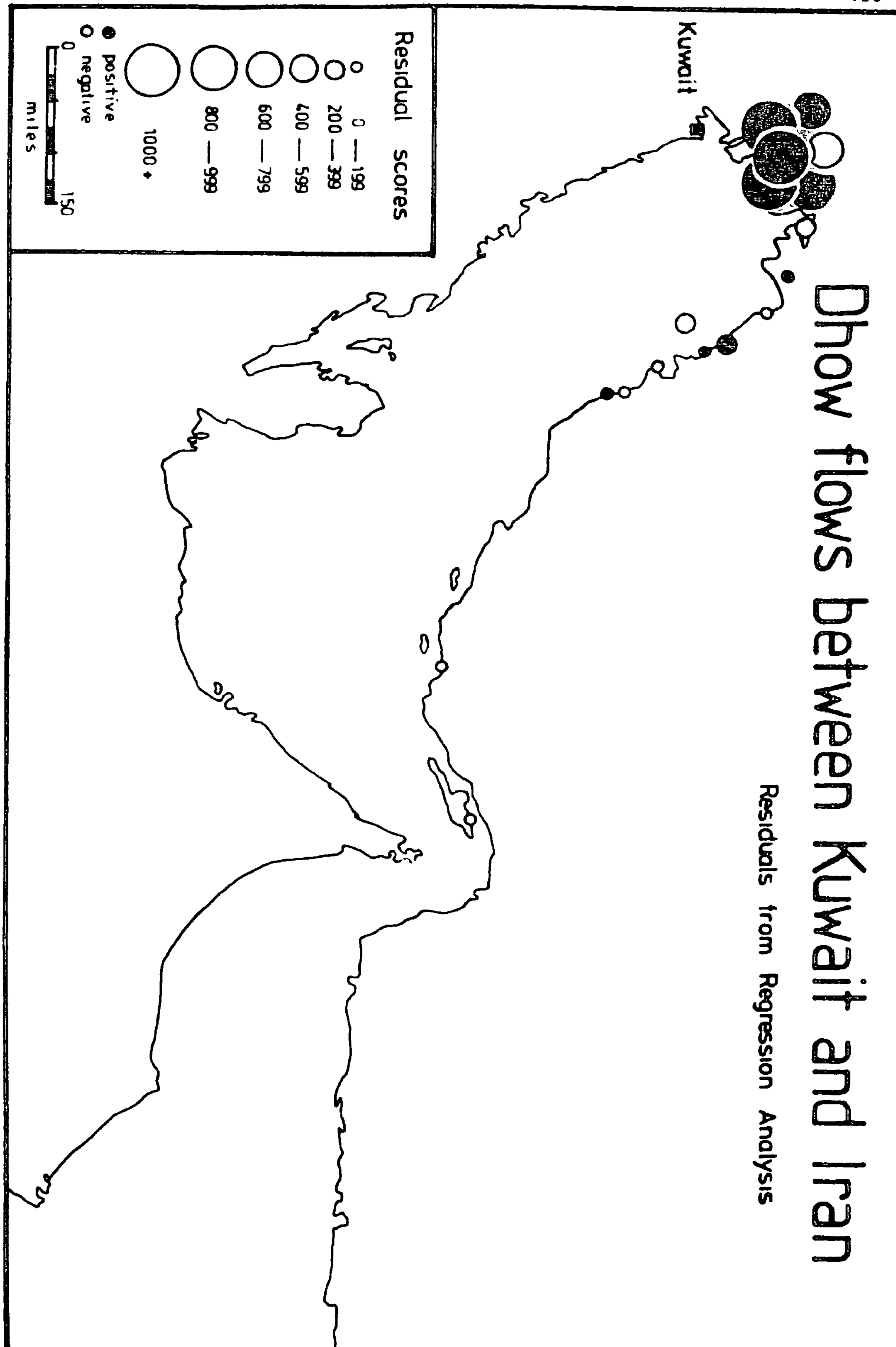

Dhow flows between Kuwait and Iran
Residuals from Regression Analysis
Kuwait
Residual scores
0 — 199
200 — 399
400 — 599
600 — 799
800 — 999
1000 +
positive
negative
0
150
miles

FIGURE 4.13

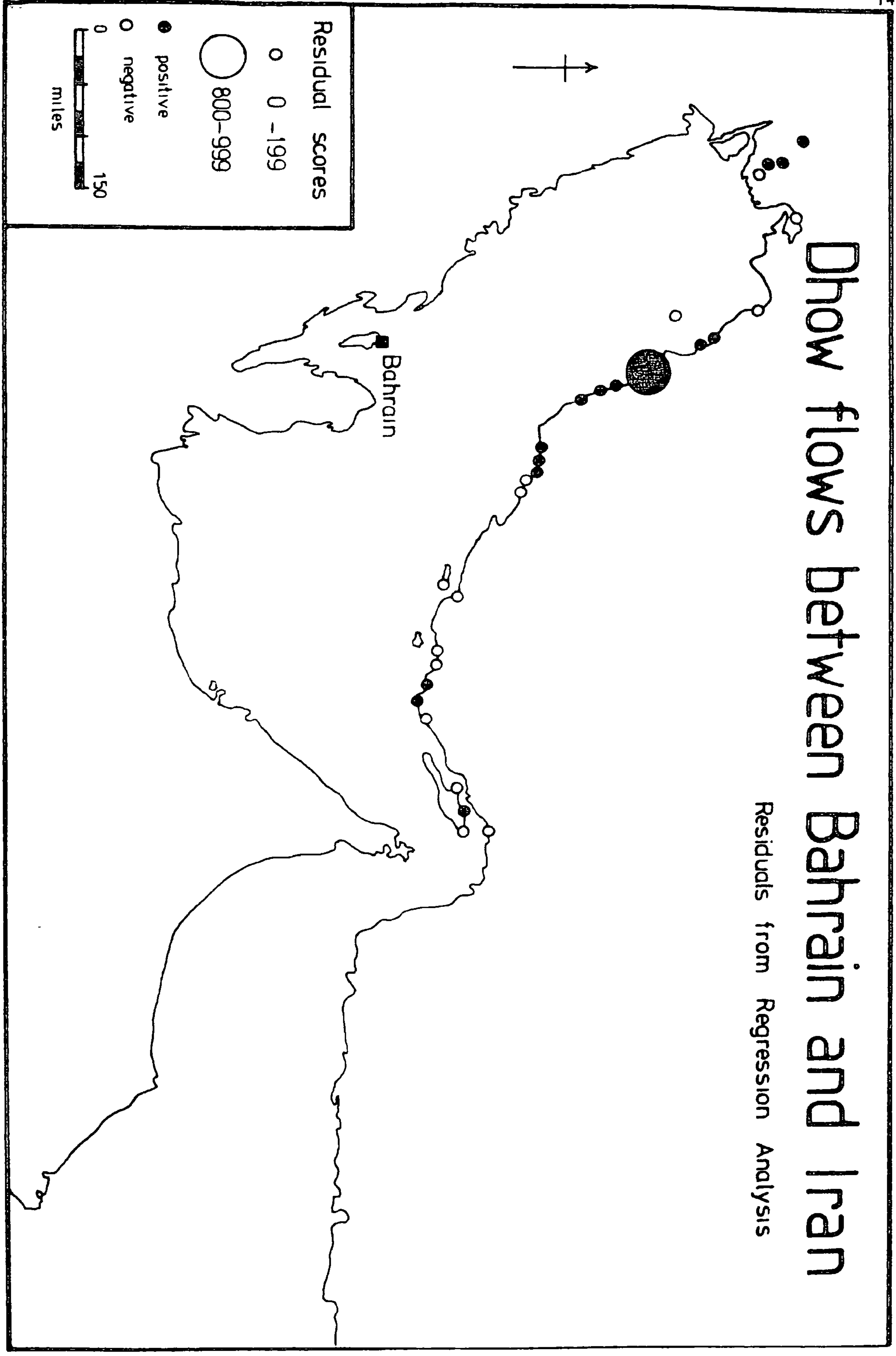
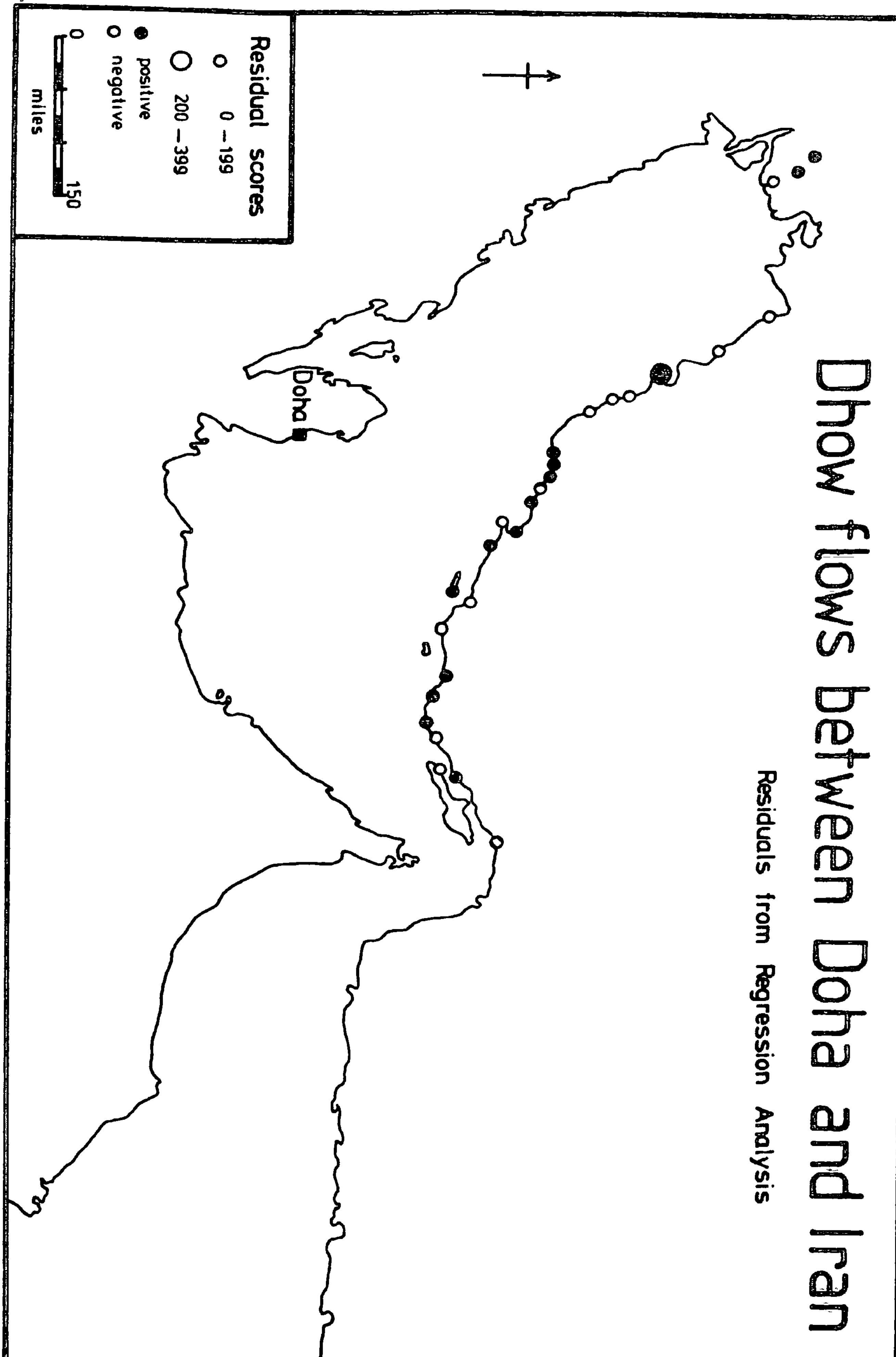

Dhow flows between Bahrain and Iran
Residuals from Regression Analysis
Residual scores
0 -199
800-999
positive
negative
0
150
miles
Bahrain

FIGURE 4.14



Dhow flows between Doha and Iran
Residuals from Regression Analysis
Residual scores
0 – 199
200 – 399
positive
negative
0
150
miles
Doha

FIGURE 4.15

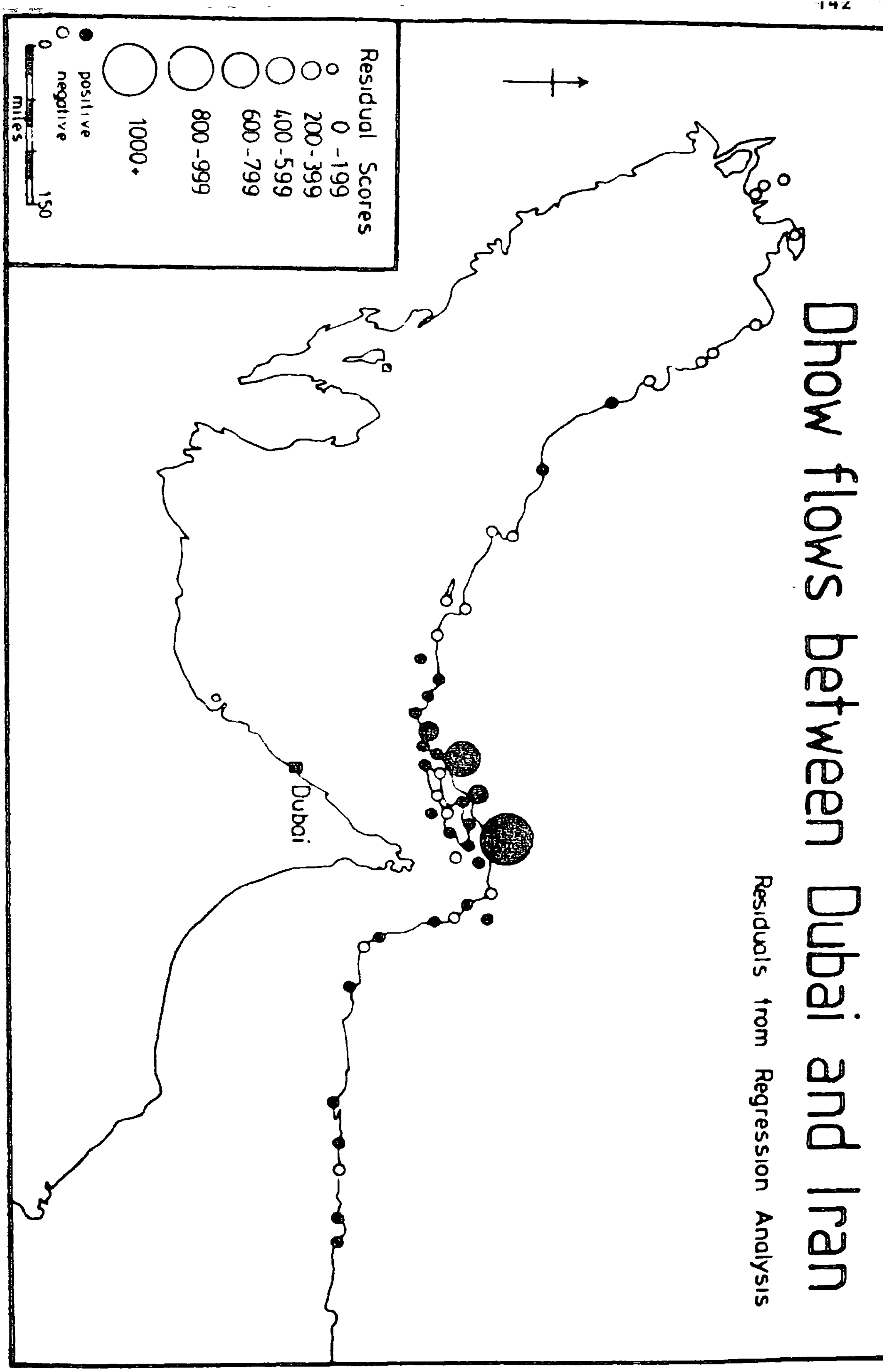

Dhow flows between Dubai and Iran
Residuals from Regression Analysis
Residual Scores
0 -199
200-399
400-599
600-799
800-999
1000+
positive
negative
0
150
miles
Dubai

FIGURE 4.16

distance). The prediction was made in terms of a linear relationship of the form :

$$\log F = a + b (\log P/D)$$

The following levels of explanation were achieved in respect of r^2 values :

Kuwait	0.9128
Bahrain	0.6220
Doha	0.6724
Dubai	0.7812

The graphical representation of the analyses is represented in Figures 4.9, 4.10, 4.11 and 4.12, for Kuwait, Bahrain, Doha and Dubai respectively. Residuals from the analyses were calculated and tabulated in Tables 4.12, 4.13, 4.14 and 4.15. Figures 4.13, 4.14, 4.15 and 4.16 display the spatial pattern of positive and negative 'residuals' for each analysis.

INTERPRETATION OF RESULTS

An analysis of dhow interaction between Arabian and Iranian ports is significant because, lacking the competition from road transport development that threatens to challenge the viability of routes between Arabian ports, these routes have a reasonable chance of survival. The results obtained indicate that the analyses achieved the highest level of explanation using Kuwaiti data, followed by Dubai, with lower levels of explanation for Doha and Bahrain. Thus, the hypothesis that Kuwaiti dhow flows may be explained by a P/D relationship is reasonably substantiated by the result, but low levels of r^2 for Dubai, Doha and Bahrain are more difficult to explain. In all probability the village population factor has a distorting effect on results. That is, whereas most of Kuwait's dhow flows are of a shorter distance to the larger villages and towns of the more densely populated S.W. corner of Iran, many of the flows from Dubai, Doha and Bahrain are to the smaller villages of the southern and south eastern coast of Iran. These 'villages' such as Naband (population 16), Taheeri (199), Bunji (283), Konorak (144) and Siriq (189) (see Table 'E' in the appendix) are very small in size but have sizeable dhow flows to Arab ports irrespective of the distance involved (see Table 'F' in the appendix). The significance of the high Iranian customs tariff and its effect in stimulating dhow flows to small Iranian coastal villages is discussed in Section 4.6.

Kuwait

Figure 4.13 emphasises that the positive residual flows (ie. flows greater than 'expected') are heavily concentrated in the riverside villages on the east bank of the Shatt al Arab, focusing on the link between Khuzistan and Kuwait. Hendijan, Ganaveh, Rig and Dilwa also display positive residuals.

Bahrain (see Figure 4.14)

A contiguous belt of villages with positive residuals lies due north of Bahrain from Ganaveh in the west to Ayyarnat in the east, but concentrating heavily on Bushire.

Doha (Figure 4.15)

Doha is not a major dhow port but has a large positive residual link with Bushire, together with positive residuals with many of the smaller villages along the Iranian coast from Dayyer to Puhul.

Dubai (Figure 4.16)

Judging by the positive residuals, Dubai dominates dhow flows along the south-eastern Iranian coast from Qais, through Qeshm Island and along the northern coast of the Gulf of Oman, but focusing on Bandar Abbas.

4.6. MERCHANT PERSPECTIVES

"Basically we do business on speculation"

(Kuwaiti Merchant, 1972)

Merchants think spatially, as well as economically. Transport technology is the basic utility permitting them to carry out trading transfers between spatially dispersed regions. To gain an understanding as to the rationale behind the trading relationships of key merchants, in so far as it impinges upon transport utilization, trade perception and behaviour patterns, an interview survey was carried out in the ports of Kuwait, Bahrain and Dubai. Posing a questionnaire for merchants presents certain problems. They are shrewd and canny, not unnaturally keeping their cards close to their chest in so far as the competitive world of business acumen is concerned. Consequently, their attitudes to questioning ranged from extremely helpful through to total unco-operation. The positivist/objective stance of modern quantitative geography demands that their answers be quantified and mathematically mulled over for explanatory or predictive purposes. Such an exact process is not possible with regard to this particular survey. Quoting numbers and figures in the field of commercial enterprise is taboo in the suqs of Kuwait and other Gulf port cities, as much as it is in the Exxon Skyscraper in the Rockefeller Centre, New York. Apart from business caution, problems of data collection are compounded by a lack of tax laws within the Gulf states. Books and records of transactions are unnecessary for accounting purposes and hence are quite often absent, certainly private. To have approached these businessmen with an ' a-b-c- ' type of questionnaire with a quick-firing succession of answers to be sought would have been to invite suspicion. To counteract this form of research environment, the questions to be posed were fixed firmly in mind, but the interview often took the form of a conversation. The accuracy of any given response, is, of course, untestable, except by empirical observation or statistical back-up. The results are therefore to be treated with sceptism.

The objective of the interviews was both specific and random. Directly, the aim was to add some subjective flesh to the objective bones of statistical data collected elsewhere; by eliciting the motivation (goal) of each merchant with regard to his perception of alternative trade and transport options and his interpretation of events through feedback of an informative or operational nature, and to gauge his appreciation of the behavioural environment within which he was obliged to operate. In short, one hoped to put the merchant's world in a socio-economic and socio-political context. On the random side, the process of conversation often gave insights into the psychological, social and economic side of his life, through comments and asides not directly sought by questioning. The result is a collection of interviews, individually specific to a particular merchant or trade, but collectively a commentary on the functional disposition of a particular entrepot, and on the Gulf as a trading system.

The selection of merchants to be interviewed was not a random process. They represent a group sample chosen on a size/significance basis, rather than any areal sub-division of the port city concerned. The sample group was selected in consultation with the Chambers of Commerce of Kuwait, Bahrain and Dubai, who identified the major commodity trades of the ports, together with the most significant merchants defined on the basis of size, turnover, size of operation and experience.

Such a process, though having its pitfalls, is possible in relatively small seaports such as Kuwait, Bahrain and Dubai, where though an apparent profusion of merchants exists on first inspection, experience teaches that the major percentage of foreign trade is handled by a comparatively few, large, multi-faceted merchant families who dominate trade, or who are at least highly representative. These merchants are often long-established members of the politico-economic community in each port, whether Arab or non-Arab in culture. The term 'merchant elite' is an appropriate term. History has described a parallel identification between the political and business elite; more often than not they are one and the same. Major merchants have political power and prestige as well as financial strength, ranging in stature from Shaikh Rashid bin Said Al Makhtum of Dubai, who might be described as the chief merchant of that port as well as its ruler, through to large merchant families in Kuwait, who are not members of the Al Sabah ruling family, but nonetheless, wield significant power and influence in the Majlis and Diwan Amiri.

Merchants are often multi-faceted in their business operation and commodity specialization. They are often both importers and exporters, wholesalers and retailers, sometimes on the same, deceptively small premises. Commodities and business links often have a diverse range, though most merchants have a 'specialization'. Nor is merchant influence confined to one port: the major merchants exert considerable business influence and interlinkage elsewhere in the Gulf and beyond, through a network of agencies, entrusted and run by members of the same family or by trusted partners. As well as making money in other Shaikhdoms and other ports, in the pre-electronic age of communication, merchant agencies acted as information filters and business attenae, receiving and disseminating news of business opportunities, intrigues and calamities, through a network of dhow routes traversing the Arabian, Persian, Indian and East African coasts, a role they still perform. Nor were, and are, the merchants purely engaged in trade and (because of their financial success) power politics: they have a high stake in transportation too. Merchants often own the local means of transportation. The modern merchant elite has a wide involvement in the ownership of transport, sharing the costly running and construction of shipping lines, airlines and even dry docks. In fact, merchants are financiers, bankers and industrial entrepeneurs, as well as traders.

The most successful merchants are therefore in a very real sense the financier string-pullers of the state and that is why in trying to answer the question of "who controls" (who takes the decisions?), the answer very often is one man or one select group of men, a merchant elite, who take decisions across a number of boardroom tables and along a number of business fronts. This narrow, political and economic power base has its parallels with Japan.

The Merchants

> "The wholesale trade of any city will extend outwards as far as the limits of commercial intelligence available to that city's Merchants."
>
> (J.E. Vance, 1970, p. 156).

The answers supplied by the merchants (see appendix Table 'G') to the questions posed, (see appendix Table 'H'), revealed opinions on two key aspects of the natur e of the Gulf's business community at a time of rapid change in the Gulf's history; namely their perception of commercial opportunities, and their perception of the role of transport in facilitating or hindering the perceived business opportunities.

4.6.1 THE GEOGRAPHY OF MARKET PERCEPTION

Commercial 'intelligence' involves two main tasks: firstly, the seeking out of a commercially viable and suppliable 'market'; and secondly, once it is found, the exploitation, or avoidance of any official sanctions or regulations, which lie athwart that market. This section examines the perception of Gulf Merchants towards both their market opportunities and tariff barriers.

Merchants within the Gulf Shaikhdoms have limited internal markets. The three Shaikhdoms studied all have small populations: Kuwait (800,000), Bahrain (200,000), Dubai (100,000) (Beaumont, Blake and Wagstaff, 1975, p. 177). As such, local merchants seek business opportunities to re-export to markets within the Gulf and

TABLE 4.16 : Kuwait - Exports and Re-exports by Dhow, 1971

	Value (KD)	Weight (Kilos)
Iraq	13,567	85,487
Saudi Arabian	117,364	3,120,879
Bahrain	588,245	4,590,162
Qatar	419,140	1,386,055
S. Yemen	17,356	253,664
Sharjah	54,606	466,083
Oman	285,499	4,450,958
Dubai	860,511	8,716,715
Abu Dhabi	860,672	6,628,592
Ras Al Khaimah	34,572	949,754
India	4,477	8,259
Iran	2,262,833	30,632,487

Source : Central Statistical Office,
Planning Board,
Kuwait.
(unpublished)

TABLE 4.17 : Bahrain - (Exports and Re-exports 1972)

	Value (BD)	Weight (Kilos)
Abu Dhabi	568,819	1,794,670
Dubai	2,204,365	4,806,713
India	49,363	76,822
Iran	1,916,194	17,417,144
Kuwait	2,145,628	2,943,066
Oman	446,985	1,969,741
Qatar	332,708	3,343,958
Saudi Arabia	16,522,858	25,259,312
Iraq	5,642	31,556

Source : Foreign Trade Statistics, 1972,
Ministry of Finance and National Grading. p3.

TABLE 4.18 : Dubai - (Exports and Re-exports 1971 and 1972)

	(QDR)	
	1971	1972
Qatar	14,416,239	11,247,757
Iran	63,924,175	-
Muscat	17,397,759	30,488,635
Far East	11,143,624	17,539,063
Ceylon	2,570,411	-
Bahrain	5,680,746	6,964,993
S. Yemen	425,200	51,000
Kuwait	5,220,492	6,454,550
Saudi Arabia	3,998,875	6,444,752
Abu Dhabi	2,770,386	-
Other States	236,805	87,819,819

Source : 1972 Foreign Trade Statistics,
Port and Customs Dept., Dubai. pp79-80.

elsewhere in the Middle East and South Asia.

Tables 4.16, 4.17 and 4.18 illustrate the destination, and level of the re-export trade of Kuwait, Bahrain and Dubai. Kuwait was the only state for which the author was able to obtain a breakdown of trade statistics that differentiated dhow transport from ocean steamer, air and road transport. Since interest focuses on the nature of dhow transport, those figures are tabulated in Table 4.16. Undifferentiated figures for Bahrain and Dubai, however, can be construed to be largely representative of dhows, with the exception of the Dubai-Oman trade of which much travels by road (though no corroborative statistics exist.) An analysis of the multitude of trade routes across the waters of the Gulf breaks down into three major specialist trade patterns with regard to the three states studied:

1. Gulf Shaikhdoms - Iran trade,
2. Trade between the Arab States of the Persian Gulf,
3. Trade between Dubai and India and Pakistan.

1. <u>Gulf Shaikhdoms - Iran Trade</u>

Iran is supplied by the Arab shaikhdoms with a range of commodities, some legally imported, some illegally. Trade falls into two categories: food and smaller amounts of clothing and building materials supplied to many of the more 'remote' towns and villages along the Iranian coast; and secondly, articles such as radios, watches and cigarettes 'smuggled' into Iran to avoid heavy duties. Of course, much of the information gained with respect to the smuggled commodities was obtained by conversation with several merchants and officials and was not corroborated statistically. For example, in Table 4.18, figures for Iranian re-exports mysteriously 'disappear' for 1972, subsumed presumably under 'other states'. The author has personally witnessed sailors from an Iranian dhow berthed at Bahrain (Manama) stitiching jute bags over cartons of American cigarettes destined presumably for

Iran. Such trades are frustrating for the researcher who knows their great significance, particularly on routes to India, Pakistan and Iran, but who faces a lack of statistical evidence with which to measure their precise value. Yet their existence has to be stated.

The analysis of dhow flows in Section 4.5.2 and the application of a modified gravity model has indicated that the ports of Kuwait, Bahrain and Dubai each have their spheres of influence along the Iranian Gulf coast. Broadly, the villages along the waterways of the Shatt Al Arab in the west up to and including Bandar Rig in the east, fall within Kuwait's sphere of influence, from the town of Bushire to the village of Ayyarnat within Bahrain's and from Qais Island to Iran's villages on the Gulf of Oman within Dubai's area of trading dominance. It is perhaps stretching Christaller's Central Place model beyond its theoretical assumptions (Haggett, 1972, p.287) to suggest that the pattern of dhow flows from Iranian villages to and from Arabian ports is explained by a form of maritime 'central place system' stretching across the Persian Gulf, but in effect that is what happens. Faced with poor, slow or costly land communication along the Iranian coast or across the Zagros mountains to higher order centres such as Bushire, Shiraz and Bandar Abbas, merchants within the small coastal villages, particularly those south-east of Bushire, naturally gravitate to nearest higher order centre across the Persian Gulf to obtain some of the basic essentials of life. Naturally, there is an Iranian customs tariff to be complied with (see Section 4.6.2) but the Iranian Government issues import 'permits' to villagers who are themselves, exporters of local produce, and such permits are used to purchase goods in Arabian ports.

The Dubai merchant, Mohammed Al Fothaim, commented on the frequent visits to Dubai (by dhow) of Iranian shopkeepers to buy foodstuffs, vegetable oil, turmeric and tamarind. Trade statistics reveal that Kuwait and Bahrain specialise in re-exporting two basic food commodities - rice and tea (which has a high rate of consumption in Iran).

		Value	Weight - Kilos
Kuwait (1)	Rice KD	11,599,202	673,009
(1971)	Tea KD	388,241	129,991
Bahrain (2)	Rice BD	652,591	12,736,355
(1972)	Tea BD	157,677	377,625

Sources: (1) Kuwait Foreign Trade Statistics, 1971

(2) Bahrain Foreign Trade Statistics, 1972.

Dubai, unfortunately, does not publish re-export figures by commodity. The Iranians consume Thai or Burmese rice rather than the more costly Pakistani (basmati rice) and visit agents Youssef Akbar Ali Reza (Bahrain and Dubai), Shrukralla, and United Rice (Bahrain), W.J. Towell (Kuwait) and C. Purchottam (Bahrain and Dubai). The Purchottam family is long established in the Gulf region: Landen (1968, p.15) noted the dominance of Indian merchants in the Gulf in the late nineteenth century, of whom, 'typical was Rathansi Purchottam, who in the 1890's was not only the largest exporter in Muscat, but one of the two leading arms merchants". (p. 139). In Kuwait, the Purchottam family are major re-exporters of tea, along with Mustafa Sulaiman Abdul Karim and Haji Ibrahim Marafie. In Dubai, two of the largest tea importers, Jinda Tea Sales, and Gulaibi Tea, estimate to sell 98% and 80% of their tea to Iranian merchants respectively.

2. Trade between the Arab States of the Persian Gulf

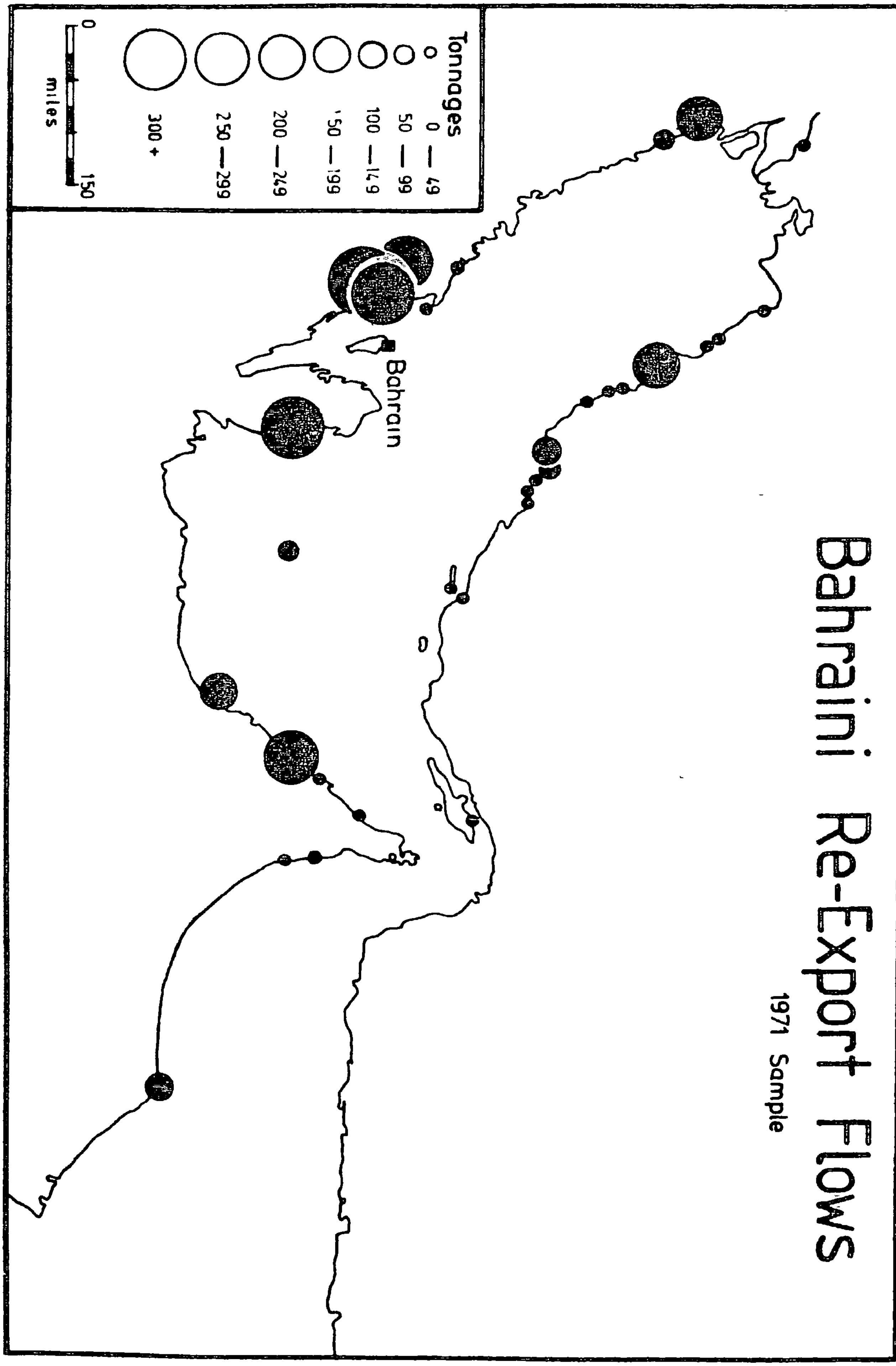
Trade between Arab Gulf states, using dhows, can be classified into two categories: 'regular' trades and 'irregular' trades. The best example of a 'regular' dhow trade route is the one linking Bahrain with the Saudi ports of Al Khobar and Dammam. Bahraini merchants take advantage of three market factors in their favour to sustain a year round transhipment trade with Saudi Arabia. Firstly, they pay no duty on transhipped goods

TABLE 4.19

: Bahrain Dhow Flows - Transit and Local Shipping Bills, 1971

	MARCH			JUNE			SEPTEMBER			DECEMBER			TOTAL		
	Trans.	Loc.	Total	Trans.	Loc.	Total	Trans.	Loc.	Total	Trans.	Loc.	Total	Trans.	Loc.	Total
Dammam	94.370	-	94.370	309.038	0.620	309.658	125.131	0.060	125.191	401.485	49.485	450.970	930.024	50.165	980.189
Al Khobar	270.740	62.171	332.911	184.724	16.938	201.662	299.849	16.555	316.404	89.986	78.553	168.539	845.299	174.217	1,019.516
Dubai	18.435	16.669	35.104	67.051	3.690	70.741	44.849	42.427	87.276	34.593	27.568	62.161	164.928	90.354	255.282
Abu Dhabi	1.036	12.970	14.006	29.481	4.180	33.661	10.890	52.002	62.892	6.343	45.405	51.748	47.750	114.557	162.307
Muscat	80.000	-	80.000	11.515	0.065	11.580	0.794	6.295	7.089	20.676	1.090	21.766	112.985	7.450	120.435
Doha	28.512	0.383	28.895	141.772	9.149	150.921	63.977	-	63.977	72.018	1.265	73.283	306.279	10.797	317.076
Qatif	1.851	-	1.851	77.204	24.464	101.668	89.947	4.359	94.306	46.282	25.645	71.927	215.284	54.468	269.752
Kuwait	14.129	7.950	22.079	25.167	31.064	56.231	47.678	0.460	48.138	61.250	4.920	66.170	148.224	44.394	192.618
Tombok	4.050	-	4.050	-	-	-	-	-	-	-	-	-	4.050	-	4.050
Rig	15.000	5.600	20.600	0.468	-	0.468	-	-	-	-	-	-	15.468	5.600	21.068
Dilwa	0.606	5.233	5.839	20.104	2.430	22.534	-	-	-	6.190	0.950	7.140	26.900	8.613	35.513
Bulklair	12.198	-	12.198	23.203	0.380	23.583	-	-	-	6.035	-	6.035	41.436	0.380	41.816
Ganaveh	27.582	35.610	63.192	34.459	-	34.459	-	1.080	1.080	11.873	-	11.873	73 914	36.690	110.604
Dayyer	11.404	0.374	11.778	46.752	6.910	53 662	17.455	0.126	17.581	14.070	1.360	15.430	89.681	8.770	98.451
Kangoon	16.550	25.832	42.382	-	-	-	20.038	1.775	21.813	22.938	1.943	24.681	58.326	29.550	88.876
Ayyumat	0.700	4.185	4 885	-	-	-	-	1.795	1.795	-	-	-	0 700	5.980	6.680
Khorramshahr	-	1.000	1.000	-	1.000	1.000	2.300	-	2.300	-	-	-	2.300	2.000	4.300
Bushire	-	0.525	0.525	0.318	0.870	1.188	8.722	5.261	13.983	203.551	6.940	210.491	212.591	13.596	226.187
Taheeri	-	1.680	1.680	15.300	8.400	23.700	-	-	-	-	-	-	15.300	10.080	39.000
Ras Al Khaimah	-	-	-	2.888	-	2.888	-	-	-	-	0.072	0.072	2.888	0.072	2.960
Moyan	-	-	-	20.472	0.144	20.616	-	-	-	-	-	-	20.472	0.144	20.616
Ajman	-	-	-	40.824	-	40.824	-	-	-	-	-	-	40.824	-	40.824
Ras Tanura	-	-	-	-	4.500	4.500	-	0.828	0.828	10.143	15.110	25.253	10.143	20.438	30.581
Lowar	-	-	-	-	1.129	1.129	-	2.517	2.517	1.000	0.095	1.095	1.000	3.741	4.741
Lavan	-	-	-	-	2.685	2.685	-	-	-	-	-	-	-	2.685	2.685
Dis	-	-	-	-	-	-	15.378	71.594	86.972	-	-	-	15.378	71.594	86.972
Daylan	-	-	-	-	-	-	7.052	-	7.052	-	-	-	7.052	-	7.052
Masira	-	-	-	-	-	-	-	6.263	6.263	-	24.967	24.967	-	31.230	31.230
Salalah	-	-	-	-	-	-	-	29.475	29.475	-	-	-	-	29.475	29.475
Jubail	-	-	-	-	-	-	-	-	-	0.973	0.640	1.613	0.973	0.640	1.613
Khor Fakkan	-	-	-	-	-	-	-	-	-	1.500	0.585	2.085	1.500	0.585	2.085
Dargwan	-	-	-	-	-	-	-	-	-	-	8.310	8.310	-	8.310	8.310
Kalba	-	-	-	-	-	-	-	-	-	-	0.215	0.215	-	0.215	0.215
Shu'aibah	-	-	-	-	-	-	-	-	-	-	56.000	56.000	-	56.000	56.000

Source : Customs Manifests, Bahrain.



Bahraini Re-Export Flows
1971 Sample
Tonnages
0 — 49
50 — 99
100 — 149
150 — 199
200 — 249
250 — 299
300 +
0
150
miles
Bahrain

FIGURE 4.17

passing through the Free Transit Zone at Mina Sulman. Secondly, in many cases, Bahraini merchants are agents for the Gulf for a variety of foreign manufactured products. Thirdly, the speed of discharge and customs clearance facilities in Bahrain is used to its best advantage.

Ameen Trading are a typical import-export firm. They are commission agents for firms manufacturing clothes and shoes in China, Hong Kong, Taiwan and Japan. Having direct contact with suppliers they are able to purchase large stocks of new items, 50% of which they re-export (tranship) to Saudi Arabia. Holding the agency on such items precludes Saudi businessmen from importing directly. Akund Awazi agency imports similar items, shipping 85-95% to Saudi markets.

Table 4.19 and Figure 4.17 illustrate the spatial pattern of Bahraini re-export flows and underline the function of Bahrain in operating as a 'warehouse' for goods destined for Saudi markets. The data was acquired by sorting through and aggregating all the customs manifests at Manama based on a stratified sampling method. All the transit and local shipping bills (re-exports) were aggregated for a calendar month at three monthly intervals (March-June-September-December) for 1971. Tonnage of cargo by destination was recorded. The pattern reveals three types of trade: Firstly, the dominant regular transit trade to ports in eastern Saudi Arabia; secondly, a transit/re-export trade of a lower order of magnitude to other major Gulf ports; and thirdly, a less regular, smaller scale trade to small villages and towns on the southern Iranian coast.

Irregular trades within the Gulf are explained mainly by merchant exploitation of shortages. The movement of rice and certain building materials are examples. Pakistani 'basmati' rice is consumed as a staple food in all the Arab states of the Gulf. The main supplier is W. J. Towell, a firm who has held the monopoly since 1958 because of its ability to purchase an entire Pakistani crop (by public tender) for distribution through the Gulf and elsewhere in the world. In 1973, the firm distributed basmati through the Gulf as follows:

Saudi Arabia	36,000 tons
Kuwait	25,000
Dubai	10,000
Bahrain	10,000
Sharjah	6,000
Abu Dhabi	6,000
Muscat	3,000

Source: W.J. Towell.

This proportional distribution leads from time to time to redistributions between states by merchants who sell on demand, and therefore the price rises. The pace of construction activity along the Gulf, coupled with the propensity for world price rises in such commodities as steel and cement, presents certain Gulf merchants with the chance to exploit their situation. For example, Kuwaiti merchant Badr Al Salim re-exports steel products to Iran and Saudi Arabia by utilizing his large stock and under-selling world price rises in Soviet, Chinese, Japanese, Korean and Indian steel. In a similar vein, Mustafa Sultan was selling steel bars at KD 61 a ton in February 1972, compared with the world price of KD 68. The juxta-position of Kuwait and Iraq attracts Iraqi commercial attaches to recommend purchases of 'Kuwaiti' steel through government contracts. Cement, is another commodity in great demand throughout the Gulf, and is exploitable in the sense that shipping 'charter rates' are an open market, allowing specialist merchants such as Khalid Al Ghanaim (Kuwait), Mohammed and Ahmed Haji and Abdullah Kayed Ahli (both Dubai) to purchase large quantitites of cement by charter, for later redistribution to Gulf markets. For example, in 1971/1972 the following major tonnages of cement were imported into Dubai:

Origin	1971	1972
India	75,005,000 Kilos	31,740,935 Kilos
Pakistan	56,100,000	106,381,000
Kenya	83,102,500	51,700,000

Source: Dubai Foreign Trade Statistics 1972, p. 227.

3. Trade between Dubai and India and Pakistan

Although the dhow trade between Gulf ports and East Africa is largely eclipsed, the traditional link between the Indian sub-continent and the Gulf continues, though few dhows in this trade route venture west of Dubai which has become the major terminus of the trade. The dominant direction of the trade has been reversed in favour of flows of commodities to India and Pakistan with ships returning to Dubai usually with empty holds. The nature of the gold smuggling trade, together with the re-export of watches, radios and other consumer goods is discussed in Section 4.6.3. However, Dubai merchants dealing in imported textiles (chiefly from Japan) serve to illustrate the basic nature of business perception with respect to the Indian/Pakistani market. Basically, India in particular, despite the distance factor, is seen as a large market of 600 million, where, to quote one Dubai merchant, "if you take 1% of 600 million, that is still a large number." Messrs. Royal Traders and Regal Traders of Dubai, exploit what they call the demand, "of rich people crazy for non-Indian products", including re-exported Japanese textiles (despite domestic Indian production of excellent handloom cotton textiles), British silk, Japanese and Swiss watches and American cigarettes. Royal Traders reported 25 - 40% profit margins on Japanese textiles smuggled into India. The extent of this particular trade (all conveyed to India by purpose-built dhow) can be judged, in the absence of re-export figures, by import statistics denoting very high import levels of Japanese nylon textiles:

Imports of Japanese Nylon Textiles, Dubai 1971/72:

1971		1972	
Kilos	Value (QDR)	Kilos	Value (QDR)
2,492,350	45,220,021	3,633,200	76,959,311

Source: Dubai: Foreign Trade Figures, 1972, p.184

4.6.2. TARIFF BARRIERS

An important issue concerns whether or not 'Developing' states should protect their economies by sheltering behind high tariff walls. The Economist, P.A. Samuelson, advances the theory that, "in any economic system unhampered trade promotes a mutually profitable international division of labour, greatly enhances the potential real national product of all countries and makes possible higher standards of living all over the globe." (1958, p.672). However, in reality, "it is rare that unhampered trade is allowed to take place between nations." (Toyne, 1974, p.253). Instead, the existence of tariffs and certain trade agreements constrain the forces of specialization and free trade. In some cases, developing countries have felt themselves quite justified in a policy of tariff protection in the national interest, or on specific social or economic grounds such as the need to curb unemployment or to protect newly established industries. Since 1948, the United Nations sponsored General Agreement on Tariffs and Trade (GATT) has sought to lower tariff walls, or at least to promote certain international commodity agreements (ICA) where it is established that either widespread unemployment or considerable surpluses cannot be avoided by normal market forces under free trade conditions. In practice, many Developing Countries feel that tariff protection is the only way by which foreign trade can be constrained and their economies allowed to develop to the stage at which they are able to derive reasonable terms of trade (H.G. Johnson, 1967).

Trade policy instruments that a state may use to protect its domestic industry by restricting imports, are basically of two types: The first policy aims to control the price of the imported product through the use of customs duties, taxes and other charges levied on importation. Alternatively, there are policies designed to limit the quantity of goods imported through the imposition of import quotas, licences, or, in the case of the Persian Gulf, the Arab boycott of items made by firms deemed to be in sympathy with Israel. However, "recourse to quantitative import restrictions has tended to be the exception to general practice at least in the majority of developed countries, while the customs tariff has gained in importance as a trade policy instrument. This is in line with the concept of non-discrimination in international trade, one of the basic principles of GATT, which governs 85% of total world trade." (O.M. Hill, 1970, p.13).

Tariff Policy within the Persian Gulf

1. Historical Significance

Differential customs tariffs are a major factor in the movement patterns of certain commodities in Gulf's intra-system trade. In fact, tariff barriers are of historical, as well as contemporary significance, and examples of the relationship between trade patterns and tariffs go back at least two hundred years. The Arab historian, Abu Hakima (1965), cites a case study from the late eighteenth century in his History of Eastern Arabia: In 1770 - 80, the merchants of the Turkish controlled port of Basra contrived to avoid paying the heavy duties levied on imports by their over-lords. The main trade route was Bombay-Muscat-Bushire-Basra-Baghdad-Aleppo. Basra merchants arranged for cargoes of Indian cloth, building materials, sugar, spices, metals and drugs to be consigned via Kuwait (then known as 'Grain') and on by caravan to the markets of Aleppo to avoid these duties. Abu Hakima estimates that in bypassing Basra, the merchants defrauded the Turkish Government of 15-17%

of the value of customs duties. In this same link in the 1790's both Abu Hakima (1965) and Landen (1967 comment on the contrasting ability of the Government of Muscat to exploit this entrepot trade in a more water-tight fashion than did Basra. The abandonment of 'Gombroon' (Bandar Abbas) as a trading station by the Europeans in 1763, left Muscat in commercial control of the Gulf of Oman and Straits of Hormuz and able to exploit trade in the period 1750-1800 by charging a 6½% duty on all imports (latter reduced to 5%). Landen (1967, p.61) estimated that, "in the last decade of the eighteenth century about 5/8 of the total long-distance trade in the Persian Gulf passed through Muscat". Couched in systems terms, the customs revenue, noted by Abu Hakima (1965) as being used for storage and reinvestment, allowed Muscat, in the period from 1750 until the coming of the steamship in 1862, to move into a state of dynamic equilibrium in which the acquisition of substantial customs revenues and their investment ultimately led a growth on the spatial extent of Omani commercial control, particularly in the actual expansion of the Omani trading empire to include ports of East Africa and Zanzibar in the reign of Sultan Said bin Sultan 1806-1856.

The port of Lingeh provides another classic historical case-study of the sensitivity of merchants to tariff conditions. Lingeh inherited the nodal trading position of Hormuz and Bandar Abbas as a strategic entrepot at the head of the Gulf, from the late eighteenth century onwards. Gunther Schweizer (1972, p.15) plots the demise of Bandar Abbas, and relates it to anarchic conditions in Iran during the eighteenth century, and in particular to the decision of Nadir Shah (1727 - 1747) to develop the port of Bushire as his naval power base. Without emanating Muscat as an entrepot, Lingeh nonetheless built up a sizable transit trade during the nineteenth century based on liberal trading policies. A severe blow was struck to this modest commercial success when in 1887, Lingeh fell under the Persian administration of Gulf ports. By 1908 (Lorimer, 1915), Lingeh was a declining town:

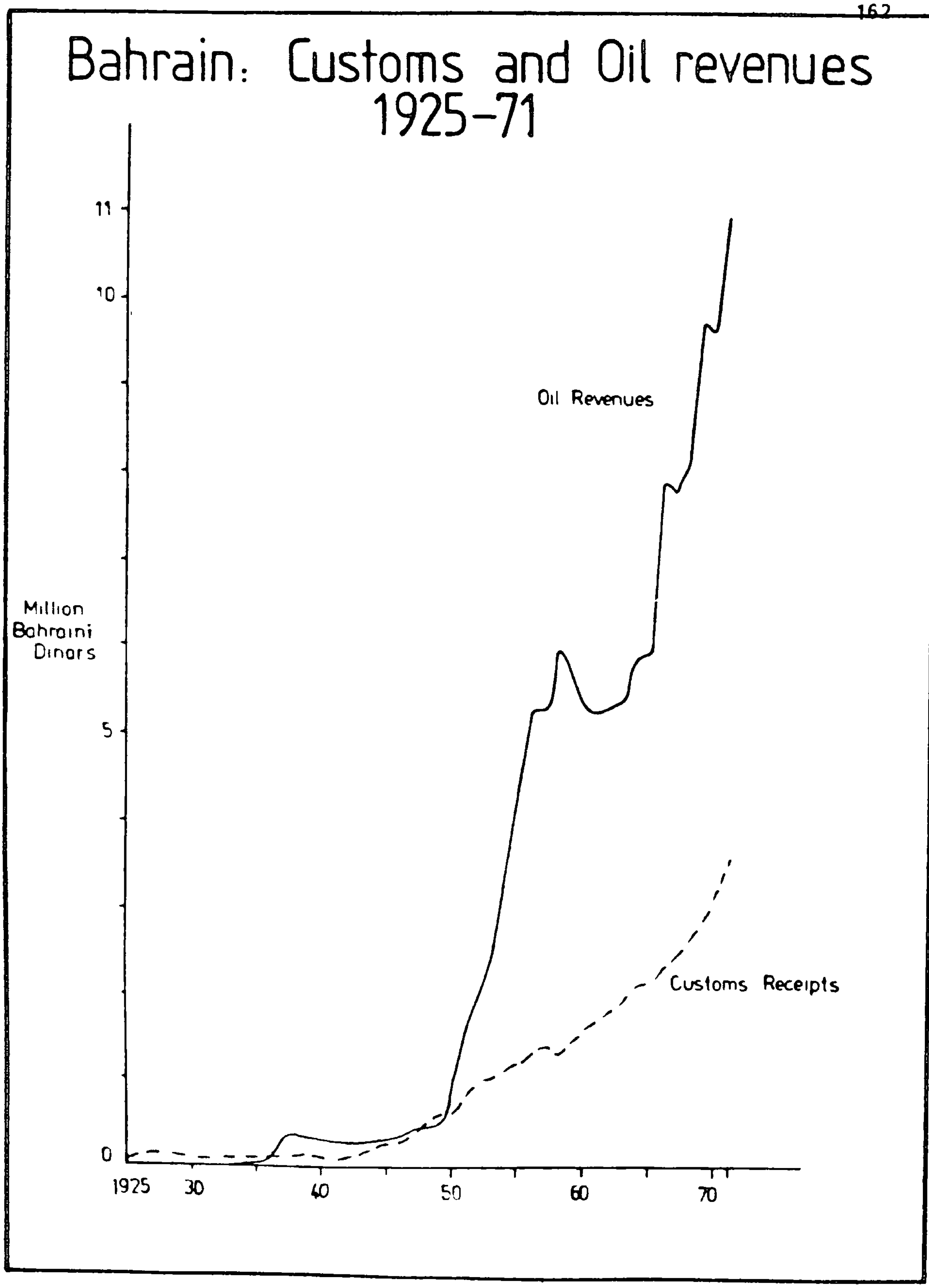

Bahrain: Customs and Oil revenues
1925–71
11
10
5
0
Million
Bahraini
Dinars
Oil Revenues
Customs Receipts
1925
30
40
50
60
70

FIGURE 4.18

the cause of which was directly attributable to the zeal of the reformed Persian Customs and the disastrous imposition of a high customs tariff which effectively shattered the basis of Lingeh's transit trade. Faced with financial loss, the merchants of Lingeh looked elsewhere for a base to trade profitably, turning ironically to a competitor, the port of Dubai on the Arabian coast. Initially establishing agencies in Sharjah, Lingeh merchants eventually migrated in large numbers to Dubai, where it was estimated (Lorimer, 1915) that goods imported could be sold for 10% cheaper than similar goods imported through Lingeh.

Bahrain offers a more recent example of how the significance of customs revenue has dropped away in terms of government revenues after the oil finds of the twentieth century came on stream. Figure 4.18 illustrates that until 1935, Bahraini revenues depended wholly on import customs whose quantity depend on the success of the pearl trade. In the 1920's Bahrain employed a 5% tax on imports, a 2% tax on re-exports and a 1 $\frac{3}{4}$% tax of transhipped or transit cargo. This World Slump of 1929-30, together with the competition from Japanese cultured pearls led to a reduction in revenues in the early 1930's, due principally to the drop in price of commodities such as rice, coffee and flour. Duties were therefore increased in 1933 - 34 from 5 to 10% on luxury items, and from 5 to 15% on tobacco and liquor. However, fortunately oil revenues began to be paid from 1935 onwards, leading to a position by 1950 where oil revenues assumed the major significance in terms of national economy, leading to a point in 1958, where the Government was able to scrap the 2% transit tax, and thereby stimulate its transit trade to Saudi Arabia without endangering economic stability.

11. <u>Contemporary Policy</u>

Contemporary trade policy within the Gulf consists firstly of the case of a variety of tariff barriers designed to affect the prices of certain imports, and secondly of an Arab Agreement for the promotion of Trade and an Israeli Boycott, both of which are designed to

TABLE 4.20

: Comparative Customs Tariff on Selected Commodities within the Gulf - 1973

	Kuwait	Bahrain	Qatar	Abu Dhabi	Dubai	Oman	Saudi	Iran	Iraq
Pharmaceuticals	4	5	2.5	2.5	3	5	Nil		
Domestic Iron	4	5	2.5	2.5	3	7	20	30-15	
Stationery	4	5	2.5	2.5	3	7	15	40-Nil	
Air Conditioners	4	10	2.5	2.5	3	17	5	25-35	
Refrigerators	4	10	2.5	2.5	3	7	15	25-35	
T.V./Radios	4	10	2.5	2.5	3	7	15	25-75	
Record Players	4	10	15	2.5	3	7	15	25-75	
Fresh Meat	4	5	2.5	2.5	3	5	Nil	10R-Nil	
Watches	4	10	2.5	2.5	3	7	10	30-2	
Ready-made Clothes	4	10	2.5	2.5	3	7	25	200R-500R	
Shoes	4	10	2.5	2.5	3	7	25	100R-600R	
Cotton Textiles	4	5	2.5	2.5	3	7	20	18.3R-90R	
Nylon Textiles	4	5	2.5	2.5	3	7	20	18.3R-90R	
Canned Food	4	5	2.5	2.5	3	7	25	6R-50R	
Fresh Fruit	4	5	2.5	Nil	3	7	Nil	3R-25R	
Timber	4	5	2.5	2.5	3	7	5	750R-2000R	
Photo Film	4	10	2.5	2.5	3	7	15	100R-20R	
Alcohol	100	50	50	2.5	3	50	Ban	80R-320R	
Cigarettes	4	15	10	2.5	3	7	SR 5 per kilo	100R-200	
Live Animals	4	5	2.5	2.5	3	7	Nil	Nil	
Eggs	4	5	2.5	2.5	3	7	Nil	5R-Nil	
Coffee	4	5	2.5	2.5	3	7	SR 0.30 per kilo	30R-30R	
Tea	4	5	2.5	2.5	3	7	SR 0.60 per kilo	51R-49R	
Rice	4	5	2.5	2.5	2	7	Nil	1R-Nil	
Wheat	4	5	2.5	2.5	2	7	Nil	Nil-Nil	
Flour	4	5	2.5	2.5	2	7	Nil	Nil-5R	
Sugar	4	5	2.5	2.5	2	7	15	2.5R-5.25R	
Perfume	4	5	2.5	2.5	3	7	20	400R-600R	
Furniture	4	10	2.5	2.5	3	7	30	100-200	
Steel Bars	4	5	2.5	2.5	3	7	5	2R-2R	
Cars	4	10	2.5	2.5	3	17	30	15-20	
Lorries	4	10	2.5	2.5	3	17	10	25-Nil	
Cardomon	4	5	2.5	2.5	3	7	SR 1.50 per kilo	5R-10R	
Cement	4	5	2.5	2.5	2	7	SR 21 per ton		
Soap	4	5	2.5	2.5	3	7	15	35R-40R	

N.B. Dubai 4.625 until Sept. 1973 Air Cargo : 2% (Watches, gems of 1½%)
Saudi New Tariff June 1973
Iran Duty and C.B.T. (Commercial Benefit Tax)

Sources : Respective Customs Tariffs.

affect the quantity of trade between nations.

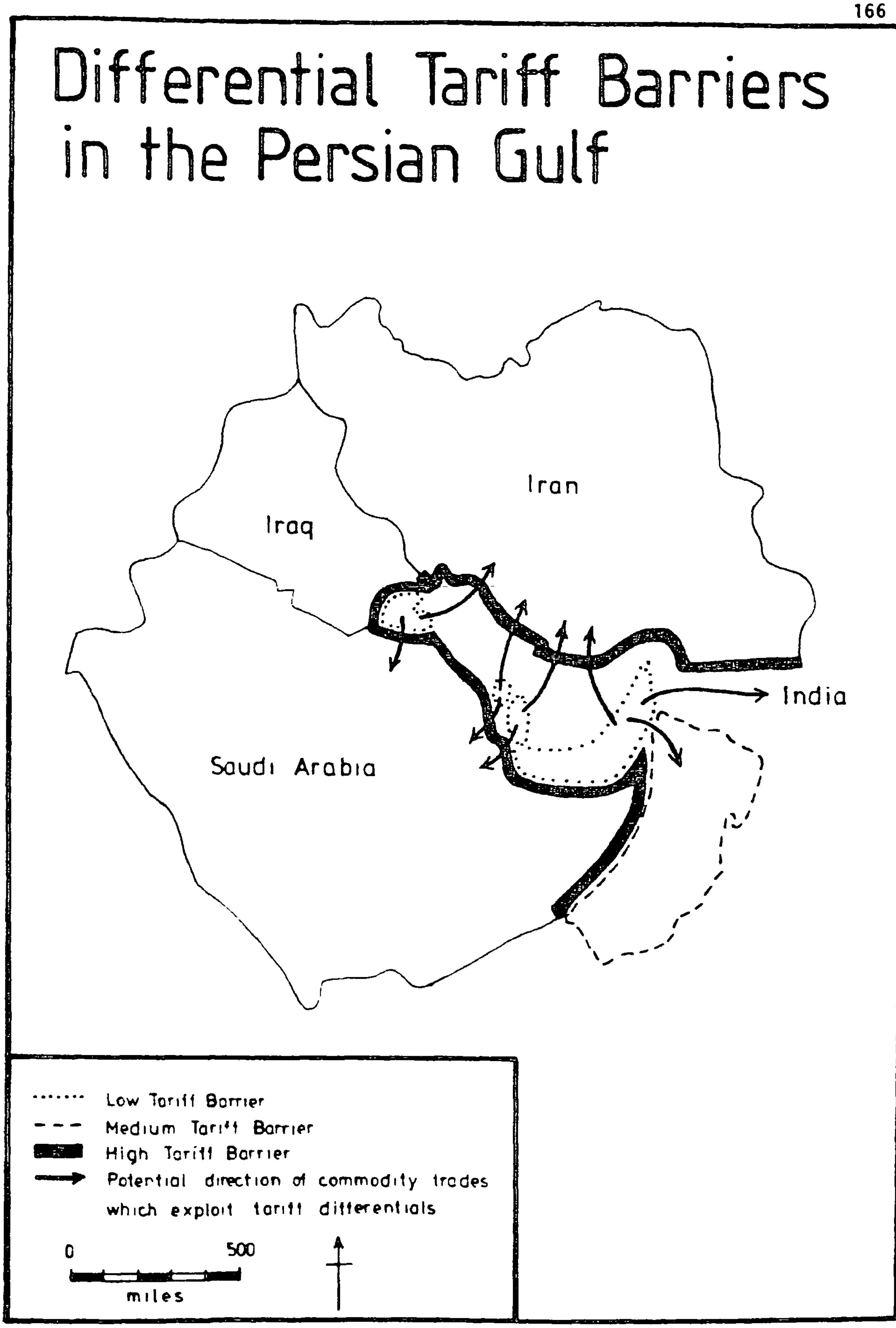
Tariffs

Basically, customs duties are normally levied to provide revenue to the government, or to protect domestic industry, or for both reasons. Table 4.20 is a comparative display of the customs tariffs in effect in the Gulf in 1973 for a selection of commodities. Scrutiny of the table records a three-fold classification according to the scale of tariff. Kuwait, Qatar, Abu Dhabi and Bahrain operate a low tariff policy with duty on most items below 5% ad valorem. The duty collected provides Government with revenue which forms a decreasing proportion of total revenue earned in the wake of the oil industry and industrialization projects. These low tariffs, therefore, are symbolic of the states desire to attract trade through low tariff walls in order to stimulate the growth of national economies, plus the attractive transit and re-export commerce. Oman is representative in an intermediate category. Most items carry a 7% duty, though there are much higher rates on certain key commodities (i.e. 17% of air conditioners, cars and lorries).

Saudi Arabia and Iran are representative as the third, high tariff category. The two richest states have embarked upon a programme of industrialization to diversify their oil-centred economies. Characteristically, with growing industrialization the emphasis usually shifts from duties levied primarily for revenue, towards duties designed to project domestic industry. For example, the high duty payable on cigarette imports into Iran reflects a protectionist policy towards local industry. Kuwait, though a low tariff state, also protects its local industry via higher tariff rates on imported substitutes.

Trade Agreements

Apart from the unique boycott of firms who trade with Israel, some Gulf states operate



Differential Tariff Barriers in the Persian Gulf
Iran
Iraq
Saudi Arabia
India
Low Tariff Barrier
Medium Tariff Barrier
High Tariff Barrier
Potential direction of commodity trades which exploit tariff differentials
0
500
miles

FIGURE 4.19

certain preferential arrangements. The Arab Agreement for the Promotion of Trade, 1957, was signed by Kuwait, Iraq, Egypt, Syria, Lebanon, Jordan and Yemen. In this agreement intra-regional trade in certain industrial items carried a 5% or 25% reduction on usual tariff rates. Agricultural production in these Arab League States were exchangeable free of duty. Outside the Gulf an Arab Common Market was established in January 1965, involving Egypt, Syria, Iraq, Jordan, Sudan and Yemen, and providing for the gradual dismantlement of tariffs and quantitative restrictions on trade. Within the Gulf, the arguments for the establishment of a Gulf Free Trade Area have been examined by R. El Mallakh (1968). Essentially, El Mallakh feels that Regional Economic Co-operation would be assisted by the elimination of tariffs between the Gulf states. Such a Free Trade Area would doubtless cut down on smuggling, but equally it would undermine the free trade economics of Kuwait, Bahrain and Dubai.

Spatial Consequences

Figure 4.19 is an attempt to illustrate in map form, the trading dynamic inherent in the existing tariff structure within the Gulf (see Table 4.20). It makes its point that without a common tariff policy, imports to the Gulf can arrive through the lower tariff nations, and from there filter throughout the region. Given the differential pattern of tariffs in the Gulf, the merchants of Kuwait, Bahrain, Qatar and the United Arab Emirates are well placed to act as middlemen for the re-export and transit trade to Iran, Saudi Arabia and Oman - as well as to the Indian sub-continent where a similar differential arises. Iraq carries on only small scale trade with the other Gulf States.

111 The Merchants' Perception of Tariff Barriers

Perception of the Iranian Tariff

Iran's protective tariff, together with its coastline of over 1,000 miles length, makes it a natural business target for merchants in the low tariff shaikhdoms across the Gulf. Increasing vigilance by Iranian customs officials (using hovercraft) together with the issuing of licenses permitting villages to import small quantities of basic necessities in Arab ports (i.e. 50 - 100 k.g. of rice a month) have failed to stop the illegal entry of certain high tariff items. W.J. Towell in Kuwait, imported 250,000 cases of cigarettes in 1972 (1 case = 10,000 cigarettes or 10.84 kg, i.e. 2,500,000,000 million cigarettes or 2710 tons) of which 30% were consumed locally and 60% and 10% respectively were 're-exported' to Iran and Iraq). 'Sharif and Hatiam (Bahrain) estimated that a total of 120,000 cases of Winston cigarettes a month were being shipped to Iran in 1973. A Kuwaiti firm who acted as agents for a branch of Japanese radios, admitted 're-exporting' 80% of their stock to Iran in 1973: pocket two-ways transistor radios were smuggled in jute bags mixed with genuine products (i.e. toys) which were declared and liable to a low duty.

Perception of Saudi and Omani Tariffs

Saudi Arabia and Oman have land borders with 'low tariff' Kuwait and the United Arab Emirates. Untraceable lorries and other vehicles can travel at night avoiding main roads and customs posts. An admitted practice in Dubai for merchants shipping goods by road into Oman through recognized existing posts is the 'under valueing' of manifests. One Dubai firm admitted declaring only 60 -70% of the correct value of textiles shipped to Muscat in order to save duty for the merchant concerned. Also unsubstantiated is the claim by Bahrain merchants, that although Bahraini Government statistics of re-exports to Saudi Arabia are correct, the 'second copy' is often altered to a figure lower than the real value for Saudi Customs.

Perception of Indian Tariff

Before 1961, Portuguese Goa, only three hours from Bombay was the centre of smuggling into India. Kuwait up to 1966, and Dubai after that date, took over that mantle as the only 'free port' within the Indian Ocean maritime system. For one Dubai firm the inducement to smuggle is clear cut: Cloth in India is expensive due to a 500% duty on yarn imports, and finished textiles are banned from importation. Hence the inducement to smuggle to satisfy demand. This firm reported the unprovable claim that in 1973, 2 - 4 boats a day left Dubai for India (except in the monsoon seasons) carrying between 200 - 300 rolls of nylon textiles (each roll weighs 50 kilos and contains 1,000 yards of cloth).

4.6.3 SMUGGLING

Smuggling is endemic within the Gulf and its wider maritime trading system. It is a form of adaptive specialization geared to the survival of sailors and merchants alike. It is likely to have been practiced in minor forms for centuries. Villiers (1940) likens the activity as carried on by nakhodas, crewmen, passengers and merchants, as a way of life: a habitual supplement to the precarious financial position of sailors in the yoke of their merchant masters. It is a fitful activity, wavering in regard to changes in the demand for certain commodities, in the availability of those commodities, and in the external raising and lowering of customs tariffs. It has derivative activity on which it is founded - that of bureaucratic corruption.

From a Eurocentric perspective, the activity known as smuggling has a clear, unseemly, criminal label attached to it. Smugglers are considered, circumscribers, deviationists, from the usual ordered bureaucratically controlled system of trade and movement between nations. The word smuggling, in its European usage, is to be used ill-advisedly. In a Gulf context, such irregular flows of goods and people are not thought of by the peoples of the Arabian littoral as shadowy, illegal acts, which indeed are not even considered to be 'smuggling'. Such activity falls under the umbrella of every day activity of making a living through the carrying or transit trade.

The character of smuggling has changed and contracted in a similar manner to the curtailment of the dhow trading system (see Section 3.3). It has changed from being a

TABLE 4.21 : Sample of 51 manifests for period March 1 - April 19, 1973, Smuggled Commodities.

	Number of Units
Radios	657 boxes
Cigarettes	17 "
Tea	571 boxes (9427 kg)
Televisions	6
Nylon Ropes	46 units
Nylon Mats	34 "
Fishing Nets	140 "
Clothing	24 boxes
Tape Recorders	4 units
Car Spares	1 box
Nylon Bags	8 boxes
Sugar	1 bag
Radiograms	1 unit
Glassware	2 boxes
Watch-making equipment	1 box

Source : Kuwait,
Port and Customs Department.

TABLE 4.22 : Sample of Exporting Dhows, April 1-8, 1973.

Destination	Total Cargo Kg	Number of dhows	
		Legal Trade	Smuggling
Abadan	693,986	25	0
Khorramshahr	183,332	10	0
Rig	1,801	1	4
Ganaveh	6,010	6	1
Daylam	2,210	2	1
Bushire	1,240	3	0
Dilwa	5,065	1	1
Bulkhair	120	0	1
"Bahrain"	26,529	1	8
"Doha"	3,040	0	2
"Abu Dhabi	30,199	1	0
Sharjah	7,590	2	0
"Dubai"	151,833	3	4
Ras al Khaimah	13,418	2	0
Muscat	206,491	3	0

TABLE 4.23 : Official Figures : Kuwaiti Re-exports by Dhow, 1971

(a) Cigarettes

Destination	KD Value	Kg Weight
Qatar	133,824	228.274
Dubai	142,588	211.828
Bahrain	11,017	16.235
Iran	6,195	10.547
Other	12	25
Total :	293,636	466,905

(b) Transistors

Destination	Number	KD Value	Kg Weight
Qatar	37,053	38,639	81,106
Dubai	10,702	9,725	23,792
Bahrain	8,516	9,250	18,259
Iran	2,300	2,072	4,780
Abu Dhabi	200	250	630
Ras al Khaimah	145	140	350
Saudi Arabia	350	350	320
Other	62	105	210
Total :	59,328	60,531	129,447

Source : Kuwait,
Port and Customs Department.

small-scale, widespread activity, practiced the length and breadth of the dhow system from the Gulf, across the South Arabian coast to East Africa, leading Villiers (1940) to conclude that some sailors were inveterate smugglers, into a highly organized activity to exploit the regional demands and inequalities resulting from tariff differentials between the Gulf Shaikhdoms and 'customers' in Iran, Pakistan and India. In short, smuggling by dhow became during the 1950's, 1960's and 1970's, became a highly organized form of specialization, for 'group' profit, as opposed to former small-scale operations.

The geography of smuggling (by dhow) in the Gulf, is by definition, difficult, if not impossible, to measure, though its explanation is possible. Data related to regular trade is at best sketchy and often unreliable; data on 'irregular' trade has to be arrived at via indirect sources. In some cases statistical anomalies revealed in official statistics are a clue to the geographical pattern of smuggling activity.

Two spatial patterns emerge from the study of smuggling in a Gulf context; both involve the circumscription of tariff barriers (see Section 4.6.2). The first involves the smuggling activities within the Gulf, principally between 'low tariff' Arabian entrepots and 'high tariff' Iran. The second pattern links the Gulf (principally represented by Dubai) to the Indian sub-continents.

The Arabian - Iran Trade

Tables 4.21, 4.22 and 4.23 is a compendium of unpublished statistics obtained from Kuwait customs officials at Sief Harbour (Table 4.21 and 4.22) and the Bureau of Statistics (Table 4.23) as examples of the spatial extent of smuggling. Table 4.23 is compiled from a specially prepared computor breakdown of foreign trade by mode of transport obtained by the author for the year 1971 (Sea, Dhow, Air and Road). Tea, cigarettes, nylon textiles, electrical goods from the bulk of the commodities smuggled in the sample (see Table 4.21). Overt smuggling to small Iranian ports such as Rig, Ganaveh and Dilwa, is seemingly more significant in comparison to 'smuggling' to the lower Gulf states of Bahrain, Doha and Dubai (see Table 4.22). This is misleading. Fear of arrest by vigilant Iranian customs officials, despite the long coastline, has forced nakhodas to prepare a second, or bogus, manifest, itemizing the carriage of goods to some Arab state rather than to Iran. Hence, in Table 4.22 some 11,529 kg of goods manifested to Bahrain are likely to have been smuggled to Iran, as well as 3,040 kg 'manifested' to Doha and 7,970 to Dubai. The official trade figures are therefore wrong. Table 4.23 reveals official statistics denoting heavy re-exports of cigarettes and transistor radios to Qatar, Dubai and Bahrain. Cross-checking with the Gulf states concerned revealed that no such cargoes ever arrived (i.e. they do not show on customs statistics) with the conclusion being that they were smuggled to Iran.

The Gulf - India Trade

Dubai is the centre of the more specialized, highly organized 're-export' trades to India. Three main cargoes dominated the trade through the late 1960's and early 1970's - gold, watches, textiles. Section 4.2.4. has commented on the construction and use of specialist dhows on this route. An example of how dhow transport nakhodas and merchants carved themselves a commercial niche was the exploitation of the so-called 'gold-trade'.

Gold Trade

"Get Gold", wrote King Ferdinand of Spain to his men in South America in 1511, "humanely if you can, but against all hazards get gold". Prof. R. Tiffen (T. Green, 1971) has not ed that, "nobody could have ever conceived of a more absurd waste of human resource than to dig gold in distant corners of the earth for the sole purpose of transporting it and re-burying it immediately afterwards in deep holes....". The dhow system of the Gulf was uniquely adaptable to the conveyance of this specialist commodity once Portuguese

TABLE 4.24 : Dubai : Gold Imports 1965 - 1972

	Metric Tons	(QDR million)
1965	118.1	-
1966	126.8	-
1967	104.5	16.1
1968	167.3	26.1
1969	138.5	26.7
1970	259.0	30.5
1971	215.5	28.0
1972 *	225.0	

Source : W.R. Duff (1971)
* C. Dennett (1972)

Goa had ceased as the major supplier of the Indian market.

"Gold", wrote T. Green (1971) "to the Indian is like an 'American Express Card' and his life insurance policy to an American. It is as much a part of life as the caste system and sacred cows". It is a hoarded commodity, symbol of 'Lakshmi', the Hindu goddess of wealth, used as a wedding dowry ('strindhana'), and is the principal female status symbol. An Indian Law of 1947 forbad its importation, forcing the trade underground, initially to Goa, then to Kuwait in early 1950's, and to Dubai in the mid 1960's until economic inflation cut the margins of profitability in the early 1970's.

In 1968, the Middle East market absorbed just of 90 tons of gold bullion (Smets, 1971) in addition to conveyancing a further quantity of almost 200 tons onwards, principally to the Indian market. Dubai, its merchants, sailors and its dhows were chief engineers and beneficiaries of this trade. Table 4.24 charts the rapid rise in the tonnage of gold imported for shipment by dhow in the preiod 1965 – 1972. Imports of gold rose from an average in Dubai of QDR 300,000 per month in 1960 to QDR 2,600,000 in 1972, the profits from carriage to India forming the backbone of the initial economic and urban growth of the emirate prior to the beginning of oil revenue in 1972. A fleet of dhows was built or adapted to serve Dubai as the third largest gold market in the world.

At its height up to 40 of the dhows described in Section 4.2.4. were used to carry the golden cargo. The 22 - 24 carat gold was carried by the crew, hidden in corsets designed to carry small '10 tola bars' weighing 3.72 ounces (116.00 gm) each. The sailors, as such, were merely a small part in a well run system, in which merchants, foreign banks, middlemen and receivers took their cut, although it was the sailors who bore the risks of arrest and imprisonment. A round trip, weather dependent, took an average between 9 - 12 days to complete from Dubai to Bombay's outskirts, from which a Dubai investor was lucky if he made 8 or 9% profit on a voyage (Bennett, 1973). The downturn in the trade (post 1972) again illustrates the force of external (economic) influence on the dhow transport system, together with the constant need for merchants and sailors to adapt to new commercial circumstances.

4.6.4. MERCHANT PERSPECTIVES : MICRO - SCALE CASE STUDIES

The following section consists of a set of micro - scale case studies of the methods used by 12 merchants (8 from Bahrain, 4 from Dubai) in the conduct of their trading operations which involve dhow transport. The first 8 merchant (all Bahraini) studies include supporting data obtained by sifting through customs manifests lodged in the Customs warehouse at Manama dhow harbour. In each case the data (taken from transit and re-export shipping bills) provides evidence of the destination of re-exported cargoes (by weight) through an aggregration of a two week sample of manifests taken from the first calendar week in the months of September and December 1971.

1. H.E. MUFTAH (Bahrain)

(in Kilograms - Kg)

Destination	Textiles	Clothes and Shoes	Spices	Household goods	Total
Dammam	119628	34334	-	16185	170147
Al Khobar	1602	-	17000	7500	26102
Qateef	6941	15035	-	-	21676
Kuwait	16832	654	-	15000	18986

(144 manifests)

Muftah is a clearing agent whose main business lies in dispatching small lots of textiles, clothes, shoes and household items (suitcases, sheets and pharmaceuticals) to Saudi customers through the ports of Dammam, Al Khobar and Qateef. He is also an agent for imported cardomon seeds and ginger which he re-exports to Al Khobar.

In 1971 the Saudi port of Dammam was afflicted by delays caused by insufficient berthing capacity and problems associated with discharge and clearance of cargoes by the port and customs authorities. In this context, the majority of Saudi customers who use Muftah as a supplying agent do so because of the time factor advantages offered by importing cargoes through the Bahraini port of Mina Sulman. Bahrain is attractive because of the faster handling rates in the port (as opposed to those at Dammam) and faster clearing times through customs and the Bahraini banks. On average, in 1971 it took 3 days to clear a cargo in Bahrain as against 2 weeks in Saudi Arabia. A further factor in favour of Bahrain is that use of the short-sea transit route to the Saudi mainland affords an opportunity to alter the amount of the value of a cargo shown on a 'second copy' of a customs manifest, thereby defrauding Saudi customs of a portion of the duty which would be levied.

On arrival in Bahrain merchandise destined for Saudi customers in transferred to Muftah's care on the instructions of a Bahraini bank. He then clears the cargo and arranges for its transhipment by dhow through the dhow harbour at Manama to Saudi mainland ports. The cargoes are usually transferred by Muftah's staff of five men (three in the port of Mina Sulman, one clearing agent and one man who arranges dhow transport at Manama) who divide cargoes up into small lots of about 10 cases for shipment.

2. AKUND AWAZI (Bahrain)

(Kg)

Destination	Textiles	Clothes/Shoes	General Household Items	Total
Dammam	-	19657	29329	48986
Qateef	3000	-	-	3000
Doha	-	774	491	1265
Dubai	-	743	-	743

(50 Manifests)

Similarly, Akund Awazi dispatches most of his re-export cargoes through to the port of Dammam. The firm is the Gulf agent for a number of brands of Chinese, Japanese and Taiwanese shoes and items of clothing, together with suitcases imported from China, Taiwan and Singapore. He estimates that 85 - 95% of his re-export trade is with Saudi customers who visit his agency in Bahrain to place orders in bulk. In the case of Chinese goods, a Saudi government ban on direct sailings of Chinese, Soviet and other 'socialist' vessels into Dammam forces Saudi merchants to import merchandise indirectly through a third party. Chinese goods are sometimes transhipped in Hong King and arrive in the Gulf aboard Maersk, Johnson or 'W.I.L.' line vessels. The cost of transporting items by dhow between Bahrain and Dammam averaged 300 - 400 fils a package (depending on the size) in 1973.

Akund Awazi tends to import large quantities of goods at one time and stores them in warehouses in the port area of Mina Sulman for periods ranging from 2 days to 4 months before moving his cargoes in response to seasonal demand. He also re-exports smaller quantities to Doha and Dubai, (where he supplies 3 and 4 retail outlets respectively). It is sometimes the case that Qatar and Dubai merchants find it cheaper to import via large wholesalers like Akund Awazi than to import directly themselves in smaller amounts.

3. AMEEN TRADING (Bahrain)

(Kg)

Destination	Textiles	Clothes and Shoes	Household Items	Foodstuffs	Total
Dammam	6870	31349	55953	12091	110263
Qateef	796	3536	4110	-	8432
Al Khobar	1111	2105	-	-	3216
Dubai	-	900	-	-	900

(46 manifests)

Ameen is both an importer and clearing agent for a wide range of items most of which emanate from the Far East. Again, his major re-export trade involves supplying Saudi customers with blankets, suitcases, sheets, umbrellas, dusters, needles, padlocks, hindges, biscuits and toilet paper, together with large quantities of Hong Kong, Japanese and Chinese made clothes and shoes. The same trading factors apply to Ameen as for Muftah and Akund Awazi.

4. MOHAMMAD AL KAZI (Bahrain)

(Kg)

Destination	Textiles	Clothes and Shoes	Household Items	Total
Dammam	11989	41551	26835	80375
Al Khobar	3990	210	34938	39138
Qateef	5501	16339	12827	34667
Kuwait	12777	1630	2558	16965
Doha	-	-	469	469

(123 manifests)

Al Kazi is another one of the group of about 25 key agents who supply Saudi Arabian merchants from Bahrain. He himself is Saudi born but has been resident in Bahrain for 40 years during which time he has built up an agency which supplies a range of clothes, shoes, perfumes, toys, towels, rugs, blankets, mosquito nets, haberdashery and suitcases to the mainland. In business terms he feels that the cost advantages offered by Bahraini agents (i.e. items are cheaper because they are purchased in bulk) outweighs any problems with the relative slowness of Saudi ports and customs.

5. KEWALRAM (Bahrain)

(Kg)

Destination	Textiles	Household Items	Total
Dammam	6445	-	6445
Dubai	284	382	666
Muscat	214	-	214

(7 manifests)

6. DANAWELLA (Bahrain)

(Kg)

Destination	Clothes	Household Items	Total
Dubai	15179	690	15869
Qateef	1003	-	1003
Dammam	432	-	432
Doha	89	-	89

(53 Manifests)

Kewalram and Danawella are two examples of Indian firms with head-quarters in Bahrain whose main re-export trade involves supplying their branch retail outlets elsewhere in the Gulf through warehouses in Mina Sulman. Kewalram use Bahrain's 'free zone' to import textiles (mostly Japanese), while Danawella do the same in the context of Far Eastern items of clothing. In 1971, the 'free zone' at the port of Bahrain offered advantages in terms of nil import charges on stored cargoes (i.e. that do not leave the port area), and the generally low level of storage charges (6 fils per package or 50 fils per cu. foot or B.D. 2 per ton for 14 days; after which the rate rises to 240 fils per ton).

7. SHUKRALLA (Bahrain)

(Kg)

Destination	Rice	Tea	Ghee	Clothing	Total
Kangan	16195	225	-	-	16420
Ginawa	-	-	8000	-	8000
Dilwa	5490	-	-	-	5490
Dayyer	4500	225	-	-	4725
Bolkheyr	3915	720	-	-	4635
Bushire	2250	-	-	-	2250
Doha	-	-	-	1848	1848

(17 manifests)

8. YOUSSEF AKBAR ALI REZA (Bahrain)

(Kg)

Destination	Rice	Sugar	Total
Bushire	135000	-	135000
Al Khobar	16340	-	16340
Dayyer	5965	6000	11965
Doha	4200	-	4200
Kangan	3500	-	3500
Khor Fakkan	-	2050	2050
Bolkheyr	1400	-	1400
Dilwa	700	-	700

(21 manifests)

Shukralla and Youssef Akbar Ali Reza are both merchants of Iranian descent who conduct the bulk of their re-export trade with Iran emphasizing the part played by ethnic links in trading patterns. In fact most of the villagers and merchants who visit ports on the Arabian coast tend to do business, where possible, with resident Farsi speakers. The core of the trade with Iranian coastal villages and towns consists of food cargoes. Shukralla specialises in importing Thai rice and Sri Lanka tea, while Ali Reza specialises in sugar, Burmese and Thai rice. Both merchants store their supplies in the warehouses of Mina Sulman laregly for sale to visiting Iranians who purchase small quantities of rice, tea, sugar, turmeric margarine and other basic food items either for themselves or on behalf of others in Iran.

9. MOHAMMAD AL FOTHAIM (Dubai)

In trading terms the majority of merchants based in Dubai look either northwards to Iran or eastwards to Oman and the Indian subcontinent for external markets. Al Fothaim is the agent for Honda and Yamaha marine engines in the lower Gulf, servicing sub-agencies in the U.A.E., Qatar and Oman. Ironically, although the firm supplies engines for use in dhows, it is aware that markets in the U.A.E. and Oman are threatened as road transport grows at the expense of dhow routes. The trend throughout the 1970's has been for increasing proportions of cargoes destined for Oman to travel by road (in 'taxi' lorries or private lorries and half-trucks) rather than by dhow. Road vehicles are faster, safer, less susceptible to bad weather and offer possibilities for avoiding customs duty payable on entry to Oman (e.g. by circumventing customs posts). Set against these points, dhow transport is cheaper (e.g. in 1973 dhows transported cement from Dubai to Muscat at 2 Rials a bag, whereas the road freight was close to 12 Rials a bag) and can accommodate larger loads than lorries (200 tons for dhows, 5 tons for most lorries).

10. MOHAMMAD AND AHMAD HAJI YOUSSEF RAHMANI (Dubai)

This firm supplies timber to customers in Oman. It gains its commercial advantage by importing large quantities of timber into Dubai and offering supplies at prices that smaller firms cannot match. A significant quantity of timber was re-exported to Oman prior to the opening of the deep-water port at Matrah. Timber is a cargo which in the past has been carried by dhows. However, most of Rahmani's trade is carried on by road because of the fact that a lorry or half-truck can complete the journey to Muscat or Matrah (door to door) in a few hours, whereas a dhow may take 10 - 15 days to fully load its cargoes plus 3 - 4 days transit time to Muscat. Seasonal factors also affect cargoes of timber dispatched from Dubai to Salala in Dhofar, where rough seas in summer restrict landings of cargo.

11. YOUSSEF AKBAR ALI REZA (Dubai)

Youssef Akbar Ali Reza (Dubai) is a branch of the Bahrain-based company but operates over a different marketing area. The Dubai agency stocks rice, sugar, and ghee and sells quantities to visiting Iranian businessmen and private citizens who visit Dubai to 'stock up'. The commercial sphere of influence of this company stretches from Qais to Jask along the Iranian coast, a distance of over 360 miles. The basic commodity of rice is transported by dhow back to the Iranian island and coastal communities in a time period which averages 15 hours (compared with 4 - 5 days taken to transport a cargo of Iranian produced Gilan rice from Rasht in northern Iran). In general, Dubai offers merchants from Iranian coastal settlements a wider range of commodities, in greater quantities at a cheaper price than those obtainable from distant Iranian higher-order centres such as Shiraz, Bushire, Isfahan and Bandar Abbas.

12 REGAL TRADERS (Dubai)

Regal Traders is an example of an Indian-owned firm (with 60 years experience in the U.A.E. - it was previously based in Sharjah) which devotes a considerable proportion of its business activity to re-exporting cargoes to customers in India and Pakistan. During the 1970's, the low import duties levied by the government of Dubai (see section 4.6.2) permitted the firm to import large quantities of Japanese textiles into Dubai for subsequent re-export by dhow to markets behind the high import tariff walls of India.

4.7. FUTURE FUNCTION OF DHOWS

The question as to whether the Gulf dhow transport system will survive in its present form, if at all, is linked to two sets of factors. Firstly, it is related to whether or not trade routes of suitable type and intensity will perpetuate; and secondly whether or not dhows can resist competition from other forms of transport. Sections 4.3 - 4.6 have analysed the nature of cargo trades presently functioning. In this section the nature of developments in competitive sea, road and air transport systems is considered in relation to the survival of dhow transport.

4.7.1. COMPETITION FROM ALTERNATIVE TRANSPORT MODES

Kuwait was the only Gulf state for which a mode of transport breakdown of trade figures could be obtained. The proportion of trade imported and exported through Kuwait by each means of transport in 1971 is indicated in Table 4.25. These statistics show a trend generally found within the Gulf Shaikhdoms: namely, that their imports (by weight) arrive overwhelmingly by sea (96% in Kuwait) , although some higher value commodities arrive by air or road. The mode of carriage of exports and re-exports depicts a more balanced distribution among transport alternatives. In reality, exports are usually shipped by sea, but re-exports are shipped by dhow, or road vehicle or aircraft. The significance of road transport is clearly apparent from these figures, both in terms of value (44.10%) and weight (44.48%). However, tables 4.26 and 4.27 illustrate that the pattern of Kuwaiti road and

Table 4.25

KUWAIT: FOREIGN TRADE BY MODE OF TRANSPORT, 1971

	Imports		Exports	
	Value (KD)	Weight (Kilos)	Value (KD)	Weight (Kilos)
AIR	20285785	8107148	5606713	1890532
	(8.77%)	(0.05%)	(16.32%)	(0.32%)
DHOW	5287887	131385300	5542416	61665990
	(2.29%)	(0.88%)	(16.14%)	(12.36%)
ROAD	37468620	484260174	15182535	211895579
	(16.19%)	(3.24%)	(44.16%)	(42.48%)
SEA	168341467	14322981744	8029905	223325151
(STEAMER)	(72.75%)	(95.83%)	(23.38%)	(44.78%)

Source:

Central Statistics Office
Planning Board
Kuwait
(unpublished)

TABLE **4.26** : Kuwait : Trade by Mode of Transport, 1971
By Value (KD) % of Total Trade

	Dhow		Road		Air		Sea	
	Imp.	Exp.	Imp.	Exp.	Imp.	Exp.	Imp.	Exp.
Iraq	1.90	0.36	96.78	97.41	1.31	2.21	0.01	0.01
Syria	0.04	0.93	95.46	93.10	3.90	5.96	0.52	0
Lebanon	0.08	0	83.06	89.30	16.73	10.69	0.08	0
Jordan	0.03	0	99.30	91.94	0.65	8.05	0	0
Saudi Arabia	0	1.73	97.17	96.82	1.23	0.87	1.59	0.49
Bahrain	80.95	51.12	0.98	3.48	15.43	17.86	2.49	27.52
Qatar	0	28.76	66.12	53.95	33.88	12.06	0	5.73
Dem.Yemen	48.61	33.72	0.33	0.97	51.04	23.79	0	26.47
Yemen	0	0	46.10	19.03	53.90	36.12	0	44.84
Sharjah	0	88.94	0	0	0	6.02	0	5.02
Muscat	99.00	85.54	0	0.12	0.99	3.67	0	10.65
Oman	94.47	69.20	0	0	5.53	7.19	0	23.60
Dubai	29.28	65.26	0.06	0.64	68.23	14.71	2.01	19.39
Abu Dhabi	0	71.23	0	0.13	0	12.56	0	16.02
Ras al Khaimah	93.19	97.55	6.80	0.28	0	0.64	0	1.52
Umm al Qawain	0	100	0	0	0	0	0	0
Ajman	0	100	0	0	0	0	0	0
Fujairah	0	100	0	0	0	0	0	0
India	1.33	0.68	0.70	0.20	4.59	41.06	92.92	58.04
Iran	91.93	92.19	1.11	0.71	2.80	4.36	4.15	2.71
Kenya	0.47	0	0.01	0	0.21	0	99.30	100

Source : Central Statistics Office,
Planning Board,
Kuwait.
(unpublished)

TABLE 4.27 : Kuwait : Trade by Mode of Transport, 1971 (By Weight) % of Total Trade

	Dhow		Road		Air		Sea	
	Imp.	Exp.	Imp.	Exp.	Imp.	Exp.	Imp.	Exp.
Iraq	0.79	0.10	99.03	99.81	0.16	0.07	0	0
Syria	0.16	0.15	92.21	99.43	0.40	0.41	0.22	0
Lebanon	0.14	0	99.77	99.57	2.01	0.42	0.05	0
Jordan	0.05	0.01	99.65	99.94	0.28	0.04	0	0
Saudi Arabia	0	5.65	96.93	93.02	0.43	0.04	2.62	1.21
Bahrain	91.25	56.90	1.94	6.39	4.75	1.37	2.03	35.33
Qatar	0	26.99	99.17	69.65	0.82	1.26	0	2.10
Dem.Yem	92.80	29.12	0.12	0.11	7.08	1.79	0	68.97
Yemen	0	0	95.54	9.16	6.46	2.43	0	88.39
Sharjah	0	97.78	0	0	0	0.06	0	1.16
Muscat	99.13	94.23	0	0.07	0.86	0.35	0	5.33
Oman	99.46	95.23	0	0	0.54	0.16	0	4.59
Dubai	72.19	87.83	0	0.59	6.93	0.90	20.78	10.68
Abu Dhabi	0	92.09	0	0.11	0	1.07	0	6.62
Ras al Khaimah	68.08	98.94	31.92	0.09	0	0.02	0	0.93
Umm al Qawain	0	100	0	0	0	0	0	0
Ajman	0	100	0	0	0	0	0	0
Fujairah	0	100	0	0	0	0	0	0
India	2.32	0.09	0.66	0.00	0.51	0.90	96.48	98.99
Iran	97.57	98.10	0.66	0.48	0.07	0.26	1.67	1.14
Kenya	0.28	0	0	0	0	0	99.30	100

Source : As for Table 4.26

Table 4.28

ORIGINS OF DHOWS ARRIVING AT THE PORT OF DUBAI

1967 - 1978

(Number of dhows arriving)

Origin	1967	1969	1971	1972	1977	1978
Iran	1912	1475	2720	2394	2942	4474
U.A.E.	732	724	582	469	100	302
India	588	474	1208	1121	356	3895
Pakistan	39	72	84	151	146	2560
Qatar	216	194	274	210	74	102
Bahrain	165	159	271	254	94	380
Oman	156	154	267	495	85	49
Saudi Arabia	115	111	124	159	31	53
Kuwait	82	123	151	47	83	80
Dem Yemen	80	0	46	0	56	10
Iraq	24	68	45	69	14	10

Source: Government of Dubai, Statistical Reports 1967 - 1978 dhow re-exports is confined to specific routes. The principle dhow routes ran from Kuwait to Iran, Bahrain, the U.A.E. and South Arabia (Oman and Democratic Yemen), while road routes focus on northerly states (Lebanon, Jordan, Syria and Iraq) and the Arabian states of Saudi Arabia, Qatar and the Yemen Arab Republic. Although the sea link to Iran will remain important, the clearest threat to dhow transport is the construction of the road network running from Kuwait along the Gulf littoral to Oman.

Recent published figures of dhow movements through the port of Dubai, although inconclusive, tend to confirm the threat posed by road development (see table 4.28). Statistics for the late 1970's show a growth trend on routes linking Dubai with Iran, India and Pakistan, a slower rise on the Bahrain route, but a clear downturn in the level of movements on routes from Oman, Qatar, Saudi Arabia Iraq and other Shaikhdoms of the U.A.E. (all of which are linked to Dubai by the main road system which runs the length of the Gulf from Basra to Muscat. It is unlikely that chance alone will explain why dhow flows have declined fastest on routes where they face direct competition from road transport.

4.7.2. THE INTRUSION OF NEW SHIPPING TECHNOLOGY

In a situation where the operators of dhows are finding that the number of 'exclusive' dhow routes are being reduced through competition from road transport, they are unlikely to welcome a further direct challenge from the maritime industry itself. The present system liner routes offers little in the way of a threat to short-sea dhow routes since there is little competition for cargoes. However, developments in the sphere of containerization, roll on-roll off (Ro-Ro) and lighter aboard ship (LASH) systems do pose a real threat in terms of compeition for cargoes.

In the late 1970's conventional and containerized liner services to the Gulf focus on the major deep-water ports but carry a minimum of cargoes between these ports (except in the case of regional liner companies - e.g. United Arab Shipping Company and Arya Line, Iran). However, the linked container feeder service based on Sharjah and Khor Fakkan (with a through road service along the road system of the eastern Arabian littoral), and through Ro-Ro and LASH feeder systems do directly duplicate some existing dhow routes.

Perhaps the most significant development has been the opening up of Ro-Ro feeder routes in the Gulf by the FOSS Shipping Consortium (Fred Olsen Seaspead Svedel) and the Meredith Shipping Company (UK) in the late 1970's (North, 1977). FOSS brought four feeder vessels into service in 1977 each with an ability to carry 22 (12 metre) trailers or 94 (22 foot TEUs.) These craft have a laden draught of only 3.2 metres and have the potential to carry cargoes virtually anywhere in the Gulf where there are deep-water jetties or beaches to run up. Each ship has a range of 1200 miles from the base ports at Dammam, Kuwait, Dubai and Bandar Shahpour (Barrett, 1977). In August 1977, Meredith Shipping launched a Ro-Ro service to Sharjah (from Felixstowe, LeHavre, Antwerp and Marseilles) with land and sea feeder services to all ports in the Gulf, including the use of a 750 TEU feeder barge.

LASH represents the development of an alternative system as a means of loading barges onto deep-sea ships and transporting items across oceans, before dropping them off into riverine or shallow water regimes such as the Shatt Al Arab and much of the coastline along the Gulf. These craft which can consist of a mother ship (of 46,000 dwt) and 89 barges (each requiring only 3.5 metres draught) were developed originally by Gulf Central Line of the U.S.A., for use along the Mississippi River. Gulf Central presently operate routes from the U.S.A., U.K., and European continent to Dammam, Bandar Shahpour, Doha, Abu Dhabi and Kuwait. As yet they are weakly developed in the Gulf though they do possess the capability of servicing coastal settlements which lack formal port facilities either by using the original LASH system, or by using derivative systems such as FLASH (shallow draught vessels that carry 8 - 15 barges towed by deep-sea tugs) or SPLASH (self-propelled feeder LASH craft) systems.

The extent of competition from these systems is difficult to predict. It seems likely that will be used with increasing economic efficiency to distribute full (return) loads between the major deep-water ports. (e.g. Dubai-Bandar Abbas; Bahrain-Bushire). However, even given their technical capability of servicing 'beach' ports such as Dayyer, Puhul and Tiab, and riverine ports such as Gosbar, Hendijan and Minab, it seems questionable whether they can prove economic enough, or suitable, to carry the irregular, mixed and 'native' cargoes that have been discussed in Section 4.4.

4.7.3 DHOWS AS SPECIALIST FEEDERS

Overall, the analysis presented in Chapter 4 adds up to a picture of contraction, but not the total eclipse of dhow transport in the 1970's. It appears that competition from road transport and new shipping systems is gradually eroding the proportion of trade available to be carried by dhows. It seems likely that the 'new' cargoes of the twentieth century (steel, cars, cement, electrical goods) will be 'taken away' by alternative transport modes, leaving the 'traditional' cargoes of foodstuffs, building materials and household items as staple cargoes.

A future scenario would probably include the incursion of modern shipping technology on inter-deep water port routes in the Gulf, leaving the dhows a niche as specialist feeders linking together deep water ports with smaller ports and coastal villages to complete the distribution chain. It is difficult to predict the speed of the march of new technology but it seems likely that three specialist feeder functions will persist into the 1980's. Firstly, the true cross-trades linking the Arabian entrepots with Iranian ports, coastal and riverine villages appears to be the strongest area of trade potential. Secondly, it seems very possible that Dubai will continue to send re-exported cargoes to the Indian sub-continent. Thirdly, it is unlikely that 'through' dhow trades linking the Arabian ports from Sur to Basra will cease altogether, but they may only continue to exist at an increasingly low ebb. Overall, the survival of the network of dhow routes is very desirable if the better developed corners of the Gulf littoral are to be connected with those areas where the waves of modernization and development have yet to lap.

CHAPTER 5

TECHNOLOGICAL CHANGE AND BEHAVIOURAL RESPONSE 11: INTERNATIONAL SHIPPING AND PORT DEVELOPMENT

James Bird (1971, p.195) has described the interconnection between shipping development and port development as being essentially a "master-servant" relationship in which the vessels function as masters, and ports as servants. The corollary of this relationship is that states (as the initiators of port development projects) are the servants of shipping operators (who act as agents of change in the way in which they adopt new designs and technologies for vessels). A miss-match in the relationship between the sizes and types of vessels and the adequacy of port facilities to receive them can have "profound repercussions, not only upon port layouts but also on the ability of a port to retain or advance its relative position in a national (or regional) league table" (Bird, op at, page 195).

Accordingly the first part of this chapter considers the nature of port congestion in the Gulf and the role of the 'masters' (i.e. vessels) in contributing to the problem. Part 5.1 considers the growth of international shipping in the Gulf and the contribution it makes towards pressurizing governments to invest in new or expanded port facilities because of a tendency on the part of some shipping lines to overtonnage. Part 5.2 examines the responses that can be made by shipping conferences when faced with slow turn-around times caused by inadequate or congested ports. Part 5.3 discusses the responses open to the "servants" (i.e. governments) in the way they adapt their ports to changes in shipping technology and levels of trade within the overall context of the desire of all the Gulf states to promote rapid social and economic development. Direct investment in port facilities is considered, together with the option of incorporating new technology into the design of ports. A further option discussed relates to the decision of some of the Gulf states to enter the international shipping industry (either independently or in some form of joint project) as a means of both improving the shipping service to the Gulf, and as a method of industrial diversification.

The second part of this chapter (i.e. 5.4) examines the spatial and locational implications of port development particularly in the context of the widespread construction of new facilities in the 1970's. In particular the question of the current hierarchy of ports in the Gulf and the nature of overlapping hinterlands and forelands is considered in relation to what some observers believe will be a tendency towards an over-provision of conventional berths during the 1980's.

5.1 THE CONTRIBUTION OF INTERNATIONAL SHIPPING TO PORT CONGESTION IN THE GULF

5.1.1 PORT CONGESTION IN THE GULF

> "But Nejdi could only recognise three kinds of steamers. They were markobs gaz, markobs stricks and fastmail."
>
> (Villiers, 1940, p. 226)
>
> "I knew no mistake in his identification of Arab ships."
>
> (Villiers, 1940, p. 226)

In 1971, the Persian Gulf was served by a total of 88 individual shipping lines, each with a different schedule, routing pattern, frequency-of-call, and level of trade. Clearly, it is to the advantage of states, particularly in the so-called Developing World, to be well served with a variety of sh ipping networks. However, in the case of the Gulf, circumstances of spatial imbalance both in the rate of port development, and in the adequacy of port facilities, cause problems which have a tendency to be aggravated by the multitude of shipping services.

A common theme has been the spectacle of port congestion, represented by cargoes piling up on docksides and ships lying at an anchor waiting for berths. In such circumstances, it is not surprising that shippers, traders and governments tend to put the blame for port congestion on the physical inadequacies of specific ports in relation to the size and range of port facilities, and the efficiency of port operations. This view, however, may be only a partial explanation.

Bathurst (1973) acting in his capacity as United Nations Inter-regional adviser on ports and shipping has noted in a "Report on a Mission to the State of Qatar" (UNCTAD INT/69/718(1)) a tendency towards "overtonnaging" in the Gulf as a result of the policies of individual shipping lines with regard to their trading patterns. Bathurst regards "overtonnaging" as a serious contributory factor to the port congestion problem in the Gulf: indeed, he considers this phenomenon to be the major factor, rather than the issue of port size.

A tendency exists in the Gulf to view port dev elopment problems from an essentially 'nationalistic' view,a perspective that may be misguided, for the reason that external influence on present shipping patterns in the Gulf will always have a strong interacting affect. It seems that port developers in the Gulf sometimes appear blind to the external characteristics of port operation. Bathurst considers that it is all too easy to interpret the present visual and statistical evidence of port congestion by the bland assertion that ports are necessarily too small or are inadequately run. Something more fundamental appears to be wrong. Bathurst comments that, "something is drastically wrong concerning the situation regarding shipping services in the whole Gulf area as is evidenced by the fact that severe delays are occurring in several of the ports" (1973, p.1).

Shipping services appear to be seriously 'overtonnaged', that is, with regard to a particular company or shipping route, the total volume of cargo presently handled, could be handled by fewer ships if services could in some way be rationalised. A close scrutiny of port shipping data reveals that on several occasions, two, three or even four ships on the same company route are at berth at the same port simultaneously, or also follow one another very closely.

Allowing for the fact that this 'bunching' is sometimes caused by strikes, delays, or even religious holidays, the phenomenon is nonetheless of cause for concern. Interpreted nationally, an excessive number of sailings not only increases congestion, but it adds substantially to the total freight charges incurred by the recipient nation. Preliminary work on S.E. Asian ports (Bathurst, 1973) illustrates that this problem is not unique to the Persian Gulf, since shipping conferences in this theatre of world shipping provide 190 sailings per annum, "because it suits their convenience" (p.1), whereas only a maximum of 130 sailings on a rationalised basis are needed for adequate trade. The cost of these 60 excessive sailings has been calculated to amount to "approximately U.S. dollars 1.7 million per annum, or about 20% of the total freight charges of the countries concerned", (p.1).

The reality of the port congestion situation appears to be a combination of linked internally and externally derived shortcomings. Section 5.3 points to the fact that some ports have, or had, insufficient facilities, space, berths and equipment to handle certain levels of tonnage, and that throughput in some ports is less than could reasonably be expected for the equipment and facilities that are available. All these factors however, together with the problem of 'overtonnaging' have an interacting effect, leading to a distortion of the 'actual' situation wherein the 'apparent' situation is quite misleading. The essential problem here is to differentiate between 'causes' and 'symptoms'. In reality, there appear to be more ships on certain of the sea routes than is warranted by the level of trade. This situation has led to a lack of berths available for vessels, leading to a point where ports are apparently causing delays, the result of which is that shipping conferences are forced to increase surcharges and freight rates to cover the costs of delay. In this particular vicious circle, the 'apparent symptom' appears to be a lack of berthing space. However, in fact, the 'actual cause' may be a general overtonnaging of routes and a lack of rationalisation of shipping services. The actual fault may lie with the shipping lines and conferences rather than the ports themselves. Decision-making and control of policy with regard to shipping lines and conferences lies mostly outside the control of internal port planners within the Gulf. This problem seems to point to the need for some form of co-ordinating 'Shipping Council' with sitting members from all the Gulf ports as well as the representatives of shipping lines meeting to resolve issues of rationalisation and congestion.

5.1.2 The Growth of the Ocean Shipping Network

Section 3.4.1 outlined the early growth of steamship services in the Gulf. This section analyses the modern pattern of shipping by reference to the individual named companies. Data relating to the recent growth and relative commercial success of individual shipping lines in competing for traffic at each of the major deep-water ports of the Gulf is impossible to procure, at least in a detailed form, embracing a good 'run' of data. Comparative data has been processed for a five-port comparative study of 'overtonnaging' for the year 1971, but data prior to that date was found to be generally unobtainable.

The State of Kuwait, however, does furnish in its published 'Customs and Ports Annual Reports', a reliable dossier on shipping line activity in that port for the period 1959-1971 (see appendix Table 'J'). Since during this period Kuwait has functioned as a major seaport in the Gulf, served by the majority, if not all, the lines linking the Gulf with its external trading environment, the statistics tabulated in appendix Table 'J' serve as an accurate indicator of the growth of shipping lines and of shipping company influence in the Gulf in

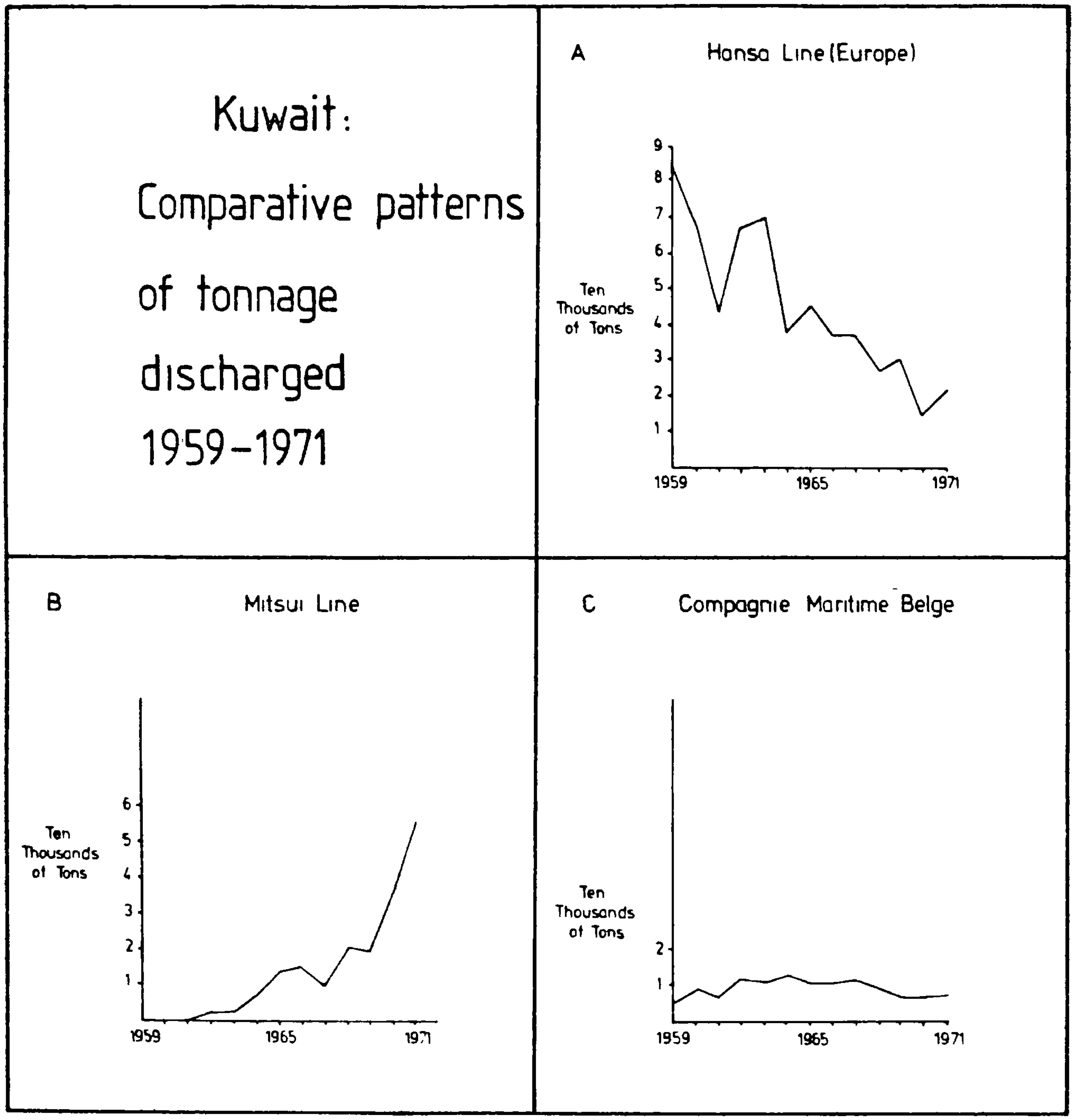

Kuwait:
Comparative patterns of tonnage discharged 1959-1971
A
Hansa Line (Europe)
Ten Thousands of Tons
9
8
7
6
5
4
3
2
1
1959
1965
1971
B
Mitsui Line
Ten Thousands of Tons
6
5
4
3
2
1
1959
1965
1971
C
Compagnie Maritime Belge
Ten Thousands of Tons
2
1
1959
1965
1971

FIGURE 5.1

response to a number of factors. The large number of links (174) that have served Kuwait at some time during this period is a feature of these statistics. Each shipping line is annotated by a letter denoting which of the six major shipping routes vessels operate (N.W. Europe, Medit. Europe, U.S.A., Far East, India-Pakistan, Australia-New Zealand).

Three main features are apparent with regard to these figures. Firstly, there is a group of 15 'core' liner routes that have been operational throughout the period 1959-71, and in some cases, for many years beforehand. As such, they are the lines with the largest trading tradition and expertise, and in most cases, though not all, are the most successful tonnage carriers of cargo to the Gulf. This group consists of Hansa Line, Strick and Ellerman (now P. & O.), Lauro, Holland-Persian Gulf Line, Swedish East Asia/'WIL' Line, Novelle Companie Peninsula Havraise, Compagnie Maritime Belge, Yugolinja, Lombarda Ligure, Concordia, Hellenic, Maersk, Nippon Yusen Kaisha, 'K' Line, Mitsui Line, British India Steamship Line, and the 'tramp', or 'charter' vessels. Figure 5.1 illustrates contrasting patterns of tonnage carried by 'core' Shipping lines. Figure 5.1 (a) (Hansa Line) is characteristic of a line with a significant, though falling % volume of total trade. The very large actual and relative volumes of cargo carried by lines such as the Hansa, Strick and Lauro Lines in the early period 1959 - 60 are indicative of the reliance upon Europe for building materials and consumer durables in the initial period of Kuwait's investment in urban and economic development projects. Links with the Indian sub-continent and Far East were limited in the period 1959 - 63. Mitsui (Graph 5.1 (b)) is an example of Japanese 'core' shipping line which has grown rapidly in tonnage carried during the period under review, in contrast to the low dispersion, medium tonnage levels carried by the Campagnie Maritime Belge (Figure 5.1 (c)).

The second trend to be noticed is the increasing number of shipping lines calling at Kuwait. In fact, the network in 1971 is double that of 1959. One should distinguish here between shipping lines and shipping routes. A feature in this context is that the names of the shipping lines often appear several times in appendix Table 'J'. This phenomenon is a function of the fact that many of the shipping lines have diversified and increased the number of routes they operate in-and-out of the Gulf. For example, the Kuwait Shipping Comapny had by 1971, four routes to-and-from N.W. Europe, East-coast U.S.A., Japan and Australia. Other lines with regular multiple routes by 1971 included Arya, P & O., Nedlloyd, Hansa. In the following analysis of overtonnaging this distinction between a shipping line and its world routes is retained: each route is treated as a separate link in the network. In other words, in for example the case of the West German Line, Hansa, its routes between the East coast U.S.A.-Gulf and N.W. Europe-Gulf, are treated as two separate shipping company links. This essential practice of the separation of lines by world links is often a problem for the researcher. In this research, the author was obliged to familiarise himself in such a way that he could recognise the shipping line and route of a ship from the name of a vessel. None of the five ports studied in depth rendered a tabulation of statistics which differentiated between shipping line, name of vessel and route. The process of checking the name and route of every ship calling at a port in a given year is tedious, but the end result produces a more satisfactory situation whereby in any subsequent analysis the true pattern of the shipping network can be obtained rather than the present situation of either a lack of statistics differentiating between name and line, or an obscured position wherein statistics for individual lines are recorded (e.g. in Bahrain) but which do not distinguish between different routes. Unfortunately, mere recognitive ability is not enough, because month in and year out, shipping lines will switch their vessels to alternative routes both inside and outside the Gulf network. Hence, the author had to consult Lloyds Register of Shipping for the relevant months in question to cross-check that the named vessel in question was plying on its 'usual' route, or not. The author would urge that in future, agencies keeping statistics of port movements will tabulate them in such a way to denote name of vessels, shipping line and route. The increase in administrative book-keeping would be offset by very real gains in statistical analysis with a spatial element.

Thirdly, the Kuwaiti statistics reveal a real increase in the number of shipping lines and routes operating on the Far Eastern run, linking the Gulf with Pakistan, India, S.E. Asia, China and Japan. Apart from the main world shipping lines with operational links into the Gulf, appendix Table 'J' also illustrates the large number of small-scale (often tramp steamer) lines, often operating only 1 or 2 ships which appear on the network. The tendency for these small lines is to 'fade out' after a short period of time.

Table 5.1 compares the major route networks between the Gulf and its external environment for the period 1959 - 71. Time is measured against the number of shipping lines operating on each of seven major routes (N.W. Europe, Medit. Europe, U.S.A. (East Coast), U.S.A. (West Coast), India-Pakistan, Far East and Australia-New Zealand). The table depicts the fundamental nature of a changed situation in this 13 year period. In 1959 the spread between the 'highest' and 'lowest' number of companies carrying on trade on any one route is low (7 - 3 range). By 1971, the situation has altered to a 23 - 1 range.

Table 5.1

KUWAIT : THE NUMBER OF SHIPPING ROUTES

PER MAJOR SHIPPING NETWORK, 1959 - 1971

	NW Eur	Medit	USA(E)	USA(W)	Far East	Ind/Pak	Aust	Other	Total
1959	6	6	6	3	7	5	4	-	37
1960	7	4	7	2	6	8	3	-	37
1961	7	6	4	2	8	7	3	-	37
1962	8	4	4	2	8	6	3	-	35
1963	9	5	5	4	10	5	2	-	40
1964	10	4	5	4	8	15	1	-	47
1965	9	4	5	2	10	8	3	1	42
1966	15	4	7	2	14	17	7	1	67
1967	14	4	8	2	13	12	6	1	60
1968	20	4	8	2	10	12	6	1	63
1969	13	5	7	2	18	25	5	1	76
1970	10	6	8	1	23	28	10	1	87
1971	10	6	7	1	18	23	7	2	74

Source: Appendix Table 'J'

TABLE 5.2

Shipping Lines Operating to the Persian Gulf

Name	Route	Name	Route	Name	Route
1. Mitsui	FE	31. K	FE	61. Pacific International	FE
2. China National Chartering	FE	32. Showa	FE	62. SCI	I
3. BISN	I	33. Maersk	FE	63. Collin Navigation	I
4. P. & O.	FE	34. Johnson	FE	64. Concordia	USA
5. P. & O.	A	35. IKI	FE	65. Pan Islamic	I
6. P. & O/Strick	A	36. Maldike	I	66. Hellenic	USA
7. Jugolinya	M	37. UASPH	I	67. HMEL	E
8. Barber	USA(E)	38. Pilship	I	68. Pakistani Shipping	I
9. Polish	E	39. Scindia	I	69. NYH	FE
10. Kuwait S.C.	E	40. Raj	I	70. Golden	I
11. Kuwait S.C.	FE	41. Taiya	FE	71. Steamtrans	USA
12. Kuwait S.C.	USA(E)	42. Evergreen	FE	72. Collis	I
13. Pakistan National	I	43. Soesea	FE	73. Damader	I
14. Hansa	E	44. Southern	USA(E)	74. Sagar	A
15. Hansa	USA(E)	45. DSR	M	75. Rosewell	USA
16. NYK	FE	46. Wil	FE	76. Lombarda Ligure	M
17. Arya	USA(E)	47. Malabar	FE	77. Sri Lanka	I
18. Arya Razie	O	48. Qatam Al Faza	O	78. Arya (Egypt)	O
19. Arya	E	49. States Marine Isthmian	USA	79. Arya (Iran)	O
20. Iraqi	E	50. American Eastern	USA	80. S.C.I.	A
21. RIL	O	51. Black Sea	O	81. Mercury	O
22. Lauro	M	52. Iran Line	E	82. Y.S. Kisen	FE
23. Dubai National	I	53. SEA	I	83. Arya	FE
24. NCHP	M	54. Seiwa	FE	84. Nippon	FE
25. SMEL	E	55. Guan Guan	I	85. Miyashi	FE
26. P. & O/Strick	E	56. China Ocean	FE	86. Tokyok	FE
27. Nedlloyd	E	57. Universal	I	87. Biko	FE
28. Nedlloyd	USA(E)	58. CMB	E	88. Kuwait S.C.	A
29. Nedlloyd	USA(W)	59. Yamashita Shinonin	FE		
30. Sica	I	60. Hinode	FE		

KEY : USA(E) East/South Coast USA
USA(W) West Coast USA
O Other
FE Far East
A Australia/New Zealand
E N. Europe
M Mediterranean Europe

The pattern over the last few years in the period is indicative of an increasing number of shipping lines using the Far Eastern and India-Pakistan networks. In a sense this 'duo' is really one linear network since many 'slow service' lines from Japan and S.E. Asia in fact call at Indian and Pakistani ports en route for the Gulf, picking up and discharging cargo in the process. Again, for some lines, it is statistically impossible to extract this distinction between the 2 routes (i.e. Far Eastern and India-Pakistan) by dividing the cargo between the 2 routes. Hence the India-Pakistan figures for the number of services using the route is a little inflated due to the 'doubling up' of shipping lines in which some ships originating and terminating in the Far East also pick up cargo for the Gulf at Indian and Pakistani ports.

However, as a first approximation to the problem of overtonnaging, Table 5.1 suggests that Far-Eastern and India-Pakistan routes might be most in need of rationalization by reducing the number of ships voyaging on these 2 routes. The question to be asked is whether this sharp increase in the number of shipping lines using the Far-Eastern and India-Pakistan routes, especially since 1968, has been accompanied by a complimentary increase in the total tonnage of cargo carried on these two routes? The suspicion appears to be, that the number of ships, and volumes of tonnage, have not increased in parallel.

The analysis is now broadened to consider the total network of shipping lines operating throughout the Persian Gulf. Table 5.2 lists the names of all the shipping lines which visited the Gulf ports during 1971. The lines are numbered 1 - 88: a means of identification that is retained for subsequent Regression analyses. Each line is denoted according to the route on which is operates: as such, some lines appear more than once by virtue of their operation of multiple routes.

Broadly, a group of base ports is common to each route network, with the addition of some optional ports used by particular shipping lines. Carriers on the North-West Europe - Persian Gulf route (e.g. P. & O. Hansa, Nedlloyd, CMB, Arya and Kuwait S.C.) pick up cargoes at London, Hamburg, Bremen, Rotterdam and Antwerp, as well as at subsidiary ports in the British Isles, Northern France and Scandinavia. On the Mediterranean-Gulf route (the carriers include NCHP, Yugolinja and DSR) the loading ports include Barcelona, Marseilles, Genoa, Leghorn, Naples, Venice, Trieste and Rijeka. Terminal ports of the East/South Coast U.S.A. - Gulf route (whose major carriers are Nedlloyd, Barber, Kuwait S.C., Concordia, Hansa, Hellenic and States Marine Isthmian) are Houston, New Orleans, Norfolk, Baltimore, Philadelphia and New York, while on the West Coast U.S.A.-Gulf route (Nedlloyd and Hoegh Line) the major loading ports are Vancouver, San Francisco and Los Angeles.

Although clearly divisible into two route networks by virtue of the pattern of base ports, the Far East - South and South East Asia - Gulf route, is in a spatial sense one linear network, with vessels loading at either the major Japanese ports (Moji, Nagoya, Kobe Yokohama), or ports en route in China (Shanghai, Whampoa,) Taiwan (Keelung), South Korea (Pusan), Hong Kong, Singapore, Thailand (Bangkok), India (Bombay) and Pakistan (Karachi). The major carriers on this 'route' include P. & O., Maersk, Kuwait S.C., Wil, Mitsui, Yamashita Shinonin, Johnson, Pacific International, Showa, K, NYK, Hinode, Hong Kong Island, Seiwa, China National, China Ocean, and Evergreen. The intermediate ports on the Far East-Gulf run themselves from a distinctive group of base ports in South Asia (Calcutta, Madras, Bombay, Colombo, Karachi) served by 'local' shipping lines (e.g. Pan Islamic, S.C.I., Damoder, National Shipping of Pakistan, Maldive and Malabar). Australia and New Zealand, by virtue of their geographical locations off the major Far East - Gulf route, form a separate route network whose carriers (P. & O., Kuwait S.C., S.C.I., Clausen, Sagar) link the ports of Sydney, Melbourne, Adelaide, Freemantle, Wellington and Auckland to the Gulf.

The 'other' shipping routes denoted in Table 5.2 embrace the East European routes of the Polish Ocean Line (base ports - Gydnia and Gdansk) and the Soviet Black Sea Line (base port - Nicoliave), together with the South and East Africa route (major carriers - Royal Inter Ocean and Mercury) linking Durban, Beria, Maputo, Dar es Salaam and Mombasa with the Gulf.

Internally, the rotation of ports-of-call between the Gulf of Oman and the Shatt al Arab varies between individual shipping lines. Not all lines call at all the major Gulf ports. Nor is the 'order-of-call' of ports linear, or regular. Indeed, only the regular passenger-mail steamers linking Bombay with Basra (Damoder, B.I. and Pan Islamic Lines) run up and down the Gulf in a regular East-West, West-East pattern (i.e. Muscat-Dubai-Doha-Bahrain-Dammam-Kuwait-Khorramshahr-Basra). As one might expect, there is a tendency for ports at the 'extremities' of the Gulf to act as initial or final ports of discharge (notwithstanding Muscat, outside the Gulf) to minimise the amount of 'doubling back' the Gulf(e.g. Dubai, Kuwait) whereas ports in the centre of the Gulf (Dammam, Bahrain, Doha) tend to be preferenced as ports of discharge in the middle of the discharge rota. However, there is no clear pattern apart from the fact that Dubai is definitely favoured as a first port-of-call by virtue of its geographical position, and its large size of 15 berths, rendering it very rarely full, at least in the early 1970's.

A contributory factor to the level of congestion in the Gulf is a lack of co-ordination between shipping lines, Port authorities and shipping agencies, in adjusting the scheduled routing patterns of shipping lines to stave off the congestion which frequently occurred (in the 1970's) at well known bottlenecks such as Dammam and Khorramshahr. It appears that a

'Central Traffic Control Mechanism' needs to be created in a location such as Muscat or Dubai, to maximise the traffic pattern in the Gulf, both to reduce congestion in ports, and to reduce the waiting time for vessels. Such a control system would require basic data from each port and each individual vessel as it enters the Gulf. The vessel would need to supply information as to the tonnage and nature of cargo to be discharged, or loaded, at each Gulf port. The ports would furnish data as to current berthing capacity and 'turnaround times', together with certain variable types of data such as the 'urgency of the cargo', 'delay times', closures due to public holidays or labour disputes. Given proper co-ordination via an efficient telecommunications system, a specified rotation of Muscat-Kuwait-Abu Dhabi-Bahrain-Doha-Dubai-Dammam, which on the face of it seems unrealistic because of the amount of deviation involved, might become an economic proposition for port and shipping line alike, given the high costs of congestion and delay in waiting for a berth. Unfortunately, ideal though this may appear, the problem, especially in the eyes of shipping agents and stevedores, begins at the loading ports, since cargo is loaded at the point of origin in a specific 'reverse order' designed to fit a specified schedule of discharge ('first in, last out' principle). Given a sudden change of plan by a shipping controller, cargo stowed deep in a hold is often difficult to unload in the instance of a changed order of discharge. A great deal of time, effort and money is wasted by shifting cargo to get at the cargo 'underneath'.

5.1.3 Overtonnaging

The theme of this section is that shipping in the Gulf is 'overtonnaged' and that decisions will have to be made to rectify the situation. As yet, no statistical analysis has been presented to illustrate the spatial variation of the problem in the Gulf. A comparative study of five major seaports on the Arabian side of the Gulf is presented below -

TABLE 5.3

Kuwait Shipping Flows - Residuals from Regression Analysis

Line	Actual Tonnage	Expected Tonnage	Residual	Residual per Ship
1. Mitsui	55633	29512	+ 26121	+ 669.77
22. Lauro	40557	19953	+ 20604	+ 763.11
10. KW. Europe	33337	17378	+ 15959	+ 664.96
2. China National	44741	15849	+ 28892	+ 1313.27
51. Black Sea	43473	14791	+ 28682	+ 1365.81
14. Hansa Europe	22969	15849	+ 7120	+ 323.64
19. Arya Europe	18913	13490	+ 5423	+ 285.42
6. P. & O. Aust.	13557	13490	+ 67	+ 3.53
42. Evergreen	71291	8710	+ 62581	+ 4813.92
33. Maersk	24267	8710	+ 15557	+ 1196.69
7. Yugo	10579	9772	+ 807	+ 57.64
11. Kuwait FE.	57975	8128	+ 49847	+ 4153.92
9. Polish	22236	8128	+ 14108	+ 1175.67
45. DSR	11003	8128	+ 2875	+ 239.58
54. Seiwa	9742	8128	+ 1614	+ 134.50
62. SCI	12393	6607	+ 5786	+ 578.60
61. Pacific International	11997	6607	+ 5390	+ 539.00
46. Wil	17723	5888	+ 11835	+ 1315.00
67. HMEL	14818	5888	+ 8930	+ 992.22
32. Showa	6920	6607	+ 313	+ 31.30
58. CMB	7993	5129	+ 2864	+ 358.00
13. Pakistan National	2542	2344	+ 198	+ 49.50
74. Sagar	3427	1778	+ 1659	+ 553.00
47. Malabar	3697	1122	+ 2575	+ 1287.50
75. Rosewell	1588	513	+ 1075	+ 1075.00
18. Arya Razie	589	513	+ 76	+ 76.00
3. P. & O. Bomb.	7560	52481	- 44921	- 680.62
26. P. & O. Europe	28750	36308	- 7558	- 160.81
34. Johnson	10628	25119	- 14491	- 439.12
16. NYK	11023	16596	- 5573	- 240.74
64. Concordia	8517	16596	- 8079	- 351.26
15. Hansa USA	9092	14791	- 5699	- 271.38
4. P. & O FE	8683	12589	- 3906	- 217.00
8. Barber	8537	12882	- 2428	- 134.89
35. HKI	9091	10965	- 1874	- 117.13
36. Maldike	8766	10965	- 2199	- 137.44
59. Yamashita Shinonin	8032	10965	- 2933	- 183.31
21. R.I.L.	5609	10471	- 4862	- 324.13
73. Damader	8016	8128	- 112	- 9.33
29. Ned USA W.	4815	7413	- 2598	- 236.18
52. Iran	1097	8128	- 7031	- 585.92
31. K	3488	6607	- 3119	- 311.90
49. States Marine	2878	6607	- 3729	- 372.90
24. NCHP	4632	5129	- 497	- 62.13
66. Hellenic	3695	5129	- 1434	- 179.25
53. S.E.A.	2423	4467	- 2044	- 292.00
20. Iraqi	3302	3715	- 413	- 68.83
80. SCI. Aust.	1851	3715	- 1864	- 310.67
76. Lombarda Ligure	697	3715	- 3018	- 503.00
12. Kuwait USA	1193	2344	- 1151	- 287.75
5. P. & O. NZ.	493	2344	- 1851	- 462.75
72. Collis	958	1788	- 830	- 276.67
77. Sri Lanka	455	513	- 58	- 58.00
79. Arya Iran	426	513	- 87	- 87.00
23. Dubai National	300	513	- 213	- 213.00
78. Arya Egypt	221	513	- 292	- 292.00

TABLE 5.4

Bahrain Shipping Flows - Residuals from Regression Analysis

Line	Actual Tonnage	Expected Tonnage	Residual	Residual per Ship
26. P. & O. Europe	43173	25704	+ 17469	+ 371.68
33. Maersk	24440	18197	+ 6243	+ 189.18
27. Ned Europe	23664	13804	+ 9860	+ 394.40
35. H.K.I.	8621	8511	+ 110	+ 6.88
14. Hansa Europe	20605	6918	+ 13687	+ 1052.85
6. P. & O. Aust.	7598	6457	+ 1141	+ 95.08
61. Pacific International	9901	5888	+ 4013	+ 364.82
22. Lauro	8910	5370	+ 3540	+ 354.00
7. Jugo	7572	5370	+ 2202	+ 220.20
29. Ned USA W.	7397	5370	+ 2027	+ 202.70
31. K	7864	4786	+ 3078	+ 342.00
24. NCHP	6237	4266	+ 1971	+ 246.38
20. Iran	7450	3802	+ 3648	+ 521.14
58. CMB	6253	3802	+ 2451	+ 350.14
53. S.E.A.	5161	3236	+ 1925	+ 320.83
9. Polish	3274	3236	+ 38	+ 6.33
40. Raj	5827	2692	+ 3135	+ 627.00
56. China Ocean	4747	2692	+ 2055	+ 411.00
11. Kuwait FE	2396	2138	+ 258	+ 21.50
47. Malabar	2497	1622	+ 875	+ 291.67
54. Seiwa	1968	1622	+ 346	+ 115.33
66. Hellenic	1660	1622	+ 38	+ 12.67
2. China National	2228	1072	+ 1156	+ 578.00
69. NYH	1704	537	+ 1167	+ 1167.00
16. NYK	1091	537	+ 554	+ 554.00
65. Pan Islam	892	537	+ 355	+ 355.00
57. Universe	556	537	+ 19	+ 19.00
5. P. & O. NZ.	573	537	+ 36	+ 36.00
13. Pakistan National	569	537	+ 32	+ 32.00
3. P. & O. Bombay	6012	35481	- 29469	- 453.37
34. Johnson	11537	13864	- 2267	- 87.19
64. Concordia	8419	9550	- 1131	- 62.83
10. Kuwait Europe	8935	9120	- 185	- 10.88
21. R.I.L.	6515	7943	- 1428	- 79.33
59. Y-S	3409	7586	- 4177	- 298.36
62. S.C.I.	1871	8511	- 6640	- 415.00
36. Maldive	5040	5370	- 330	- 33.00
46. Wil	3773	5370	- 1597	- 159.70
18. Arya Razie	3397	5370	- 1973	- 197.30
42. Evergreen	2734	5888	- 3154	- 286.73
4. P. & O. FE	3084	6457	- 3373	- 281.08
28. Ned USA E.	3874	4786	- 912	- 101.33
15. Hansa USA	1562	3240	- 1678	- 279.67
17. Arya USA	1710	2692	- 982	- 196.40
12. Kuwait USA	1781	2138	- 357	- 89.25
49. States Marine	1372	2138	- 766	- 191.50
70. Golden	1560	1622	- 62	- 15.50
1. Mitsui	1530	1622	- 92	- 30.67
19. Arya Europe	969	1622	- 653	- 217.67
72. Collis	958	1622	- 664	- 221.33
52. Iran	657	1622	- 965	- 321.67
68. Pakistani Shipping	921	1202	- 281	- 140.50
71. Steamtrans.	497	537	- 40	- 40.00
67. HMEL	151	537	- 386	- 386.00

Source : Government of Bahrain Port & Customs Department, Mina Sulman.

TABLE 5.5

Doha Shipping Flows - Residuals from Regression Analysis

Line	Actual Tonnage	Expected Tonnage	Residual	Residual per Ship
26. P. & O. Europe	31534	19498	+ 12036	+ 308.62
4. P & O. Far East	32478	12589	+ 19889	+ 864.74
10. Kuwait Europe	15685	10715	+ 4970	+ 261.58
22. Lauro	19671	9120	+ 10551	+ 659.44
27. Red Europe	20600	9120	+ 11480	+ 717.50
14. Hansa Europe	18137	8710	+ 9427	+ 628.47
7. Yugo	8559	6607	+ 1952	+ 177.45
61. Pacific International	6855	6607	+ 248	+ 22.55
54. Seiwa	9479	5495	+ 4232	+ 470.22
60. Hinode	20012	4467	+ 15545	+ 2220.71
9. Polish	5284	5012	+ 272	+ 30.22
24. K.C.H.P.	8298	3388	+ 4910	+ 982.00
16. NYK	9110	2754	+ 6356	+ 1589.00
31. K	4596	2138	+ 2458	+ 819.33
59. Y-S	1279	834	+ 445	+ 445.00
82. Y.S. Kisen	980	834	+ 146	+ 146.00
3. P. & O. Bombay	4488	20417	- 15929	- 398.23
65. Pan Islamic	4686	16982	- 12296	- 384.25
6. P. & O. Aust.	7390	8318	- 928	- 66.29
8. Barber	5539	6607	- 1068	- 97.09
15. Hansa USA	4334	7080	- 2746	- 249.64
17. Arya USA	4048	7080	- 3032	- 252.67
20. Iraqi	3466	3981	- 515	- 85.83
21. R.I.L.	2411	3981	- 1570	- 261.66
28. Red USA E.	2019	3388	- 1369	- 273.80
73. Damader	1017	3981	- 2964	- 494.00
81. Mercury	1178	2754	- 1576	- 394.00
76 Lombarda Ligure	1231	2138	- 907	- 302.33
88. Kuwait Aust.	1211	1906	- 695	- 347.50
62. S C.I.	1122	1906	- 784	- 392.00
80. S.C I Aust	683	1906	- 1223	- 611.50
11. Kuwait FE	517	834	- 317	- 317.00

Source : Qatar National Navigation and Transport Co. Ltd., Doha.

TABLE 5.6

Dubai Shipping Flows - Residuals from Regression Analysis

Line		Actual Tonnage	Expected Tonnage	Residual	Residual per Ship
26.	P. & O. Europe	19474	19055	+ 419	+ 11.97
10.	Kuwait Europe	19094	14454	+ 4640	+ 178.46
4.	P. & O. FE	13530	13183	+ 347	+ 15.09
27.	Ned Europe	22150	11482	+ 10668	+ 533.40
14.	Hansa Europe	13365	10000	+ 3365	+ 197.94
1.	Mitsui	9991	9988	+ 3	+ 0.18
35.	H.K.I.	13802	8511	+ 5291	+ 377.93
6.	P. & O. Aust.	11585	7763	+ 3822	+ 294.00
61.	Pacific International	16782	7244	+ 9538	+ 794.83
11.	Kuwait FE	16977	6607	+ 10370	+ 942.73
36.	Maldive	7527	7244	+ 283	+ 23.58
7.	Jugo	7260	7244	+ 16	+ 1.33
40.	Raj	6101	5495	+ 606	+ 67.33
46.	Wil	5646	5495	+ 151	+ 16.77
22.	Lauro	5922	5012	+ 910	+ 113.75
31.	K	5558	5012	+ 546	+ 68.25
23.	Dubai National	9429	3891	+ 5538	+ 923.00
16.	NYK	4271	2692	+ 1579	+ 394.75
56.	China Ocean	2819	2692	+ 127	+ 31.75
13.	Pakistan National	12601	2089	+ 10512	+ 3504.00
39.	Scindia	10930	2089	+ 8841	+ 2947.00
[illegible]	China National	9250	2089	+ 7161	+ 2387.00
60.	Hinode	5345	2089	+ 3256	+ 1085.33
51.	Black Sea	3149	2089	+ 1060	+ 353.33
29.	Ned USA W.	2579	2089	+ 490	+ 163.33
42.	Evergreen	2223	2089	+ 131	+ 43.66
47.	Malabar	7527	1445	+ 6082	+ 3041.00
5.	P. & O. NZ.	2391	1445	+ 946	+ 473.00
63.	Collin Navigation	1618	776	+ 842	+ 842.00
41.	Talja	1450	776	+ 674	+ 674.00
44	Southern	1398	776	+ 622	+ 622.00
57.	Universe	844	776	+ 68	+ 68.00
3.	P. & O. Bombay	7701	34581	- 26880	- 401.19
34.	Johnson	10385	13183	- 2798	- 121.65
15.	Hansa USA	8022	12023	- 4001	- 190.52
62.	S.C.I.	4782	13490	- 8708	- 362.83
21.	R.I.L.	5922	10715	- 4793	- 266.28
33.	Maersk	5617	8913	- 3296	- 219.73
9.	Polish	7135	7244	- 109	- 9.08
25.	SMEL	5877	6166	- 289	- 28.90
45.	DSR	5216	6166	- 950	- 95.00
24.	NChP	4074	5495	- 1421	- 157.89
8.	Farber	2310	5495	- 3185	- 353.89
28.	Ned USA E.	3073	5012	- 1939	- 242.38
18.	Arya Razie	2107	4467	- 2360	- 337.14
20.	Iraqi	4109	4467	- 358	- 51.14
59.	Y-S	2149	3891	- 1742	- 290.33
19.	Arya Europe	1964	2692	- 728	- 180.00
54.	Seiwa	1948	2089	- 141	- 47.00
12.	Kuwait USA	1717	2089	- 372	- 124.00
53.	S.E.A.	1228	2089	- 861	- 287.00
50.	American Eastern	720	2089	- 1369	- 463.00
52.	Iran	1414	1445	- 31	- 15.50
55.	Guan Guan	1348	1445	- 97	- 48.50
32.	Showa	1155	1445	- 290	- 145.00
49.	States Marine	376	1445	- 1069	- 534.50
38.	Pilship	668	776	- 108	- 108.00
17.	Arya USA	636	776	- 140	- 140.00
37.	USAPH	620	776	- 156	- 156.00
48.	Qatar	530	776	- 246	- 246.00
30.	Sica	500	776	- 276	- 276.00
43.	Soesea	205	776	- 571	- 571.00
58.	CMB	179	776	- 597	- 597.00
64.	Concordia	85	776	- 691	- 691.00

Source . Gray, MacKenzie and Co. Ltd., Dubai.

TABLE 5.7

Dammam Shipping Flows - Residuals from Regression Analysis

	Line	Actual Tonnage	Expected Tonnage	Residual	Residual per Ship
1.	Mitsui	56431	25119	+ 31312	+ 1204.31
14.	Hansa Europe	40479	20893	+ 19586	+ 1030.84
27.	Ned Europe	34179	21878	+ 9601	+ 480.05
10.	Kuwait Europe	29448	21878	+ 7570	+ 378.50
46.	Wil	31957	23442	+ 8515	+ 387.05
31.	K	25192	17783	+ 7409	+ 463.06
34.	Johnson	23582	16982	+ 6600	+ 440.00
35.	H.K.I.	19159	15849	+ 3310	+ 236.43
51.	Black Sea	23280	15849	+ 7433	+ 530.93
60.	Hinode	35342	13804	+ 21538	+ 1794.83
29.	Ned USA W.	18919	11749	+ 7170	+ 717.00
20.	Iraqi	14895	10471	+ 4424	+ 491.56
59.	Y-S	20367	8511	+ 11856	+ 1693.71
24.	NCHP	18066	7244	+ 10822	+ 1803.67
58.	CMB	23510	6166	+ 17344	+ 3468.80
22.	Lauro	4045	3891	+ 154	+ 51.33
12.	Kuwait USA	3968	3891	+ 107	+ 35.67
86.	Tok Yok	8027	2692	+ 5335	+ 2667.50
72.	Collis	6087	2692	+ 3395	+ 1697.50
56.	China Ocean	3178	2692	+ 486	+ 243.00
85.	Miyashi	5753	1479	+ 4274	+ 4274.00
84.	Nippon	4555	1479	+ 3076	+ 3076.00
25.	SMEL	3358	1479	+ 1879	+ 1879.00
26.	P. & O. Europe	28807	31623	- 2816	- 93.87
36.	Maldine	26565	27542	- 977	- 37.58
4.	P. & O. FE	27718	26915	+ 803	+ 32.12
64.	Concordia	21378	24547	- 3169	- 137.78
7.	Jugo	15704	17783	- 2079	- 129.94
15.	Hansa USA	14047	14791	- 774	- 59.54
66.	Hellenic	12561	15849	- 3288	- 234.86
16.	NYK	12077	14791	- 2714	- 167.23
9.	Polish	10453	14791	- 4338	- 333.69
33.	Maersk	12474	14791	- 2317	- 178.23
28.	Ned USA E.	11935	12882	- 947	- 86.09
83.	Arya FE	6937	9333	- 2396	- 299.50
19.	Arya E.	6099	8511	- 2412	- 344.57
42.	Evergreen	5389	8511	- 3122	- 446.00
5.	P. & O. NZ.	4499	9333	- 4834	- 604.25
81.	Mercury	5933	8511	- 2578	- 368.29
8.	Barber	4499	7244	- 2745	- 457.50
6.	P. & O. Aust.	6077	7244	- 1167	- 194.50
32.	Showa	4902	7244	- 2342	- 390.33
62.	S.C.I.	3785	7244	- 3459	- 576.50
65.	Pan Islam	2610	7244	- 4634	- 772.33
18.	Arya Razie	1483	8511	- 7028	- 1004.00
11.	Kuwait FE	4759	5012	- 253	- 63.25
17.	Arya USA	4124	5012	- 888	- 222.00
45.	DSR	3901	5012	- 1111	- 277.75
53.	S.E.A.	2993	5012	- 2019	- 504.75
44.	Southern	1104	5012	- 3908	- 977.00
13.	Pakistan National	1851	3891	- 2040	- 680.00
88.	Kuwait Aust.	1172	2692	- 1520	- 760.00
87.	Eiko	324	1479	- 1155	- 1155.00
39.	Sardinia	5845	6166	- [illegible]	- 64.20

Source: [illegible]

Kuwait, Dubai, Bahrain, Doha and Dammam. Data is presented in Tables 5.3 - 5.7 represents the total number of vessels calling at each port, distinguished by the volume of ships and tonnage discharged per shipping route. The time period of this analysis relates, with the exception of Dammam, to January 1st - December 31st, 1971. The author was unable to obtain data for Dammam for the same period, but the data obtained, although not strictly comparable in terms of time period (it relates to the period 1.7.72 - 30.6.73) is nonetheless identical in format and useful as a general comparison.

The purpose of this analysis was to test the hypothesis that the Gulf ports suffer from 'overtonnaging' as a contributory factor to the phenomenon of port congestion. Further, it tests the hypothesis suggested in Section 5.1.2 that Far Eastern, Indian and Pakistani Shipping Lines are the major candidates for rationalization. The particular relationship to be examined was the ratio between the number of vessels calling at a port during a one year time period, and the total tonnage of general cargo discharged during that same time period. The quantitative technique adopted was the standard Regression Analysis. The decision as to which of the two variables to make 'dependent' or 'independent' was difficult since the relationship between the actual number of vessels and actual tonnage discharged is a two-way process. To have made 'vessels' the dependent variable would have meant that one would be dealing with resultant residuals denoting vessels as fractions, or decimals - an unsatisfactory situation. Therefore it was decided to make the number of vessels the 'independent variables' (the 'X' axis), and the tonnages discharged the 'dependent variables' (the 'Y' axis). Thus structured, the aim of the Regression Analysis was to determine through an analysis of 'residuals' whether each shipping line was discharging 'more' or 'less' tonnage of cargo than would be expected given the number of vessel arrivals. Thus achieved, the intention was to highlight those lines with discharge rates less than would be expected

Analysis of Overtonnaging Kuwait

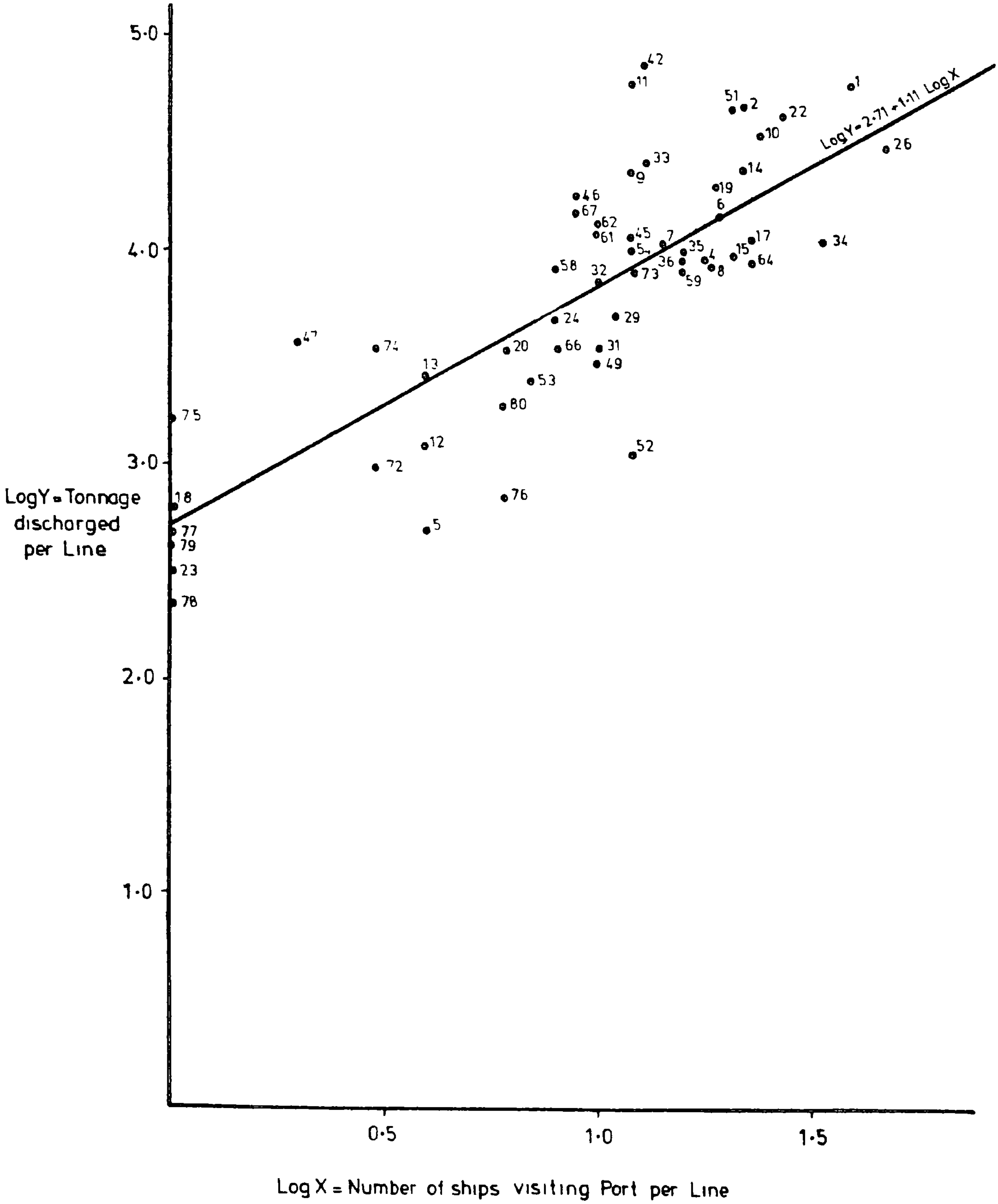


FIGURE 5.2

Analysis of Overtonnaging Bahrain

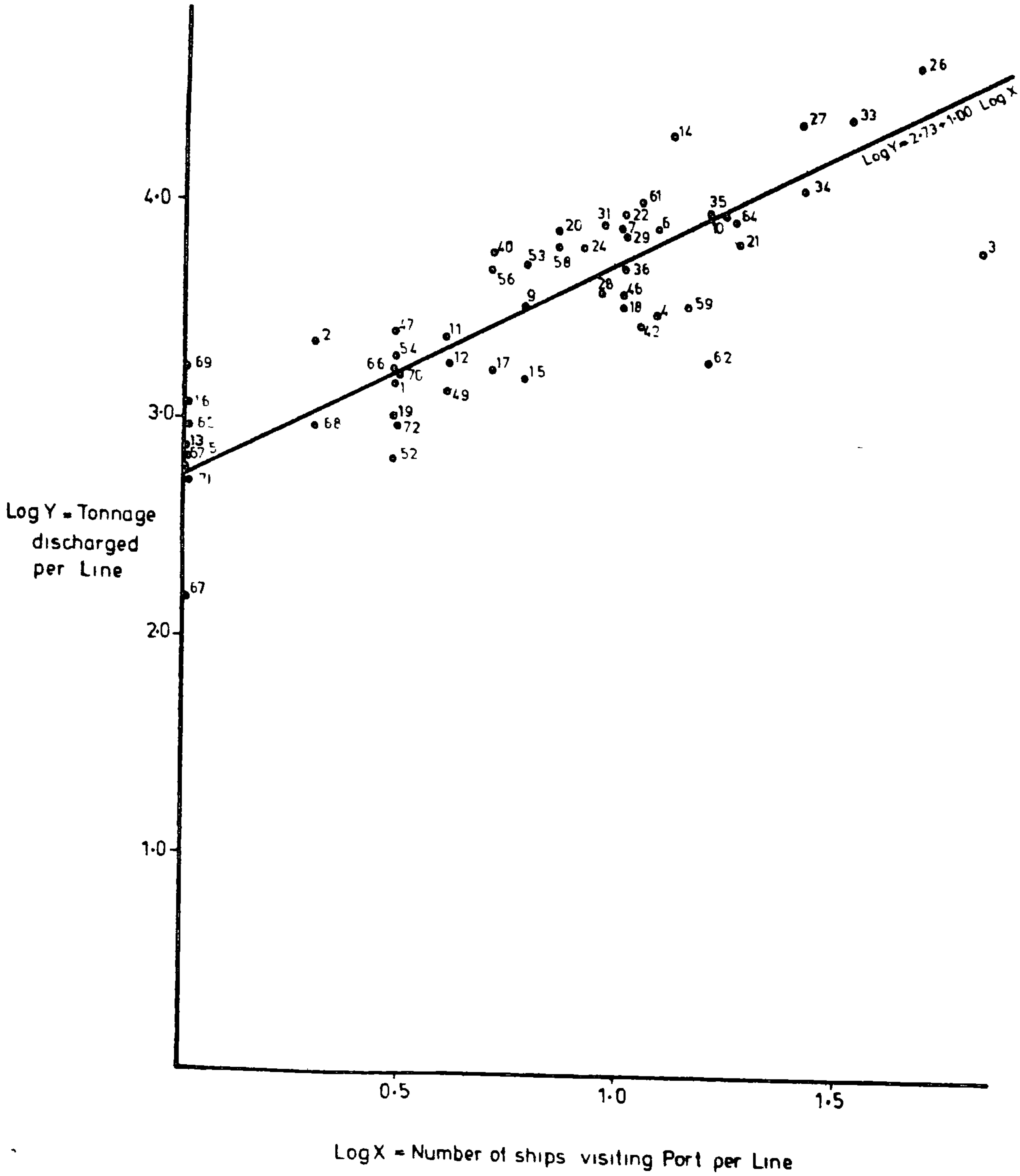
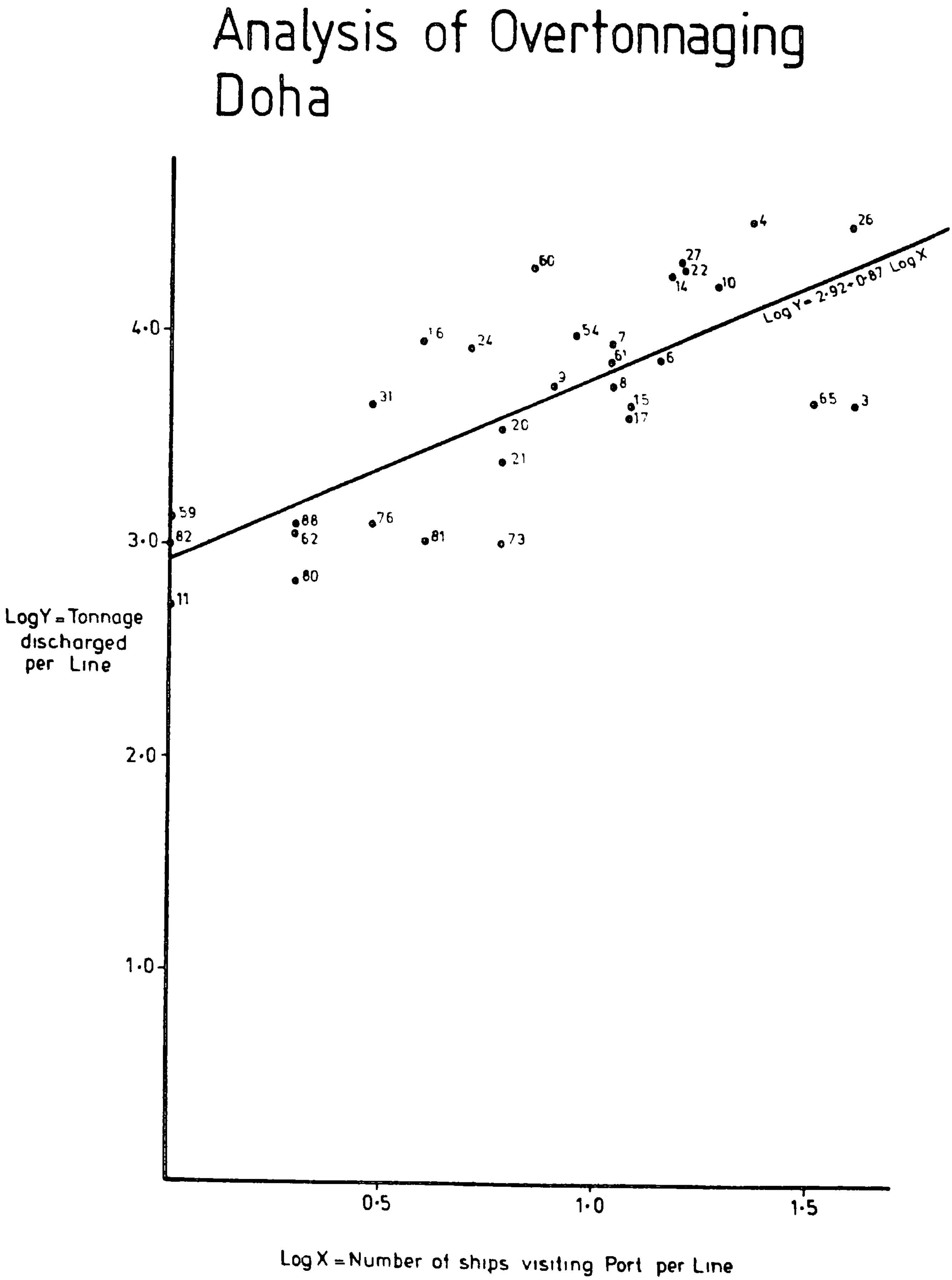
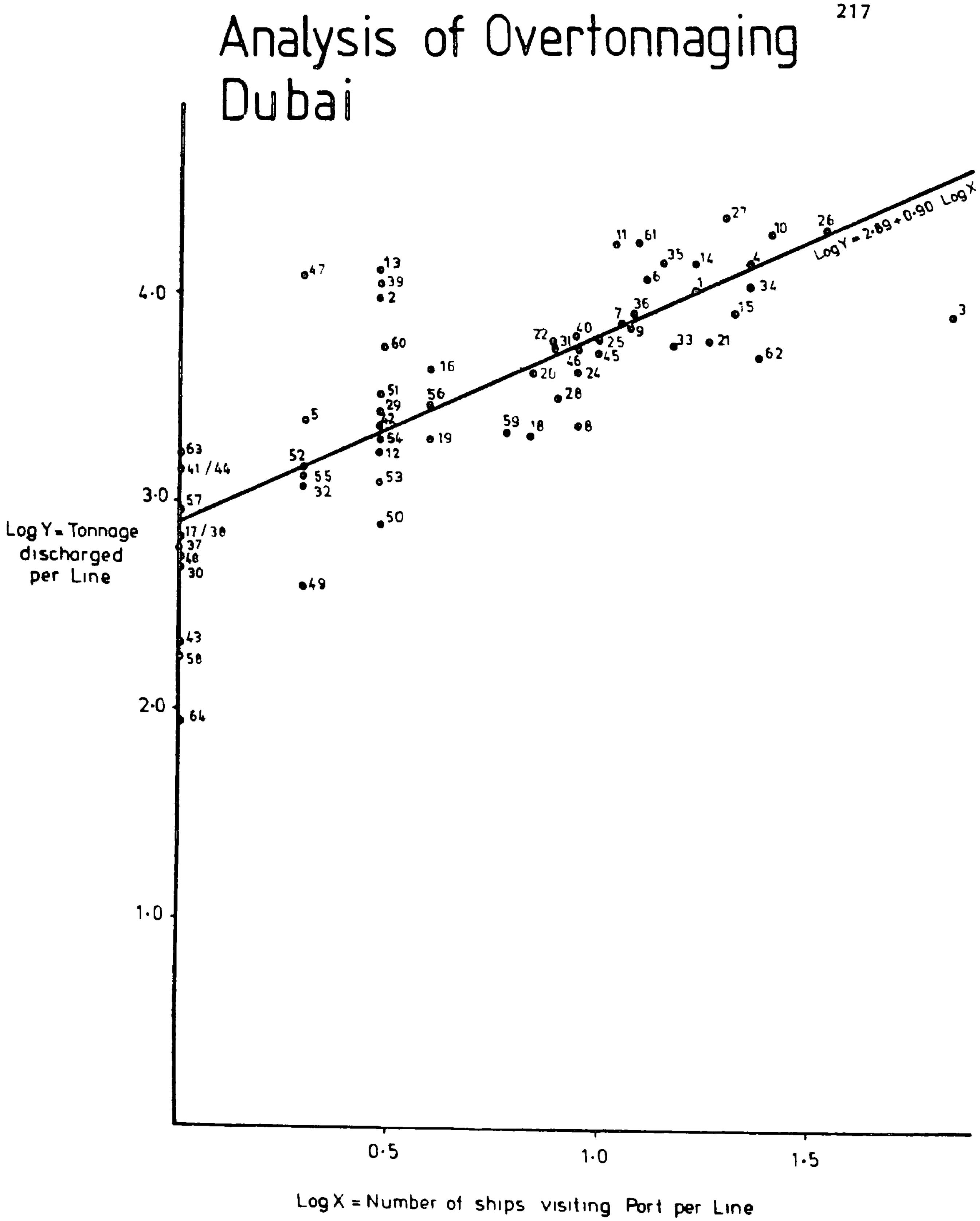


FIGURE 5.3



Analysis of Overtonnaging
Doha
Log Y = 2·92 + 0·87 Log X
4·0
3·0
2·0
1·0
0·5
1·0
1·5
Log Y = Tonnage discharged per Line
Log X = Number of ships visiting Port per Line
4
26
27
22
14
10
60
16
24
54
7
61
6
9
8
31
15
17
65
3
20
21
59
82
88
62
76
81
73
80
11

FIGURE 5.4



Analysis of Overtonnaging Dubai
Log Y = 2·89 + 0·90 Log X
Log Y = Tonnage discharged per Line
Log X = Number of ships visiting Port per Line
4·0
3·0
2·0
1·0
0·5
1·0
1·5

FIGURE 5.5

Analysis of Overtonnaging Dammam

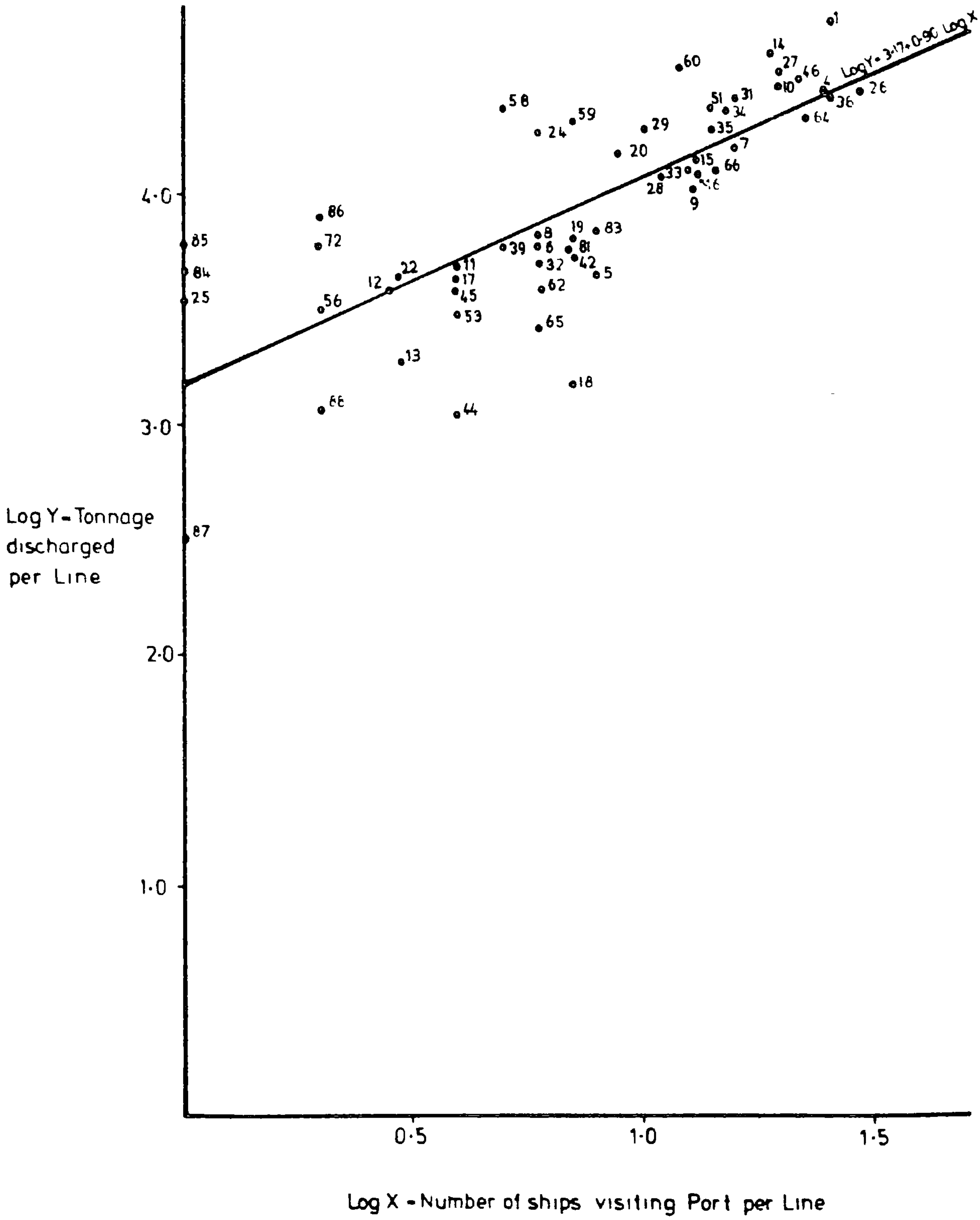


FIGURE 5.6

(i.e a situation in which in a given time period a relatively large number of vessels on a particular route call at a port and discharge a correspondingly low level of tonnage - overtonnaging), at which point it is possible to measure the specific nature of the problem.

Results of Regression Analysis

The results of the regression analysis for each of the five ports under study are illustrated both in graphical and tabular form in Figures 5.2 - 5.6 and Tables 5.3 - 5.7 respectively. After calculation of the Regression equations, residuals (of the level of tonnage discharged per shipping route) were calculated for each case. The resultant Regression equations, correlation coefficients and values of r^2, are tabulated below:

Regression Equations

Kuwait	$\text{Log } Y = 2.71 + 1.11 \text{ Log } X$
Bahrain	$\text{Log } Y = 2.73 + 1.00 \text{ Log } X$
Doha	$\text{Log } Y = 2.93 + 0.87 \text{ Log } X$
Dubai	$\text{Log } Y = 2.89 + 0.90 \text{ Log } X$
Dammam	$\text{Log } Y = 3.17 + 0.90 \text{ Log } X$

	r (Correlation coefficient)	r^2 (% of explained variance)
Kuwait	0.9506	90
Bahrain	0.9120	83
Doha	0.9260	86
Dubai	0.8819	78
Dammam	0.9395	88

The regression equations, correlation coefficients and r^2 values are similar. The lower level r^2 for Dubai is possibly explained by the significant number of large tonnages discharged at that port in 1971, particularly of building materials for both industrial, infrastructure and urban development, which distorts the pattern. The performance of the shipping lines is now analysed separately, before comparative conclusions are drawn about the nature of overtonnaging.

Kuwait

The Kuwaitis have themselves been successful in operating as carriers of cargo to the Gulf, particularly on the Far Eastern and European routes. The Kuwait Shipping Company has the second highest positive residual (i.e. a greater tonnage carried per shipping route than might be expected given the number of ships operating on that route) of all the lines calling at Kuwait. A feature of positive Kuwaiti residuals is the prominence of certain non-conference lines - Evergreen, Black Sea, China National Chartering Corporation, Lauro and Polish Ocean Line, which chalk up high residuals per vessel by virtue of the large tonnages, chiefly building materials, they convey to Kuwait. Hansa and HMEL, and Mitsui, Wil and Maersk Companies, are the most successful lines operating on the major N.W. European and Far Eastern routes respectively.

On the deficit side, the negative residuals (i.e. those routes depositing a smaller tonnage than might be expected for a given frequency of calls and which are therefore possible targets for rationalization) are dominated by the 'British India' passenger-general cargo link between Bombay, Karachi, and the Gulf ports (-44921), and the disappointing performance of the Johnson Line (-14991) on the Far Eastern run. A feature of port congestion is the occupancy of berths by these passenger ships on the Bombay-Gulf run, which, although embarking and disembarking passengers, and loading and unloading small amounts of cargo, in a short space of time, nonetheless occupied 'scarce' berths until the demise of the service in the mid- 1970's. N.Y.K., the 'K' Line, and P.& O. on the

Far East route, Concordia, Hansa and States Marine Isthmian on the U.S.A. (East Coast) route, P. & O. and the Iran Line on the N.W. European route, Lombarda Ligure (Mediterranean) and R.I.L. (East Africa) have high negative residuals (see Table 5.3).

Bahrain

Bahrain has close economic and political links with Europe, particularly with the U.K., together with an important transhipment trade of Far Eastern products (principally Chinese and Taiwanese) between Manama and Al Khobar/ Dammam in Saudi Arabia (see Chapter 4). In such circumstances, it is not surprising to find high positive residuals among European and Far Eastern carriers. Foremost among these carriers are P. & O. (+17469), Hansa (+13687) and Nedlloyd (+9860) on the N.W. European route, and Maersk, Pacific International and 'K' on the Far Eastern route. In passing, one should mention that the success, or otherwise, of securing cargo on a particular Gulf sea route is quite often a function of the energy expended by an individual agent representing a shipping line in securing cargoes at each Gulf port.

A major negative residual is again a characteristic Bombay-Gulf passenger run. The poor performance of the Shipping Corporation of India, running on the same route, renders the Bahrain-India run singularly overtonnaged (see Table 5.4).

Doha

Doha is the smallest port of the five studied, and is served by the fewest number of Lines, due to the smaller size of the state (circa 130,000 in 1971) and the lack of any significant re-export trades except the road-based trade with Saudi Arabia. Like Bahrain, its political and economic links were traditionally with Britain, until independence in 1971. The major carriers are mostly on the European (P. & O. +12036; Nedlloyd +11480; Hansa +9427; Kuwait S.C. +4970) or Japanese runs (Hinode +15545; P. & O. +19889; and NYK +6356), together with the two successful "Mediterranean" Europe operators, N.C.H.P. and Lauro. The negative residuals isolate the recurring feature of the Bombay-Gulf service, whose operators are rivalled in the level of overtonnaging by the competing Pan Islamic Line which operates on the same route when its ships are not employed on the Hajj (Pilgrim) trade to Jeddah (bound for Mecca) on the Red Sea.

Dubai

Dubai, the largest port, is served by the greatest number of lines, though many call infrequently, discharging (by weight) chiefly building materials. Pacific International (+9538), and K.S.C. (+10370) are strong Far Eastern carriers, complimented by the success of Nedlloyd on the N.W. European run (+10668). The usual high negative residuals in the Bombay-Gulf run (-26880) is at least partly counterbalanced by the Pakistan National Line (+10512) on the same route). Unfortunately, S.C.I. is again disappointing, (-8708) on this particular channel of trade.

Dammam

Although not strictly comparable in time scale, Dammam's results are interesting, because this is the first of the ports where the passenger liners do not call, and therefore the negative residuals are spread more widely through the various companies. In this regard no clear candidate emerges as a major overtonnaged route, but it is noticeable that all except two of the U.S.A. - Gulf shipping companies have negative residuals (Concordia -3165; Hansa -774; Hellenic -3288; Nedlloyd -947; Barber -2745; Arya -888). The major positive residuals accrue to Hansa, C.M.B. (mostly cargoes of steel products) and Nedlloyd on the N.W. Europe run, N.C.H.P. on the Mediterranean run, and Mitsui (+31312), Hinode (+21538) and Yamashita Shinonin on the Far East-Gulf route.

TABLE 5.8

Port Concentration (Tonnage Residuals per Ship/per Line : see Tables 5.10-5.14)

Shipping Line Number*	Kuwait	Bahrain	Doha	Dubai	Dammam	Mean Residual (for lines using 2 or more Ports)
1	+ 669.77	- 30.67	-	+ 0.18	+ 1204.31	+ 460.69
2	+ 1813.27	+ 578.00	-	+ 2387.00	-	+ 1426.09
3	- 680.62	- 453.37	- 398.23	- 401.19	-	- 483.35
4	- 217.00	- 281.08	+ 864.74	+ 15.09	- 32.12	- 413.87
5	- 462.75	+ 36.00	-	+ 413.00	- 604.25	- 95.75
6	+ 3.53	+ 95.08	- 66.29	+ 294.00	- 194.50	+ 26.36
7	+ 57.64	+ 222.20	+ 177.45	+ 1.33	- 129.94	+ 65.33
8	- 134.89	-	+ 97.09	- 333.59	- 457.50	- 260.84
9	+ 1175.67	+ 6.33	+ 30.22	- 9.08	- 333.69	+ 173.89
10	+ 664.96	- 10.88	+ 261.58	+ 178.46	+ 378.50	+ 294.52
11	+ 4153.92	+ 21.50	- 317.00	+ 942.73	- 63.25	+ 947.58
12	- 287.75	- 89.25	-	- 124.00	+ 35.67	- 170.14
13	+ 49.50	+ 32.00	-	+ 3504.00	- 680.00	+ 726.37
14	+ 323.64	+ 1052.85	+ 628.47	+ 197.94	+ 1030.84	+ 646.64
15	- 271.38	- 279.67	- 249.64	- 190.52	- 59.54	- 210.15
16	- 240.74	+ 554.00	+ 1589.00	+ 394.75	- 167.23	+ 425.95
17	-	- 196.40	- 252.67	- 140.00	- 222.00	- 202.76
18	+ 76.00	- 197.30	-	- 337.14	- 1004.00	- 365.61
19	+ 285.42	- 217.67	-	- 180.00	- 344.57	- 114.20
20	- 68.83	+ 521.14	- 85.83	- 51.14	+ 491.56	+ 161.38
21	- 324.13	- 79.33	- 261.66	- 266.28	-	- 232.85
22	+ 763.11	+ 354.00	+ 659.44	+ 113.75	+ 51.33	+ 388.32
23	- 213.00	-	-	+ 923.00	-	-
24	- 62.13	+ 246.38	+ 982.00	- 157.89	+ 1803.67	+ 237.80
25	-	-	-	- 28.90	+ 1879.00	-
26	- 160.81	+ 371.68	+ 308.62	+ 11.97	- 93.87	+ 87.51
27	-	+ 394.40	+ 717.50	+ 533.40	+ 480.05	+ 531.33
28	-	- 101.33	- 273.80	- 242.38	- 86.09	- 175.90
29	- 236.18	+ 202.70	-	+ 163.33	+ 717.00	- 211.71
30	-	-	-	- 276.00	-	-
31	- 311.90	+ 342.00	+ 819.33	+ 68.25	+ 463.06	+ 276.14
32	+ 31.30	-	-	- 145.00	- 390.33	- 188.87
33	+ 1196.69	+ 189.18	-	- 219.73	- 178.23	+ 246.97
34	- 439.12	- 87.19	-	- 121.65	+ 440.00	- 51.99
35	- 117.13	+ 6.88	-	+ 377.93	+ 236.43	+ 126.02
36	- 137.44	- 33.00	-	+ 23.58	- 37.58	- 44.86
37	-	-	-	- 156.00	-	-
38	-	-	-	- 108.00	-	-
39	-	-	-	+ 2947.00	- 64.20	-
40	-	+ 627.00	-	+ 67.33	-	-
41	-	-	-	+ 674.00	-	-
42	+ 4813.92	- 286.73	-	+ 43.66	- 446.00	+ 1030.96
43	-	-	-	- 571.00	-	-
44	-	-	-	+ 622.00	- 977.00	-
45	+ 239.58	-	-	- 95.00	- 277.75	- 44.39
46	+ 1315.00	- 159.70	-	+ 16.77	+ 387.05	+ 389.78
47	+ 1287.50	+ 291.67	-	+ 3041.00	-	+ 1540.05
48	-	-	-	- 246.00	-	-
49	- 372.90	- 191.50	-	- 534.50	-	- 366.30
50	-	-	-	- 463.00	-	-
51	+ 1365.81	-	-	+ 353.33	+ 530.93	+ 750.02
52	- 585.92	- 321.67	-	- 15.50	-	- 307.69
53	- 292.00	+ 320.83	-	- 287.00	- 504.75	- 190.73
54	+ 134.50	+ 115.33	+ 470.22	- 47.00	-	+ 168.26
55	-	-	-	- 48.50	-	-
56	-	+ 411.00	-	+ 31.75	+ 243.00	+ 228.58
57	-	+ 19.00	-	+ 68.00	-	-
58	+ 358.00	+ 350.14	-	- 597.00	+ 3468.80	+ 894.99
59	- 183.31	- 298.36	+ 445.00	- 290.33	+ 1693.71	+ 273.40
60	-	-	+ 2220.71	+ 1085.33	+ 1794.83	+ 1700.29
61	+ 539.00	+ 364.82	+ 22.55	+ 794.83	-	+ 430.30
62	+ 578.60	- 415.00	- 392.00	- 362.83	- 576.50	- 233.54
63	-	-	-	+ 842.00	-	-
64	- 351.26	- 62.83	-	- 691.00	- 137.78	- 310.71
65	-	+ 355.00	- 384.25	-	- 772.33	- 267.19
66	- 179.25	+ 12.67	-	-	- 234.86	- 133.81
67	+ 992.22	- 386.00	-	-	-	-
68	-	- 140.50	-	-	-	-
69	-	+ 1167.00	-	-	-	-
70	-	- 15.50	-	-	-	-
71	-	- 40.00	-	-	-	-
72	- 276.67	- 221.33	-	-	+ 1697.50	-
73	- 9.33	-	- 494.00	-	-	-
74	+ 553.00	-	-	-	-	-
75	+ 1075.00	-	-	-	-	-
76	- 503.00	-	- 302.33	-	-	-
77	- 58.00	-	-	-	-	-
78	- 292.00	-	-	-	-	-
79	- 87.00	-	-	-	-	-
80	- 310.67	-	- 611.50	-	-	-
81	-	-	- 394.00	-	- 368.29	-
82	-	-	+ 146.00	-	-	-
83	-	-	-	-	- 293.50	-
84	-	-	-	-	+ 3076.00	-
85	-	-	-	-	+ 4774.00	-
86	-	-	-	-	+ 2667.50	-
87	-	-	-	-	- 1155.00	-
88	-	-	- 347.50	-	- 700.00	-

Conclusions: Company Performance

Broadly, the comparative performance of shipping lines with reference to 'ship-tonnage ratios' varies between ports. At the outset, one must stress that this analysis is only partial in terms of a Gulf 'overview' and care must be taken not to draw conclusions which relate to those ports not specifically analysed. The data is limited, and hence so are the conclusions. There is no analysis of the major Iranian ports of Khorramshahr, Bandar Shahpour, Bushire and Bandar Abbas, nor of Basra or Abu Dhabi. Shipping lines which fare poorly in tonnage performance at the five ports analysed, may, in fact, fare better at the other ports. Hence conclusions may only properly be made with reference to these five ports, though certain general points may also be considered.

Table 5.8 is a comparative tabulation of the performance of each of the 88 shipping routes which focus on the group of five ports. Some shipping lines call at all five ports, some at only one. In the light of this fact it is only fair to judge a Line if it calls at, at least three of the ports studied. Table 5.8 isolates the theme of 'port concentration' in the sense of denoting the apparent success of a shipping line in concentrating its trade at one, or a limited number of ports in the Gulf. Table 5.8 has been annotated to illustrate 'concentration' by indicating the dominant port (i,e. largest positive) residual for every line calling at three, or more, Gulf ports. The groupings are illustrated below :-

Doha

P. & O.	(Bombay-Gulf)	Nedlloyd	(E)
P. & O.	(FE)	'K'	(FE)
Barber	(USA) East	Hinode	(FE)
NYK	(FE)		
NCHP	(M)		

Dammam

Mitsui	(FE)	Nedlloyd	(USA) East
Kuwait S.C.	(USA) East	Johnson	(FE)
Hansa	(USA) East	CMB	(E)
S.M.E.L.	(E)	Yamashita	(FE)
Nedlloyd	(USA) West	Collis	(I)

Dubai

China National	(FE)	Arya	(USA) East	Iran Line	(E)
P. & O.	N.Z. (A)	Malabar	(I)	Pacific International	(FE)
P. & O.	Aust. (A)	H.K.I.	(FE)		
Pakistan National	(I)	Maldive	(FE)		

Bahrain

Jugolinja	(M)	States Marine	(USA) East	Hellenic	(USA) East
Hansa	(E)	S.E.A.	(I)		
Iraqi	(E)	China Ocean	(FE)		
R.I.L.	(O)	Concordia	(USA) East		
P. & O.	(E)	Pan Islamic	(I)		

Kuwait

Kuwait S.C.	(E)	Lauro	(M)	Wil	(FE)
Kuwait S.C.	(FE)	Showa	(FE)	Black Sea	(O)
Polish Ocean	(O)	Maersk	(FE)	Seiwa	(FE)
Arya	(E)	Evergreen	(FE)	S.C.I.	(I)
Arya	(O)	DSR	(M)		

KEY:

USA.E - U.S.A. East/South Coast

USA.W - U.S.A. West Coast

E - N.W. Europe

M - Medit. Europe

A - Australasia

FE - Far East

I - India-Pakistan

O - Other

An extension of this analysis is the calculation of the 'mean residual' of each Line (positive or negative) for all Lines calling at three or more ports. The following table arranges into rank order those Lines displaying the highest positive residual 'means' - i.e. undertonnaged Lines.

<u>Rank Order - Top 10</u>

1.	Hinode	(FE)
2.	Malabar	(FE)
3.	China National	(FE)*
4.	Evergreen	(FE)*
5.	Kuwait S.C.	(FE)
6.	CMB	(E)
7.	Black Sea	(O)*
8.	Pakistan National	(E)
9.	Hansa	(E)
10.	Nedlloyd	(E)

* = Non-Conference
(See Table 5.8)

It is significant to note that in this list the 'weight' of cargo normally carried portrays a significant bias. The top eight Lines have a tendency to carry bulky cargoes such as building materials (timber, steel or foodstuffs (rice). Only Nedlloyd and Hansa have broader-based general cargoes.

Finally, the following table sets out those lines (calling at three or more ports) with negative residuals (i.e. with a tendency to overtonnage).

Rank Order

1.	P/O/Damodar	(I)	- 483.55
2.	States Marine	(US)	- 366.30
3.	Arya	(O)	- 365.61
4.	Concordia	(US)	- 310.71
5.	Iran Line	(US)	- 307.69
6.	Pan Islamic	(I)	- 267.19
7.	Barber	(US)	- 260.84
8.	S.C.I.	(I)	- 233.54
9.	R.I.L.	(O)	- 232.85
10.	Nedlloyd USA (W)	(US)	- 211.71
11.	Hansa	(US)	- 210.15
12.	Arya	(US)	- 202.76
13.	S.E.A.	(I)	- 190.73
14.	Showa	(FE)	- 188.87
15.	Nedlloyd U.S.A. (E)	(US)	- 175.90
16.	K.S.C.	(US)	- 170.14
17.	Hellenic	(US)	- 133.81
18.	Arya	(E)	- 114.20
19.	P.O. NZ	(A)	- 95.75

20.	Johnson	(FE)	-	51.99	
21.	Maldive	(FE)	-	44.86	
22.	DSR	(M)	-	44.39	(see Table 5.8)

Conclusions with Reference to Decision Making

Again, it should be stressed that those lines identified above as being susceptible to overtonnaging, have done so only in a partial study of the Gulf based on the statistics of a one year sample. One is on safer ground to identify the problem rather than to point the finger at certain lines. The dilemma is that in a 'Third World' situation where data is limited or unavailable, whether or not to analyse the data available, or to have no analysis of a problem is the choice. Clearly, the former option should be taken. Given these limitations, it is possible, however, to identify a number of points in connection with the phenomenon of overtonnaging.

Two main patterns emerge from the analysis. Firstly, there is a contrast between the 'irregular', chartered vessels (e.g. those of China National and Evergreen Lines) which tend to dispatch a few, fully-laden vessels to the Gulf, and a number of 'regular' liners (e.g. Barber, Concordia), who perhaps because of intense competition for cargoes on certain routes seem unable to sustain high levels of cargo (tonnages) for each trip at each port. Secondly, the low tonnage performance of the P. & O. and Pan Islamic passenger services to the Gulf makes them a drain on berthing space in ports where space is at a premium (e.g. Bahrain).

In Tables 5.9 and 5.10 the results of the analysis of overtonnaging are carried a stage further in order to relate the results to the processes of decision-making. The residual for each Line was allocated to its operational route and aggregated. Table 5.9 tabulates the aggregated results, by routes, for each of the five ports examined - Kuwait, Bahrain, Dubai, Dammam and Doha.[4] The comparative results are consistently favourable in terms of

TABLE 5.9 : Tonnage Residuals per Shipping Route (Aggregate of residuals per Shipping Line operating on each route)

Route	Kuwait	Bahrain	Dubai	Dammam	Doha
N.W. Europe	+ 25294	+ 44926	+ 17089	+ 55176	+ 37398
Medit. Europe	+ 20771	+ 7713	+ 7396	+ 7465	+ 16506
Far East	+170630	+ 5195	+ 36416	+ 90215	+ 49002
India/Pakistan	- 42194	- 42912	- 20606	- 9734	- 31973
USA-East/South Coast	- 21445	- 5828	- 10775	- 15612	- 8215
USA-West Coast	- 2598	+ 2027	+ 490	+ 7170	Nil
Australasia	- 1989	+ 1177	+ 4768	- 7580	- 2846
Other	+ 37625	- 1973	- 1018	- 6511	- 2874

TABLE 5.10 : Aggregate Tonnage Residuals per Shipping Route (Aggregate of residuals per Shipping Line operating on each route)

Route	
N.W. Europe	+ 179,883
Medit. Europe	+ 59,851
Far East	+ 351,458
India/Pakistan	- 147,419
USA-East/South Coast	- 61,875
USA-West Coast	+ 7,089
Australasia	- 6,470
Others	+ 25,249

performance (i.e. positive residuals) for the N.W. European, Mediterranean, and Far Eastern routes. A mixed trend (both positive and negative residuals) is a feature of the Australasian, West Coast U.S.A., and 'Other' routes, while both the East Coast U.S.A. and Indian - Pakistani routes show consistent evidence of route overtonnaging, with the exception of 'residuals per vessel' on the India/Pakistan route with reference to the ports of Bahrain and Dubai.

Finally, these figures are again collated in Table 5.10 which aggregates the scores for each of the five ports studied. The evidence of overtonnaging at least as far as the aggregate results for these five ports is concerned, shows overtonnaging to be most serious on the East Coast U.S.A. , India/Pakistan and Australasia routes (with total aggregate residuals of -61,875; -147419, and -6470 respectively.

In conclusion, having analysed the results of the performance of both individual shipping lines and individual shipping routes, it appears that development control must subsequently take the form of co-ordinating decision-making at two levels: linking the operators of seaports within the Gulf, and the conferences without. This analysis presents results for one year only; a similar analysis needs to be repeated by port authorities and shipping conferences through succeeding years in order to establish significant trends. As far as shipping conferences are concerned, the results above indicate that in particular those conferences operating on the East Coast U.S.A. and India-Pakistani routes, namely the '8900' Conference, and Karachi/Indian/Straits/ Japanese Conferences respectively, might consider rationalizing their shipping services to the Gulf in order both to reduce port congestion and reduce competition within their own conference structures.

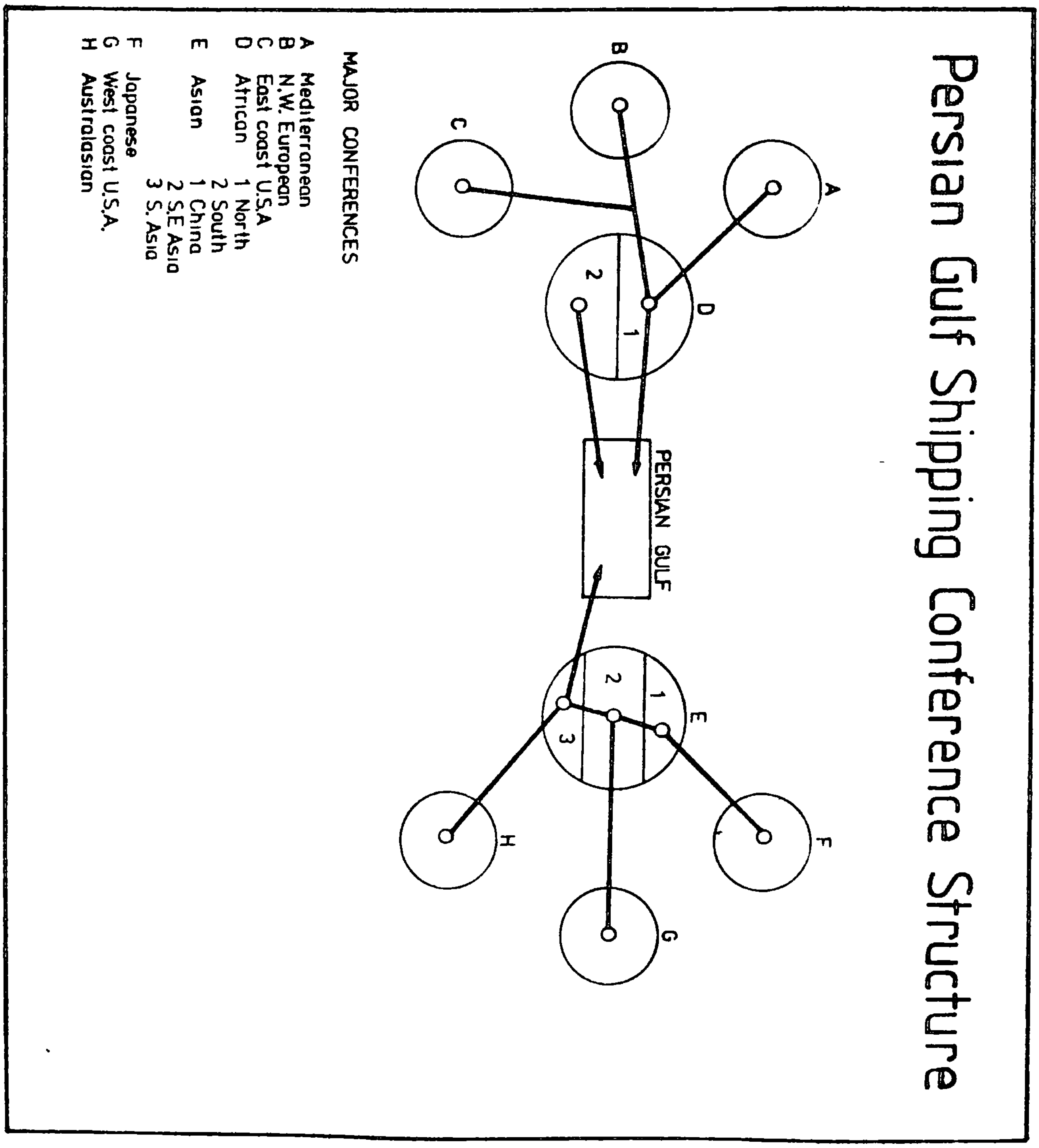

Persian Gulf Shipping Conference Structure
A
B
C
D
1
2
PERSIAN GULF
E
1
2
3
F
G
H
MAJOR CONFERENCES
A Mediterranean
B N.W. European
C East coast U.S.A
D African 1 North
2 South
E Asian 1 China
2 S.E Asia
3 S. Asia
F Japanese
G West coast U.S.A.
H Australasian

FIGURE 5.7

5.2 THE RESPONSE BY SHIPPING CONFERENCES TO PORT CONGESTION

5.2.1 CONFERENCE STRUCTURES

Shipping conferences are organizations "under which freight rates, schedules and other matters are agreed on between ship carriers in respect of particular routes" (Couper, 1972 p.15). Each conference is made up of a group of shippers operating on a route connecting a group of ports at the origin with a group of ports at the destination. In the context of the Persian Gulf, the conferences define the major trading systems that are linked with the Gulf Maritime Trading System. There are five major trading systems connecting major industrial zones of the World with the Gulf. Figure 5.7 illustrates the structural relationship between shipping conference organization and inter-system maritime routes to the Gulf. The major trading systems are the American (split between east and west coast maritime links), the European (split between the N.W. European and Mediterranean links), and the Japanese. Much of the 'developing world' serves as a zone of intervening opportunity between the Gulf and the major industrial regions. To the west and south of the Gulf lies the African 'zone', to the east the Asian 'zone' subdivided into Far Eastern (China) south-east Asian (including Indonesia) and South Asian zones. The re-opening of the Suez Canal in June 1975 had the effect of detaching the south, east and west Africa 'zone', leaving North Africa as a zone of intervening opportunity along the major European and East U.S.A. links with the Gulf. The thick lines (in Figure 5.7) linking the major industrial regions with the gulf define the basic route network. Carriers linking major industrial regions with the Gulf usually, unless they are express carriers, (eg. Kuwait Shipping Co.) pick up and discharge cargoes 'on-line' through the zones of intervening opportunity defined on the map. Seven 'tributary' or minor conferences, flow into the major networks. Tables 5.11 - 5.13 list the major and minor (i.e. routes carrying relatively low tonnages of cargo) conferences according to their trading routes:

TABLE 5.11

Route	Major Conference	Minor Conference
U.S.A. East	1. '8900 Rate Agreement'	
U.S.A. West	1. Constellation (U.S. West Coast-Pacific-Gulf)	
N.W. Europe	1. ACMEL (Associated Continental Middle East Liner)	
	2. U.K. - Gulf Conference	
Medit.Europe	1. Medmecon (Mediterranean-Middle East Conference)	1. A.M.I.M.O. (Accordo Merci Italia-Medio Oriente)
Far East	1. Japan (Japan-Arabian Gulf Conference)	1. Hong kong (West Bound Tariff No: 6)
		2. Taiwan-Gulf
		3. Karachi-Gulf
		4. Straits-Persian Gulf Tariff No: 3
		5. India-Gulf
Australasia		1. Australia-Gulf

TABLE 5.12

Japan	U.S.A.East	U.S.A.West	Europe N.W.	Europe Medit
Arya	Barber	Nedlloyd	'P. & O'	Lauro
Johnson	Hansa	Hoegh	Arya	Concordia
'K'	Hoegh	Royal Interocean	'K.S.C.'	Iraqi
'K.S.C.' (Kuwait)	Concordia		Nedlloyd	Nedlloyd
Maersk	Hellenic		'NCHP'	'NCHP'
Mitsui	Nedlloyd		Hansa	Hansa
'NYK'	'K.S.C.'		Polish Line	Yugolinya
'SCI'	States Marine		Strick and Ellerman	Lombarda Ligure
'P. & O'				'S.E.A.'
Showa				'WIL'
Yamashita Shinonin				

Australasia
P. & O.

External Base Ports : Table 5.13 lists the major base ports within each of the Conference structures operating to and from the Gulf.

TABLE 5.13 :

1. Major Conferences

A.C.M.E.L./UK	M.E.D.M.E.C.O.N	'8900'	Constellation	Japan
Le Havre	Naples	New York	Los Angeles	Yokohama
Dunkirk	Genoa	Boston	Portland	Moji
Rotterdam	Trieste	Norfolk	Seattle	Nagoya
Amsterdam	Rijeka	New Orleans	Tucoma	Osaka
Bremerhaven	Marseilles	Baltimore	Longview	
Hamburg	Barcelona		Vancouver	
Copenhagen				
Oslo				
Gothenburg				
Gdynia				
Gdansk				
Szczecin				
Liverpool				
London				
Glasgow				
Middlesborough				

2. Minor Conferences

Hong Kong	Taiwan	Karachi	Amimo	Staits
Hong Kong	Taipai	Karachi	Genoa	Singapore
	Kaoshung		Leghorn	Port Swettenham
			Naples	Penang

Australia
Melbourne
Freemantle
Adelaide
Sydney

5.2.2. FREIGHT RATES AND SURCHARGES

The action of shipping conferences in varying both freight rates and surcharges levied on individual ports does have an influential effect both on the level of trade passing through ports and the pattern of port development in the region. In practice, transport costs rarely reflect an unmodified distance principle. In the Gulf, maritime transportation rates are related to a number of processes including the 'grouping' of commodity rates (into a class rate system) the tapering of freight rates, and various measures of freight rate discrimination which favour a particular cargo, route, or port.

In the operation of ocean transport, freight rates are related directly to ocean freight carrying costs. Only a part of the cost of a liner operation can be attributed to the commodities themselves (i.e. through the calculation of the class rate system). The remainder are attributed to individual voyage costs and the overall operational costs of running a shipping enterprise. Costs attributable to a voyage are related directly to the amount of time it takes to complete a shipment. Chapter 1.2 has commented on the widespread nature of port congestion in the Gulf during the last decade caused in part by an under-provision of deep-water berths and slow turn-around (i.e. rates of discharge) in port. In such circumstances delays in waiting for a berth or in discharging cargo add considerably to the expensive daily operating costs of running a cargo vessel (averaging approximately $8,000 a day in 1977). In these conditions shipping conferences reserve the right to respond to delays caused by problems in ports by levying additional cargo rates and surcharges on offending ports in order to cover the unallocable costs incurred by delay.

In effect, the categorization of commodities and ports inot 'groups' is a form of discrimination practiced by shipping conferences which may have consequences both for the level of trade handled by a port, and the progress of social and economic development in

TABLE 5.14 : Conference Additionals and Surcharges in the Persian Gulf, 1973

Major 14	Conferences 1	2	3	4	5	6	7	8	9	Total 'In-ports'	Total Surcharges	Rank
Bahrain	I	I	I	I	I	I	I	I	I	9	0	1
Kuwait	I	I	I	I	I^s	I^s	I	I	I	9	2	2
Dubai	I	I	I	I	I	I	0	I	I	8	0	3
Basra	I	I	0	I	I^s	I	I	I	I^s	8	2	4 =
Dammam	I	I	0	I^s	I	I	I	I	I^s	8	2	4 =
Khorramshahr	I	I	0	I	I^s	I^s	I	I	I^s	8	3	6
Bushire	I	I	I	I	I^s	I^s	0	I	0	7	2	7
Bandar Shahpour	I	I	0	I^s	I^s	I^s	I	I	0	7	3	8
Doha	I	I	I	I	0	0	0	I	0	5	0	9
Bandar Abbas	I	I	0	I	0^s	0^s	0	I	0	4	2	10
Muscat	0	0	I	0	I^s	I^s	0	0	0^s	3	3	11
Abu Dhabi	0	0	I	0	0	0	0	0	0	1	0	12
Sharjah	0	0	0	0	0	0	0	0	0	0	0	13 =
Ras al Khaimah	0	0	0	0	0	0	0	0	0	0	0	13 =
Other												
Abadan	I	I	0	I	0	0	I	I	0	5		
Umm Said	0	0	0	I	0	0	0	0	0	1		
Ras Tanura	I	I	0	0	0	0	I	I	0	4		
Shuaibah	I	I	0	I	0	0	0	I	0	4		
Umm Qasr	I	0	0	0	0	0	0	I	0	2		

I = In-port
0 = Out-port
s = Surcharged

KEY :
1 Medmecon
2 Amimo
3 Karachi-Gulf
4 '8900'
5 Japan-Gulf
6 Hong Kong-Gulf
7 Constellation
8 ACMEL
9 Straits

Source : Published Tariffs for Respective Conferences, 1971

TABLE 5.15 : (In U.S. dollars per ton discharged)

	Medmecon	Amimo	Karachi	'8900'	Japan	Hong Kong	Constellation	Acmel	Straits
Dubai	–	–	–	–	–	–	–	–	–
Basra	–	–	N.P	–	–	–	–	–	–
Dammam	–	–	N.P	–	–	–	–	–	–
Khorramshahr	–	–	N.P	–	–	–	–	–	–
Bushire	–	–	–	–	–	–	–	–	N.P
Bandar Shahpour	–	–	N.P	–	–	–	–	–	N.P
Doha	–	–	–	–	3.20	3.05	7.00	–	N.P
Bandar Abbas	–	–	N.P	–	3.20	3.05	–	–	N.P
Muscat	5.00	5.10	–	8.20	–	–	14.50	4.90	N.P
Abu Dhabi	5.00	5.10	–	8.20	3.20	3.05	7.00	4.90	N.P
Sharjah	5.00	5.10	N.P	8.20	3.20	3.05	7.00	4.90	N.P
Ras al Khaimah	5.00	5.10	N.P	8.20	3.20	3.05	7.00	4.90	N.P

N.P. = Not Published.

a state. Leubuscher's (1963) work in West Africanports suggested that certain shipping conferences may be accused of 'influencing the economic growth of countries by their rates and discriminatory policies" (Couper, 1972, p. 102) which have the effect of favouring certain ports against others. In more recent times 'UNCTAD' has been alerted to the detrimental effects of freight rate discrimination in the so-called Third World (The Liner Conference System, 1970, p. 87).

The base ports at the Gulf end of a conference trading system are subdivided into 'in-ports' and 'out-ports' thereby creating a hierarchical system of seaports. Cargoes discharged at in-ports are charged freight on the normal scale of published charges . However, an 'additional' charge is levied on cargo delivered to those ports labelled as 'out-ports' (by virtue of their facilities, size and level of trade). Table 5.14 is a synthesis of the 'in-port/out-port' balance for each of the 14 major seaports of the Gulf with reference to 9 of the 13 conference tariffs (for which data was available in 1973). The table is arranged in a rank order based upon the number of 'in-port' categorizations for each port. Bahrain, Kuwait and Dubai head the list of rankings for in-ports. The ports of the lower Gulf (Bandar Abbas, Muscat, Abu Dhabi, Sharjah and Ras al Khaimah) are a spatial backwater in terms of port development measured with reference to their out-port status. The scale of additional charges for outports per conference is tabulated in Table 5.15.

Conferences levy, where appropriate, surcharges relating to the level of turn-around time in port, currency devaluation, and route deviation costs (e.g. around the Cape of Good Hope, June 1968 - June 1975). Table 5.16 indicates the level of individual surcharges levied upon a port by virtue of the congested conditions in that port which could add (in 1972) an extra £300 - £500 per day operating costs on ships delayed in securing a berth.

TABLE 5.16:

	8900	Japan	Hong Kong	Straits	
Kuwait	-	3.59	3.59	-	(in U.S. dollars
Basra	-	3.74	3.55	3.75	or % levied per
Dammam	15%	- -	-	10%	ton discharged).
Khorramshahr	10%	3.74	3.55	3.75	
Bushire	-	3.19	3.05	-	
Bandar Shapour	10%	5%	5%	-	
Bandar Abbas	-	3.19	3.05	-	
Muscat	-	3.01	2.85	2.75	

The significance of ocean freight rates in relation to port development in the Gulf is the manner in which conference rates are either an incentive for port development (either involving the construction of deep-water facilities, or the extension of existing facilities), or act as a disincentive to development and are therefore detrimental to the level of economic growth of a state. In order to check the rather over-simplified hierarchy in Table 5.14, a further hierarchy has been calculated using real commodity class rates, additionals and surcharges levied on each of the major seaports of the Gulf. Using data from published conference rates, eight common commodities were selected for comparison across a sample of five major conferences. A ton of rice, a ton of cement, a ton of steel bars, a ton of timber, 40 cu. feet of air conditioners, 40 cu feet of shoes, was aggregated for delivery at each port across each of the five conferences. The results are tabulated in appendix Table "I", where an aggregate of results across commodities and conferences is tabulated in dollars. This result was then converted into index form using the formula :

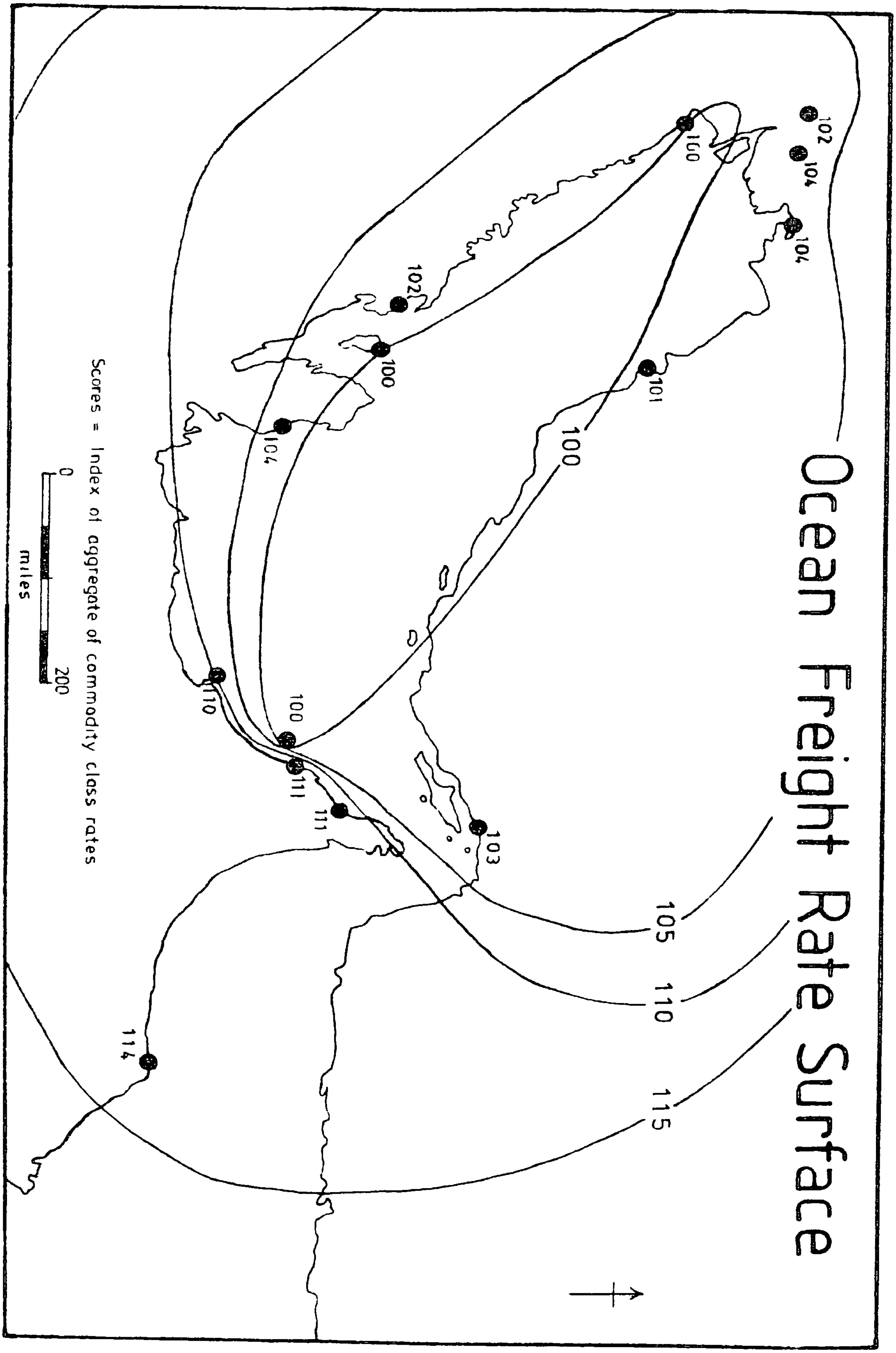

Ocean Freight Rate Surface
Scores = Index of aggregate of commodity class rates
0
200
miles
100
105
110
115
102
104
104
160
102
100
101
104
110
100
111
111
103
114

FIGURE 5.8

$$\text{Index} = \frac{\text{Total aggregate Freight Rates per Port}}{\text{Lowest total aggregate Freight Rate within the Group of Gulf Ports}} \times 100$$

and the index rank order tabulated in Table 5.17. The rank order bears an approximate resemblance to the order in Table 5.14, but statistically the significant breakpoint appears to be the 104–110 line separating Abu Dhabi, Sharjah, Ras al Khaimah and Muscat from the remainder of the ports. The results in Table 5.17 are represented in isopleth map form in Figure 5.8. The map reveals a pattern in which the lower Gulf ports (on the Arabian peninsula) appear to be at a disadvantage in terms of the level freight rates when compared to the remainder of the Gulf ports. Dubai stands alone in an advantageous position in relation to rates at neighbouring ports in the lower Gulf region, perhaps partially explaining the port's dominance of the entrepot trade in this region.

TABLE 5.17: Index: Comparative Conference 'Base Freight Rates' to Persian Gulf Ports, for selected commodities, 1971

		Index
1 =	Bahrain	100
1 =	Dubai	100
3	Kuwait	100
4	Bushire	101
5	Basra	102
6	Dammam	102
7	Bandar Abbas	103
8	Doha	104
9 =	Bandar Shahpour	104
9 =	Khorramshahr	104
11	Abu Dhabi	110
12 =	Sharjah	111
12c	Ras al Khaimah	111

14 =	Muscat	114

5.3 SOLUTIONS TO PORT CONGESTION

5.3.1 RESPONSE BY GOVERNMENTS I - INVESTMENT IN HARBOUR FACILITIES

The most compulsive response by governments in the Gulf to serious port congestion has been to finance the construction of new or expanded port facilities in an effort to match the provision of berths with demand for additional port capacity. This response has involved two basic difficulties: firstly, not all the Gulf states have oil revenues large enough to finance expensive projects; and secondly, few of the states possess the necessary engineering know-how, technology, or skilled labour to undertake construction projects without overseas assistance.

Notwithstanding the high cost of building harbours, table 5.18 illustrates the large sums recently invested in a range of port development projects. As estimated $4,671 million has been invested in new or expanded port facilities, with a further $ 2,972 million invested in the construction of harbours which incorporate linked industrial development schemes. In both cases, the two most wealthy oil-producing states, Saudi Arabia and Iran, have invested the largest sums (amounting to 72% and 52% of the total costs respectively). Other states for whom oil-revenues have come on-stream only comparatively recently (e.g. U.A.E.), or who have relatively scarce financial resources (e.g. Oman) have had to be prudent with investment allocations. However, if it is clear that Saudi Arabia and Iran are intent on providing an appropriate scale of port facilities to match their ambitious programmes of national development, the same can be said for each of the Gulf states, for they are all currently constructing new harbour facilities.

TABLE 5.18

ESTIMATED COSTS OF PORT INVESTMENT PROJECTS

IN THE GULF, 1973 - 1980

1. COSTS OF DEVELOPING COMMERCIAL HARBOURS

		Millions of $	
Dammam[1]		1700	
Jubail, commercial harbour[1]		885	
Bandar Abbas[2]		800	
Khor Al Zubair, Iraq[1]		500	
Port Sulman, Bahrain[3]		203	
Port Rashid, Dubai[2]		200	
Port Khalid, Shasjah[4]		100	
Port Raysout, Oman[1]		76	
Shuwaikh, Kuwait[5]		65	
Port Saqr, Ras Al Khaimah[2]		52	
Port Qaboos, Oman[6]		44	
Khor Fakkan[2]		32	
Umm Al Qaiwan[7]		14	
	TOTAL	4671	*no data for Basra or Bandar Shahpour

2 COSTS OF DEVELOPING INDUSTRIAL HARBOURS

Jubail, industrial harbour[1]		944	
Jebel Ali,[1] industrial harbour		769	
Bandar Abbas, shipyard[2]		600	
Dubai, dry dock complex[8]		464	
Bahrain, Arab Ship Repair Yard[2]		140	
Umm Said, industrial harbour[9]		55	*no data for Shuaiba
	TOTAL	2972	

Sources:

1. Smith (1978)
2. Sucharov MEED, March 25, 1977
3. M.E.E.D. March 1978
4. M.E.E.D. July 1977
5. M.E.E.D. Aug. 77
6. Shipping World and Shipbuilder: Jan. 1976
7. Civil Engineering, Oct. 1977
8. Civil Engineering, Oct. 1978
9. M.E.E.D. April 1977

TABLE 5.19

GROWTH IN NUMBER OF DEEP-WATER BERTHS

IN GULF PORTS 1940 - 1980

	1940	1950	1960	1970	1980
Basra	6	6	6	10	16
Khorramshahr	1	6	7	9	13
Abadan	3	3	3	3	4
Umm Qasr	-	-	-	3	6
Bandar Shahpour	2	2	6	6	28
Khor Al Zubara	-	-	-	-	5
Port Shuwaikh	-	-	5	7	20
Port Shuaiba	-	-	-	5	13
Bushire	-	-	-	-	2
Dammam	-	2	7	7	40
Bahrain	-	-	-	6	16
Doha	-	-	-	4	9
Port Zayed	-	-	-	3	17
Port Rashid	-	-	-	5	37
Port Khalid	-	-	-	2	7
Port Saqr	-	-	-	-	7
Khor Fakkan	-	-	-	-	2
Bandar Abbas	1	1	1	6	26
Matrah	-	-	-	-	8
Jebel Ali	-	-	-	-	5
Jubail	-	-	-	-	14
TOTAL	13	20	35	76	295

% Distribution of Berths

Upper Gulf	92	85	77	57	36
Mid Gulf	0	10	20	22	27
Lower Gulf	8	5	3	21	37

The very high costs of these projects appertaining in the late 1970's and early 1980's made contracts that seemed expensive at the time such as Dubai's original 15 berth Port Rashid (operational in 1973 at a total cost of $50 million) and Matrah's 8 berth Port Qaboos (operational in 1974 at a total cost of $44 million) seem relatively inexpensive. Unfortunately, during the inflationary period preceding the rise in oil prices in 1973/74, the Gulf states have been unable to make much headway in solving the problem of their shortfall in technology and labour. Hence a large proportion of the costs arrayed in Table 5.18 is made up of consultancy, labour and plant costs occrrued on harbour development contracts.

Table 5.19 reveals that the growth in the number of deep-water berths (conventional and non-conventional) is uneven in both time and space. Measurements taken at the beginning of each decade during the period 1940 - 1980 show a dramatic surge in the total number of berths in the 1970's, when almost a four-fold increase was achieved. Spatially, the most pronounced change of the era is the evening out of berth provision between the 'upper' (Basra, Khorramshahr, Abadan, Bandar Shahpour, Umm Qasr, Khor Al Zubair, Shuwaikh and Shuaiba), 'middle (Dammam, Bahrain, Bushire, Jubail, Doha and Umm Said) and 'lower' Gulf (Abu Dhabi, Dubai, Sharjah, Ras al Kaimah, Bandar Abbas, and including Khor Fakkan and Matrah). Over the forty year period the dominance of the 'upper' Gulf has slowly been eroded, firstly by the 'middle' Gulf region, and dramatically during the 1970's by the 'lower Gulf, which, if Khor Fakkan and Matrah are included, actually aggregates the largest number of berths by 1980.

5.3.2 NEW TECHNOLOGY IN PORTS AND SHIPPING

Port development in the Gulf is complicated by technological changes in transport systems. During the 1970's the handling of general cargo in particular had become polarized between the through transport use of containers and the improved, but conventional, break-bulk techniques. On a world scale the rapid shift to unitized methods of handling cargo presented the governments of the Gulf states with the dilemma as to whether to invest in conventional general cargo berths, or to invest in more advanced and costly container berths and handling facilities (Sucharov, 1977).

Containerization offers certain advantages which are particularly applicable to trade flows between more developed countries where a steady two-way flow of cargo is backed up by comprehensive road and rail systems. In particular containerization offers ease of handling, greater security and flexibility when it comes to forwarding cargoes to inland destinations. However, in the context of the Gulf possible gains in terms of faster vessel turn-around times are offset by weakly developed inland transport systems, together with the fact that still in the late 1970's a large proportion of incoming cargoes are made up of heavy equipment for the construction industry (Barrett, 1977, estimated between 50 - 60%) which it is not always possible to confine in a 40 foot or 20 foot standardized box.

Pressure to develop container handling berths in the Gulf initially came from outside sources. Faced with increasingly congested ports many shipping companies opted to transfer cargoes to container or Ro-Ro vessels to ease delay on their vessels. By the end of the 1970's an impressive array of shipping lines offered a regular container service to the Gulf - Arabian Peninsula Container Line (a joint venture between U.A.S.C. and P. & O/Straith-Ellerman), Barber Middle East Line, Maersk, Concordia, Hoegh, Hansa-Nedlloyd -C.M.B., Medtainer, Seaspeed, N.C.H.P., Cunard Arabian Middle East Line, Blue Star Line, Associated Container Transportation, Arya-Seatrain, Gulf Shipping Line and Beaufort Gulf Services. The number of container services grew so rapidly that it became apparent that too many vessels were operating the service as many container ships entered the Gulf with less than full loads, triggering off a price-cutting war in 1977.

By the end of the 1970's the LASH (lighter aboard ship) system had been little exploited in the Gulf, although the ports of Bandar Abbas and Bandar Shahpour include the provision of LASH terminals in their current development programmes. The system will probably expand in the 1980's given the nature of the Gulf's coastline, but it may not match the rate at which Ro-Ro services are introduced into the Gulf.

Ro-Ro vessels came into their own during the peak period of congestion (1975-77) because they made no special demand on port facilities (berthing stern to quay), and required only 25 metres of water frontage and a small labour force to unload them. These vessels proved attractive both in terms of rapid turn-around time (a typical Ro-Ro ship can discharge 5000 tons of cargo in 8 hours) and favourable insurance policies from the rare incidence of damage to cargo. However, time saved has to be offset against generally higher freight rates on Ro-Ro trades relative to container services. It is not easy to compare the two rating systems as container rates are levied on each container according to the value of the cargo (which is designed to encourage the carriage of low value cargoes), whereas Ro-Ro shipping involves a two-tier price system with cargo on wheels being charged per linear metre and other cargoes per 1000 Kgms or $1\frac{1}{2}$ cu. Metres, whichever is the greater (ME.E.D 5th Nov, 1976). The main cost disadvantage of Ro-Ro is that it does not always make the most economical use of a vessel's available space. Nevertheless, in the sense that Ro-Ro and standard container ships are competitive systems Smith (1978) reports that Ro-Ro rates were holding steady in 1978 (e.g. $500 per linear metre on the U.K. - Gulf run), whereas container rates (on the same route) fell from a maximum of $2600 per 20 foot containers in 1977 to $2000 in 1978 (reflecting the over-provision of services to the Gulf at that time). While most observers feel that the future for shipping operations to the Gulf lies in the increasing use of containers (in the belief that the Ro-Ro system was essentially a means to help solve the short term problem of port congestion), they also point to the fact that Ro-Ro rates have steadied indicating that demand should continue over the medium term. One line, Seaspeed Ferries which operates a Japan - Dammam, Bandar Shahpour, Dubai service has ordered giant versions of Ro-Ro ships to operate on this route because of the relatively low operating costs (Smith, 1978, p.66).

Seaspeed is one of the major operators of Ro-Ro ships to the Gulf. The shipping consortium 'FOSS' (Fred Olsen Seaspeed Svedel) started operations in 1976 when the Greek owned seaspeed services joined Fred Olsen of Norway with the intention of operating on the Northern Europe - Gulf route. In March 1977, the group was joined by the Swedish operator Svedel. The consortium operate a service to Dubai and Dammam from Felixstowe, Antwerp, Rotterdam and Hamburg, and from Genoa, Trieste and Marseilles, with connecting services to Kuwait, Bandar Abbas and Bandar-Shahpour using shallow-draught feeder Ro-Ro vessels. Other services using Ro-Ro vessels include the Meredith Shipping Company which began operating a service from Felixstowe, Antwerp Le Havre and Marseilles to the new Ro-Ro terminal at Sharjah in 1977. Maritime Transport Overseas Services commenced a two vessel Ro-Ro service from the UK/North Continent to Dubai and Bandar Abbas in 1975. Arghiris Line serves Dubai, Dammam and Sharjah with a service from Felixstowe, and in 1978 Hoegh Ugland Auto Lines began to import cars into the Sharjah Ro-Ro terminal (Civil Engineering, Oct. 1978).

It is apparent that at the beginning of the 1980's the resolution of the dilemma concerning conventional versus container berths has been resolved in favour of conventional berths. It remains to be seen whether pressure to accept containers will overtake some of these facilities, and in fact tender them obsolete. Table 5.20 lists the extent to which container and Ro-Ro berths, container gantries and LASH terminals have been incorporated into current port expansion schemes. For the most part, even though some ports have included substantial investment in modern handling methods - Dammam, Port Rashid, Bandar Abbas, Bandar Shahpour, Shuaiba and Jubail - the degree of conversion to non-conventional general cargo berths remains under 20% for each port. The exception is Sharjah which

TABLE 5.20

EXTENT OF INCORPORATION OF NEW HANDLING TECHNIQUES INTO HARBOUR DESIGNS, 1980

	Container Berths	Container Gantries	RO-RO Berths	LASH Terminal	Container & RO-RO berths as a % of total berths
Dammam	5	4	1		15%
Port Rashid, Dubai	5	2	2		19%
Jebel Ali, Dubai	5*				
Bandar Abbas	4	4	2	1	23%
Bandar Shahpour	4	4		1	14%
Port Shuaiba, Kuwait	4	1			31%
Port Zayed, Abu Dhabi	3				18%
Jubail	2	7			14%
Shuwaikh, Kuwait	2	2			10%
Port Khalid, Sharjah	2	2	1		43%
Khor Fakkan	2	2			100%
Port Saqr, Ras Al Khaimah	2				29%
Basra,	1	1			6%
Umm Qasr	1				17%
Port Qaboos, Muscat	1*				
Fujairah	1*				

* planned

No facilities planned at Doha, Bushire, Khor Al Zubair and Umm Said

Source: Owen (1978) p.167

has taken the bold step of developing two container ports at Sharjah and Khor Fakkan in effort to establish a linked, specialist container function capable of servicing a wide area of the Gulf region.

RESPONSE BY GOVERNMENTS II:

5.3.3 INVESTMENT IN NATIONAL SHIPPING LINES

The dilemma over the extent of incorporation of modern shipping and handling technology into the design of ports carries over into the sphere of investment in national shipping lines. In this case decisions have to be made as to which type of vessel would represent the most profitable investment. The case for and against state participation in international shipping in the Gulf has been stated in Chapter 1.5. Despite doubts as to the wisdom of participation in the shipping industry, it is apparent that the 1960's and 1970's have witnessed an increasing involvement of some of the Gulf states in this sector.

On a national basis the extent of state involvement in shipping, although modest, has involved all the Gulf states except Bahrain, Qatar and Oman. Kuwait and Iran have been the two most active states involved in the industry. The Kuwait Shipping Company (K.S.C.), founded in 1966, had built up a fleet of 13 conventional liners by 1972 before it subsequently formed the basis of the United Arab Shipping Company which was founded in 1976 (see Section 5.3.4.) The Kuwait Oil Tanker Company (in which the state had a 49% stake) had acquired a fleet of 19 tankers totalling 2125956 dwt by 1978, of which 7 vessels were supertankers of over 200,000 dwt. The Iranian Arya National Shipping Line (founded in 1967) owned 36 vessels by 1976 and carried 3 million tons of cargo to Iranian ports during that year (Smith, 1978, p.69). In the late 1970's, Arya introduced container ships on its services between Iran and Europe in co-operation with Seatrain Lines of the U.S.A. It also ordered 5 19,000 dwt semi-containerized vessels from Japanese yards and purchased 5 landing craft costing $1.2 million to service ports without conventional berthing facilities. The state sector has been supplemented by two private Iranian companies: Iran Express Line of Teheran ordered two multi-purpose cargo ships of 15,000 dwt each, and the Shahyad Shipping and Trading Company operates a monthly service between Japanese ports and Khorramshahr using 4 14,000 dwt Japanese-built container ships of 213 TEU capacity. In 1978, the National Iranian Tanker Company operated a fleet of three vessels totalling 148742 dwt.

Iraq founded its national shipping line, Iraqi Line, in 1959, increasing the size of its fleet to 15 conventional vessels (totalling 80898 dwt) by 1977 (EIU, 1978). The parallel Iraqi National Oil Company fleet comprised 15 tankers in 1978 totalling 1366285 dwt, none of which were in the supertanker class. In contrast, the Saudi government has been reluctant to commit state funds into large-scale shipping investment and has left the operation of vessels carrying the Saudi flag largely to private companies or joint enterprises. It does have a minority shareholding in the National Saudi Shipping Line, whose majority shareholders are the Al Quraishi family. In January 1978 this line announced that it was raising its authorized capital from $4 million to $120 million with the aim of capturing 40 - 50% of Saudi Arabia's seabourne trade via the purchase of a fleet of container ships (Smith, 1978). Similarly the participation of the U.A.E. in state-run shipping lines has been modest, limited to the operation of the Abu Dhabi National Oil Companies' 3 tankers (totalling 655949 dwt in 1978) and a small fleet of cargo ships operated by the Dubai-based Gulf National Navigation Company.

However, this apparently limited involvement of the state in shipping is misleading. In an era of rapid technological change and financial inflation, the Gulf states have reacted cautiously to the temptation to invest in large fleets. There is some doubt in government circles about the appropriate scale of participation in financial and operational terms, together with type of vessels and trade routes to be operated. A way around this hesitancy has been to spread the risks involved by entering into joint shipping ventures between the states themselves, and between other states and private companies.

5.3.4 JOINT VENTURES IN SHIPPING

It seems likely that co-operative projects involving Gulf states and outside interests will prove the cornerstone of the region's shipping policy into the foreseeable future (Beckett 1976). By 1980, three levels of joint enterprise were in evidence. Possibly the most significant are multi-national ventures involving Middle-Eastern states; second in prominance are a group of bi-lateral agreements between Gulf states and outside governments or private companies; finally, the second half of the 1970's witnessed the growth of small-scale arrangements between private companies in the Gulf and outside interests.

The establishment of the Arab Maritime Petroleum Company (A.M.P.T.C.) in 1973 by the seven founder members of O.A.P.E.C. was a pioneer venture. By 1977, each of the member states contributed one tanker to the Company (Saudi Arabia, Kuwait, Qatar, U.A.E., Libya and Algeria) except for Iraq which contributed two. The fleet of eight ships totalled 2085497 dwt in 1977 (Smith, 1978 p.39). Each of the founder members holds a 13.57% shareholding, together with two additional members, Bahrain and Egypt, who hold 5% and a nominal share respectively. This project clearly represents a political as well as economic venture, designed to increase the influence of the Arab states in world affairs through O.A.P.E.C. Unfortunately the scheme was launched at an inappropriate period embracing the steep rise in oil prices and the subsequent slump in the demand for tankers in 1976-1977. Consequently in the first full year of operation AMPTC lost KD 276,167 ($952,000) in 1975 (O'Byrne, 1977). In common with other national oil tanker companies, except the Kuwait Oil Tanker Company, AMPTC found difficulty in securing cargoes when faced, it is alleged, by a siege mentality among the existing world oil tanker companies who sought to deny cargoes to the consortium and in so doing stifle its birth and development (O'Byrne, 1977). In mid 1977 two of AMPTC supertankers were laid up in Norway, two were placed on one-year time charters, and two further vessels were also placed on charter. Nonetheless, although the overall intention of AMPTC is to carry a certain proportion of Arab oil in its vessels (10%) it is apparently willing to suffer a certain level of financial loss in the short term during which time it is training Arab crews in the skills of seamanship as a basis for the future.

Parallel to the birth of AMPTC is the formation of the United Arab Shipping Company (U.A.S.C.) in 1976, owned jointly by the governments of Kuwait, Saudi Arabia, Bahrain Iraq, Qatar and the U.A.E. In a short space of time this Kuwait-based company has emerged as a significant force on liner trades linking the Gulf with Europe, North America and Japan. UASC was formed by merging the nucleus of the K.S.C. fleet with ships of member states and had achieved a fleet size of 58 vessels(with 4 additional, 19000 dwt container ships, on order from Hyundai's yard in South Korea) totalling over 1 million dwt by 1979 (Arab Economist, 1979). Member states have agreed to restrict their national fleet to a maximum of a total of 120,000 dwt each. The reason for the creation of the company was as much concerned with laying a foundation for a solid base in the field of non-hydrocarbon shipping as part of the downstream industrialization favoured by OAPEC, as it was with capturing a major share of Gulf liner trade. In fact the first eighteen months of trading yielded a modest net profit of KD 9.1 million, a level which might have been higher were it not for the down-turn in liner trades associated with port congestion in the period 1975-77. UASC's prime objective is to win a 40% share in the total seabourne trade of member states. By 1979 it has been calculated that UASC carried well under 20% of this trade (Arab Economist, 1979), though performance on some routes exceeded this level. UASC transported almost 28% of the tonnage carried on the Japan-Gulf route in 1978 (O'Byrne, 1978).

The creation of UASC offers a number of advantages for member states. Firstly, the fusion of national fleets has created a company of sufficient size and financial strength (it has authorized capital of $1.65 billion, of which $600 million was paid up by 1978 - Smith, 1978) to compete with existing international companies. This financial strength gives it the confidence to take the risk of investing in new technology, although in fact the present fleet composition includes mostly conventional ships, 50 of which are multi-purpose, including 30 with an average container capacity of 288 TEUs. However, doubts remain as to the wisdom of heavy investment in container vessels which have led to the company's interim decision to set up a joint venture of its own by establishing the Arabian Peninsula Container Line (APCL) in association with Straith-Ellerman in 1978. A further development involving UASC has been the expansion of a sister company - ARATRANS- which acts as a ground handling organization with agents and equipment in member states designed to offer door to door service to inland destinations.

Although partners in UASC, member states are still free to set up bi-lateral shipping groupings outside the consortium. In 1977, for example, Kuwait established joint ventures with India and Egypt to transport key bulk commodities such as wheat. Iran, a non-member of UASC, has also been active in the field of bilateral arrangements. In its oil sector the state-owned National Iranian Tanker Company (NITC) signed an agreement in

1977 to purchase 3 VLCC's and 2 product tankers from B.P. (worth $60.5 million) in a deal in which B.P. contributed a further 5 tankers to make up a joint fleet of 10 tankers to form the Irano-British Shipping Company (O'Byrne, 1977).

Outside the public sector private investors have also been involved in a number of joint ventures. This trend is perhaps most evident in Saudi Arabia where an example is the businessman Adnan Khashogi whose company 'Triad' formed a joint shipping company with an interested party in Argentina with a vèw to transporting fresh meat and livestock to the Gulf (Smith, 1978, p. 70). 'Triad' was also involved in the late 1970's with setting up a joint Saudi Arabia - Finnish Shipping Company - Saudi International Shipping (SIS) - in co-operation with Finnlines and Valmet of Finland. Two other ventures in 1977 were the formation of the Saudi Arabian Maritime Company (SAMARCO), a joint venture with Mobil and Fairfield Maxwell of the U.S.A., for the operation of 5 tankers totalling 984907 dwt, and the creation of the Saudi Shipping Company (SASCO) in co-operation with Mitsui O.S.K. of Japan which operates 4 tankers totalling 779793 dwt (O'Byrne, 1977). Some Iranian companies are following suit. Hirsch (Iran) and the Astran International Company (UK) formed a joint container-rail-road-air freight service from Western Europe to the Gulf in 1978 (Smith, 1978). Similarly, Austiran' - a joint Australian-Iranian Shipping Company - has been formed to transport frozen mutton to Iran in two chartered container ships.

The majority of such joint ventures have been in operation in the past half-decade 1975-1980. It is therefore a little premature to evaluate their future prospects. However, it seems that for both state and private interests in the Gulf they offer a means of entering an international industry in furtherance of a general policy of industrialization, and at the same time spreading the risks involved in participation. In contrast, however, co-operation in the field of port development in the Gulf has been less marked, except in the context of port management and engineering consultancy. This fact means that the spatial and locational implications of port development have a sharp, competitive edge.

5.4. SPATIAL AND LOCATIONAL IMPLICATIONS OF PORT DEVELOPMENT

5.4.1 A HIERARCHY OF GULF PORTS

The situation at the beginning of the 1980's with respect to the development of existing and entirely new harbour facilities in the Gulf is fluid. This fluidity is the result of the transitional stage reached by Gulf states in their port expansion schemes, many of which are still under construction or subject to uncertain plans for future development. Amid the current spate of port development projects lies the worry that ultimately the escalation in the number of berths, of all types, will intensify port competition to a point where in the future some ports will suffer a marked down-turn in trade because of a general over-provision of berths in the region. In this context a study by the Shipping agent 'Gray Mackenzie' has predicted that by 1982 all the Gulf states - except Kuwait and Bahrain - will show a surplus of conventional berths. In the case of the U.A.E., that surplus may well be unacceptibly high rising it is predicted to a level of 70% excess capacity of conventional and container berths (Grainge, 1980). Set against this possibility, the war between Iraq and Iran, currently unresolved at the time of writing, has already inflicted damage to port installations at Khorramshahr and Abadan, a situation that would place a strain on Iranian ports without recourse to assistance from neighbouring Gulf states .

The relevant theory relating to the development of a port hierarchy suggests that fears about over-expansion in port facilities are justified. The 'typical' sequence of development of seaports and their inland route connections in former colonial seaboard regions was first explained by Taaffe, Morrill and Gould in their 'ideal - typical sequence model' based on research in Ghana and Nigeria in 1963. This model attempted to demonstrate that a system of seaports will develop into a hierarchy of more or less important ports as ports gain certain commercial advantages in relation to the penetration of inland transport systems. The model is represented by a series of four 'phases' through which a set of ports in a 'port system' will pass during the process of port development. These phases emanate from a set of scattered ports with weak inland and coastal connections (Phase 1.), a few of which subsequently develop major lines of inland penetration which leads to the growth of inland centres and the differential growth of coastal ports which possess these penetration lines (phase 2.). The initial development of port hinterlands is intensified in phase 3 as feeder routes and lateral inter-connections between ports and inland urban centres develop. Finally the process of inter-linkage of routes develops to a point where a stabilized hierarchy of ports and inland centres is linked together by a network of high priority routes (phase 4.). The overall conclusion of Taaffe, Morrill and Gould's historical analysis of the development of a transport system is that within a regional set of ports a hierarchy will develop based on the differential ability of a few ports to grow with respect to the level of trade they handle through a process of 'capturing' port hinterlands at the expense of neighbouring ports.

This model has been shown to have a wider applicability than just the West African region. Haggett (1965) has suggested that the development of the railway network in South East Brazil has contributed to the focusing of economic activity on the cites of Rio de Janeiro and Sao Paulo. Rimmer (1967) applied the model in a general discussion of the evolution of the Australian seaport hierarchy, refining the model somewhat to demonstrate the contribution of maritime and coastal routes to the concentration of trade in the more successful seaports. Other studies including those of Ward (1969) on Malaysia, Stanley (1970) on Liberia, and Riddell (1970) on Sierra Leone used the 'ideal-typical sequence model' to describe the pattern of transport development associated with the era of colonial penetration and exploitation.

However, in the context of the Gulf there are difficulties in applying this model directly as an aid to the prediction of the likely hierarchy of seaports in the 1980's. In contrast to conventional applications of the model to individual states bordering on ocean, the Gulf ports represent a set of national ports representing eight states facing one another across a relatively narrow maritime cul-de-sac. It is possible to study each state in isolation but in practice, given the nature of the physical geography of interior Arabia and Iran and the distribution of population, it is more realistic to treat the Gulf ports as a regional set of ports arranged in a port hierarchy, irrespective of national boundaries. The process of port concentration in the Gulf is influenced by the fact that several of its major seaports are 'regional' as well as 'national' ports. As such the development of a port hierarchy via a process of the differential ability of ports to command 'market areas' is often as much influenced by short-sea foreland penetration as it is by hinterland penetration. Given this regional situation of a set of closely-spaced national seaports in a confined space, the normal process of the development of a port hierarchy via the economic benefits of hinterland penetration is complicated by the process of political competition between the 15 deep-water commercial ports (including Matrah and Khor Fakkan) and 4 industrial ports that had been developed by 1980.

Taken as a whole, the regional set of Gulf ports in 1980 fits uneasily into phase 2 of the 'ideal-typical sequence model', represented by only a few major lines of inland penetration to a relatively small number of major inland centres which has contributed to the growth of Basra, Khorramshahr, Bandar Shahpour and Dammam as major ports serving their respective inland capital cities. The development of feeder routes and lateral inter-connections in land (phase 3) is in general weakly developed and is likely to remain so

TABLE 5.21

THE PATTERN OF SEAPORT EVOLUTION IN THE GULF

Phase	Time period	Composite form	Leading ports in Hierarchy	Overall trend
1	c2300BC-1500BC	Initial concentration	Dilmun(Bahrain), Mogan (Oman?) Ur-Babylon (Mesopotamia)	Unconsolidated dhow port structure
2	c1800BC-300AD	Diffusion	Gerrha(E.Arabia) Rev Ardashir (Persia) Bahrain	
3	c300AD-c800	Concentration	Siraf:Rev Ardashir Basra	
4	c800-c1100	Diffusion	Siraj; Basra Hormuz, Sohar	
5	c100-c1200	Concentration	Qais, Bahrain	
6	1280 - 1350	Diffusion	Hormuz,Bahrain Muscat, Sohar	
7	1350 - 1620	Concentration	Hormuz	
8	1620 - 1770	Diffusion	Muscat, Bandar Abbas, Basra, Bahrain, Sohar	
9	1770 - 1860	Concentration	Muscat, Basra	
10	1860 - 1920	Diffusion	Muscat, Basra Bushire, Lingeh, Bandar Abbas, Khorramshahr (Mohammerah), Kuwait, Bahrain, Dubai	Initial Steamer port hierarchy
11	1920 - 1950	Concentration	Basra, Bahrain, Khorramshahr, Kuwait	Consolidation of steamer port hierarchy
12	1950 -	Diffusion	Basra, Bahrain, Khorramshahr, Kuwait, Bandar Shahpour, Dammam, Dubai	Port expansion in the 'oil era'

for sometime given the uneven distribution of population in the region. Ironically, lateral connections are perhaps most developed in the U.A.E., a factor which contributes to port competition in this state.

Whereas, within the national framework in which the 'ideal typical' model is set it is possible to speak of the concentration of trade in certain national ports, in a regional sense the pattern of seaport evolution in the Gulf during the past three decades is more representative of the process of the diffusion of trade between ports. The distinction between an era of 'port diffusion' and an era of 'port concentration' is made on the basis of the distribution of the region's total trade between the ports. In an era of 'port concentration' only a few of the many ports in a port 'complex' are of disproportionate significance; whereas during an era of 'port diffusion' an absolute or relative increase in the number of functioning ports brought about by the increasing significance of new or expanding (previously smaller) ports leads to a redistribution of the region's trade between a larger number of ports with the subsequent relative decline of higher-order ports (Ogundana, 1970, p.169).

The port hierarchy of 1980 is in a state of flux. In the first half of the present century seabourne trade in the Gulf had tended to concentrate in the small number of ports that had proved most successful in attracting and developing steamer trades with the outside world (Basra, Bahrain, Khorramshahr and Kuwait) - see Table 5.2[1]. Post 1950, trade had been diffused through an increasing number of ports as each state in the region has sought to underpin its national development programmes via the construction of ports commensurate with the size and nature of their foreign trade. Some of these port development projects involve the construction of entirely new ports - Shuaiba, Jubail, Jebel Ali - others involve the resurgance of existing ports - Sharjah, Ras Al Khaimah, Bandar Abbas, Doha,

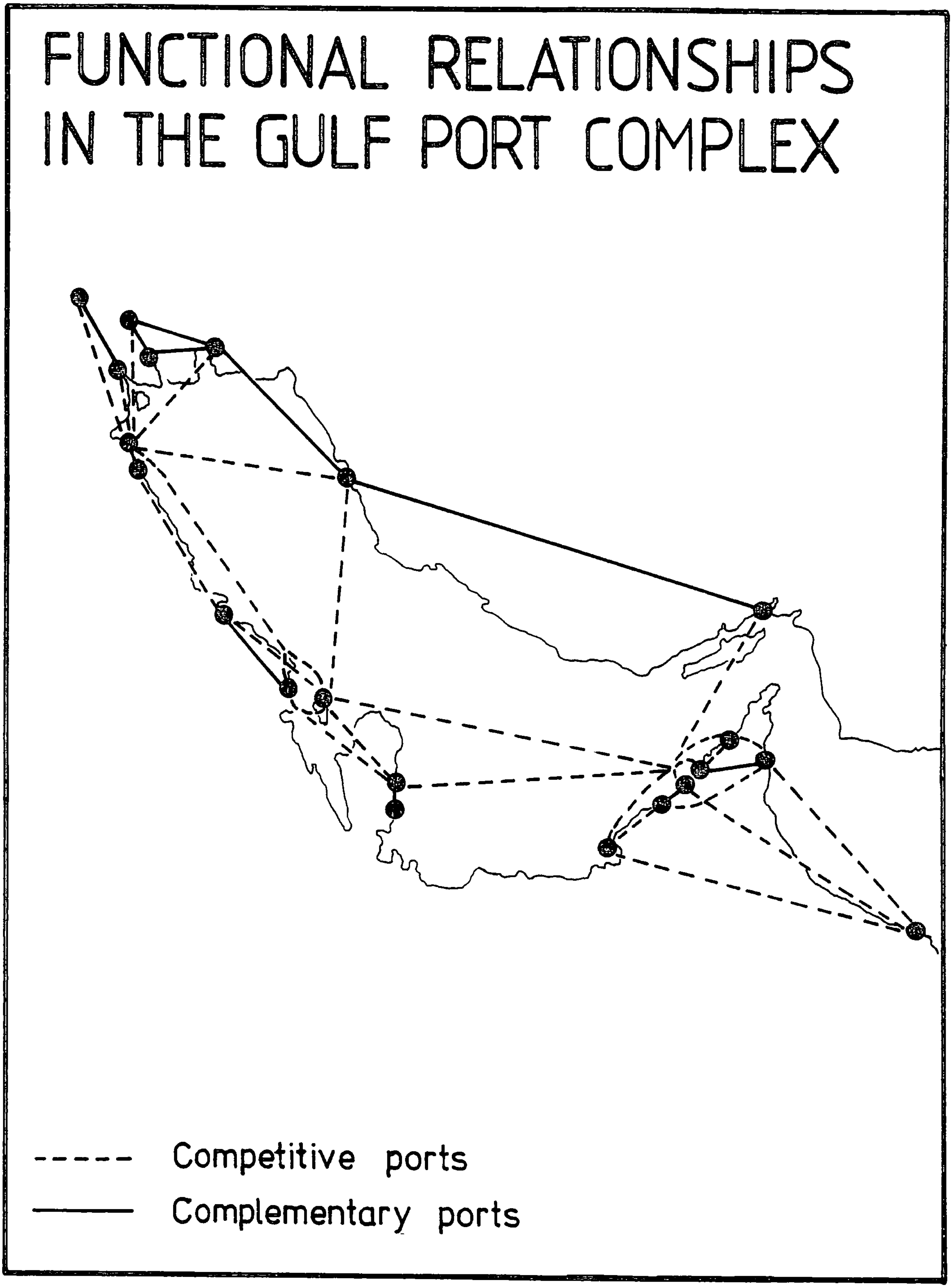

FUNCTIONAL RELATIONSHIPS
IN THE GULF PORT COMPLEX
Competitive ports
Complementary ports

FIGURE 5.9

Abu Dhabi and Muscat-Matrah. Ultimately, if the pattern of port concentration - diffusion -concentration etc., is to hold good for the Gulf the present pattern of port diffusion will be resolved by a concentration of trade in the most successful ports at some point in the future. However, the present increase in the number of ports in the Gulf need not necessarily be regarded as over-provision per se within the context of some future consolidation of trade in only a few of its ports. The key to the interpretation of the present and future port hierarchy lies in the nature of functional relationships between the ports.

Figure 5.9 depicts the nature of port competition and port complimentarity in the Gulf in 1980. Broadly defined those ports exhibiting a complimentary functional relationship compliment each other by handling particular cargoes to and from a common hinterland or foreland (e.g. The Kuwait ports of Shuwaikh and Shuaiba). In contrast some ports can be held to be in a competitive relationship with other ports in the Gulf in the sense that they vie for cargoes in common, overlapping hinterlands and forelands. It is the phenominon of port competition that presents the most acute problem in the context of the contemporary spate of port development in the Gulf, and, as such, it turns on the issue of overlapping hinterlands and forelands.

5.4.2 CARGO FLOWS

The type of cargoes imported, exported and re-exported by Gulf ports have been discussed elsewhere in this thesis particularly in the context of dhow trades (Chapter 4.4) and there is no need for repetition here. However, the broad direction of cargo flows may briefly be examined to explain the physical limits of port hinterlands and forelands in the region (See Fig. 5.10).

Most imports arrive in the Gulf by sea, although a proportion arrive by road from the Levant, Eastern and Western Europe along the road network which connects Iraq with Oman along the littoral of eastern Arabia or through the networks linking Turkey with Iran. During the 1970's very little trade passed by road from the Arabian states through

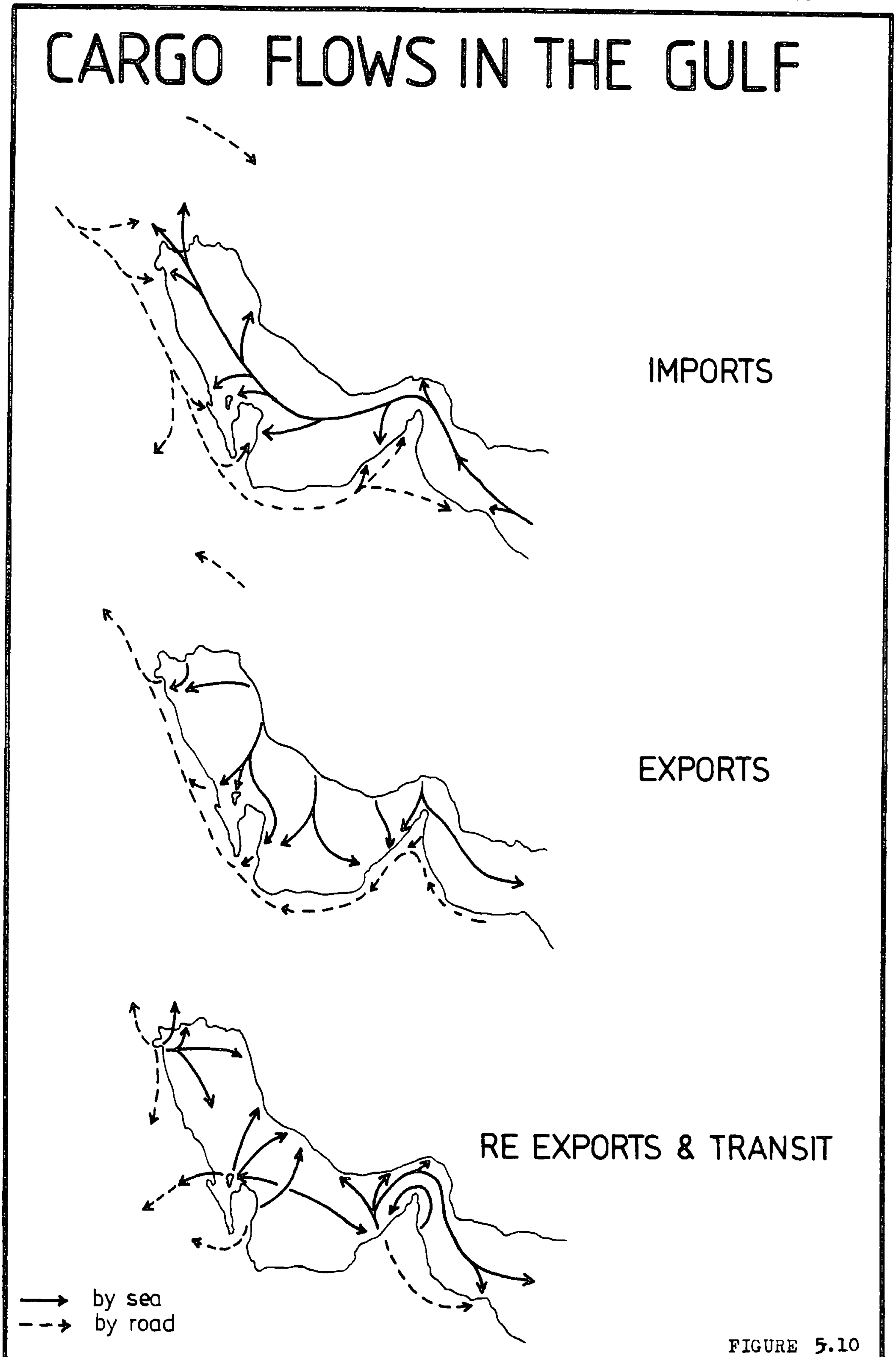

CARGO FLOWS IN THE GULF
IMPORTS
EXPORTS
RE EXPORTS & TRANSIT
by sea
by road

FIGURE 5.10

Iraq into Iran because of the nature of political relations in the region. A small proportion of high value-to-weight ratio commodities are imported into the Gulf by air. Iraq and Iran receive a proportion of their imports through their rail links into Eastern and Western Europe via Turkey.

Exports consist of two basic types. Firstly, the bulk of locally-produced primary products and manufactured goods (ranging from petroleum, petroleum products, nitrogenous fertilisers, aluminium ingots to consumer goods) are mostly exported out of the region by sea through the Straits of Hormuz, with a much smaller population leaving by air, road or rail. Secondly, locally-produced agricultural products and industrial goods move between the Gulf states either by dhows, barge, Ro-Ro feeder vessels, road or air.

Re-exports, and goods in transit, are moved mostly by sea (dhow, barge or Ro-Ro vessel) or road to destinations within the Gulf, except for the trades with the Indian subcontinent or 'through' transit trades across the 'land bridge' between Europe and Asia. However, it is the case that most of these flows emanate from the region's principle entrepots (Kuwait, Bahrain and Dubai) to destinations within each port's sphere of influence.

5.4.3 OVERLAPPING HINTERLANDS

The fieldwork for this research was centred on the ports of Kuwait, Bahrain and Dubai and as such it is not therefore possible to describe the exact cargo, hinterlands and forelands for each of the major Gulf ports because of a lack of data. However as each of these ports is in fact the major trading entrepot for the 'upper', 'middle' and 'lower' Gulf regions respectively, it is possible using the flow data (utilised in Chapter 4) to accurately describe the hinterlands and short-sea forelands of the sea ports in so far as they impinge upon the hinterlands and forelands of other ports in the region.

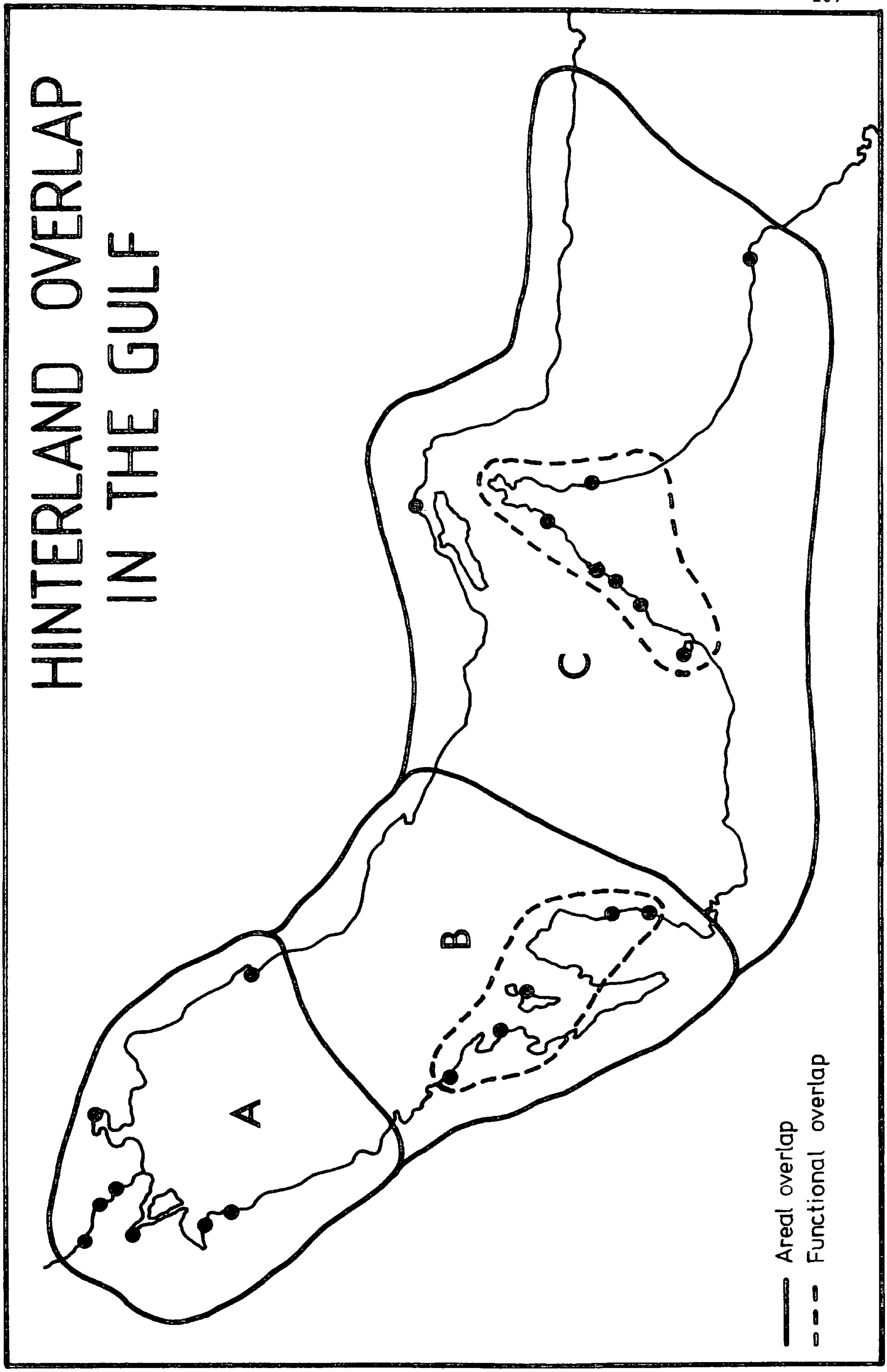

HINTERLAND OVERLAP
IN THE GULF
A
B
C
Areal overlap
Functional overlap

FIGURE 5.11

The phenominon of overlapping spheres of influence in the Gulf derives essentially from the shape of the region and the spacing of its national seaports. Until the last twenty years the dhow was the major medium of overlap, but in recent time road trasnport has been increasingly important in terms of hinterland overlap. Chapter 4 has presented a detailed study of the direction of cargo flows by dhow and the reader should refer to it in this context.

Although each seaport can be said to have its 'primary' hinterland within which it dominates the economic life of the area concerned (e.g. Dammam has been, until the construction of Jubail, the dominating Saudi seaport for eastern Saudi Arabia, including the capital Riyadh), the existing port hierarchy in the Gulf, regardless of national boundaries, gives rise to three areas of 'areal' overlap, and two areas of 'functional' overlap .

"Areal" overlap, or competition between two ports of comparative size for cargo of the same type to and from the same area, can in a sense apply to the whole Gulf region, but a more detailed examination of export, re-export and transit flows reveals three sub-regions. In the 'upper' Gulf ('A' in Figure 5.11), the forelands of Iraqi and Kuwaiti ports and the Iranian ports of Khorramshahr, Bandar Shahpour and Bushire overlap. In this set of ports Kuwait (Shuwaikh) dominates in the sense that it includes part of Iraq and Iran its trading area (i.e. where it either receives or dispatches cargo), whereas trade between Iran and Iraq is minimal. In the 'middle' Gulf region ('B'), Bahrain is dominant with trading areas extending into Saudi Arabia, Qatar and Iran. In the 'lower' Gulf ('C'), Dubai is the pivot of re-export and transit flows, extending its commercial influence along the S.E. Iranian coast, Indian and Pakistani coasts, into Oman and over the northern emirates region of the U.A.E.

TABLE 5.22

ESTIMATED PORT CAPACITY FOR MAJOR GULF PORTS

1980

	Millions tons per annum
Bandar Shahpour[1]	16
Bandar Abbas[2]	16
Dammam[1]	10
Port Rashid, Dubai[3]	9.25
Basra/Umm Qasr[4]	6
Shuwaikh, Kuwait[5]	6
Khor Al Zubair[5]	5
Port Zayed, Abu Dhabi[3]	4.25
Port Sulman, Bahrain[3]	4
Port Khalid, Sharjah[3]	3.75
Khorramshahr[5]	2.3
Doha[3]	2
Port Saqr, Ras Al Khaimah[3]	1.75
Port Qaboos, Matrah[5]	1.5
Bushire[1]	1
Port Raysout[5]	1

1. Owens, (1978)
2 Sucharov (1977)
3 Estimate at 250,000 tons per berth
4 Cockburn (1978)
5 Economist Intelligence Unit (1978)

Two areas of marked 'functional' overlap where the hinterland of a large port over-runs that of a smaller port for certain cargoes because of the greater number of ships sailing into the larger port (Couper, 1971, p.125) focus on the U.A.E. and Bahrain. In the case of the U.A.E., Dubai is the paramount port despite harbour developments elsewhere in its hinterland, and as such it dominates the economic life of the northernemirates and part of northern Oman. In the 'middle' Gulf, the dominance of Bahrain as a centre of trading expertise and distribution over an area extending into eastern Saudi Arabia and Qatar has been weakened by the extensive expansion of Dammam and the construction of the causeway to the Saudi mainland, but it still maintains its status as an entrepot.

In general terms it can be said that the hinterlands of most of the major Gulf ports, with the exception of the overlaps - Basra/Umm Qasr, Khorramshahr/Bandar Shahpour, the northern emirates of the U.A.E., and the incursion of Kuwait into the north-eastern corner of Saudi Arabia - cover discrete slices of national territory. However, the pattern in relation to coastal forelands is very inter-twined, but with the overall dominance of Kuwait, Bahrain and Dubai.

5.4.4 PORT COMPLIMENTARITY 1: NATIONAL PORTS

In five out of the eight Gulf states the development of seaports has been conceived in a national as opposed to a regional context. As such the function of the deep-water ports of Iraq, Iran, Saudi Arabia, Qatar and Oman is primarily to serve their respective national hinterlands. In contrast, the ports of Kuwait and Bahrain, and some of the ports of the U.A.E. have a significant, sometimes over-riding role, in servicing hinterlands and forelands outside national boundaries.

TABLE 5.23 : Iraqi Ports

Number of Vessels calling at Port		Tonnages (DWT)	
Basrah		Imports	Exports
1962	730	971541	491776
1963	710	871495	424482
1964	723	1071729	473038
1965	823	973538	539298
1966	845	1069940	717286
1967	794	1088502	411391
1968	751	870271	270420
1969	639	760990	392265
1970	491	945931	279914
1971	875	2107599	N.A.
Umm Qasr			
1968	57	129388	-
1969	36	120778	-
1970	73	154158	-
1971	89	270628	-

Sources : (i) Basrah 1962-70, and Umm Qasr 1968-70 Statistical Pocket Book 1960-70, Central Statistical Organisation, Baghdad, 1972.

(ii) Basrah 1971 and Umm Qasr 1971, Iraqi Ports Administrative Annual Statistical Bulletin, 1971.

TABLE 5.23 (Continued)

Iraqi Ports - Number of vessel arrivals and quantity of cargo discharged, 1975 - 2977

	1975	1976	1977
Number of vessels entering Iraqi ports	828	891	987
Quantity of tonnage discharged (thousands of tons)	3466	3430	3772

Source: Iraq Annual Abstract of Statistics, 1977, p. 194 - 195

At the head of the Gulf the Iraqi port of Basra is primarily a national port serving Iraq as its major import-export habour for general cargo. A certain amount of transit cargo is handled for onward shipment to and from Syria, Lebanon and Jordan, but little cargo is re-exported or transhipped through the port to other Gulf states. At the time of writing the military confrontation between Iraq and Iran had closed the Shatt Al Arab to shipping and hence had closed the port of Basra.

During the past two decades the government of Iraq has steadily increased the capacity of Basra by building additional berths to cope with increased trade. The number of deep-water berths has risen from 5 in the early 1960's, to 9 in 1965, 10 in 1973, 12 in 1976 and 15 (plus a specialised container berth) in 1980. However, Iraq has the problem of the political vulnerability of Basra which in recent times has been caught up in the boundary disputes with Iran (1969, 1971, 1980) which have blocked off the disputed waterway. In order to offset Basra's isolated position 80 miles upstream from the Gulf, the government of Iraq took the step in 1968 of constructing the port of Umm Qasr which has unrestricted access to Gulf waters. This new port (consisting of 3 conventional and 1 container berth in 1978) which is situated at the confluence of the Khor Zubair and Khor Abdullah is presently conceived as the main port for expansion in the 1980's. The present 4 berths (which are equiped to handle bulk imports of sulphur, steel and grain, and to export liquid petroleum gas) are planned to be supplemented by up to 43 new berths during the 1980's. The capacity of Basra and Umm Qasr in 1980 was an estimated 6 million ton per annum (Cockburn, 1978) - see Tables 5.22 and 5.23.

Iran has four deep-water ports each of which has a primary function of serving the Iranian National Economy. Before the revolution that overthrew the Shah in 1979, the capacity of these four ports was 9 million tons per annum, a figure that was to have been raised to 36 million tons by the end of the Sixth Development Plan in 1983. However,

TABLE 5.24 : Imports and Exports at Iranian Ports, 1958-1971 (Excluding Oil Products : In thousands of tons)

	Khorramshahr		Bandar Shahpour		Bushire		Bandar Abbas		Total	
	Import	Export	Import	Export	Import	Export	Import	Export	Import	Export
1958-59	548.4	163.5	467.6	-	26.2	23.4	-	-	952.2	168.9
1959.60	729.9	135.3	424.1	-	64.9	27.8	-	-	1222.9	163.1
1960-61	890.7	215.6	587.4	-	99.0	23.5	12.5	29.4	1589.6	286.5
1961-62	760.8	230.8	541.3	-	31.6	19.1	9.6	55.4	1343.3	305.3
1962-63	831.7	247.9	435.2	-	37.7	12.5	18.7	50.7	1323.3	321.1
1963-64	757.3	246.7	374.2	11.1	56.2	24.5	32.6	75.5	1220.3	357.8
1964-65	1098.2	294.0	923.0	10.0	70.8	19.8	35.0	105.9	2127.0	429.8
1965-66	1115.1	356.7	722.8	9.5	58.5	18.5	16.9	136.7	1913.3	521.5
1966-67	1432.8	369.0	512.4	9.3	52.3	9.7	30.0	125.4	2027.5	513.4
1967-68	1272.3	277.7	652.3	16.1	49.7	6.8	25.2	110.1	1999.4	410.7
1968-69	1381.6	262.3	848.1	149.6	42.1	3.1	67.1	178.2	2339.3	593.2
1969-70	1212.7	348.3	787.6	46.5	52.1	5.9	67.9	143.4	2120.3	544.1
1970-71	1228.4	470.3	814.1	196.7	42.5	23.6	120.7	238.5	2205.7	929.1

Source : R.K. Ramazani (1972) p81. Compiled from Bank Markazi Iran Bulletin 5 (May-June 1966) : 136-137, and March-April 1968 : 946-47; and Majallah, Ordibehesht va Khordad 1350, Sal-i Dahom, Shomareh-i Sad va Shanzadahom va Sad va Hefdahom (Tenth year, Nos. 116 and 117 (May-June, 1971)), pp94-95.

TABLE 5.24 (Continued)

Imports into Iranian Ports, 1975 - 76 / 1977 - 78

(thousands of tons)

	1975 - 76	1976 - 77	1977 - 78
Khorramshahr	3,638	4,194	3,860
Bandar Shahpour	3,563	4,694	5,640
Bushire	614	844	864
Bandar Abbas	1,796	2,508	3,220
Abadan	932	946	925

Source: Iran Almanac, 1978, p.325 - 326

having recovered by the late 1970's from the Gulf's most severe dose of port congestion, described by Owens (1978, p. 164) "as a good example of how a port system can crumble under a sudden influx of large amounts of traffic", Iran has suffered a new setback in the form of the capture (and damage to) the port of Khorramshahr by invading Iraqi forces. This situation of the closure of Khorramshahr means inevitably that Iran will have to rely more than usual on Arab entrepots across the Gulf (if it is politically possible) to tranship and re-export cargoes for Iranian markets.

Iran's major port of Khorramshahr (see Table 5.24) suffers from similar strategic and site disadvantages to the Iraqi port of Basra. Prior to the present hostilities with Iraq, the Iranian government seems to have acknowledged this problem by taking the decision to concentrate the greater proportion of its port development on the ports of Bandar Abbas and Bandar Shahpour. Nonetheless, Khorramshahr still handled over half of Iranian imports by sea in the 1970's, though its relative position was being slowly eroded by Bandar Abbas and Bandar Shahpour. Khorramshahr's dominance is derived from the fact that it was the first Iranian port to accommodate a large deep-water commercial jetty in 1939. Subsequently, the number of berths has been increased from 3 in 1955, to 9 in 1973, and 13 in 1980 when its nominal capacity was 2.3 million tons per annum.

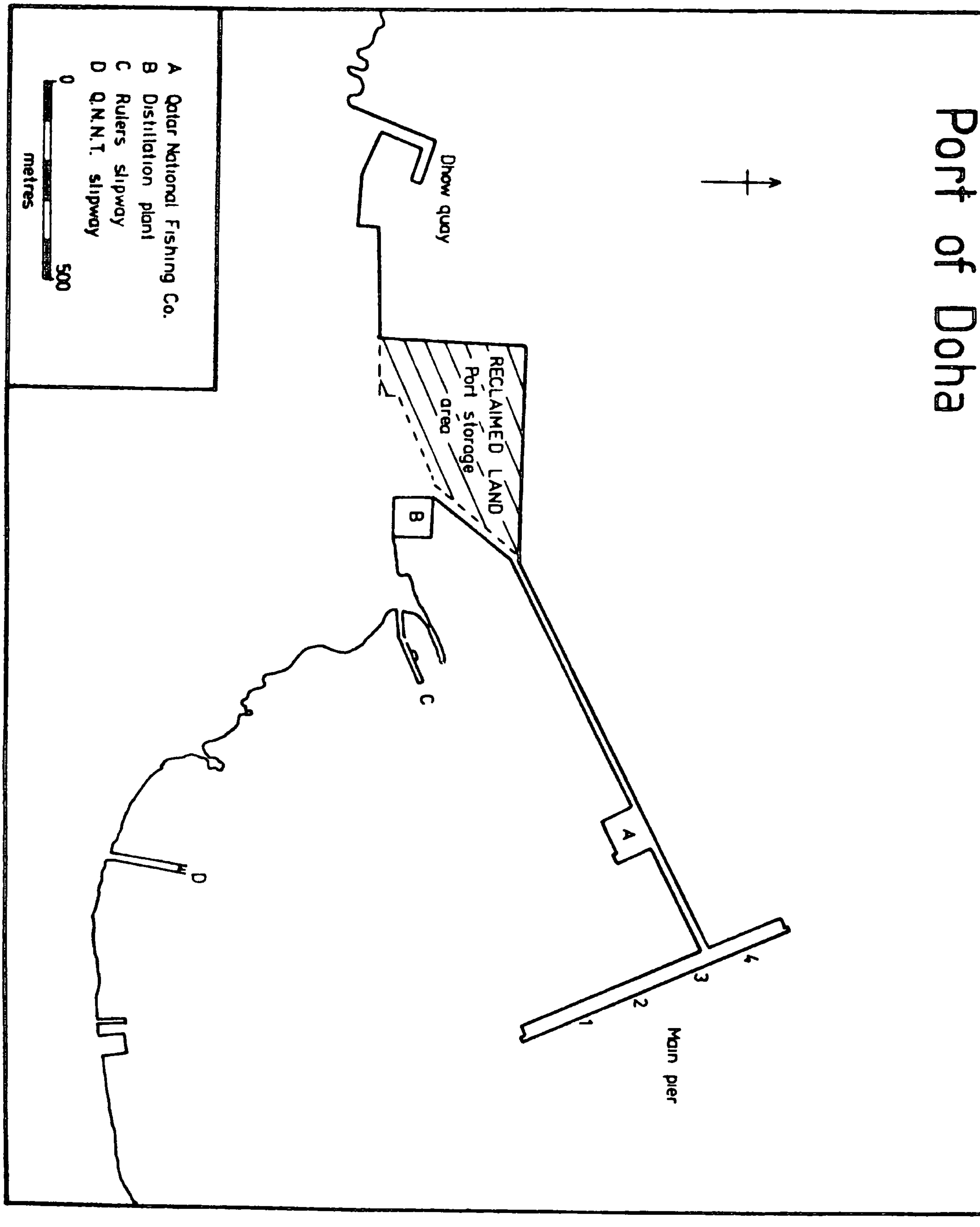
The distribution of the Iranian population is uneven with a concentration of urban and rural settlements in the north and west of the state and relatively low population densities in the south and east. Accordingly, the decision to develop Khorramshahr's neighbouring port of Bandar Shahpour in Khuzistan as the state's major seaport for the 1980's reflects both its strategic and economic advantages vis a vis its hinterland. Since 1945 the port has been linked to its interior hinterland by a spur from the trans-Iranian Railway. The number of berths have been increased rapidly in the 1970's rising from 6 in 1970, to 14 in 1977, and

34 in 1980 (four of which are container berths, plus a LASH terminal), bringing the capacity to 16 million tons per annum.

Bushire is the only deep-water port between Bandar Shahpour and Bandar Abbas, a distance of approximately 600 miles. Its facilities are limited to two conventional berths and one dolphin berth and it seems that at present the Iranian government have no plans either to extend the commercial port or to develop industry in the port area. Its present capacity (1980) is estimated at 1 million tons per annum. The weakly developed network of ports between the Khor Musa and the Straits of Hormuz partly explains the function of the Arabian entrepots of Kuwait, Bahrain and Dubai as suppliers of the smaller towns and villages along this long stretch of Iranian coast.

In contrast to Bushire the port of Bandar Abbas has been developed during the 1970's as a major commercial, industrial and naval port for Iran's south east region which is over 1000 km from Teheran. In 1967, a new 6 berth port was opened on a site 6 miles west of the town, incorporating an ore-loading terminal for the export of chrome ore (from Kerman and Sirjan), copper ore (from Sar Cheshmeh) and iron ore (from Gol-e-Gohar). However during the 1970's the status of Bandar Abbas as a centre for regional development has been symbolised by the construction of a new commercial and industrial port (see the next section) which opened in 1979, 20 km. from the town. Aside from special berths linked to industrialization projects, the new port has a total of 14 conventional, 4 container and 2 Ro-Ro berths; together with a LASH terminal, giving it a capacity of 16 million tons in 1980.

In many ways the development of Saudi Arabia's Gulf ports is a mirror image of the Iranian process, though with fewer ports involved. Lacking an entrepot function, the Saudi ports of Dammam and Jubail (see the next section) serve as both import centres and nodes for



Port of Doha
Dhow quay
RECLAIMED LAND
Port storage area
B
A
C
D
Main pier
1
2
3
4
A Qatar National Fishing Co.
B Distillation plant
C Rulers slipway
D Q.N.N.T. slipway
0
500
metres

FIGURE 5.12

TABLE 5.25

Tonnage imported into Dammam, 1977 - 1979

(metric weight tonnes)

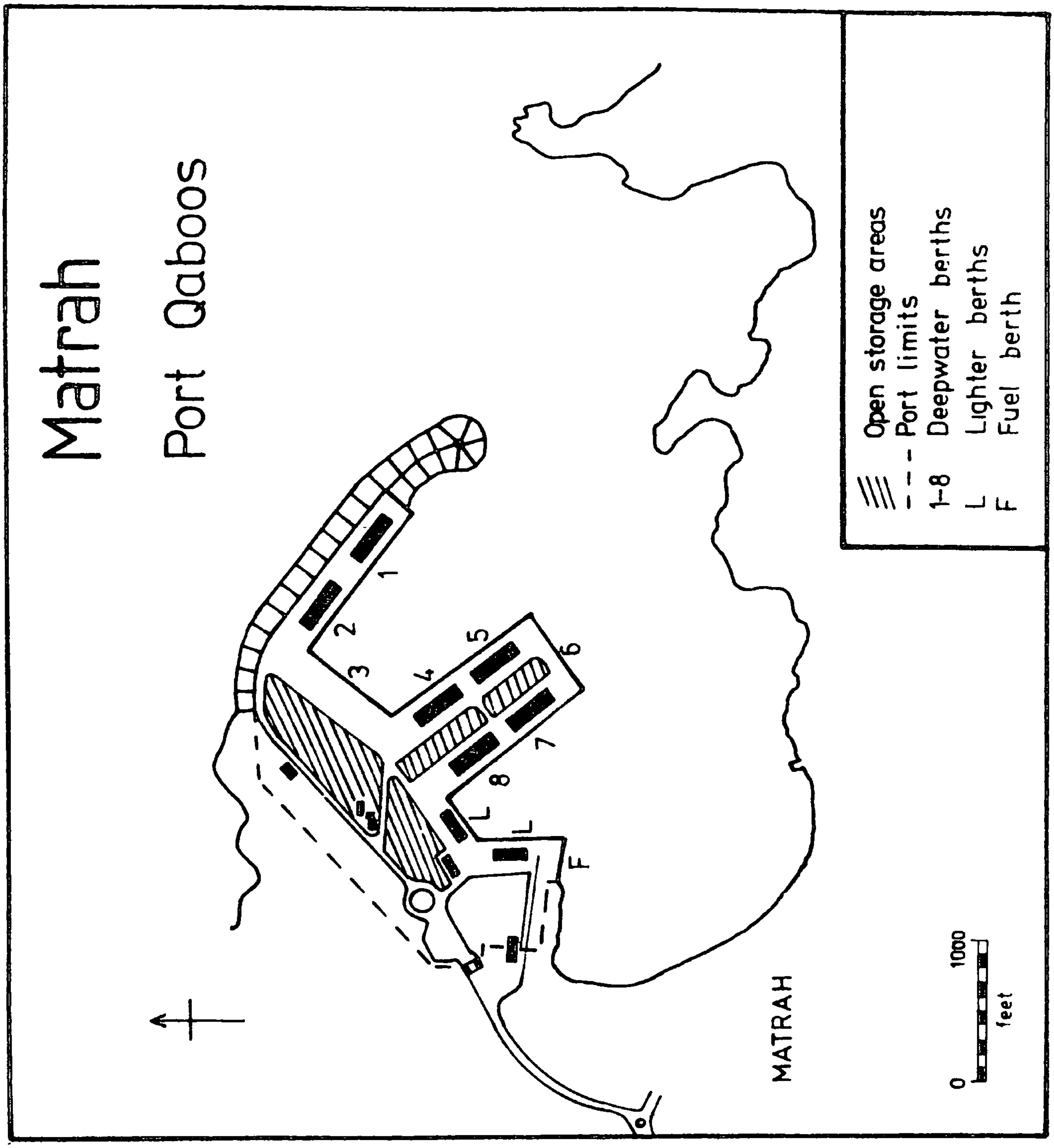
1977	6579884
1978	7686631
1979	8739385

Source: Annual Statistics 1979

Kingdom of Saudi Arabia Ports Authority, p.38

export orientated industrialization schemes. The Saudi government has concentrated investment on Dammam and Jeddah (on the Red Sea) though it has fostered smaller-scale projects at Jizan, Yenbo (both on the Red Sea) and Qateef. The development of the port of Dammam in the 1970's has been rapid. The 7 berths existing in 1973 have been increased to 32 conventional, 5 container and 3 Ro-Ro berths by 1980 (Seatrade, July 1978). Its function is essentially national, serving a wide hinterland in eastern Saudi Arabia.

Qatar and Oman are two small nations which have built new harbours to service their respective national hinterlands. In the case of the Qatari port of Doha it has played a limited role in the 1960's and 1970's in transhipping and re-exporting cargoes to Saudi Arabia, the U.A.E. and the Iranian coast. However, as each of these states has developed its own port facilities this trade has slackened off (e.g. see section 4.7.1, table 4.28). The port of Doha (see Figure 5.12) has grown along with the rise in imports from 80,300 tons in 1953, 271,000 tons in 1962, to 912,000 tons in 1979 (Times, Sept. 3, 1980). The deep-water port was opened to traffic in 1970 with a four-berth jetty. This jetty was expanded by an additional five berths in 1977 in the aftermath of the era of mid-decade port congestion in the Gulf. In the 1980's, plans to build a second port at Jazirat Alyah (15 km. from Doha) encompassing a possible 50 new berths seem questionable both in the light of the general drift towards possible berth overprovision in the region, and with regard to the fact that currently in excess of 35% (by value) of Qatars imports arrive by road through the Saudi customs port at Salwa (M.E.E.D, April 1977).



Matrah
Port Qaboos
Open storage areas
- - - Port limits
1–8 Deepwater berths
L Lighter berths
F Fuel berth
1
2
3
4
5
6
7
8
L
L
F
MATRAH
0
1000
feet

FIGURE 5.13

TABLE 5.26

Oman : Tonnage of cargo imported into Port Qaboos and Port Raysout, 1975 - 1978, in thousands of tons

	1975	1976	1977	1978
Port Qaboos	1035	1158	1239	1256
Port Raysout	216	222	250	260

Source: Oman: Statistical Yearbook, 1978
p. 59, Table 45

Port Qaboos at Matrah (see Figure 5.13) is Oman's only national deep-water port save for a small development at Mina Raysout whose four general cargo berths (capacity 1 million tons per annum in 1980) are disigned to service a hinterland in the southern province of Dhofar. The present port of Matrah came into operation in 1974, and was trading at slightly less than capacity (1.5 million tons per annu m) in 1977. Towards the end of the last decade containers were taking up to 25% of traffic (Owens, 1978) which prompted the Omani government to consider either building a new container berth or adapting some of the existing 9 deep-water berths and 3 shallow-water berths for the purpose.

5.4.5 PORT COMPLIMENTARITY 11: SEAPORTS AND INDUSTRIALIZATION IN THE GULF

A general policy in the Gulf states is for government to invest an increasing proportion of their oil revenues in major industrialization schemes as part of an overall policy of economic diversification. The advantage of seaports as locations for these projects, apart from benefits derived from internal and economies of scale, is that they offer the most economic sites for developing spatial linkages between overseas commodity markets and raw materials, and locally produced energy inputs (Couper 1978). All the Gulf states, with the exception of Oman, have by 1980 developed large-scale industrial sites either adjacent to commercial ports or at new spatially separate locations with their integrated port facilities. Given the resource limitations of the region, the range of enterprises tends to be roughly common to most coastal industrial sites in each state - oil refining, petrochemicals, fertilisers, aluminium and steel making. Some, but not all, of these projects have been financed on a Pan-Arab or international basis.

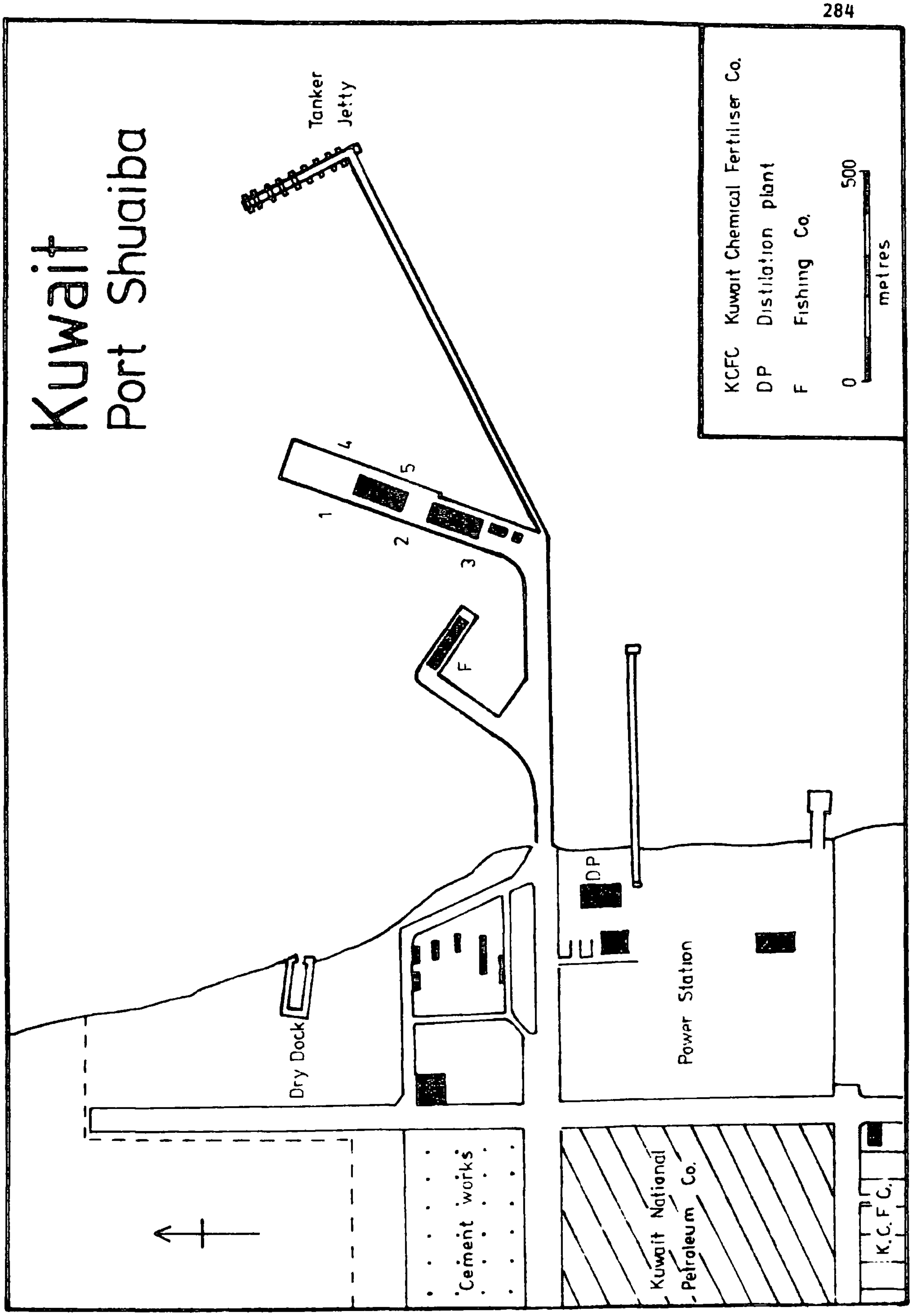

Kuwait
Port Shuaiba
Tanker Jetty
KCFC Kuwait Chemical Fertiliser Co.
DP Distillation plant
F Fishing Co.
0
500
metres
4
5
1
2
3
F
DP
Power Station
Dry Dock
Cement works
Kuwait National Petroleum Co.
K.C.F.C.

FIGURE 5.14

Specifically, three types of industrial port are present in the contemporary Gulf - industrial complexes with their integrated port facilities, mixed commercial and industrial ports, and ports which include marginal wharves for handling industrial cargoes (e.g. Bandar Shahpour, Dammam, Umm Qasr and Sitra- 'Alba jetty).

One ot the earliest examples of an integrated industrial complex and seaport stemmed from the decision of the Kuwaiti government to found the Shuaiba Area Industrial Development Board in 1964. The industrial area adjacent to the port of Shuaiba consists of a 10 sq. mile zone of heavy and medium scale industrial plant, dominated by the Kuwait National Fertiliser Company plant and the Kuwait National Petroleum Company Refinery, both of which have marketing forelands of international proportions, particularly in the western Indian Ocean states. The capacity of the port has been increased in line with the development of the industrial area, rising from 900,000 tons per annum in 1967 (five conventional berths plus a two-berth oil pier - See figure 5.14) to 1.5 million tons per annum in 1973, to 3.5 million tons per annum in 1980 (14 conventional and 1 container berth - owens, 1978).

The Qatari port of Umm Said is similar in conception to Shuaiba. It is located 40 km. south of Doha and represents the state's industrial diversification programme based on a fertiliser and natural gas plant and a steel mill. The port consists of 9 berths, 2 of which are set aside for unloading iron ore, 3 for exporting petroleum, and 4 for general cargo (Sucharov, 1977). In a similar vein, the Iraqi government has built a new industrial port of Khor Al Zubair to serve a new petrochemical, fertiliser and steel making complex, south of Basra. The port, begun in 1976, was scheduled for completion in 1981 with an operational capacity of 5 million tons per annum and consisting of 5 berths, one of which will be used to export phosphates (Cockburn 78).

On a much larger scale, the development of the Saudi port of Jubail, the Iranian port of Bandar Abbas, and the U.A.E. port of Jebel Ali represent the focus of ambitious, coastal industrialization projects. Barrett (1978) has described the Jubail schemes as an excellent example of a 'macro-project' (i.e. consisting of large single -purpose engineering projects, geographically confined to a designated site, utilising proven, state of the art technology). Under a scheme began in 1976. The Royal Commission for Jubail (and Yenbou on the Red Sea) is supervising the transformation of the small fishing village of Jubail (90 km. north of Dammam) into a major urban community of 200,000 people based upon the development of a large-scale port and industrial area. Under the direction of the General Petroleum and Minerals Organisation (PETROMIN) and the Saudi Basic Industries Corporation (SABIC) the new city will have 16 primary industries in its overall plan - consisting of 2 export refineries, 4 petrochemical plants, 1 lube-oil refinery, 1 petroprotein plant, 1 polyisoprene plant, 2 methanol plants, 1 steel mill, 1 aluminium smelter (and bulk terminal) and 2 fertiliser plants. The major port development involved consists of both a commercial and an industrial port. The first two commercial berths were opened in 1978. By 1980 the commercial harbour had an additional 14 berths (of which two are container berths). The industrial harbour will eventually consist of a further 14 berths for general use, a tanker terminal, and additional berths to handle bulk cargoes of iron-ore, sulphur, limestone, alumina and salt.

At a smaller scale, the new industrial harbour of Bandar Abbas, adjacent to the commercial port, was opened in 1979. Planned as a focus for industrialization in south east Iran, its specialized berths can export iron ore, copper ore and chrome ore, and import bulk grain. The port also includes a tanker berth, shipyard, and 2 dry docks.

A parallel venture to the Juba il development is the creation of what is in effect a new planned city of 400,000 based on a new industrial complex at Jebel Ali in the U.A.E., 20 miles south west of Dubai. This project has been termed "contraversial" (Halcrow, M.E.E.D. 1978) and a "white elephant" (May, Middle East Construction, Sept, 1977) because of its scale and apparent audacity. On shore, a planned industrial free zone is scheduled to include by 1982, an aluminium smelter, steel mill, vehicle assembly plant, liquid petroleum gas plant and a desalinization plant (Smith 1978). A very large new port scheduled to include perhaps as many as 60 berths by 1982 (5 of which were operational by 1978) is planned to include specialized berths for bulk handling, transit cargoes, petroleum products and containers, as well as conventional berths.

A further aspect of industrialization and port development in the Gulf relates to the establishment of national, Pan-Arab and joint venture shipping fleets (see Chapter 5.3.3 and 5.3.4). The creation of such a shipping industry, if it is to be effective, requires the development of appropriate back-up schemes including "management, brokerage, marketing, surveying, insurance and legal services, ship repair services and maritime education" (Couper 1978, p. 110). In this regard the ports of Bahrain, Dubai and Bandar Abbas are the sites of ship repair docks. To date, the repair yard at Bahrain (Arab Ship Repair Yard - A.S.R.Y.) is the most successful (E.I.U. 1978, p. 71). ASRY is financed by 7 constituent members of OAPEC - Bahrain, Saudi Arabia, Kuwait, Iraq, Qatar, Libya and the U.A.E. (Except Dubai) - and is a symbol of OAPEC's purpose of developing industry in the Gulf. Like the rival yard in Dubai, a major operational problem has been the hiring of foreign management and skilled labour, However, in ASRY's case it has been partially solved by the agreement of the Portuguese firm, LISNAVE to operate the yard for 10 years from 1977 onwards. The yard is situated at the end of a 6 km. causeway south of Ras Al Hidd (Muharraq Island) and consists of one dry dock (maximum capacity 500,000 dwt), four wet repair docks, two marginal wharves and an import quay.

Neither ASRY, or the facility at Dubai, are expected to be profitable yards in the near future (M.E.E.D., April 1978) because of the high capital costs (the cost of the Dubai project rose from £91 million in 1973 to £232 in 1978 because of inflation - Civil Engineering, Oct. 1978), high labour costs, the addition of two further dry docks at Bandar Abbas, and the state of the international shipping market. The Dubai project which, along with Port Rashid, symbolizes the advancement of the emirate from a dhow port to a major international shipping and ship repair centre in twenty years, is planned to include 3 dry docks (one with a capacity of 1 million dwt), two of which were operational by 1980.

5.4.6 PORT COMPETITION 1 - THE UPPER GULF

KUWAIT

As already mentioned, the Iraqi and Iranian deep-water ports are essentially 'national' in function, with trade between the two states presently stopped by military confrontation. "Competition in the context of the upper Gulf therefore involves the port of Kuwait as a harbour which handles cargoes destined from Iraq, Iran and Saudi Arabia.

The main commercial port of Mina Shuwaikh lies to the west of the 'old city' of Kuwait. It has been expanded steadily over the last 30 years coincident with the most rapid change in the social and economic development of the state. In the period following World War Two it was apparent that a combination of a deep-water anchorage and a sprawling dhow harbour protected by two miles of rubble breakwaters was inadequate to cope with the build up of trade which rose from 50,000 tons of imports in 1947 to 450,000 tons by 1954 (Rendel, Palmer and Tritton, 1962).

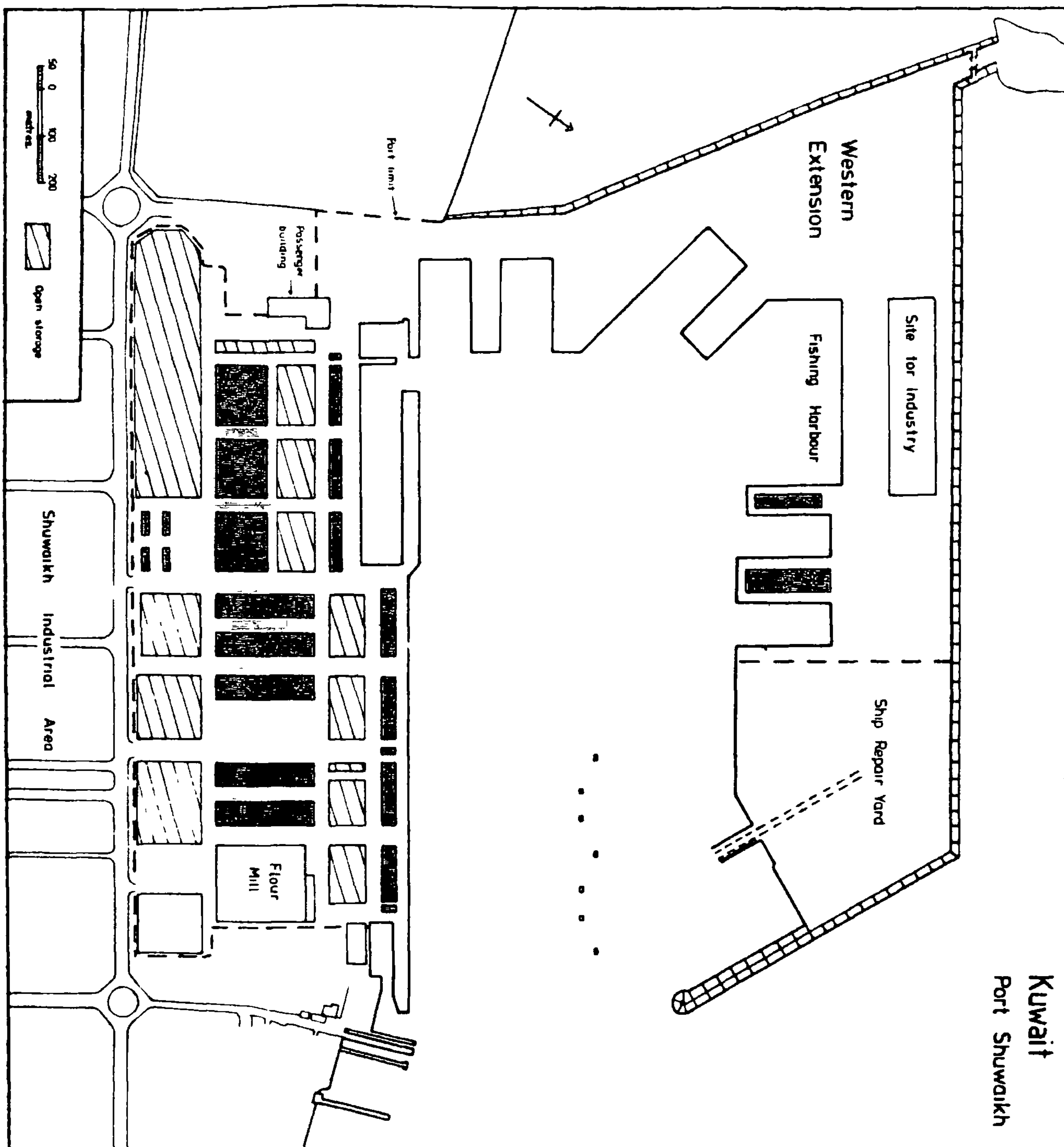

Kuwait
Port Shuwaikh
Western Extension
Site for Industry
Fishing Harbour
Ship Repair Yard
Flour Mill
Shuwaikh Industrial Area
Port limit
Passenger building
Open storage
50 0 100 200
metres

FIGURE 5.15

TABLE 5.27

Kuwait: Number of vessels entering the port of Shuwaikh and total tonnage discharged, 1973 - 1976

	Number of Vessels	Tonnage discharged
1973	1161	1304046
1974	1167	1781857
1975	1615	2003926
1976	1804	4716000

Source: Annual Statistical Abstract, 1977
Ministry of Planning, State of Kuwait
Tables 252 and 253.

Notwithstanding Kuwait's traditional role as an entrepot serving communities in the upper Gulf littoral, Mina Shuwaikh was developed essentially as a 'national' seaport. The first permanent deep-water berths were opened in 1959 (4 berths) by which time trade had risen to 1 million ton per annum. Subsequently the port was extended along the western shore (in 1968) and out to sea via a series of encompassing breakwaters in the period 1970 - 1980 - See Figure 5.15. The western extension provided an additional 4 berths, increasing the port capacity to 2.5 million tons by 1973. In the latest period of development the port capacity has risen from 4.5 million tons per annum in 1976 to 6 million tons by 1980 via the addition of a further 10 conventional and 2 container berths. In 1980, the port of Shuwaikh handled 4 million tons of cargo, 500,000 tons of which was transhipped to Iraq (Times, June 6, 1980).

In reality, the function of Shuwaikh vis a vis neighbouring ports in Iraq, Iran and Saudi Arabia (specifically, Basra-Umm Qasr, Khorramshahr, Bandar Shahpour, Bushire and Dammam) is perhaps in a sense more complimentary than competitive. At the height of the universal period of port congestion in the mid 1970's the port of Kuwait helped neighbouring states cope with the problem. It has been estimated that 35 - 40% of all Kuwaiti imports during this period were in fact transit cargoes for Iraq and Saudi Arabia (M.E.E.D., April 1977), a large proportion of which passed through the port of Kuwait. Clearly this proportion can be expected to fluctuate, even drop sharply, as the Saudi ports of Dammam and Jubail, and the Iraqi port of Umm Qasr reach their planned capacities. However, as recent events have shown, the closure of the ports of Basra, Khorramshahr and Abadan (because of the war between Iraq and Iran) is an invitation for the port of Kuwait to channel cargoes in transit by sea or road. Clearly therefore, this Kuwaiti 'help' can also be construed as competition in the sense that these transit cargoes could, and should, have been imported directly by neighbouring ports.

Chapter 4 has demonstrated that the relationship between Kuwaiti and Iranian ports is clearly competitive in the sense that the extent of dhow flows between Kuwait and the smaller ports and villages on the Iranian coast reveals that the dhows operating out of the port of Kuwait are channeling certain re-exported commodities which ought in theory to have arrived via seaward and landward distribution networks from the Iranian ports of Khorramshahr, Bandar Shahpour and Bushire. In the 1980's it is likely that this trading relationship will persist unless there are alterations in the tariff differentials between Kuwait and Iran (see Chapter 4.62), or changes in the Iranian internal transport network, possibly including the development of Ro-Ro and LASH systems capable of serving the more remote Iranian coastal settlements.

5.4.7 PORT COMPETITION 11 - THE MIDDLE GULF

BAHRAIN

Exploiting the island's central position in the Gulf has always been the crux of the commercial activity of Bahraini merchants and businessmen. As such, the economic health of the state has depended on the commercial vibrancy of its harbours through which pass important transit and re-export cargoes destined for the mainland. In the contemporary situation the deep-water port of Bahrain (Mina Sulman), and its associated dhow harbour at Manama, are placed in a competitive relationship with Dammam, Jubail, Doha and Bushire. In this context Chapter 4 has demonstrated the spatial configuration of Bahraini dhow trades with ports and villages in the middle Gulf region (see Figure 4.17).

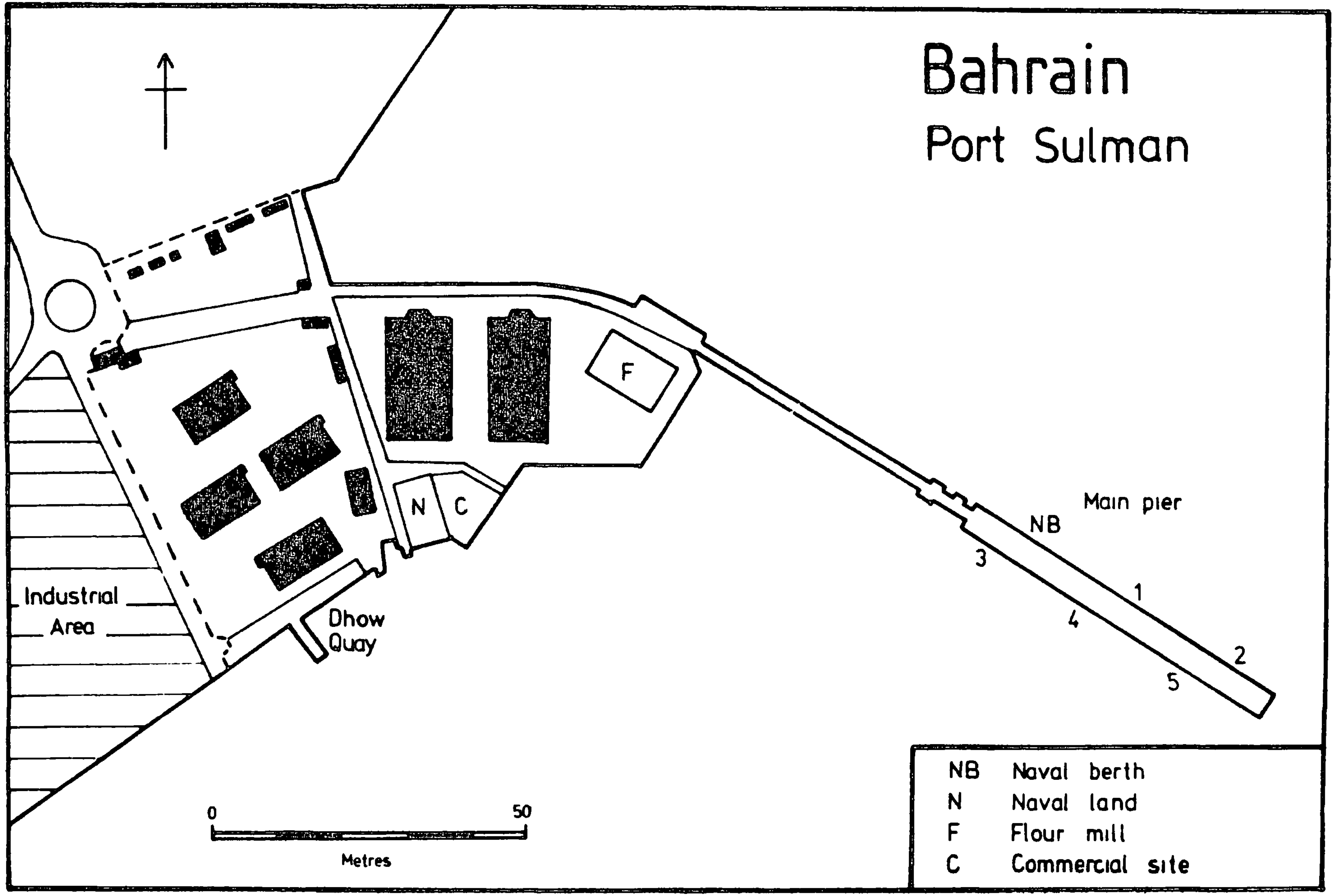

Bahrain
Port Sulman
Main pier
NB
3
1
4
2
5
F
N
C
Dhow Quay
Industrial Area
0
50
Metres
NB Naval berth
N Naval land
F Flour mill
C Commercial site

FIGURE 5.16

The government annual report of 1958 gave a clear statement of the policy which underlay the development of the state's deep-water port facilities: "Our constant endeavour must therefore be to keep Bahrain in the eye of all industrialized countries and other Gulf countries as a storehouse of the Arabian Gulf, from which their goods can be delivered more speedily and cheaply than they can from the original source" (p.5). The storehouse policy was strengthened by the opening of Mina Sulman and its associated transit and storage warehouses in 1962. In 1973, the original 6 berths were estimated to have a total capacity of 450,000 tons per annum - see Figure 5.16. However, during the period of the mid-1970's Mina Sulman suffered from both a lack of berthing and warehousing space. In mid-1977 the Port Authority estimated that as much as 70% of goods imported were being stored in the port for period in excess of 6 months. The extension of the port by an additional 2 conventional, 2 container and 1 Ro-Ro berths, and associated storage facilities (completed in 1979), has helped alleviate congestion.

However, by 1980 the nature of Mina Sulman's competitive relationship with the mainland had changed markedly from the position ten years earlier. Chapter 4 has demonstrated that in volume terms (tonnage and value) by far the most significant entrepot trade links Bahrain with the Saudi ports of Dammam, Al Khobar and Qateef. A number of factors have now combined together to make it likely that the nature and volume of this trade will alter in the 1980's. Firstly, the Saudi government has developed the ports of Dammam and Jubail to a point where they now have adequate berthing space to accommodate incoming vessels under normal trading circumstances. Secondly, the construction of a causeway linking the main island of Bahrain to the Saudi mainland will largely curtail the need for the conveyance of transit cargoes by dhow. Thirdly, pressure from the Bahraini government placed on merchants to reduce the time they have traditionally stored cargoes in the port (i.e. until market conditions are favourable) has upset the operation of transit and re-export trades. In this regard the government has reduced the maximum storage time from 2 years to 2 months, and the banks of Bahrain have been squeezing merchants by refusing credit for companies with uncleared goods. The significance of goods stored in port warehouses can be guaged from the fact that in 1976 - 77 the government raised B.D. 1 million from the sale of uncleared goods. Added to these pressures, merchants have had to contend with a 65% increase in handling charges in the wake of the employment of the Korean firm Young Kim Enterprises in 1977 to help clear the quayside congestion. Taken together, these factors mean that Bahraini merchants in the 1980's will have to show all their commercial skill and enterprise if they are to hold onto traditional markets inside Saudi Arabia.

Transit and re-export trades elsewhere in the Gulf are likewise threatened by port development programmes and the introduction of new shipping technology. Qatar and the U.A.E. are now furnished with adequate deep-water harbours. Iran, however, has not expanded its small deep-water port of Bushire in the middle-Gulf and it is therefore likely that the dhow-based (possibly supplemented by feeder Ro-Ro and LASH systems) re-export trade from Bahrain to Iran will continue in the 1980's though with competition from other Gulf entrepots. In general however, it seems highly probable that the traditional entrepot trades carried on through Bahrain will be increasingly squeezed via a combination of port development and the application of new technology in transport elsewhere in the Gulf.

5.4.8 PORT COMPETITION 111 - THE LOWER GULF

THE EMIRATES

The development of seaports in the United Arab Emirates is characterized by both its lateness and intensity. The U.A.E. was founded in 1971 by federating the existing seven emirates, some of which have a history inter-emirate political and economic rivalry. Despite

TABLE 5.28

SPACING OF PORTS IN THE EMIRATES

(Approximate distances on paved roads in miles)

Destination:		1	2	3	4	5	6	7	8
Origin:									
1	Abu Dhabi	-	90	98	102	118	144	168	186
2	Dubai	90	-	8	12	28	54	78	96
3	Sharjah	98	8	-	4	20	46	70	88
4	Ajman	102	12	4	-	16	39	74	92
5	Umm Al Qaiwain	118	28	20	16	-	32	90	108
6	Ras al Khaimah	144	54	46	39	74	-	80	98
7	Fujairah	168	78	70	74	90	116	-	18
8	Khor Fakkan	186	96	88	92	108	98	18	-

the union, the co-ordination of economic planning in the first ten years of the state's existance has been fractured, and there evidence to suppose that each emirate is proceeding with a programme of economic development regardless of the greater degree of economic rationalisation and specialization that might have been expected to follow the creation of the state.

Projects involving the development of seaports in the emirates exemplify this continuing spirit of inter-emirate rivalry. During the last decade Abu Dhabi, Dubai, Sharjah and Ras Al Khaimah have all embarked on the construction of major deep-water port facilities, while the remaining three emirates are either contemplating the construction of large-scale ports (Fujairah), or else have commissioned more modest projects (Ajman and Umm Al Qaiwain). The key question in this context is not so much the number of berths built (93 are due to be operational by 1982 - see Table 1.2) but whether the ports constructed constitute viable economic ventures, or whether some of them at least are essentially prestige projects which are liable to operate at a loss and represent a drain on the emirate's resources.

At the base of the skeptism as to the viability of so many berths in the state lies the fact that the ports are closely spaced together (see Table 5.25) and that their common national hinterland outside each individual port city or town is limited (with the exception of Al Ain) to small, scattered rural communities in the desert and mountaineous interior. In 1978 the United Nations estimated the total population of the U.A.E. to be only 558,000 (U.N. Commission for Western Asia.) In the south, the location of the port of Abu Dhabi is such that it commands a hinterland roughtly corresponding to the boundary of the emirate, though with some competition from Sharjah and particularly Dubai. In the northern Emirates however, the situation is more critical because two major seaports, Dubai and Sharjah, are only 8 miles apart and compete for trade in a hinterland which is complicated by both the political patchwork of non-contiguous enclaves belonging to different emirates, and by the addition of Ras Al Khaimah, Khor Fakkan and possibly

Fujairah, as new deep-water ports serving the same area.

In terms of hinterlands, the ports of Abu Dhabi, Dubai, Sharjah and Khor Fakkan (when and if its container distribution service becomes firmly established) service markets inside Oman. However, the reverse trade of the Omani port of Matrah serving markets inside the U.A.E. is minimal.

However, with respect to forelands, the port of Dubai has a different function from each of its fellow emirates. Dubai alone has developed a vigourous overseas re-export trade in the Gulf, Gulf of Oman and the western Indian sub-continent, in sharp contrast to all the other ports of the U.A.E. (with the exception of Sharjah - Khor Fakkan whose landward container distribution extends into Arabia) whose ports are primarily local ports serving national hinterlands in the emirates.

Any assessment of the scale of port development in the emirates has to take into account the over-riding economic circumstances. The construction of deep-water harbours in the U.A.E. has for the most part been under taken in the 1970's. The first eight years (1970 - 77) were set in the context of a buoyant, oil-led U.A.E. economy, the last two saw the influence of the general world economic recession take effect. The majority of the port development projects were planned and built in the era 1970-77 and represented in part a response to business confidence reflected in the high level of ordering in the private and public sectors (and the consequent port congestion), in part a response to changes in shipping technology, and in part political nervousness in each emirate which was reflected in plans to ensure economic self-sufficiency by constructing essential infrastructure.

The development of Port Zayed, Abu Dhabi (see Figure 5.17) reflects a change in response as the 1970's proceeded. Prior to federation in 1971, the government of Abu Dhabi

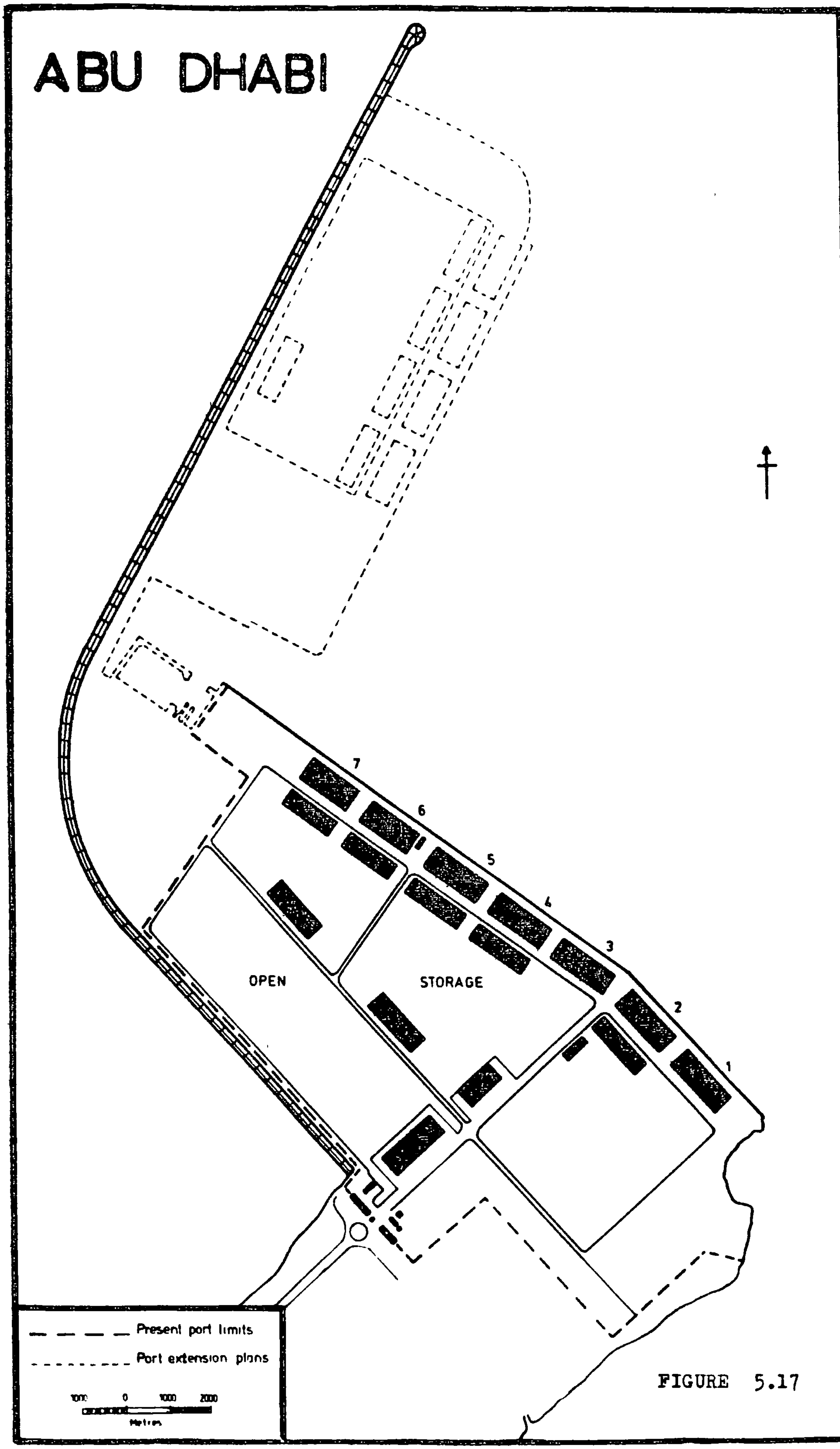

ABU DHABI
1
2
3
4
5
6
7
OPEN
STORAGE
Present port limits
Port extension plans
1000 0 1000 2000
Metres

FIGURE 5.17

took the decision to build a deep-water harbour in response to congested conditions in its open roadstead which had precipitated shipping conferences into imposing surcharges. Imports into Abu Dhabi (over 90% of which arrive by sea) had risen from 8135 dwt discharged in 1965 to 198,041 in 1971. By 1971, a proportion of the emirates imports were arriving through the U.A.E.'s principal port of Dubai. The rapid development of the emirates (expressed in terms of urban development, and the construction of industrial and infrastructure projects) would appear to justify the opening of the 6 berth port in 1972, and its subsequent expansion to 18 berths by 1980, though in less politically fragmented circumstances one might have expected Dubai to have handled much of the traffic through its port. During this phase of construction one Ro-Ro berth (1978) and two container berths were included to cater for the increase in unitized trades that followed the 1975-1977 port congestion era. A further response to the build up of trade in the mid 1970's involved the planned addition of a 34 berth outer harbour. However, in late 1977 these plans were cancelled in the light of the down-turn in trade levels (reflected in berths lying idle at the port - Smith 1978) and the scale of port development elsewhere in the federation.

Throughout the rest of the U.A.E. the pattern of port development appears to have proceeded through the 1970's regardless of the development of roads across the peninsula, and hence regardless of over-lapping hinterlands. By the beginning of the 1980's, Dubai had firmly established itself as the major seaport of the emirates (chiefly by virtue of its sizeable entrepot trade with Iran, India and Pakistan) though its paramountcy had to a certain extent been eroded by the development of Abu Dhabi and Sharjah. Given the size of the northern emirates region, Dubai ought logically to have functioned as the one major seaport of the region, capable of servicing all its neighbouring emirates to the north. However, economic and political rivalry within the federation seems to have over-riden the development of normal port-hinterland relationships.

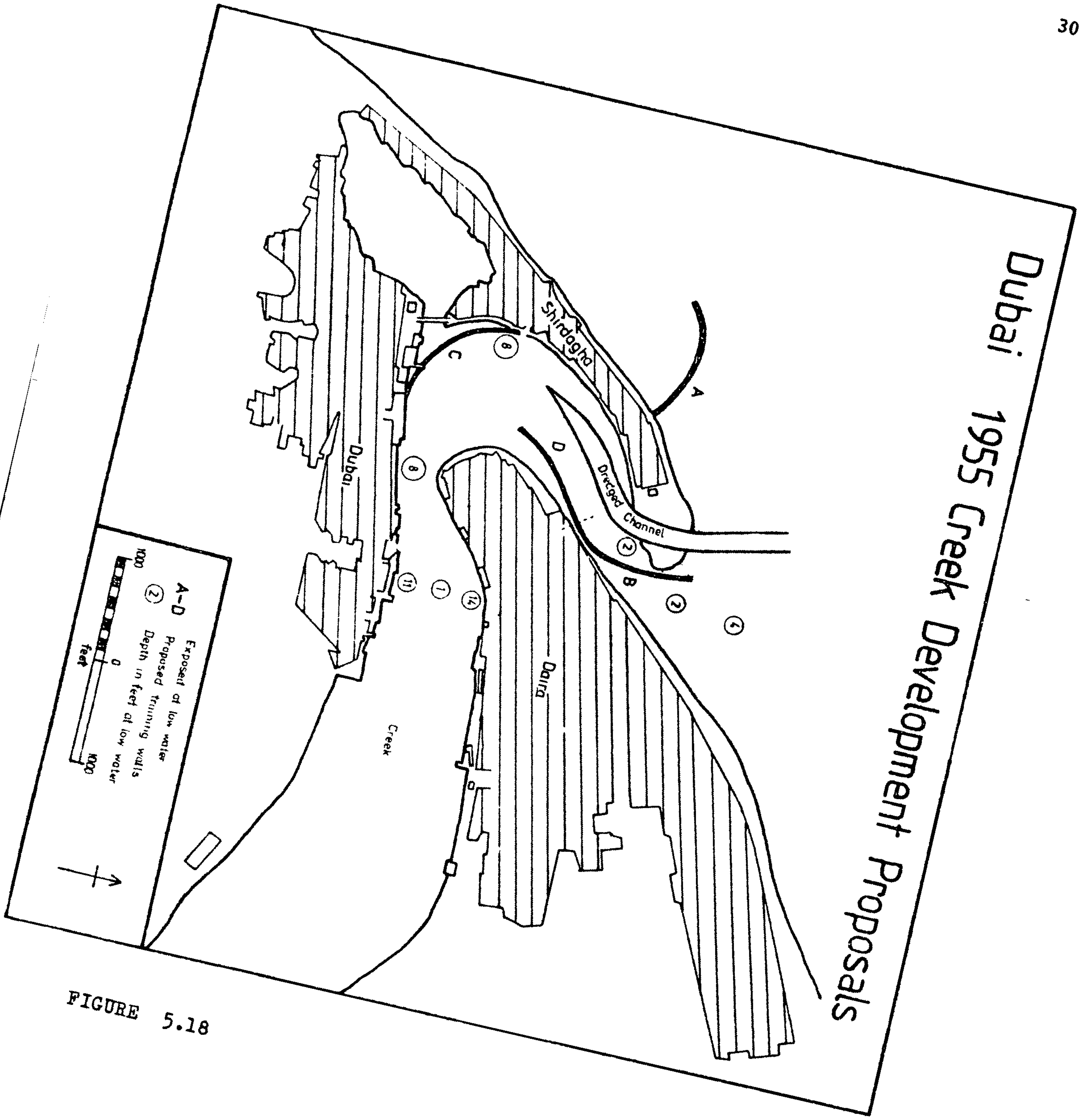

Dubai 1955 Creek Development Proposals
Shindagha
Dredged Channel
Dubai
Deira
Creek
A
B
C
D
Exposed at low water
A–D Proposed training walls
2 Depth in feet at low water
1000 0 1000
feet

FIGURE 5.18

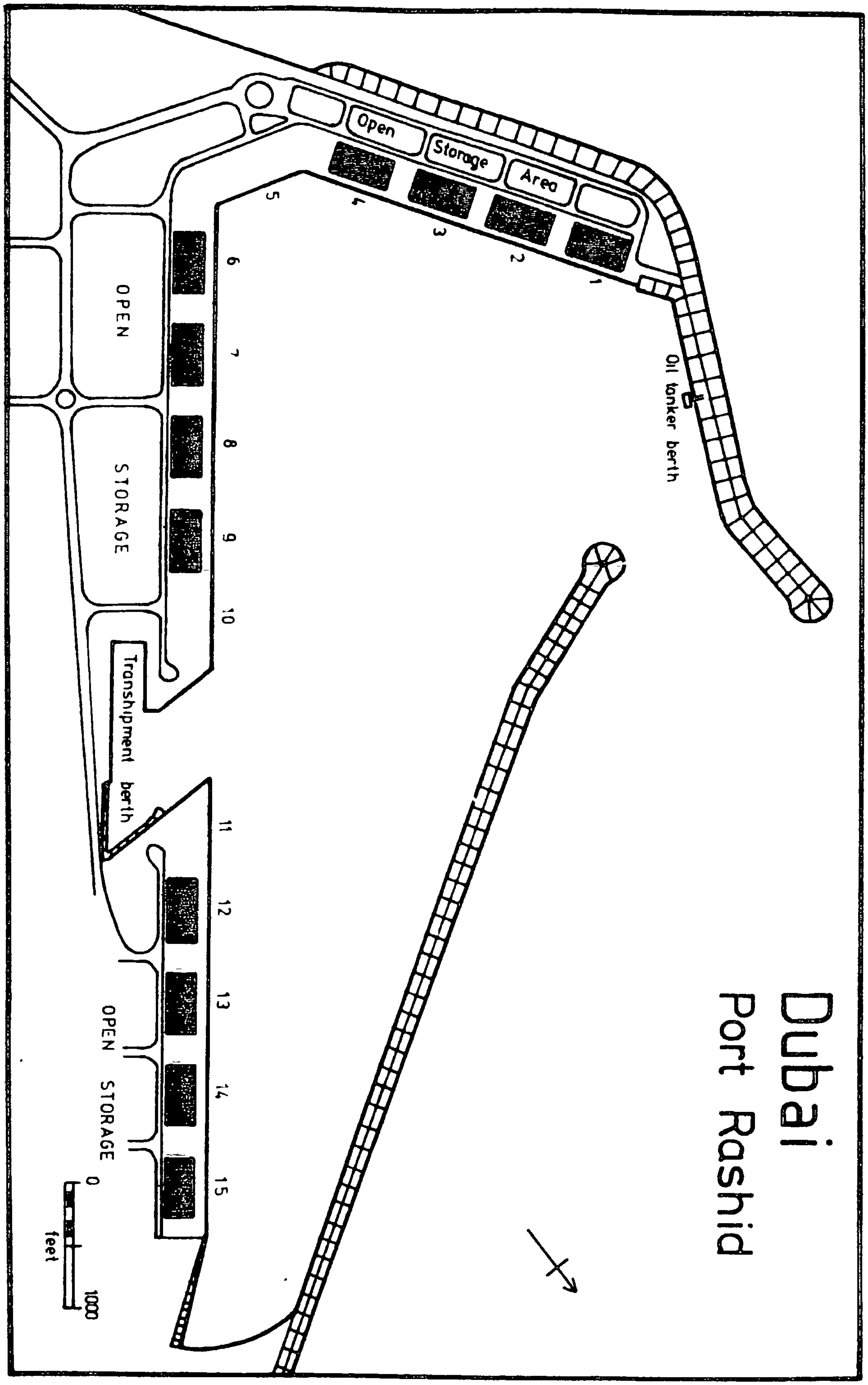

Dubai
Port Rashid
Open
Storage
Area
OPEN
STORAGE
Transhipment berth
Oil tanker berth
OPEN STORAGE
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
0
feet
1000

FIGURE 5.19

At the lower end of the port hierarchy Ajman and Umm Al Qaiwain have each constructed a wharf capable of berthing deep-draught conventional vessels (Civil Engineering, Oct, 1977). Presumably these will be used to accommodate occasional direct deliveries of cement or other construction materials. Fujairah commissioned a deep-water berth in the Gulf of Oman in 1978, though future plans to extend this project by an additional 9 berths during the 1980's seem questionable in the context of its small (primarily rural)hinterland and competition from Khor Fakkan and other higher order centres on the Gulf coast. Similarly, the new port Saqr (Ras Al Kaimah) which comprises 4 conventional berths 2 container berths and 1 Ro-Ro berth (Owens, 1978) would appear to be a duplication of facilities in Dubai and Sharjah that are capable of servicing the emirate.

Undoubtedly the most critical case of apparent duplication of port facilities is the situation with respect to Dubai and Sharjah. Dubai was first off the mark in stabilizing its creek and constructing creek wharves over a twenty five year period from the mid 1950's to 1980 (see Figure 5.18). This investment was to prove the foundation of the emirates vigourous entrepot trade. The deep-water harbour of Port Rashid (see Figure 5.19) was opened in 1971 with a total of 15 berths - a size which seemed excessive at the time, but the growth of trade during the 1970's confirmed its validity. In contrast to Abu Dhabi the ruler of Dubai, Shaikh Rashid, stuck to his decision to extendPort Rashid by an additional 22 berths (5 of which handled container ships, and 2 for Ro-Ro vessels) by 1980. The basis of this decision appears to lie in Shaikh Rashid's determination that Dubai shall remain "primus inter pares" among the Gulf emirates (Shipping World and Shipbuilder, Jan, 1976, p.81) dominating an extensive hinterland and foreland in the lower Gulf. Undoubtedly

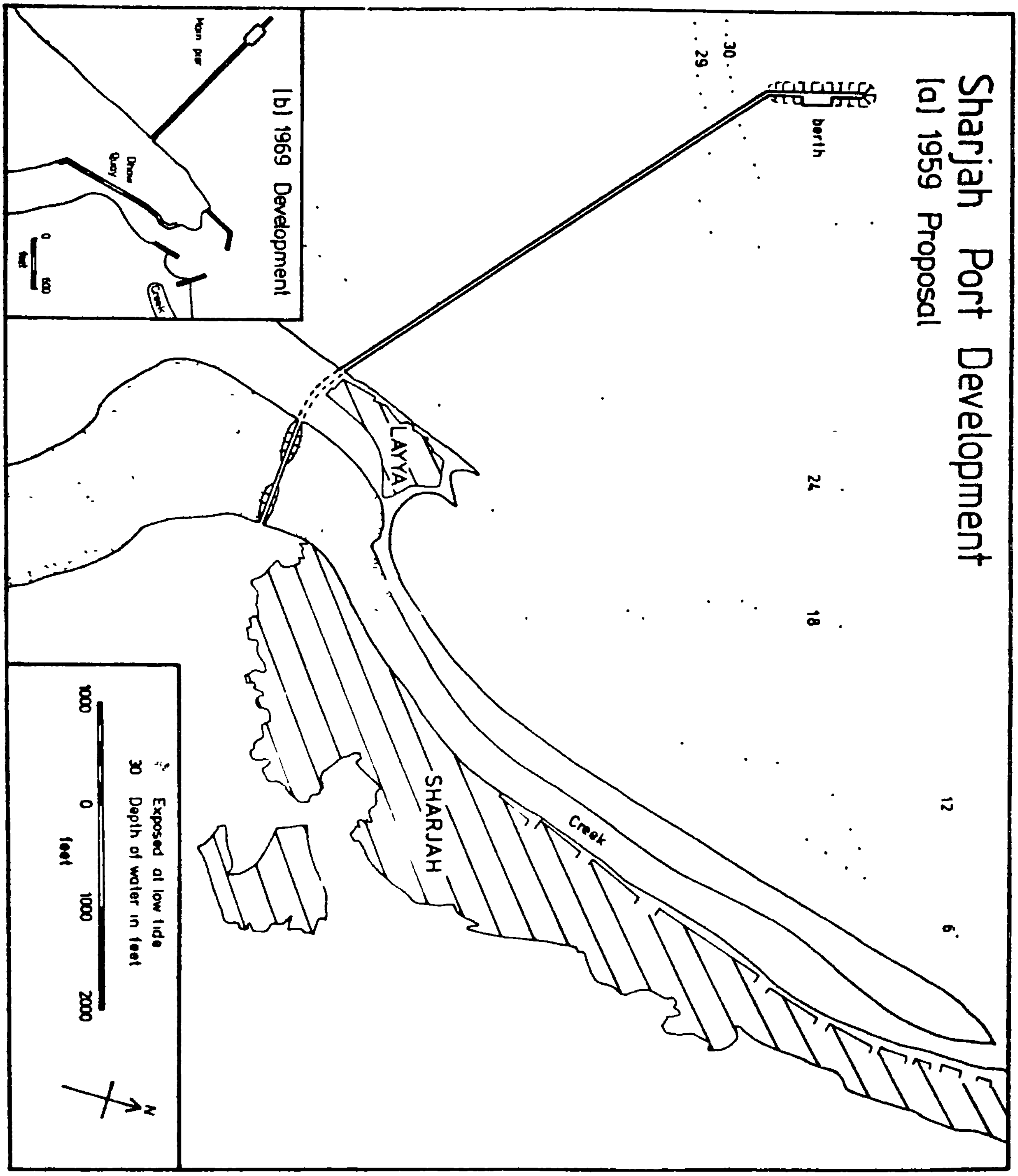

Sharjah Port Development
[a] 1959 Proposal
berth
30
29
24
18
12
6
LAYYA
SHARJAH
Creek
[b] 1969 Development
Main pier
Dhow Quay
0
feet
600
Creek
Exposed at low tide
30 Depth of water in feet
1000
0
1000
2000
feet
N

FIGURE 5.20

TABLE 5.29

Dubai : Port Rashid - Quantity of Cargo Discharged, 1971 - 1979

	Imports (DWT)
1971	514761
1972	632441
1973	1048103
1974	1796385
1975	1970797
1976	3358867
1977	3531946
1978	3351081
1979	2760133

Source: Dubai Annual Trade Review, 1980, p. 65

the general growth of trade in the mid 1970's, coupled with the rapid urban development of the emirate, necessitated port expansion beyond the 15 berth mark, though whether the size arrived at is appropriate in terms of competition from neighbouring emirates remains to be seen. An indication of trend however is reflected in the fact that general cargo handled in Port Rashid in 1978 was 25% down on 1977 (M.E.E.D., Dec . 78).

The development of Sharjah's two ports at Port Khalid and Khor Fakkan (on the Gulf of Oman) is perhaps the most contraversial in the U.A.E., especially as prior to their construction Sharjah was adequately served (along with the other northern emirates) by Port Rash id . Some commentators concede that although Sharhah is merely trying to maintain its business independence from Dubai, "the duplication of facilities is hard to brush aside" (M.E.E.D. Dec 1978). However, although to a certain extent port facilities at Sharjah and Dubai have been duplicated, the primary aim of Sharjah is certainly not a duplication of function. Port development at Sharjah and Khor Fakkan has to be seen as a linked project designed to furnish the emirate with a specialization in the rapid handling and onward conveyance of unitized cargoes by offering a fully integrated service that meshes together facilities for seabourne traffic with those of road transport.

The decision to expand the existing two berth jetty at Sharjah town (see Figure 5.20) and the jetty at Khor Fakkan was taken at a period when trade levels (and attendent port congestion) were building up in the aftermath of the 1973/74 oil price rises. The government of Sharjah took a decision to invest in facilities for handling containerized vessels which at that time were just beginning to make a significant penetration on Gulf shipping routes. Work began in 1976 on what appeared to be a far-sighted project to construct 2 berth container terminal at Khor Fakkan which would be capable of handling the largest 'third generation' container vessels (up to 57, 000 dwt) which would then not need to enter the Gulf (and would consequently save the operating costs involved in the normal multiple call system). The role of Khor Fakkan is therefore to act as a transhipment port for onward conveyance of containers by road or sea to markets in the Gulf.

A second purpose-built container terminal (the first built in the Gulf) was incorporated into the re-design of Port Khalid (Sharjah town) and was opened in 1976. The new port consisted of a two-berth container terminal, a Ro-Ro berth and four general cargo berths. In the first year of trade 1976-77, Port Khalid handled 750,000 tons of cargo (at the height of port congestion in the Gulf). However, trade fell 10% in the first five months of 1978 as the trade recession began to bite causing "a banking crisis which caused something of a liquidity crisis accentuating matters into a sharp fall in the volume of cargo being imported" (M.E.E.D. Dec, 1978, p. 55). In fact, during 1978, 18% of all imports were made up of cement (M.E.E.D. op cit) indicating that the level of trade relates significantly to the pace of economic development (particularly in the construction industry) in the emirates. The commensurate drop of 25% in Port Rahid's trade level during that year slso indicates that the opening of Port Khalid had affected the level of trade through Dubai during that year; however, it is still the case that the largest share of Sharjah's imports still arrive through Port Rashid and not Port Khalid. The continued existence of these two ports 'side by side' probably depends in the immediate future on each maintaining specialist functions (i.e. entrepot trade in the case of Dubai, container trades in the case of Sharjah) which are to a degree mutually exclusive. The decision by the Sharjah government in 1977 to cut back on planned 8 berth extension to Port Khalid by 4 berths in response to a down-turn in trade must also be viewed in part as a tacit acknowledgement that although Sharjah in the 1980's may well develop a successful, integrated container trade, Dubai will remain as the region's primary entrepot.

5.4.9 FURTHER CONSIDERATIONS

At first glance the extensive port development projects now under way in the Gulf would seem to support the view that there will soon be (in the 1980's) considerable over-capacity for handling conventional cargoes in the region. However, a more considered view of the situation, particularly with regard to political aspects, casts doubt on the validity of jumping to this conclusion in so far as it affects some states.

Whereas it is already apparent that the Gulf states are having difficulty in the short term in finding trained and skilled labour to man to the full, the expensive port facilities now built, it nonetheless appears the case that some, if not all, of the Gulf states are deliberately building in over-capacity and duplication. At the root lies the general political instability of the region. The narrow sea lanes passing through the Straits of Hormuz are not only the so-called jugular vein of the "Western Economies" but are also key access routes for vital raw materials and products involved in the drive for industrial diversification in the Gulf. Three narrow waterways - the Shatt Al Arab, the Straits of Hormuz and the Bab Al Mandab (at the entrance to the Red Sea) - are each bordered by states with a recent history of military conflict. Blockage at any one of these three has serious implications on the level of traffic passing through the other two. In this regard expensive port development in Saudi Arabia, Iraq and Iran seems less as an expensive waste of money leading to over-capacity and duplication, but mor e as a form of political insurance.

CHAPTER 6

CONCLUSION

"To many it must seem that we live in an age of moronic decision-making."

(C. West Churchman, 1968)

"It has been said that philosophers create systems because it gives them a nice warm comfortable feeling inside."

(M. Eliot Hurst, 1973)

"Development means the development of people. Road, buildings, the increase in crop output .... are not development: they are only the tools of development."

(President Dr. J. Nyerere, 1968)

6.1 RE-EXAMINATION OF HYPOTHESIS

The specific hypothesis under examination is :

"That since 1865, the intrusion of non-indigenous transport technology has resulted in the spatial dismemberment of a former maritime trading system based on dhow transport and the formation of two systems, one traditional and one modern, that are structurally and behaviourally discrete."

Reduced to its basic intention, this hypothesis implies that there is a clear, measurable relationship between the process of modernization and the creation of both constructive and destuctive forces within a traditional social framework. 'Modernization' is here defined, "as the process of change toward those types of social, economic and political systems that have developed in Western Europe and North America from the seventeenth century to the nineteenth and then have spread to other European countries and in the nineteenth and twentieth centuries to the South America, Asia and Africa continents."

(Eisenstadt, S.N. 1966, p.1). Put another way, the social impact of modernization, in the case of transport facilities, unlike the economic impact (Gauthier, 1970; Wilson, 1966) cannot be viewed as having a 'neutral' effect; rather it is either good or bad, positive or negative, creative or distructive, depending on community perspective. Modernization implies a dicotomy between the traditional and the modern, the latter being superimposed on, and displacing the other.

The veracity of this hypothesis is best examined in two stages: Firstly, did the intrusion of 'modern' transport and communication facilities dismember a former pattern of life? Secondly, if the former assertion is correct, has it contributed towards the creation of two structurally and behaviourally discrete socio-economic systems - one traditional and one modern?

1. Did the intrusion of modern transport and communication facilities dismember a former pattern of life based on trading in dhows?

The evidence clearly indicates that the forces of modernization brought about by European contact since 1507 have contributed to both a decline in the volume and importance of dhow traffic in the Gulf, and, a spatial reorientation of the network of routes. It appears that the effects on this contract were felt post 1862, rather than in the earlier era of Portuguese dominance in the Gulf. In the period 1507-1650, the Portuguese certainly disrupted certain trade routes, and ultimately influenced the redesign of the basic structure in sailing craft in the Indian Ocean and Persian Gulf, but the overall spatial pattern of economic life linking the Gulf, India and East Africa remained intact until the mid-nineteenth century. Data appears to indicate that the intrusion of superior, 'revolutionary' transport technology into the Gulf post 1862 was the most influential process of change rather than the presence of extra-regional political interference. In short, the steamer provided competition for dhow transport, particularly on the long haul India-Gulf and East Africa-Gulf routes. Landen (1967) has used the oversimplified term 'destructive' to label the competitive effect of steamer transport on sail-powered dhows in the post 1862 era. The evidence, although patchy, is that dhow transport was not destroyed by the process of competition from the steamship, it has merely contracted spatially back to the second of its two original functions: namely the traditional long distance, dhow based, exchange trade between the Gulf and the Arabian, West Indian and East Africa coasts has almost completely ceased; whereas, its secondary role of redistributing commodities imported into the major Gulf entrepots and re-exported to other parts of the Gulf littoral, and the Indian and Pakistani coast, continues. In this regard, Dubai, Kuwait and Bahrain are the three ports maintaining this entrepot function. Operationally therefore, the Gulf's motorized dhow trading system is now confined to the waters of the Persian Gulf, Gulf of Oman, and Indian and Pakistani coasts; its links with East Africa and South Arabia having all but ceased. Loss of the African connections confirms spatial dismemberment but not total destruction. However, the present contracted system is itself under threat from the 'second wave' of modernization in transport, namely competition from new technology in shipping and from road and air transport services within the Gulf.

2. Has the dismemberment contributed towards the creation of two structurally and behaviourally discrete socio-economic systems, one traditional and one modern?

(A) STRUCTURE

The nature of the process of modernization that has accompanied the intrusion of new transport technology and the development and export of petroleum resources beginning in Iran (1908) and spreading to Bahrain (1934)*, Saudi Arabia (1938)*, Kuwait (1964)*, Qatar (1949)*, United Arab Emirates (1962)* and Oman (1967)* (* dates refer to first exports of crude) has been to integrate the economies of each of the Gulf states into the wider 'world trading system'. The Persian Gulf states are now inexorably linked by virtue of their oil resources to interdependent world development processes. However, despite state economic integration into world affairs, a social dualism exists in the Gulf which mirrors the extent to which development programmes have really changed the lives of most of the inhabitants.

Traditional Society

Dhow transport can be regarded as the symbolic and real embodiment of what survives of the traditional spatial structure of Gulf society, consisting of a network of dhow routes connecting large ports and coastal villages together in a system for the exchange of local commodities, information and people. Section 3.3 illustrates that 'traditional' society is in structural contraction, increasingly being limited to parts of the Gulf which have yet to experience many of the physical manifestations of development in the 'petroleum exporting era'. This means, in practice, that dhows perform a social and economic function in supplying peripheral regions (small coastal village communities) with those items which are not easily procurable by virtue of the inability of development programmes to spread out from the economic 'core' areas of states (Hirschman, 1958). In short, dhows perform a social, structural role in linking Gulf developmental 'cores' with neglected 'peripheries'.

Modern Society

In terms of trade interconnection, the Gulf's deep-water ports (and oil terminals) have become the focii linking the Gulf to the World economic trading partners. As such, the pattern of urban and industrial development in the Gulf has concentrated on the port cities which have become the centre for the concentration of investment change.

(B) BEHAVIOUR

Traditional and Modern society in the Gulf may be differentiated in terms of the degree to which it exercises internal control over the procurement and distribution of its resources. In terms of maritime transport, this means that whereas dhow transport was essentially controlled internally by local Arab and Persian merchants and seamen, modern ocean transport is run, in most cases, by overseas shipping companies and shipping conferences, and modern port development is subject to planning and construction by overseas contractors.

Traditional Society

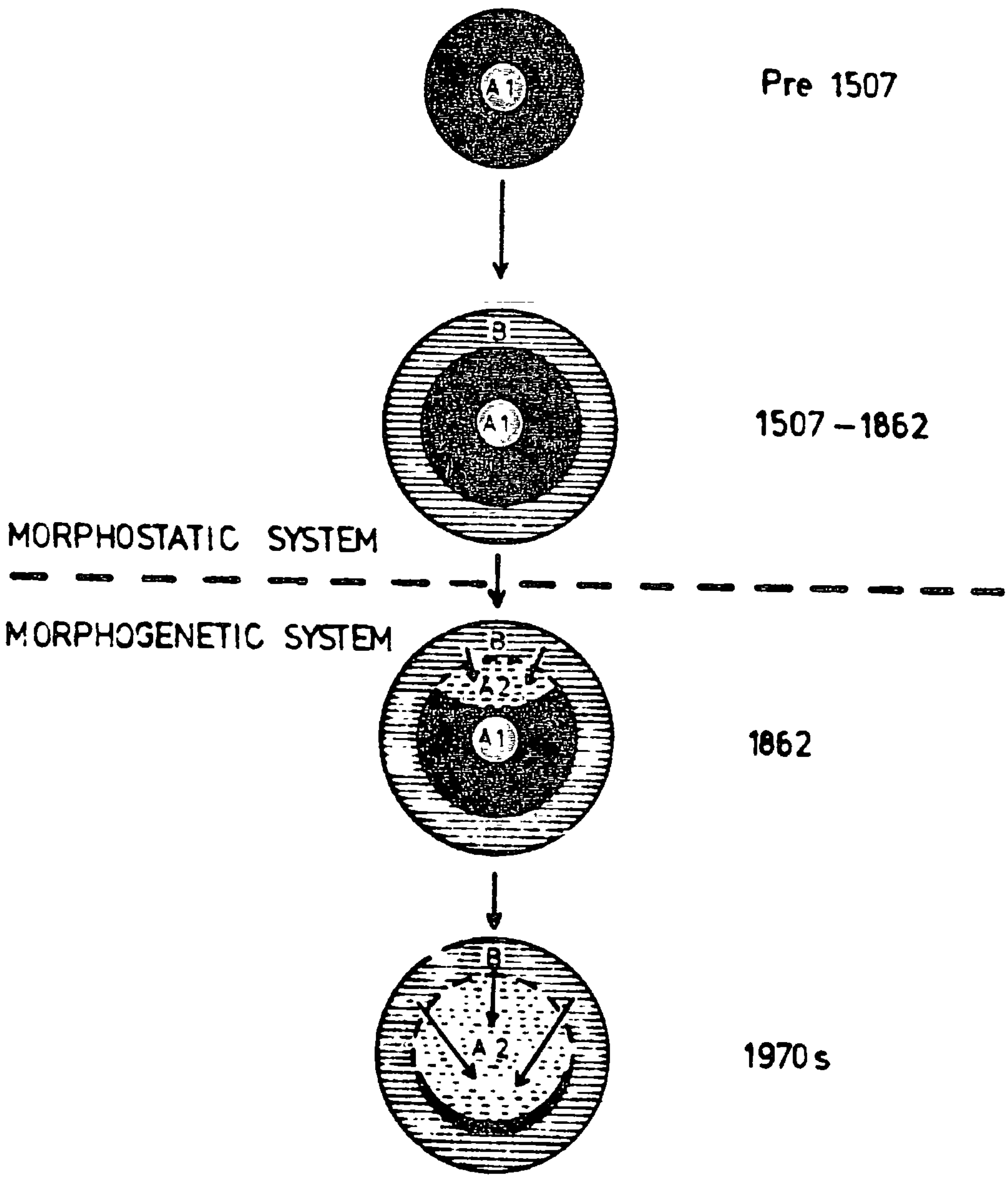
Chapter 4 highlights the fact that, although in decline, dhow transport is in local hands. As such, dhow transport is able to adopt a policy of adaptation, internally controlled, designed to counter the threats posed by competitive transport modes and unhelpful governments, by specializing in the carriage of commodities on trade routes which take advantage of local economic and political circumstances, of which differential tariff systems form the basis.

Modern Society

In contrast, modern society, by virtue of its involvement in wider world affairs, is responsive to an array of external stimuli. Section 5.1 indicates that port congestion in the Gulf, the pattern of which is a function of spatial imbalance in the rate of port development, is in fact exacerbated by the phenomenon known as 'overtonnaging', itself the product of unco-ordinated shipping services controlled by non-indigenous shipping lines. Further, the decisions of World shipping conferences in fixing the levels of 'additionals' and 'surcharges' on cargoes carried to the Gulf have a key influence on the pattern of port development in the region.

Equilibrium and Society in the Persian Gulf

A trajectory of system states



A1 Indigenous society utilising traditional technology

A2 Indigenous society adopting modern technology

B Influence of the outside world

FIGURE 6.1

Maritime Transport and Social Equilibrium

The results of this research project broadly confirm the original hypothesis. The traditional dhow trading system has been shown to have been largely displaced by a modern system based on steamer transport, isolating a smaller, contracting dhow transport system to perform the subsidiary role of redistribution within the Gulf.

In systems terms, this process of change is represented diagrammaticall y in Figure 6.1. A trajectory of 'system states' is depicted in four eras. The Persian Gulf Maritime Trading System behaved morphostatically until 1862. In the period before the arrival of the Portuguese in 1507, the system was indigenously controlled in pursuance of the local goal of acquiring and redistributing resources. Despite disruption by the Portuguese, and to a limited extent by the British, the homeostatic process maintained the system in its original form in the period 1507 - 1862. In this period traditional social and economic values (A1 - see Fig. 6.1) remained essentially separate from the values of exogamous political elite present in the Gulf. Post 1862, the system's behaviour has been essentially 'morphogenetic'. Post 1862, the influence of the outside world (B) has been felt through its introduction of the steamship, and its later economic interest in the Gulf's oil resources, which clashed with the original commercial and social goals of the system. Subsequently, 'traditional' society in the Gulf has split into a growing proportion of the local community who have adopted the use of modern technology, (A2), and a declining proportion who utilise traditional technology, including dhow transport (A1).

6.2. PRACTICAL IMPLICATIONS

This research has a pioneering function as no comparable study of port development and local shipping in the Persian Gulf has been previously attempted. As such, the simple collection of hitherto unassembled arrays of data is perhaps its major contribution to further studies. The practical conclusions drawn below must be necessarily limited to those aspects analysed: the nature of this thesis is that it asks as many questions as it answers, and these may form the basis for future research in the field.

1. The Survival of Dhow Transport

Research indicates that the following four dhow routes are likely to survive into the foreseeable future by virtue of their commercial viability and lack of competition from road transport, although each may be subject to competition from unitized feeder shipping systems.

1. Dubai - Towns and villages on Iranian coast
2. Kuwait - ditto
3. Muscat - ditto
4. Dubai - Indian subcontinent

It is urged that future research monitors trade patterns on the above routes, together with the following six routes which are judge to be under threat of curtailment by virtue of competition deriving from the pattern of road development within Arabia.

1. Kuwait - Basra
2. Al Khobar - Doha
3. Abu Dhabi - Muscat
4. Abu Dhabi - Dubai
5. Muscat - Dubai
6. Bahrain (Manama) - Saudi Arabia (Al Khobar)

2. Port Development

The two decades 1960 - 1980 have seen an era of comprehensive development and expansion and port facilities throughout all of the Gulf states. Fears that the pattern of port development is too extensive, representing in some cases a waste of scarce national resources are possibly unjustified. It is, as yet, too early to judge. Certainly each state requires, in the absence of regional co-operation, the strategic and economic security afforded by adequate seaport facilities. Port expansion schemes at Khorramshahr, Kuwait, Bandar Shahpour and Bandar Abbas and Dammam appear justified in relation to the rate of growth of throughput, particularly of imports, though Chapter 5 indicates that present problems of congestion may be due in part to an over-proliferation of shipping services on certain routes. Dubai's expansion scheme at Port Rashid seems justified given the nature of the port and its significance in its national economy, together with the promising trend (see Section 3.4.2) in terms of the growth of trade. Port development at Doha, Abu Dhabi, Matrah and Bandar Abbas was justified in relation to the previous non-existence of deep-water ports exacerbated by the high 'out-port' additionals and surcharges formerly levied by shipping conferences.

Research indicates that future research projects should focus on the following potentially significant developments :-

1. The threat posed, if any, by the port of Dammam's expansion and the causeway linking Bahrain with the Saudi mainland with reference to the Bahraini-Saudi entrepot trade, and its implications for a possible expansion of the port of Mina Sulman.

2. A possible over-provision of deep-water harbours in the United Arab Emirates. In particular, the expansion of the ports of Mina Zayed (Abu Dhabi) Port Khalid ,(Sharjah), Ras Al Khaimah and Fujairah would seem questionable in relation to Dubai's pre-existing trading expertise.

3. The threat posed by the construction of a deep-water harbour at Muscat (Matrah) to the pattern of trade presently conducted between the United Arab Emirates and Oman.

4. The relatively insignificant role played by Bushire in the Iranian system of seaports.

5. The significance of port, and industrial development at Bandar Abbas in the context of developing the underdeveloped and peripheral south-eastern region of Iran.

6. The general expansion of containerization (in all its forms) in the Gulf.

3. <u>Shipping Development</u>

Research has focused on the role shipping lines have in the development of the state in both early and later stages. One principle conclusion may be drawn in the context of the Gulf. Firstly, that a lack of rationalization among shipping lines, particularly on routes from India, Pakistan, and the eastern seaboard of the United States, appears from an analysis of those ports studied, to be a contributory factor to the problem of port congestion.

Future research might usefully be conducted in the following areas :-

1. The role of Gulf shipping lines (e.g. the United Arab Shipping Company) in the economic development of the Gulf.
2. The role of dry dock and ship repair yards in economic development.
3. The feasibility of establishing a central routeing agency for the direction of ships to unoccupied berths within the Gulf cul-de-sac, thereby minimizing delay time.
4. The future of containerized 'feeder' vessels in the Gulf.

6.3. THEORETICAL IMPLICATIONS

"He denied for instance that the world was round, and he had no conception of the geography away from the seas he knew".

(Villiers, 1940, p.222)

The theoretical implications which derive from this research are grouped under two headings: firstly, the specific nature of the role of seaports in the sphere of development; and secondly, the general impact of investment in transport facilities upon society.

1. Seaports and Development

Hoyle and Hilling (1970) conclude that seaports are well placed to act either as a growth pole or obstructive influence upon development. Both cases are true in respect of Persian Gulf situation. The location of deep-water ports along the shores of the Gulf in fact represents the spatial pattern of urban and industrial growth in the region. With the exception of Iran, Saudi Arabia and Iraq, state economic development projects have concentrated in the port cities and port environs. Similarly, the obstructive influence of inadequate port facilities (in terms of shipping surcharges, delays, high costs of indirect imports) have been recognised by all Gulf states in their decisions to build deep- water harbours to balance earlier development of oil-exporting terminals.

However, Hoyle and Hilling's bald statement, although verifiable, perhaps misses a key point: Seaports are themselves inert. It is the dynamism, or lack of it, among decision-makers concerned with port development and operation that ultimately renders a port as a growth point, or obstructive influence upon growth. How a port is controlled, or reacts to control, is ultimately the differentiating factor. Accordingly, the spatial aspects of decision-making by parties concerned with the use of ports have the ultimate bearing on port success.

Undoubtedly, the success of some of the ports of the Persian Gulf is attributable to the skill of local planners, merchants and industrialists in developing and utilizing port facilities so as to make the best use of specific local and regional circumstances. Dubai is probably the clearest example of a port deriving its success through the skilful decision-making of local entrepreneurs, foremost of which is its present Ruler. In each of the Gulf Shaikhdoms studied in depth - Kuwait, Bahrain and Dubai - the business acumen of their merchants is a major contributing factor in the relative success of their ports.

However, in his study of the port of Hong Kong, T.N. Chiu concluded that, "the development of a port is not a function of local circumstances alone. Economic and social progress in the area it serves, the rise and fall of rivals, and the development of world shipping are all important factors to which a port readily responds" (ix, 1973). These processes are at least as significant in the Persian Gulf, where the major conclusion from the research carried out is that external factors affecting port development are of paramount consequence.

External factors may be sub-divided into two topics - the significance of port forelands and the role of external decision-making in international shipping organisation, and the functional association of seaports within the Gulf.

Hoyle (1970) and Rimmer (1967) have commented that, with a few exceptions (e.g Boxer's 1961 study of Hong Kong), the analysis of seaports has been characterized by its neglect of the study of port forelands. Given its physical shape, this research has demonstrated the significance of foreland relationships in the (dhow based) entrepot trade of the Gulf Shaikhdoms of Kuwait, Bahrain and Dubai. Particularly in the case of Bahrain and Dubai, the nature of across-Gulf, short-sea, foreland linkages, rather than hinterland relationships, are a primary contributor to the commercial viability of their seaports. Further, with regard to international trade, this research has demonstrated the sensitive role played by shipping lines and shipping conferences in influencing the nature of port development problems with regard to port congestion and shipping surcharges.

A final conclusion to be drawn from the data analysis is that the ports of the Persian Gulf are best viewed as a port complex rather than as individual units. This conclusion fits in with the work of Ogundana (1970), in Nigeria, where he recognized that seaports should be assessed in a relative sense rather than an absolute sense, thereby allowing the character of a single port to be appreciated by its comparative functional relationship to other ports, especially neighbouring ports. This analysis of Gulf ports has revealed a high level of interdependence. Broadly, the major seaports of the Arabian coast have a complementary relationship with the ports and coastal villages of the Iranian coast; whereas relations between the Arabian ports are both complementary in the sense of re-export trade, and competitive, by virtue of their relative sizes, levels of port congestion and rates of handling.

2. The Social Impact of Transport Investment

Taken as a whole, the net effect of change in the post 1862 era has been to draw the economies of each Gulf state, to a greater or lesser degree, into a wider, interdependent world trading system in which the major seaports function as the central nodes linking the Gulf to all the major world economic heartlands. This process has culminated in a situation described by Mesarovic and Pestel (1975) as one in which, "the world cannot be described any more as a collection of some 100 - 150 odd nations and an assortment of political blocks. Rather, the world must be viewed as consisting of nations and regions which form a world system, through an assortment of interdependencies" (p.19). The Gulf is tied to the rest of the world through the principal interdependency of petroleum, rendering it a distinctive sub-system of the 'world economy'.

Overall, the result of concentrating investment patterns around the major points of linkage with the world economy, namely the larger port cities, the oil terminals and the seaports, has been to polarise economic development at specific points along the Gulf. The nature of investment in port facilities has therefore been to exacerbate spatially unbalanced growth within the Gulf.

Whereas this pattern of investment has undoubtedly led to economic gains for many, if not all Gulf states, it should be set against the social costs. It is necessary to pause and ask precisely what is the purpose of development? According to Boudeville's criteria (1966, pp .168 - 169) it is apparent that within the Gulf, 'growth' (a set of increases in quantities produced) has been achieved, as has 'development' (growth, plus a favourable change in production techniques and in consumer behaviour). But has 'progress' (development plus a diminuation of social tensions between groups within a society) been achieved?

In a situation where investment has been concentrated in the major urban centres (many of which are seaports) the significance of the link between 'progress' and transport investment becomes critical. Put simply, those regions lying outside the immediate environs of major urban centres are put at a disadvantage in development terms unless connected to centres of innovation and change by adequate transport facilities which allow the carriage of paraphernalia of progress.

In many parts of the 'Third World' road transport development is seen as playing a major role in facilitating the spread of resources from core to periphery (Taaffe, Morrill and Gould, 1963). However, within the Gulf, coastal craft (dhows) play a vital role in performing the same function, linking remote villages to major centres of change. As such, the present declining picture of dhow transport activity is depressing. Unfortunately, a situation has arisen in the Gulf where governments, although making laudable efforts to improve dhow berthing facilities (particularly Dubai) are loath to support local shipping financially, perhaps in spite of the fact that these craft are earners of overseas currency and provide a vital social service. Private enterprise is similarly uninterested. Couper (1973, p.193) makes observation, valid in the Gulf, that "this attitude arises from the mistaken view of local shipping as a single entity, rather than as part of a chain of transport which serves the export industry, and which may act as a stimulant to the social and econimic development of the country". Inadequate coastal shipping services in an environment like the Gulf or South Pacific means two things: firstly, the value of first rate international ocean-going shipping services will be diminished by poor local distribution; and secondly, outlying communities will suffer economic and social disadvantages. Couper's conclusion (p. 194) that, "the role of domestic shipping is thus basically to help overcome the dicotomy of incomes and opportunities between urban growth points and rural areas", applies equally to the Persian Gulf as it did to his work in the South Pacific, suggesting that investment in coastal shipping should be considered by governments and private enterprise, as a social, if not economic, necessity.

The dhow transport system of the Persian Gulf is now a peripheral transport system. This secondariness is a function of its diminished role in the transport of goods, passenger and information within the total world system. It no longer appears important in the pattern of linkages between nations, except in a local sense. As such, development, in the sense of development funds, has passed it by. In short, development in dhow transport is 'unplanned'. It is, in an interdependent world system where, "change in the operation of one part will have significant repercussions throughout the system" (Eliot Hurst, 1973), in a reflexive position, a stance of adjustment and adaptation to unhelpful changes generated in its external environment. Dhow transport, as a former institutional way of life is mistakenly in danger of being committed to the scrap heap of obsolescent technology.

Foster (1962) has commented that, "investments that involve the least change in institutions ... have the greatest likelihood of success" (p. 145), a point echoed by Kahn (1951, p. 51) who argues that modest projects which employ relatively little capital ... and attempt ... a minimum of disruption of settled habits of thinking and living are most likely to succeed than those which involve a mass frontal assault on non-western patterns of culture". In reality the Gulf has witnessed such a frontal assault by modern technology. Beaumont et al, (1976, p. 327) conclude that, "it is an open question just how long traditional socio-economic patterns can be maintained ... in the face of rapid and deliberate economic development". If G.W. Wilson (1966, p.223) is correct in assessing that, "what is required is something intermediate between a massive assault on culture and those investments which leave all else completely unchanged," then unless some investment, perhaps on a limited scale, to improve harbours, and craft operating in the coastal waters of the Persian Gulf, takes place to balance the enormous investment in deep-water harbours and ocean shipping, then the prophetic words of H. Brookfield (1973) will be given added meaning:

"Development is the modern dynamic. Development of the poor nations of the world may even make their people poorer; but it is still development." p(xi).

STATISTICAL APPENDIX

TABLE A : Bahrain - Registration of Craft

	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956
Barges	10	9	15	20	16	17	17	16	22	18	19	27	30	34	48	50	94	101	105	106	107
Motor Craft & Tugs	90	87	76	91	102	96	98	93	106	111	116	137	157	199	211	228	253	268	298	320	337
Sailing Craft	1089	1032	1006	971	930	895	889	899	897	894	913	903	908	912	910	896	838	817	784	753	720
Small Motor Launch	-	-	13	13	8	8	9	8	8	8	8	8	8	8	-	-	-	-	-	-	-
TOTAL :	1189	1128	1109	1095	1056	1016	1010	1016	1033	1031	1056	1075	1099	1153	1169	1174	1185	1186	1187	1179	1164

	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972
Barges	116	119	110	118	131	129	127	117	113	108	103	89	71			
Motor Craft & Tugs	365	380	378	391	401	394	383	372	350	340	339	328	349			
Sailing Craft	696	664	598	560	526	489	448	402	354	300	232	165	68			
Pontoons	-	-	10	10	10	10	6	4	4	3	3	3	1			
Small Motor Launch	-	-	-	-	-	-	-	-	-	-	-	-	-			
TOTAL :	1177	1174	1106	1089	1068	1024	964	895	821	751	677	585	489			

Source : Government of Bahrain, 'Annual Reports', 1936-1969, Customs Department, Manama.

TABLE B : Bahrain - Visits of Native Craft

Origin	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956
Arabian Mainland (incl. Qatar)	916	833	719	626	614	540	538	404	243	276	188	164	174	134	102	79	114	79	173	178	124
Kuwait	61	79	65	57	62	82	30	43	51	94	75	51	77	108	133	66	51	51	38	57	60
Oman Coast	197	185	183	212	193	250	245	193	217	292	247	275	334	282	277	290	272	239	215	213	287
Iran Coast	327	340	317	366	349	422	388	380	625	860	1153	792	448	629	622	781	828	902	870	712	800
Iraq	143	143	119	123	132	62	191	92	71	62	48	59	45	43	55	62	47	54	44	67	84
India	57	55	73	39	75	109	39	36	33	36	41	41	30	18	23	36	31	51	57	62	49
Africa	1	23	15	4	18	8	0	11	34	33	34	20	30	41	33	28	50	41	24	38	26
Qatar	-	-	-	-	-	-	4	2	11	46	26	29	40	20	44	72	58	53	52	71	66
Aden	-	-	-	-	-	-	1	15	0	1	0	0	0	0	0	0	0	0	-	-	1
Mukhalla	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	1	0	3	-	-	-
Pakistan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	5	1	-	2	1
Yemen	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Goa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
TOTAL :	1702	1658	1491	1427	1443	1473	1436	1176	1285	1700	1812	1431	1178	1276	1293	1416	1456	1474	1473	1402	1498

Origin	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
Arabian Mainland	147	140	196	253	359	690	823	916	936	951	961	1049	1083	986	1207	1227	
Kuwait	103	63	34	49	38	53	42	52	91	34	30	31	44	71	90	64	
Oman Coast	255	259	235	214	231	228	306	252	213	263	313	328	329	328	279	303	
Iran Coast	878	762	590	586	680	767	743	845	800	749	649	571	552	655	737	678	
Iraq	145	55	60	51	65	93	118	135	151	159	154	154	121	82	112	80	
India	36	48	41	21	24	17	17	11	10	10	11	13	6	14	21	35	
Africa	6	0	0	3	0	-	-	-	-	-	-	-	-	-	-	-	
Qatar	108	183	199	228	222	179	165	98	149	178	140	101	122	136	96	89	
Aden	1	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Mukhalla	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Pakistan	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Yemen	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Goa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Others	-	-	-	-	-	-	-	-	-	5	9	2	6	14	20	6	
TOTAL :	1680	1513	1355	1405	1619	2027	2214	2309	2350	2349	2267	2249	2263		2562		

Source : Government of Bahrain, 'Annual Reports', 1936-1969, Customs Department, Manama.

TABLE C

: Foreign Trade Matrix for the Persian Gulf States (Imports) 1971 (in millions of Kuwaiti Dinars)

Origin	DESTINATION								
	Kuwait	Bahrain	Dubai	Abu Dhabi	Oman	Qatar	Saudi Arabia	Iran	Iraq
1	1.58	0.04	0.07	0.09	-	0.07	1.72	-	6.72
2	6.72	0.50	0.05	0.15	0.06	0.03	0.89	1.02	-
3	3.25	0.04	0.00	0.06	0.00	0.25	3.23	0.13	1.33
4	-	3.14	0.91	0.19	0.40	1.07	7.36	5.99	3.29
5	0.00	0.00	-	0.00	-	-	-	0.08	0.00
6	0.13	0.01	0.00	-	-	0.00	-	0.00	0.13
7	0.94	1.43	1.71	0.18	0.14	-	3.73	0.51	0.03
8	7.36	11.10	0.44	1.72	0.00	3.73	-	1.47	0.89
9	0.58	0.00	-	-	-	0.00	2.67	0.05	0.21
10	2.01	0.04	0.00	0.01	0.00	0.19	0.48	0.10	3.63
11	0.01	0.00	-	-	-	-	-	0.21	0.01
12	0.09	0.00	0.00	0.00	-	0.00	0.48	0.00	0.05
13	0.06	0.00	0.01	0.00	0.00	-	-	0.01	0.15
14	1.21	0.55	0.21	-	0.55	0.54	1.72	0.17	0.15
15	0.40	0.39	1.35	0.55	-	0.14	0.00	2.62	0.06
16	1.13	-	1.36	0.48	0.23	1.03	6.25	1.61	0.50
17	0.25	0.00	-	-	-	-	-	1.91	0.02
18	0.43	0.08	0.02	0.00	-	0.01	-	0.05	0.00
19	0.12	0.22	0.00	-	-	-	3.28	-	0.04
20	6.55	2.26	6.30	0.65	0.69	1.22	1.47	-	0.50
21	1.55	-	0.00	0.01	-	-	-	1.78	3.07
22	0.00	0.00	-	-	-	0.00	-	-	0.02
23	0.08	-	-	-	-	-	-	-	0.00
24	0.00	0.00	-	-	-	-	-	0.03	0.00
25	0.00	0.00	0.00	-	0.03	-	-	-	0.00
26	0.68	0.20	0.54	0.07	0.14	0.09	-	0.41	0.35
27	0.00	-	-	-	0.10	-	-	-	-
28	0.43	0.00	0.06	-	-	-	-	-	0.00
29	0.15	0.00	0.00	-	0.00	-	-	0.44	0.55
30	0.06	0.00	0.00	-	0.05	-	-	0.03	0.00
31	0.00	-	-	-	-	-	-	-	0.02
32	0.40	0.09	0.01	0.00	-	0.06	8.33	0.12	0.08
33	-	0.35	0.26	0.08	0.13	0.17	-	5.43	0.04
34	0.92	0.11	0.14	0.06	0.02	0.04	-	-	0.43
35	0.02	0.00	-	-	-	0.00	-	1.41	0.05
36	0.10	0.03	0.00	-	0.09	-	-	0.35	0.09
37	0.57	0.01	0.22	0.05	0.00	0.02	1.12	4.86	2.03
38	0.00	0.00	0.00	0.00	-	0.00	-	0.63	0.63
39	0.10	0.00	-	-	-	-	-	0.23	0.01
40	34.76	9.64	9.55	8.03	0.12	3.77	48.82	106.53	8.06
41	9.09	4.40	2.54	0.06	0.42	0.59	-	3.39	9.62
42	3.90	2.10	2.67	0.02	0.07	0.26	2.00	1.05	0.02
43	8.04	2.29	3.53	0.35	0.96	1.10	5.44	11.58	6.61
44	0.04	0.01	0.00	-	-	-	-	-	0.00
45	33.31	9.89	13.63	1.92	0.73	4.06	32 87	98.61	5.67
46	4.76	1.83	1.90	0.47	0.52	0.99	3.81	2.21	2.45
47	0.06	0.00	0.06	0.00	-	-	-	0.41	0.00
48	0.80	0.20	0.40	0.00	0.02	0.00	2.29	1.94	4.26
49	2.07	0.87	0.40	-	0.00	0.01	-	4.67	0.12
50	1.57	0.18	0.40	-	0.10	0.05	4.00	2.50	0.38
51	0.21	0.24	0.60	-	0.94	-	-	-	0.39
52	1.13	0.31	0.52	0.13	0.04	0.34	-	6.99	2.43
53	3.62	0.40	0.54	0.36	0.04	0.49	7.19	16.09	9.28
54	3.02	0.90	0.74	0.42	0.07	0.16	-	5.70	3.68
55	14.07	0.93	1.23	0.81	0.05	0 93	6.24	33.62	10.85
56	17.95	3.14	2.72	1.60	0.30	1.76	22.94	146.41	6.62
57	29.36	24.35	13.98	10.92	2.32	14.49	26.01	79.33	22.30
58	0.80	0.03	0.01	0.01	0.00	0.01	-	0.67	0.91
59	5.68	4.26	2.40	1.35	0.43	0.91	13.44	17.13	4.05
60	0.17	0.02	0.09	0.00	0.00	0.02	-	-	0.09
61	9.86	2.40	1.56	0.90	0.05	1.36	12.78	33.83	5.50
62	0.01	0.03	0.08	0.03	0.00	0.03	-	1.14	0.07
63	0.24	0.11	0.18	0.02	0.00	0.02	-	1.64	0.54
64	0.00	0.02	0.10	0.00	0.00	0.00	-	-	0.93
65	2.03	0.96	0.18	0.06	0.17	0.03	0.32	6.78	1.52
66	1.93	0.25	0.46	0.24	0.01	0.12	1.90	7.75	7.44
67	3.46	1.03	7.03	0.19	0.08	0.33	4.10	12.69	2.88
68	0.75	0.04	0.03	0.01	0.00	0.00	-	1.45	3.94
69	1.71	0.23	0.63	0.05	0.02	0.08	-	14.14	4.92
70	1.03	0.02	0.14	0.03	0.00	0.03	-	0.06	3.22
71	1.98	0.02	0.03	0.00	0.00	0.06	-	7.42	2.26
72	1.11	0.11	0.12	0.07	0.00	0.04	-	3.46	5.13
73	2.01	0 06	0.11	0.04	0.00	0.06	-	16.35	0.62
74	2.66	0.08	0.32	0.13	0.13	0.08	-	69.86	21.29
75	0.86	0.06	0.03	0.02	-	0.00	0 37	4.68	1.38
76	6.49	1.94	1.35	0 80	0.83	0.76	-	18.52	2.63
77	0.12	0.00	0.03	0.00	0.00	0.00	-	0 43	0.04

/Cont'd...

(Cont'd.)

Origin	DESTINATION								
	Kuwait	Bahrain	Dubai	Abu Dhabi	Oman	Qatar	Saudi Arabia	Iran	Iraq
78	13.01	0.99	0.72	0.76	0.11	3.27	37.65	4.21	7.80
79	0.10	0.03	0.02	0.00	0.00	0.01	-	-	0.91
80	0.43	0.12	0.37	0.34	0.00	0.00	6.70	1.20	6.77
81	1.24	1.60	-	3.64	0.84	1.38	1.74	4.04	0.06
82	0.65	0.08	0.05	0.00	-	0.01	-	1.66	0.13
83	0.94	0.80	1.09	0.12	0.15	0.15	-	1.33	0.94
84	0.05	0.00	-	-	-	-	-	-	0.06

Source : Published Official Government Foreign Trade Statistics, 1971, for the States of Kuwait, Bahrain, United Arab Emirates (Dubai and Abu Dhabi), Oman, Qatar, Saudi Arabia, Iran and Iraq, converted into Kuwaiti Dinars at rates specified in Section 3.5.1 of the text.

KEY TO TABLE F

1. Egypt
2. Iraq
3. Jordan
4. Kuwait
5. Libya
6. Morocco
7. Qatar
8. Saudi Arabia
9. Sudan
10. Syria
11. Tunisia
12. Yemen
13. Dem. Yemen
14. Abu Dhabi
15. Oman
16. Bahrain
17. Afghanistan
18. Cyprus
19. Ethiopia
20. Iran
21. Turkey
22. Angola
23. Cameroon
24. Ghana
25. Ivory Coast
26. Kenya
27. Liberia
28. Malagasy
29. Mozambique
30. Nigeria
31. Senegal
32. Somalia
33. South Africa
34. Tanzania
35. Argentina
36. Brazil
37. Canada
38. Cuba
39. Mexico
40. U.S.A.
41. China
42. Hong Kong
43. India
44. Indonesia
45. Japan
46. Pakistan
47. Philippines
48. Sri Lanka
49. Taiwan
50. Thailand
51. Burma
52. Austria
53. Belgium
54. Denmark
55. France
56. West Germany
57. U.K.
58. Greece
59. Holland
60. Ireland
61. Italy
62. Luxembourg
63. Norway
64. Portugal
65. Spain
66. Sweden
67. Switzerland
68. Bulgaria
69. Czechoslavakia
70. E. Germany
71. Hungary
72. Poland
73. Rumania
74. U.S.S.R.
75. Yugoslavia
76. Australia
77. New Zealand
78. Lebanon
79. Finland
80. Malaysia
81. Dubai
82. S. Korea
83. Singapore
84. Mauritius

- = No trade
0.00 = Trade of less than K.D.10,000

TABLE D

Dhow Flows - 1971

Origin	(1) Incoming Dhows - Destination: Kuwait	Bahrain	Dubai	Doha	Abu Dhabi	Destination	(2) Outgoing Dhows - Origin: Bahrain	Doha	Dubai
Abadan	3066	9	21	-	-		36	21	19
Abu Dhabi	60	67	103	102	-		80	99	73
Aden	-	3	40	-	-		-	-	3
Asalo	-	-	-	-	-		-	15	2
Ajjarnat	-	21	-	-	-		24	33	-
Bandar Abbas	-	7	828	-	-		7	6	593
Basidu	-	-	24	-	-		-	-	9
Bustano	-	11	-	-	-		-	-	75
Bunji	-	-	28	-	-		-	-	10
B. M'uallm	-	-	46	-	-		-	-	17
Bushire	294	457	9	-	-		375	228	37
Basrah	6	2	45	7	-		-	6	59
Bahrain	162	-	271	205	80		-	159	175
Berbera	-	2	-	-	-		-	-	-
B'Shahpour	24	-	11	-	-		2	-	-
Bulkhair	12	4	-	-	-		47	3	24
Bahmashir	1188	-	-	-	-		-	-	-
Chalat	-	-	53	-	-		1	3	1
Chahbahar	-	-	66	-	-		-	-	27
Charak	6	1	53	-	-		3	9	18
Chivu	-	-	-	-	-		-	3	2
Dulab	-	-	3	-	-		-	3	29
Deyrestan	-	-	20	-	-		-	-	5
Djibouti	-	-	2	-	-		-	-	-
Doha	24	92	274	-	99		78	-	233
Das	18	13	1	-	-		34	9	3
Dubai	132	170	-	332	73		147	255	-
Dammam	-	14	-	-	-		235	6	5
Dargwan	30	1	11	-	-		8	-	50
Dayyer	-	45	-	-	-		91	30	29
Dilwa	30	52	-	-	-		82	3	-
Dayyam	102	-	-	-	-		6	3	1
Dibba	-	-	-	-	-		-	-	5
Fasabandar	-	-	-	-	-		-	-	56
Fao	750	-	-	-	-		-	-	1
Gosbar	2790	-	12	-	-		-	-	3
Garaveh	132	10	2	-	-		20	3	8
Gwadar	-	-	3	-	-		-	-	39
Herjam	-	-	29	-	-		-	-	7
Hormuz	-	-	27	-	-		-	-	20
Hendijan	264	-	-	-	-		-	-	-
'Iran'	-	-	-	350	118		-	-	-
'India'	12	23	1153	24	-		6	-	99
Jask	-	-	91	-	-		-	-	45
Jubail	-	-	-	-	-		13	-	1
Jebel Dhanna	-	-	-	-	-		1	-	-
Khosab	-	-	3	-	-		1	-	50
Khorramshahr	600	27	47	-	-		26	21	14
Konarak	-	-	63	-	-		-	-	8
Kargar	-	-	76	-	-		-	-	70
Kung	-	-	290	-	-		1	12	103
Khamir	-	-	80	-	-		-	-	192
Kamubaran	-	-	13	-	-		-	-	5
Kutch	-	-	10	-	-		-	-	25
Kuhestak	-	-	8	-	-		-	-	2
Kuwait	-	81	151	49	-		130	15	113
Al Khobar	18	1129	124	27	-		1629	27	99
Khor Fakkan	6	11	50	-	-		12	-	84
Karachi	-	1	1	-	-		1	-	95
Rangoon	-	21	-	-	-		44	18	1
Khafgi	6	1	-	-	-		5	-	5
Kharg	12	-	-	-	-		1	-	-
Khor Mashed	-	-	-	-	-		1	-	-
Khosrowabad	1308	4	-	-	-		5	-	-
Lingeh	-	-	60	-	-		-	3	87
Lavan	-	-	-	-	-		1	21	15
Larak	-	-	9	-	-		-	-	4
Laft	-	-	16	-	-		1	-	35
Lowar	-	13	-	-	-		48	3	7
Menab	-	-	72	-	-		-	-	38
Mrah	-	-	17	-	-		8	6	32
Muscat	30	17	267	17	-		37	36	207
Mohailer	-	-	2	-	-		-	-	1
Masira	-	-	4	-	-		1	3	7
[illegible]	-	-	1	-	-		-	-	-
Mogu	-	2	-	-	-		3	3	6
Naband	-	-	-	-	-		-	3	1
'Pakistan'	-	-	9	3	-		-	-	-
Puhul	-	-	354	-	-		-	6	427
Qeshm	-	5	26	-	-		-	-	111
Qais	-	-	10	-	-		-	-	49
Ras Al Khaimah	12	8	307	4	-		3	3	59
Ruwais	-	-	-	-	-		215	-	-

/Cont'd...

TABLE D

: Dhow Flows - 1971 (Cont'd.)

Origin	(1) Incoming Dhows - Destination					Destination	(2) Outgoing Dhows - Origin		
	Kuwait	Bahrain	Dubai	Doha	Abu Dhabi		Bahrain	Doha	Dubai
Rig	30	6	-	-	-		11	-	1
Ras Tanura	-	13	-	-	-		105	-	2
Salakh	-	-	1	-	-		-	-	13
Sauduni	2310	-	2	-	-		1	3	2
Suza	-	-	43	-	-		-	-	50
Sharjah	12	7	40	4	-		4	-	29
Siriq	-	-	26	-	-		-	-	19
Sur	-	-	23	-	-		-	-	102
Sahout	-	5	1	-	-		-	-	4
Salala	-	-	-	-	-		1	-	80
Somalia	-	-	-	-	-		-	-	5
Secrutia	-	-	-	-	-		-	-	3
Seeb	-	-	-	-	-		-	-	12
Sohar	-	10	-	-	-		6	-	3
Taheeri	-	1	-	-	-		4	18	-
Tiban	-	-	-	-	-		-	12	-
Tombok	-	1	-	-	-		2	3	-
Tiab	-	-	-	-	-		-	-	17
Tang	-	-	-	-	-		-	-	6
Tunazeh	-	1	-	-	-		-	-	1
Umm Said	-	-	-	-	-		1	-	-
Qatif	-	46	-	-	-		122	-	-
Kalba	-	-	-	-	-		3	-	-
Sultan	-	-	-	-	-		-	-	25
'Africa'	-	-	-	-	-		-	-	1
Kunji	-	-	-	-	-		-	-	12
Sri Lanka	-	-	124	-	-		-	-	360
	(1)	(2)	(3)	(4)	(5)		(6)	(7)	(8)
	Al Khobar								
'Iraq'	60								
'Oman'	89								
'Iran'	198								
	(9)								

Sources : (1) - Figures obtained from Port and Customs Department, Kuwait

(2) and (6) - " " " " " " " Manama

(3) and (8) - " " " " " " " Dubai

(4) and (7) - Figures supplied by Ministry of Communications and Transport, Ports Department, Doha.

(5) - Foreign Trade Statistical Report, Ministry of Finance, Customs Department, Abu Dhabi, 1971, p43.

(9) - Statistical Yearbook, 1971, Ministry of Finance and National Economy, Central Dept. of Statistics, South Arabia, p260.

TABLE E : Population of Iranian Towns and Villages on Persian Gulf Coast, 1966.

Abadan	272,962	Kargan	447
Asalo	1,091	Kung	4,285
Ayyarnat	-	Khamir	1,768
Bandar Abbas	32,628	Kumubarak	182
Basidu	491	Kuhestak	682
Bustano	1,010	Kangoon	3,370
Bunji	283	Kharg	5,262
B. M'uallm	501	Khosrowabad	353
Bushire	23,527	Lingeh	7,218
B. Shahpour	6,013	Lavan	-
Bulkhair	580	Larak	416
Bahmashir	2,179	Laft	1,335
Chalat	115	Lowor	314
Chahbahar	-	Menab	5,310
Charak	518	Mraw	967
Chivu	502	Mogan	942
Dulab	703	Naband	16
Deyrestan	507	Puhul	1,226
Dargwan	2,024	Qeshm	4,703
Dayyer	444	Qais	573
Dilwa (Delvaz)	892	Rig	2,537
Daylam	5,255	Salakh	616
Fasabandar	-	Sauduni	1,249
Gosbar	1,263	Suza	2,098
Ganaveh	4,094	Siriq	189
Henjam	418	Taheen	199
Hormuz	2,410	Tiban	63
Hendijan	3,757	Tombok	1,242
Jask	1,268	Tiab	857
Khorramshahr	88,536	Tang	124
Konorak	144		

Source : Government of Iran, Second National Census, 1966.

TABLE F

Geographical Distances between the Ports of Kuwait, Bahrain, Doha and Dubai, and Ports on the Southern Iranian Coast.

	Distances (Units)			
	Kuwait	Bahrain	Doha	Dubai
Abadan	93	333	435	594
Bushire	189	202	277	418
Bandar Shahpour	121	337	-	582
Bulkhair	212	176	246	380
Bahmashir	70	-	-	-
Charak	469	248	208	127
Dargwan	597	410	-	-
Dilwa	216	169	239	-
Daylam	150	285	367	507
Gosbar	70	-	-	570
Ganaveh	169	244	323	462
Hendijan	130	-	-	-
Khorramshahr	107	347	449	-
Kharg Island	154	220	-	-
Khosrowabad	80	320	-	-
Rig	170	240	-	460
Saudunı	65	305	407	567
Ayyarnat	-	149	185	-
Bandar Abbas	-	411	366	158
Bostaru	-	273	-	100
Chalat	-	221	190	-
Dayyer	-	146	188	295
Kung	-	297	253	102
Kangan	-	150	189	162
Lavan Island	-	192	170	172
Laft	-	355	-	140
Lowar	-	156	220	-
Mraw	-	263	220	-
Mogan	-	205	178	180
Qeshm	-	393	-	142
Taheeri	-	154	182	-
Tombok	-	150	185	-
Tunazeh	-	243	-	-
Asalu	-	-	177	254
Chivu	-	-	183	149
Dulab	-	-	283	114
Lingeh	-	-	247	101
Naband	-	-	168	240
Puhul	-	-	288	121
Tiban	-	-	167	-
Bandar M'uallm	-	-	-	103
Basidu	-	-	-	100
Khamir	-	-	-	139
Henyam	-	-	-	110
Salakh	-	-	-	110
Deyrestan	-	-	-	115
Susa	-	-	-	126
Hormuz	-	-	-	157
Larak	-	-	-	142
Tiab	-	-	-	173
Menab	-	-	-	185
Kuhestak	-	-	-	161
Siriq	-	-	-	163
Bunji	-	-	-	182
Kumubarak	-	-	-	190
Jask	-	-	-	228
Kuch	-	-	-	351
Tang	-	-	-	372
Konorak	-	-	-	418
Chahbahar	-	-	-	422
Qais	-	-	-	132
Fasabandar	-	-	-	482

TABLE G : Merchant Questionnaire - Firms Interviewed

Kuwait	
Badr Al-Salem	(B)
Khalid Al-Ghanaim	(B)
Abdullah Al-Qatami	(B)
Mustafa Sultan	(B,F)
Al Sagar Company	(B)
Central Market Establishment	(F)
W.J. Towell	(F)
Shuaib Company	(F)
Brazilia Company	(F)
Al-Raad Company	(F)
Sulaiman Abdul Karim	(F)
C. Purchottam Company	(F)
Marafie Company	(F)
Jassim Wassan	(F)
Mustafa and Majid	(F)
International Mills Company	(F)
Al Ghanim Company	(C)
Y.M. Behbani	(C)
Technical Appliances Company	(C)
Electrical Applicances Company	(C)
Contemporary Lights Company	(C)

Dubai	
Royal Traders	(C)
East-West Watch Corporation	(C)
Jashanmal	(C)
Kewalram	(C)
Mohammed Al-Fothaim	(C)
Regal Traders	(C)
United Rice Company	(F)
Youssef Akbar Ali Reza	(F)
Jinda Tea Sales	(F)
Gulaibi Tea Sales	(F)
Purchottam Kanji	(F)
K.N. Kiara	(F)
Ghulam Ansari	(F)
Damodar Das Lukhumal Gajria	(F)
Id Mahmoud Modica	(B)
Zayani Company	(B)
Arab Building Materials Company	(B)
Cicon Company	(B)
Rashid Al-Majid	(B)
Mohammed and Ahmed Haji	(C)
Youssef Rahmani	(B)
Abdullah Kayed Ahli	(B)
C. Purchottam	(B)

Bahrain			
Youssef Akbar Ali Reza	(F)	Akund Awazi	(C)
Shukralla Company	(F)	Al Nafa Company	(C)
Mohammed Ali Zanal	(F)	H.E. Muftah	(C)
C. Purchottam Company	(F)	Mohammed Al-Kazi	(C)
L. Lachmidas	(F)	Kewalram	(C)
W.J. Towell	(F)	Ahmed Kazim	(C)
Ameen Trading	(C)	Al Jamea and Al Qaisa	(C)

Key Major commodity type traded :

(C) = Consumer goods

(F) = Foodstuffs

(B) = Building materials

TABLE H : Merchant Interviews - Questionnaire

Name of Firm: ....

1. What commodities are traded by the firm?

 ....

2. Do you import directly, or indirectly, from the sources of supply?

 ....

3. What is the country of origin of each type of commodity imported?

 ....

4. What is the estimated proportion of your stock that is:

 (a) consumed internally ....

 (b) re-exported ....

 (c) held in stock ....

5. Which are the most important re-export markets for each commodity traded?

 ....

 ....

6. What is the rationale behind the firm's ability to re-export commodities to other States bordering the Persian Gulf, and/or to Syria, Lebanon, Jordan and the Indian subcontinent?

 ....

 ....

7. What mode of transport is used to convey re-exported commodities to external markets?

 ....

 ....

8. To what degree are re-export commodity trades subject to seasonal or other fluctuations in demand?

 ....

 ....

TABLE I

: Comparative Conference 'Base Freight Rates' to Persian Gulf Ports, for Selected Commodities, 1971.

	Conferences					
	Acmel	Meamecor	8900	Constellation	Japan	E
Kuwait						
Rice	32.50	29.00	43.75	37.25	38.24*	176.24
Cement	27.00	24.00	69.30	59.00	38.24*	217.54
Steel Bar	27.00	34.00	63.45	54.00	42.19*	220.64
Timber	37.50	37.00	75.20	118.50	36.19*	304.39
A/C	45.50	55.00	53.45	63.00	42.73*	259.68
Household Goods	56.50	55.00	86.35	75.50	58.39*	331.74
Cars	34.50	34.00	54.30	53.25	44.49*	221.04
Clothing	64.00	63.00	86.95	74.00	58.39*	346.34
						EE 2077.61 Index = 100
Abu Dhabi						
Rice	37.40+	34.00+	51.95+	44.25+	37.85+	205.45
Cement	31.90+	26.50+	77.50+	66.00+	37.85+	240.75
Steel Bar	31.90+	39.00+	71.65+	61.00+	41.80+	245.35
Timber	42.40+	42.00+	83.40+	125.50+	35.80+	329.10
A/C	50.40+	60.00+	61.65+	70.00+	42.35+	284.40
Household Goods	61.40+	60.00+	94.55+	82.50+	58.00+	356.45
Cars	39.40+	39.00+	70.75+	60.25+	44.60+	254.00
Clothing	68.90+	68.00+	95.15+	81.00+	58.00+	371.05
						EE 2286.55 Index = 110
Basrah						
Rice	32.50	29.00	47.75	37.25	38.39*	184.89
Cement	27.00	24.00	69.30	59.00	38.39*	217.69
Steel Bar	27.00	34.00	63.45	54.00	42.34*	220.79
Timber	37.50	37.00	75.20	118.50	36.34*	304.54
A/C	45.50	55.00	74.00	63.00	42.89*	280.39
Household Goods	56.50	55.00	86.35	75.50	58.54*	331.89
Cars	34.50	34.00	62.55	53.25	45.14*	229.44
Clothing	64.00	63.00	86.95	74.00	58.54*	346.49
						EE 2116.12 Index = 102
Bushire						
Rice	32.50	29.00	43.75	37.25	37.84*	180.34
Cement	27.00	24.00	69.30	59.00	37.84*	214.14
Steel Bar	27.00	34.00	63.45	54.00	41.79*	220.24
Timber	37.50	37.00	75.20	118.50	35.79*	303.99
A/C	45.50	55.00	74.00	63.00	42.34*	279.84
Household Goods	56.50	55.00	86.35	75.50	57.99*	331.34
Cars	34.50	34.00	62.55	53.25	44.59*	228.89
Clothing	64.00	63.00	86.95	74.00	57.99*	345.94
						EE 2104.72 Index = 101
Khorramshahr						
Rice	32.50	29.00	48.12*	37.25	38.39*	185.26
Cement	27.00	24.00	76.23*	59.00	38.39*	224.62
Steel Bar	27.00	34.00	69.79*	54.00	42.34*	227.13
Timber	37.50	37.00	82.72*	118.50	36.34*	312.06
A/C	45.50	55.00	81.40*	63.00	42.89*	287.79
Household Goods	56.50	55.00	94.98*	75.50	58.54*	340.52
Cars	34.50	34.00	68.80*	53.25	45.14*	235.69
Clothing	64.00	63.00	95.64*	74.00	58.54*	355.18
						EE 2168.25 Index = 104
Bandar Shahpour						
Rice	32.50	29.00	48.12*	37.25	36.38*	183.25
Cement	27.00	24.00	76.23*	59.00	36.38*	222.61
Steel Bar	27.00	34.00	69.79*	54.00	40.53*	225.32
Timber	37.50	37.00	82.72*	118.50	34.23*	309.95
A/C	45.50	55.00	81.40*	63.00	41.10*	286.00
Household Goods	56.50	55.00	94.98*	75.50	57.54*	339.52
Cars	34.50	34.00	68.80*	53.25	43.47*	234.02
Clothing	64.00	63.00	95.64*	74.00	57.54*	354.18
						EE 2154.85 Index = 104
Bandar Abbas						
Rice	32.50	29.00	43.75	37.25	41.04*+	183.54
Cement	27.00	24.00	69.30	59.00	41.04*+	220.34
Steel Bar	27.00	34.00	63.45	54.00	44.99*+	223.44
Timber	37.50	37.00	[illegible]	118.50	38.99*+	307.19
A/C	45.50	55.00	74.00	[illegible]	[illegible]	283.54
Household Goods	56.50	55.00	[illegible]	75.50	61.19*+	334.54
Cars	34.50	34.00	62.55	53.25	[illegible]	232.09
Clothing	64.00	63.00	[illegible]	74.00	[illegible]	349.14
						EE [illegible] Index = [illegible]

/cont'd ...

TABLE I

: Comparative Conference 'Base Freight Rates' (Cont'd)

	Conferences					
	Acmel	Meas-econ	6900	Constellation	Japan	E
Dammam						
Rice	32.50	29.00	40.53*	37.25	34.65	173.93
Cement	27.00	24.00	79.69*	59.00	34.65	224.34
Steel Bar	27.00	34.00	72.46*	54.00	38.60	226.06
Timber	37.50	37.00	86.48*	118.50	32.60	312.08
A/C	45.50	55.00	61.46*	63.50	39.15	264.61
Household Goods	56.50	55.00	99.30*	75.50	54.80	341.10
Cars	34.50	34.00	61.41*	53.25	41.40	224.56
Clothing	64.00	63.00	99.99*	74.00	54.80	355.79
						EE 2122.47 Index = 102
Bahrain						
Rice	32.50	29.00	43.75	37.25	34.65	177.15
Cement	27.00	24.00	69.30	59.00	34.65	213.95
Steel Bar	27.00	34.00	63.45	54.00	38.60	217.05
Timber	37.50	37.00	75.20	118.50	32.60	300.80
A/C	45.50	55.00	60.50	63.00	39.15	263.15
Household Goods	56.50	55.00	86.35	75.50	54.80	328.15
Cars	34.50	34.00	62.55	53.25	41.40	225.70
Clothing	64.00	63.00	86.95	74.00	54.80	343.75
						EE 2069.70 Index = 100
Doha						
Rice	32.50	29.00	43.75	44.25+	37.85+	187.35
Cement	27.00	24.00	69.30	66.00+	37.85+	224.15
Steel Bar	27.00	34.00	63.45	60.00+	41.80+	226.25
Timber	37.50	37.00	75.20	125.50+	35.80+	311.00
A/C	45.50	55.00	74.00	70.00+	42.35+	286.85
Household Goods	56.50	55.00	86.35	82.50+	58.00+	338.35
Cars	34.50	34.00	54.30	60.25+	44.60+	227.65
Clothing	64.00	63.00	86.95	81.00+	58.00+	352.95
						EE 2154.55 Index = 104
Dubai						
Rice	32.50	29.00	43.75	37.25	34.65	177.15
Cement	27.00	24.00	69.30	59.00	34.65	213.95
Steel Bar	27.00	34.00	63.45	54.00	38.60	217.05
Timber	37.50	37.00	75.20	118.50	32.60	300.80
A/C	45.50	55.00	60.50	63.00	39.15	263.15
Household Goods	56.50	55.00	86.35	75.50	54.80	328.15
Cars	34.50	34.00	62.55	53.25	41.40	225.70
Clothing	64.00	63.00	86.95	74.00	54.80	343.75
						EE 2069.70 Index = 100
Muscat						
Rice	37.40+	34.00+	51.95+	51.75+	37.66*	212.76
Cement	31.90+	26.50+	77.50+	73.50+	37.66*	247.06
Steel Bar	31.90+	39.00+	71.65+	68.50+	41.61*	252.66
Timber	42.40+	42.00+	83.40+	133.00+	35.61*	336.41
A/C	50.40+	60.00+	82.20+	77.50+	42.16*	312.26
Household Goods	61.40+	60.00+	94.55+	90.00+	57.81*	363.76
Cars	39.40+	39.00+	70.75+	67.75+	44.41*	261.31
Clothing	68.90+	68.00+	95.15+	88.50+	57.81*	378.36
						EE 2364.58 Index = 114
Sharjah						
Rice	37.40+	34.00+	51.95+	44.25+	37.85+	205.45
Cement	31.90+	26.50+	77.50+	66.00+	37.85+	239.75
Steel Bar	31.90+	39.00+	71.65+	60.00+	41.80+	244.35
Timber	42.40+	42.00+	83.40+	125.50+	35.80+	329.10
A/C	50.40+	60.00+	82.20+	70.00+	42.35+	304.95
Household Goods	61.40+	60.00+	94.55+	82.50+	58.00+	356.45
Cars	39.40+	39.00+	70.75+	60.25+	44.60+	254.00
Clothing	68.90+	68.00+	95.15+	81.00+	58.00+	371.05
						EE 2305.10 Index = 111
Ras Al-Khaimah						
Rice	37.40+	34.00+	51.95+	44.25+	37.85+	205.45
Cement	31.90+	26.50+	77.50+	66.00+	37.85+	239.75
Steel Bar	31.90+	39.00+	71.65+	60.00+	41.80+	244.35
Timber	42.40+	42.00+	83.40+	125.50+	35.80+	329.10
A/C	50.40+	60.00+	82.20+	70.00+	42.35+	304.95
Household Goods	61.40+	60.00+	94.55+	82.50+	58.00+	356.45
Cars	39.40+	39.00+	70.75+	60.25+	44.60+	254.00
Clothing	68.90+	68.00+	95.15+	81.00+	58.00+	371.05
						EE 2305.10 Index = 111

/Cont'd ..

TABLE I : Comparative Conference 'Base Freight Rates' (Cont'd.)

KEY

* Including surcharge

\+ Including outport additional

Rice	=	1 Ton of Rice
Cement	=	1 Ton of Cement
Steel Bar	=	1 Ton of Steel Bars
Timber	=	1 Ton of Timber
A/C	=	40 cu.ft. of air conditioners
Household Goods	=	40 cu.ft. of household machinery
Cars	=	40 cu.ft. of unboxed vehicles
Clothing	=	40 cu.ft. of leather shoes.

$$\text{Index} = \frac{\text{Total aggregate freight rates per port}}{\text{Lowest total aggregate freight rate within the group of Persian Gulf ports}} \times 100$$

Source : Published Conference Freight Rates for 'Acmel', 'Medmecon', '8900', 'Constellation' and Japan-Persian Gulf Conferences, 1971.

TABLE 6 : Kuwait - Shipping Lines (1959-1971) - Tonnage Discharged

Route	•	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
Charter		652126	454128	362158	1180501	475299	414435	517558	628931	817066	952315	665075	386902	622493
Hansa	E	84271	66788	44300	66920	70348	38325	45175	36841	36804	27044	30277	15052	22297
Strick	E	66218	70975	45720	44715	70140	56794	62912	47142	50259	45787	43647	35192	25120
Lauro	E(M)	61194	70080	22358	46180	50626	26675	40549	28433	38054	28018	25879	21380	33805
Holland P.G.	E	39979	40512	19912	35097	50342	27064	32473	17109	11914	12591	9514	9109	6613
S.E.A./WII	E	13677	19369	15589	22375	27685	24340	14557	17674	19372	33713	18138	17829	17725
NCHP	E(M)	8500	20342	9383	8559	17525	7698	8277	8811	12336	6348	6742	6482	4632
Saudi	E	5913	-	-	-	508	-	-	-	-	-	-	-	-
Hansa	E(M)	5271	-	5217	-	-	-	-	-	-	-	-	-	-
CNR	E	5037	9193	7203	11782	10686	12865	10970	10717	11859	8980	7250	7257	7993
Yugo	E(M)	2604	4097	12147	13296	21165	20479	35570	19425	19379	16335	14857	9426	10579
Lombarda L.	E(M)	2424	2516	2099	677	1697	1374	4164	4362	2383	2121	1690	1989	697
Trieste	E(M)	2009	-	-	-	-	-	-	-	-	-	-	-	-
Concordia	US	14835	15708	17840	20364	19073	12678	16478	14180	10038	14326	11749	8408	8504
Nedlloyd	US(W)	11949	22411	14068	20600	23159	11121	12840	12193	11035	8258	8514	4733	4815
Hellenic	US	9114	7231	10767	17265	6524	8638	4681	8479	6964	6604	6508	4617	3639
Crescent	US	8785	8126	-	-	-	4311	-	-	-	-	-	-	-
Hansa	US	5305	8433	12292	20014	20797	28158	24779	23738	19921	16590	11203	11361	9764
Cent. Gulf	US	4072	850	9451	14517	-	-	-	1023	2054	169	1097	527	-
Java and Hoegh	US(W)	2837	3231	6256	831	4011	3737	-	-	-	-	-	-	-
Oriental NE	US(W)	2495	-	-	-	3096	623	-	-	-	-	-	-	-
Isthmian SS	US	1327	1692	-	-	-	-	-	1802	5773	1670	2189	2421	2673
Maersk	FE	11785	18740	13655	12466	18331	3063	13443	12291	24827	30318	22402	22856	23705
Everett Star	FE	10708	-	-	-	-	-	-	-	-	-	-	-	-
Nyk	FE	4289	7961	6884	4892	30479	16249	10863	12910	20330	15961	17854	9773	10757
K	FE	4153	3262	2636	4698	3708	1693	4253	7516	10824	28822	3706	3352	3463
Osaka Y.K.	FE	3378	-	3378	6333	6029	-	-	-	-	-	-	-	-
Showa	FE	870	3807	2831	4750	-	-	-	1602	2012	-	6050	1388	6920
Mitsui	FE	151	386	780	2453	2281	6896	13823	14827	9765	21308	20041	38366	55568
British India	I	12421	7818	8373	9199	10445	17755	12830	14233	11458	15674	7883	6190	7530
Karachi Steam	I	6927	593	628	-	-	-	-	-	-	-	-	-	-
Calbus/Colbus	I	1979	1911	2535	1608	2798	1803	4887	2958	4320	-	-	-	-
Musa	I	1777	1272	1764	2169	1356	4798	4486	3975	7064	389	-	220	-
Royal Dutch	I	315	-	-	-	-	-	-	-	-	-	-	-	-
British India	AZ	28707	31090	11236	13621	-	-	-	8568	-	6531	10436	10657	14050
Royal Dutch	A	2409	3999	2522	-	760	-	3844	-	-	-	-	-	-
British India	A	2050	2897	78	-	-	-	-	586	-	-	-	-	-
Chart. and Irreg.	A	32040	-	-	-	-	-	-	-	-	-	-	-	-
Marchessini	E	-	13052	-	-	-	-	-	-	-	-	-	-	-
Polish	E	-	7556	16319	10661	13838	14601	12625	18860	19345	12663	15699	10970	22236
Marchessini	US	-	2472	-	-	-	-	12977	-	-	-	-	-	-
Johnson	FE	-	9027	7184	6865	12646	5054	12977	13833	15178	15892	10757	9952	10585
Gill and Amin	I	-	2318	828	-	-	-	-	-	-	-	-	-	-
Bharat	I	-	1019	-	189	-	-	-	-	-	-	-	-	-
Western S. Corp.	I	-	635	-	-	-	-	-	-	-	-	-	-	-
India S.S.	I	-	513	-	-	-	-	-	-	-	-	-	-	-
Iranian Marit.	E	-	-	13104	-	-	-	-	-	-	-	-	-	-
Marshinisiani L.	E(M)	-	-	11666	-	-	-	-	-	-	-	-	-	-
British India	FE	-	-	6957	12102	35918+	33842+	38275+	15572	9120	8055	6840	10737	8305
Eastern Navig. Co.	I	-	-	2755	-	-	-	-	-	-	-	-	-	-
Spices Maritime	I	-	-	601	-	-	-	-	-	-	-	-	-	-
Persian Ship.Service	E	-	-	-	17411	16950	17605	11741	12297	7311	3378	-	-	-
Atlantide	E	-	-	-	4639	-	-	-	-	-	-	-	-	-
Ship. Corp. of India	I	-	-	-	2954	4902	4844	4714	4299	3183	12837	32155	21652	12393
Halal Shipping	I	-	-	-	1237	154	-	-	-	-	-	-	-	-

TABLE J (Cont'd.) Sheet 2

Route		1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
Clausen	AZ	-	-	-	3940	5876	6234	6106	6880	11006	6420	8884	9894	14859
Royal Interocean	A	-	-	-	7035	-	-	-	4699	4154	4692	5496	5282	5609
Iraqi Marit.	E	-	-	-	-	4227	8124	8328	6341	10544	7699	4912	3769	3302
Navimaritime	E(M)	-	-	-	-	914	-	-	-	-	-	-	-	-
Concordia	E	-	-	-	-	-	2107	-	2984	2298	851	197	-	-
Constellation	US(W)	-	-	-	-	8444	5259	3859	5946	10173	5505	4256	-	-
American Clippers	US	-	-	-	-	2644	3107	-	-	-	-	-	-	-
Holcousis L.	OS	-	-	-	-	2163	-	-	-	-	-	-	-	-
Per. Gulf	FE	-	-	-	-	1956	-	-	-	-	-	-	-	-
Z-[illegible]	FE	-	-	-	-	276	947	3919	2606	1098	4864	5583	4209	7969
Sagar	FE	-	-	-	-	1402	-	-	-	-	-	-	-	-
Hirode	FE	-	-	-	-	-	9258	-	3510	8098	5603	7794	-	-
Hie Hock	FE	-	-	-	-	-	4710	15637	12235	14571	-	-	-	-
Hie Hock	I	-	-	-	-	-	1492	-	2552	-	-	-	-	-
[illegible]-S	I	-	-	-	-	-	183	-	3171	-	-	1510	336	63
K	I	-	-	-	-	-	2463	-	2101	-	-	816	-	-
Java and Hoegh	I	-	-	-	-	-	690	-	-	-	-	-	-	-
Jap. Ind., Pak. (Showa)	I	-	-	-	-	-	957	2673+	1115+	-	-	-	-	-
Mitsui Sok.	I	-	-	-	-	-	4868	-	129	-	-	390	186	65
IYK	I	-	-	-	-	-	4676	-	1224	-	-	119	637	266
Maersk	I	-	-	-	-	-	11772	1698	6415	-	-	574	868	561
Johnson	I	-	-	-	-	-	4753	-	3460	-	-	76	108	43
Lauro	I	-	-	-	-	-	172	-	1539	-	-	1689	500	1962
Nedlloyd	I	-	-	-	-	-	556	-	-	-	-	3382	-	-
Burma Five Star	FE	-	-	-	-	-	-	1134	4118	5590	-	-	-	-
Forstrans	E	-	-	-	-	-	-	-	3451	36775	13955	-	-	-
Isthmian	E	-	-	-	-	-	-	-	1443	-	-	-	-	-
Mid Gulf	F	-	-	-	-	-	-	-	3211	7792	9453	-	-	-
Iranian Shipping	US	-	-	-	-	-	-	3342	2915	-	-	-	-	-
Pan Islamic	I	-	-	-	-	-	-	-	2652	-	-	-	-	-
Sa[illegible]r	AZ	-	-	-	-	-	-	1618	1240	1174	1722	1115	1465	1198
[illegible]r	A	-	-	-	-	-	-	-	603	302	1212	955	990	-
Ambassador	I	-	-	-	-	-	-	-	1339	474	3622	6429	-	-
Ri[illegible]	I	-	-	-	-	-	-	846	1319	829	-	-	327	-
Singapore Shipping	FE	-	-	-	-	-	-	-	1317	-	-	-	-	-
Sri Lanka	I	-	-	-	-	-	-	60	52	1193	1707	1494	2353	455
Clausen	A	-	-	-	-	-	-	-	885	-	511	-	-	-
Kuwait	E	-	-	-	-	-	-	-	9778	25814	20640	32694	31673	33377
Black Sea	UR	-	-	-	-	-	-	35926	33448	82737	57156	46863	54198	43473
Black Sea	E	-	-	-	-	-	-	-	3636					
Sinofracht	FE	-	-	-	-	-	-	11786	32829	51247	69064	-	-	-
Kar. Reg	E	-	-	-	-	-	-	8318	21352	5244	7201	-	-	-
Porter	US	-	-	-	-	-	-	12539	15412	13[illegible]63	10296	5350	7169	8313
Fu[illegible]	FE	-	-	-	-	-	-	-	1505	-	-	-	-	-
Black Sea	I	-	-	-	-	-	-	-	-	14010	1632	-	-	-
Lamodar	I	-	-	-	-	-	-	-	-	12948	19745	25068	16550	8016
Clausen	US	-	-	-	-	-	-	-	-	457	862	-	1166	-
Sok[illegible]gar	I	-	-	-	-	-	-	-	-	6433	1454	-	-	-
Hindustan SC	I	-	-	-	-	-	-	-	-	5024	-	-	-	-
Eastern Dev.	FE	-	-	-	-	-	-	-	-	4052	-	-	-	-
Waterman	US	-	-	-	-	-	-	-	-	1230	-	-	-	-
W.H. Newman	E/F	-	-	-	-	-	-	-	-	926	4043	-	-	-
New India L.	I	-	-	-	-	-	-	-	-	596	16716	-	-	-

/Cont'd...

TABLE J (Cont'd.) Sheet 3

Route		1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
Shipping Corp. L.	A	-	-	-	-	-	-	-	-	587	-	-	-	-
Ocean Trans. L.	A	-	-	-	-	-	-	-	-	562	-	-	-	-
Seiva	FE	-	-	-	-	-	-	-	-	-	3957	10514	8378	9742
National S.L.	I	-	-	-	-	-	-	-	-	-	4357	1904	3290	2542
National	US	-	-	-	-	-	-	-	-	-	650	309	-	-
Maldive	FE	-	-	-	-	-	-	-	-	-	877	955	6012	6442
Transunion	E	-	-	-	-	-	-	-	-	-	6784	3410	-	-
Hazul	E	-	-	-	-	-	-	-	-	-	3203	-	-	-
New India	E	-	-	-	-	-	-	-	-	-	1183	-	-	-
Aria	E	-	-	-	-	-	-	-	-	-	1760	26031	17292	18913
India Steam S'G.	E	-	-	-	-	-	-	-	-	-	571	3361	-	-
Areejay	I	-	-	-	-	-	-	-	-	-	16395	-	-	-
Scindia	I	-	-	-	-	-	-	-	-	-	4891	5806	2099	-
Hamburg ME	E	-	-	-	-	-	-	-	-	-	923	7301	4215	14818
China Nat. Ch. Corp.	FE	-	-	-	-	-	-	-	-	-	-	45157	28604	44741
H.K.I.	FE	-	-	-	-	-	-	-	-	-	-	7448	10495	7808
H.K.I.	I	-	-	-	-	-	-	-	-	-	-	2312	1851	1030
India Steam Shipping	I	-	-	-	-	-	-	-	-	-	-	5113	-	-
Golden	FE	-	-	-	-	-	-	-	-	-	-	6421	2670	5194
Golden	I	-	-	-	-	-	-	-	-	-	-	373	8246	1149
Medit. Marit. Co.	FE	-	-	-	-	-	-	-	-	-	-	1935	2572	-
Medit. Marit. Co.	I	-	-	-	-	-	-	-	-	-	-	1389	5245	-
Transunion	I	-	-	-	-	-	-	-	-	-	-	64	-	-
South East Asia	I	-	-	-	-	-	-	-	-	-	-	3132	8128	2423
DSR	E(M)	-	-	-	-	-	-	-	-	-	-	2772	9643	10458
Int. Shipping Corp.	I	-	-	-	-	-	-	-	-	-	-	7308	-	-
Pelni (Indon)	FE	-	-	-	-	-	-	-	-	-	-	1481	895	-
Pelni	I	-	-	-	-	-	-	-	-	-	-	329	503	-
Evergreen	PE	-	-	-	-	-	-	-	-	-	-	1148	34645	68912
Green Star	E	-	-	-	-	-	-	-	-	-	-	1048	-	-
Admiralty L.	US	-	-	-	-	-	-	12632	-	-	-	-	-	-
Crescent S.L.	I	-	-	-	-	-	-	1681	-	-	-	-	-	-
Finlay S. Co.	I	-	-	-	-	-	-	488	-	-	-	-	-	-
Maldive	I	-	-	-	-	-	-	-	-	-	-	620	1719	2324
Evergreen	I	-	-	-	-	-	-	-	-	-	-	149	-	-
China Ocean	FE	-	-	-	-	-	-	-	-	-	-	964	1252	-
Ethiopian S.L.	A	-	-	-	-	-	-	-	-	-	-	408	-	-
Kuwait	FE	-	-	-	-	-	-	-	-	-	-	-	43578	57883
Mitsui	A	-	-	-	-	-	-	-	-	-	-	-	329	-
Ship. Corp. of I.	AZ	-	-	-	-	-	-	-	-	-	-	-	767	1851
Ceylomar	E(M)	-	-	-	-	-	-	-	-	-	-	-	21226	34939
Arya	FE	-	-	-	-	-	-	-	-	-	-	-	197	-
Arya	I	-	-	-	-	-	-	-	-	-	-	-	449	539
Arya	A	-	-	-	-	-	-	-	-	-	-	-	841	647
DSR	I	-	-	-	-	-	-	-	-	-	-	-	2407	505
Barber	FE	-	-	-	-	-	-	-	-	-	-	-	655	-
Malabar	I	-	-	-	-	-	-	-	-	-	-	-	7336	3626
Pacific Int.	FE	-	-	-	-	-	-	-	-	-	-	-	2568	9154
Pacific Int.	I	-	-	-	-	-	-	-	-	-	-	-	1138	2843
Sagar	I	-	-	-	-	-	-	-	-	-	-	-	276	220
Collis	I	-	-	-	-	-	-	-	-	-	-	-	2709	958
Raj	FE	-	-	-	-	-	-	-	-	-	-	-	485	-

TABLE J (Cont'd.) Sheet 4.

Route		1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
Hope Sea	FE	-	-	-	-	-	-	-	-	-	-	-	280	-
Hope Sea	I	-	-	-	-	-	-	-	-	-	-	-	498	-
Dubai Nat.	AZ	-	-	-	-	-	-	-	-	-	-	-	283	-
Dubai Nat.	I	-	-	-	-	-	-	-	-	-	-	-	194	-
Jarel	A	-	-	-	-	-	-	-	-	-	-	-	200	-
[illegible]	US	-	-	-	-	-	-	-	-	-	-	-	-	1193
Kuwait	I	-	-	-	-	-	-	-	-	-	-	-	-	92
Evergreen	I	-	-	-	-	-	-	-	-	-	-	-	-	2349
M.K.I.	A	-	-	-	-	-	-	-	-	-	-	-	-	253
Malabar	FE	-	-	-	-	-	-	-	-	-	-	-	-	71
Rosewell	FE	-	-	-	-	-	-	-	-	-	-	-	-	1588
Iran L.	US	-	-	-	-	-	-	-	-	-	-	-	-	1097
Dubai Nat.	UAR	-	-	-	-	-	-	-	-	-	-	-	-	300

Source : Government of Kuwait, 'Customs and Ports'.
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KEY

E - N.W. Europe
E(M) - Mediterranean Europe
US - East/South Coast USA
US(W) - West Coast USA
FE - Far East
I - Indian Subcontinent
AZ - Australia/New Zealand
UR - U.S.S.R.
UAR - Egypt
A - Australia

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