

SENATE SECRETARIAT

**REPORT OF THE STANDING COMMITTEE ON
DEFENCE AND DEFENCE PRODUCTION**

ON

**POLLUTION IN KARACHI HARBOUR AND AREAS
AROUND PAKISTAN AIR FORCE BASES
IN KARACHI**

PRESENTED BY

**SENATOR NISAR AHMED MEMON
CHAIRMAN COMMITTEE
JUNE 2007**

CONTENTS

I.	Executive Summary	03
II.	Introduction	07
III.	Stakeholders Point of View	11
	i. Navy	11
	ii. Air Force	14
	iii. Karachi Port Trust	15
	iv. Maritime Security Agency	16
	v. Karachi City District Government	18
	vi. Federation of Pakistan Chamber of Commerce & Industry	19
	vii. Karachi Cantonment Board	19
	viii. Sindh Environmental Protection Agency	19
	ix. Karachi Fish Harbour Authority	20
	x. Pakistan Environmental Protection Agency	21
	xi. SHEHRI – NGO	21
IV.	Existing Laws (Summary)	23
	i. Pakistan Environmental Protection Act. 1997	23
	ii. National Environmental Quality Standards 2001	24
	iii. Karachi Port Trust Act. 1886	25
	iv. Maritime Security Agency Act.	25
	v. Pakistan Merchant Shipping Ordinance 2001	26
	vi. Marpol 73/78	26
	vii. UNCLOS 1982	27
	viii. Fisheries Act 1897.	28
	ix. Ports Act. 1908	28
	x. Pakistan Penal Code Sec. 20, 285 & 431	29
	xi. Pakistan Territorial Water and Maritime Zone Act 1976.	29
	xii. Civil Liability Compensation Convention (CLC)	29
	xiii. OPRC, 1990	30
V.	Actions, Plans and Organizational Structure	31
VI.	Recommendations of Stakeholders	35
VII.	Major Issues	40
VIII.	Recommendations of the Committee	43
IX.	Annexure (All presentations)	45

**REPORT OF THE SUB COMMITTEE OF THE STANDING COMMITTEE ON
DEFENCE AND DEFENCE PRODUCTION ON POLLUTION IN KARACHI
HARBOUR AND AREAS AROUND PAKISTAN AIR FORCE BASES IN KARACHI**

I. EXECUTIVE SUMMARY

Pakistan Navy and Pakistan Air Force had raised the issue of environmental degradation with Senator Nisar A. Memon, Chairman Standing Committee on Defence and Defence Production during the said Committee's visit to Karachi in December 2006 and apprised him about the deteriorating environment at Karachi Harbour and the Naval Dockyard, which was causing damage to Pakistan Navy equipment including ships and submarines to the tune of about US\$ 1 billion over their life span. It was argued that of a total life of 25 to 30 years of a large platform 30 percent is curtailed due to pollution.

Pakistan Air Force submitted that huge dumps of garbage deposited near PAF Bases in Karachi were attracting large birds, which fly across landing and take off path thus posing serious threat to aircraft and their pilots. Due to this hostile environment some serious accidents had occurred in the past, resulting in loss of precious lives of pilots and total damage to high cost aircrafts.

Chairman Standing Committee on Defence and Defence Production included this subject in the agenda of the Committee meeting to understand and discuss the issue at length. Sensing the gravity of the problem, the Committee, on recommendation of Senator Mushahid Hussain Sayed supported by all Committee Members and Ministers of State for Defence and Environment, constituted a two member Sub Committee headed by Senator Nisar Memon with the mandate to study the issue intensively, given the problem at hand and make recommendations for improving environmental conditions at the Harbour and around PAF Bases in Karachi. The Sub-Committee, which included Senator Engr. Rukhsana Zuberi held 6 meetings at Karachi and Islamabad and interacted with about 60 individuals belonging to civil society and various government departments to find an amicable solution of the problem. The Sub-Committee also went around in Pakistan Navy boat to see the situation at the Dockyard and Fishing Harbour and also had an aerial view by a PAF helicopter, of the environmental situation around PAF Bases: Masroor and Faisal and Pakistan Navy Airbase Mehran.

All the stakeholders were unanimous in pointing to Lyari River, Malir River, Hub River, Hingol River and 4 Nullahs namely Habib Public School Drain (HPS), Wallace Drain, Nehr-e-Khayam and Jungle Shah Drain as the main culprits, which transported pollutants to Karachi Harbour. The Industrial Areas of Karachi has approximately over 6000 small and large industrial units, which are grouped into different industrial zones like Sindh Industrial Trading Estate (SITE), Landhi Industrial and Trading Estate (LITE), Korangi Industrial and Trading Estate (KITE), Federal B Industrial Area Industrial Estate, North Karachi Industrial Area and industries at KPT and Port Qasim Industrial Area, which discharge large quantities of industrial waste and toxic effluents into These Rivers and Nullahs opening in the Harbour. Moreover, oil pollution, including effluent discharges from mechanized fishing boats and the cleaning of bilges and tank washing by a large number of merchant vessels as well as oil tankers that pass through Pakistan compound the problem The un-treated municipal and industrial wastewater enriched with a variety of marine pollutants affects the vessels berthed in the Harbour and Harbour infrastructures are seriously affected. The indiscriminate disposal of un-treated liquid and solid waste generated from domestic sources into these Rivers and Nullahs create havoc in the costal environment. Presently there are 3 sewage treatment plants

in Karachi with total capacity of 151 MGD and about 300 MGD untreated wastewater escapes into Malir and Lyari Rivers before falling into the Sea.

Moreover, Chakora Nullah running through Shah Faisal Colony and coming towards the runway is a major source of pollution near Masroor Base. Residents of these localities dump garbage and their wastes in this Nullah and along the boundary wall of the Base. In addition to this a lot of marriage halls and weekly Bachat Bazaars are present in the under shoot of the runway. This left over garbage and waste food by marriage halls attract birds, which are a big hazard for all aircrafts coming on final approach for landing. Any major disaster can pose an imminent threat to the population of this area. Chakora Nullah, which meets Malir River near Korangi Industrial Area, is a major source of bird breeding as lot of garbage and industrial waste is dumped at this site. The place provides good combination of food and water and is an ideal breeding ground for all birds operating in the localities around Faisal Air Base. Similar problem is present in localities around Baloch Colony where a lot of un-attended garbage dumps attract birds. With the passage of time few un-authorized buildings have come up on approach funnel which is required to be addressed to avoid any unforeseen incidents.

Many buildings in Saddar and P.E.C.H.S. have been converted into jewelry and gold workshops. They pump toxic chemicals and fumes into the air and into sewers, and pose a fire/explosion hazard. They also are used for warehousing and re-packing of chemicals, food, and clothing. Textile and stitching factories are housed all over P.E.C.H.S., Nazimabad, Saddar North Karachi, Landhi, and Malir, to name a few areas. Golimar and Pak Colony in SITE Town are home to the largest marble and stone processing factories. They pollute the air, the water, and the nullahs and also dump waste into Gutter Bagicha. Meat, poultry and fish stalls open on every corner, in blatant violation of municipal regulations, polluting the area with offal and waste, attracting carrion birds.

The Sub-Committee studied all the existing laws to ascertain if any new legislation was required to control environmental pollution on land and in Karachi Harbour. It was found that there were at least 13 laws and Conventions, which govern the issue of environment of which Pakistan Environmental Protection Act 1997 was the most comprehensive on the subject. Other laws like National Environmental Quality Standards 2001, Karachi Port Trust Act 1886, Maritime Security Agency Act, Pakistan Merchant Shipping Ordinance 2001, Ports Act 1908, Fisheries Act 1897 and a number of Conventions were in place to check degradation of the environment. It was therefore considered unnecessary to propose enactment of more laws on the subject. Separate laws exist for environment protection on land and for the Harbour and the fishing harbour and there was no dearth of laws on the subject.

The Committee was of the view that non-implementation of the laws had led to the present situation. A close scrutiny of these laws suggests that there was no loop hole in any of these laws and if implemented in letter and spirit, there would be no cause for concern about pollution. For instance Section V of the Environmental Protection Act of 1997 established the Federal Environmental Protection Agency, which is responsible for the administration and implementation of the Act and the enforcement of the National Environmental Quality Standards. Section 10 of the Maritime Security Agency Act 1994 stipulates that MSA is responsible to assist other departments and agencies of the Government to maintain and preserve the quality of marine life and to prevent and control marine disasters including maritime pollution in an around the ports, harbors, coastal areas, estuaries and other areas of maritime zones. Moreover, powers under Pakistan

Environmental Protection Act 1997 have been delegated to Maritime Security Agency to check the environment at the harbour.

Section 554 of Pakistan Merchant Shipping Ordinance 2001 stipulates that the discharge of sewage and disposal of garbage into the sea is prohibited. Similarly, Section 54 of the Ports Act 1908 clearly states that if any person disobeys any rule or order he shall be punishable for every such offence with fine which may extend to Rs. 50000/- The Ministry of Ports and Shipping, which is the implementing agency of these Acts needs to rise to the occasion and implement the same. In addition to the above, Part XII of the United Nations Convention of Law of the Sea (UNCLOS) deals with protection and preservation of the Marine Environment. Article 194 of the said Convention enumerates measures to prevent, control and reduce pollution in a Maritime Environment. Last but not the least the Fisheries Act of 1997 also deals with environment degradation of the fishing areas.

Besides non implementation of existing laws the present undesirable situation regarding environment degradation on land is the result of lack of coordination between EPA, Karachi City District Government, FPCCI, KCCI, DHA and Cantonment Boards. Similarly, lack of coordination between Pakistan Navy, Karachi Port Trust, Karachi Fishing Harbour and Maritime Security Agency has resulted in the degradation of the environment of the Harbour and dockyard area. A Marine Pollution Control Board established in June 1994 and functioning under the Chairmanship of Chief of Naval Staff was transferred to the Ministry of Communications in 1999 and remained functional under the chairmanship of Minister for Communications till September 2001. Thereafter that Board was disbanded and its functions were assigned to National Environmental Coordination Committee (NECC), which is headed by DG Pakistan EPA. Not a single meeting of this Committee has been held so far because of bureaucratic wrangling among the members of the Committee. Presently DG MSA and DG Ports and Shipping, who are members of this Committee and are two star officers of Pakistan Navy, may not like to sit in a Committee headed by a BS-20 officer. Therefore whatever minimum coordination was available due to the NECC is presently non existent resulting in the present malaise. In addition Pakistan Environmental Protection Council, which is headed by the Prime Minister, has not met frequently to address environment as a national issue.

It is quite apparent from the above that the Pakistan Environmental Protection Council, which is the only forum competent to resolve conflicts between numerous agencies responsible for controlling environmental degradation, has not performed that function leading to the disbandment of the Marine Pollution Control Board and the non-operation of the National Environmental Coordination Committee. In order to establish a proper conflict resolution mechanism some agencies at the federal, provincial and the local level need to be entrusted this role so that any conflict of interest or conflict of duty is resolved amicably. It is also quite evident that too many agencies are mandated to improve the environment and many a times their duties and responsibilities overlap whereby responsibility is shifted between agencies and the polluters in such cases are at an advantage. Proper delineation of responsibilities and duties has to be done so that accountability of the agency and punishment of the polluter is made transparent. Multiple agency approach would not be in the interest of the problem at hand. Pakistan EPA, MSA and Port Authorities should ensure policing duty in their respective jurisdictions.

The question of resources available to the agencies responsible for improving the environment was never raised in the meetings by any stakeholder except for FPCCI, which complained that funds promised by the Ministry of Industries for setting up five industrial

effluent treatment plants were not provided. However, the Ministry of Finance informed the Committee that funds allocated in PSDP during the last four years are as follows:-

2003-04	445.386 million
2004-05	355.254 million
2005-06	2930.648 million
2006-07	5804.175 million

After intense discussions with the stakeholders, the Committee made 19 recommendations which are given at pages 43-44 of this report. However, some of the key recommendations are listed below:

- i) The Prime Minister of Pakistan should at his earliest convenience call a meeting of Pakistan Environmental Protection Council to consider this report and direct all concerns to implement the acceptable recommendations of the report.
- ii) Marine Pollution Control Board (MPCB) should be revived with Minister for Environment as the Chairman in place of Minister for Communication as was previously the case. The composition of the proposed Board is given at page 7 of this report.
- iii) National Environmental Coordination Committee (NECC), which has been given the mandate to control marine pollution, is presently headed by Director General Pakistan Environmental Protection Agency (BS-20). The level of the Chairman of this Committee should be elevated preferably to that of Secretary Environment and Pakistan Navy and Pakistan Air Force (PAF) should be included as Members in the Committee.
- iv) Ministry of Environment should invoke the Clauses of Pakistan Environmental Protection Act 1997 in letter and spirit and on war footing. This includes enforcement of National Environmental Quality Standards for the wastewater at Karachi by relevant agencies. The Ministry should hold quarterly meetings with Provincial Environmental Protection Agencies to monitor the situation of environmental conditions of the country. National Environmental Coordination Committee should submit quarterly progress report regarding Harbour pollution to the Senate Standing Committee on Environment.
- v) Pakistan Navy should improve its environment protection organization by creating an additional post of a Commodore to be known as Assistant Chief of Naval Staff, Maritime Affairs and Environmental Control at Naval Headquarters, Islamabad. Moreover one post of Captain and two posts of Commander may also be created to strengthen the existing set up both at Islamabad and Karachi.
- vi) Ministry of Defence should declare Masroor Air Base and its surroundings as Cantonment area.

IFTIKHARULLAH BABAR
Secretary Committee/Addl. Secy.

SENATOR NISAR A. MEMON
Chairman Committee

II. INTRODUCTION

i) During a visit of the Standing Committee on Defence and Defence Production to Naval establishments in Karachi, Gwadar and Ormara in December 2006, the Chairman of the Committee Senator Nisar Ahmed Memon observed pollution in the Karachi Harbour and at the Naval Dockyard. On enquiry, the Committee was informed that the Harbour was highly polluted and causing damage to Navy's equipment including Ships and Submarines. Moreover, marine life was also being affected. Later, on enquiry, PAF also informed the Committee Chairman that huge dumps of garbage deposited near PAF Bases in Karachi were attracting large birds, which fly across landing and take off path thus posing serious threat to aircraft and their pilots. On quite a few occasions both men and aircraft have been lost. The same was confirmed by Navy regarding its PNS Mehran Base at Drigh Road, Karachi.

ii) The Committee Chairman, therefore decided to take up the issue formally in the Standing Committee on Defence to understand the problem in the context of environment problem of Navy and PAF in Karachi and recommend remedial action. In this regard the first meeting of the committee was held on 15th March, 2007 in Islamabad. The following attended the meeting:-

1.	Senator Mushahid Hussain Sayed	Member
2.	Senator Jan Muhammad Khan Jamali	Member
3.	Senator Syed Dilawar Abbas	Member
4.	Senator Naeem Hussain Chattha	Member
5.	Senator Prof. Khurshid Ahmed	Member
6.	Senator Engr. Rukhsana Zuberi	Member
7.	Senator Kamran Murtaza	Member
8.	Mr. Ali Asjad Malhi, Minister of State for Defence	Ex-Officio Member
9.	Malik Amin Aslam Minister of State for Environment	on special invitation
10.	Lt. Gen (R) Tariq Waseem Ghazi	Secretary Defence
11.	Rear Admiral M. A. Khan, SI(M),	COM LOG
12.	Air Vice Marshal, Rao Qamar Suleman	KOC SAC PAF
13.	Mr. Muhammad Ali Afridi	Joint Secretary, MOD
14.	Air Commodore Muhammad Hanif Khan	Base Commander, PAF Base Faisal
15.	Capt. Zafar Iqbal	Commander Dockyard, Karachi
16.	Capt. M. Azhar PN,	DCP, NHQ, Islamabad
17.	Cdr. Tariq Muneeb, EPO	HQ COM LOG (Harbour)
18.	Cdr. Said Rahim	DMA & EC, NHQ
19.	WG Cdr. Shakil Ghazanfar	PAF Base Masroor
20.	Ft. Lt. Shahzad Ali	
21.	Mr. Irfan Tariq,	Architect, MOE
22.	Mr. Muhammad Aqiq,	Staff Officer to MOS, Environment

iii) The meeting showed serious concern on the issue and decided unanimously, on the recommendation of Senator Mushahid Hussain Sayed, supported by Minister of State for Defence and Minister of State for Environment that matter be pursued by Chairman Committee personally. Senator Nisar A. Memon accepted Committee recommendation and constituted a Sub Committee comprising of Senator Nisar A. Memon and Senator Rukhsana Zuberi with a view to study the problem and discuss the issue with all the stakeholders before making recommendations for improving the environment of the Harbour and areas around PAF Bases to protect men and material of Pakistan Navy & Pakistan Air Force in Karachi.

iv) The first meeting of the Sub-Committee was held on 24th March, 2007 at Islamabad wherein views of the Karachi Port Trust and the Environment Protection Agency (EPA) were heard. It was decided that a two day meeting of the Sub-Committee would be held in Karachi on 17th to 18th April to further study the problem and visit the affected areas for first hand information. Subsequently the committee visited Karachi and held meetings to discuss the issue at length. The view point of Air Force, Karachi City Government, Defence Housing Authority, Military Lands and Cantonments and SHEHRI an NGO were heard. The point of view of stakeholders is detailed in pages 7 through 18.

v) On 17th April, 2007 the meeting of the Sub-Committee was held at the Headquarters of Commander Logistics, Pakistan Navy, which was attended by officers of the Pakistan Navy, PAF, DHA, Cantonment Board, FPCCI, KCCI, Karachi District City Government, MSA, Institute of Marine Biology and Representatives of NGO, SHEHRI. The participants reiterated that the main culprits of creating pollution in the Harbour and other areas were the Lyari and Malir River and the few Nullahs flowing through the city into the sea. The detailed views of each stakeholder are given in detail in section II of this report. The same day the participants of the meeting were taken around the Dockyard and the Fish Harbour in a Naval Boat so as to assess the grave situation in both the places. It was observed that the Fishing Harbour especially was badly affected due to polluted water of Lyari River and the disposal of dead fish and discharge of other material into the sea by the fishermen. The place around the Fishing Harbour emitted foul smell and garbage could be seen floating around the place. The participants were also taken close to the mangrove forest which was also affected by the pollution in that area.

vi) On 18th April, 2007 the meeting was held at PAF Base Masroor where the Air Officer Commanding Southern Air Command and the Base Commander briefed the participants about the garbage dumps coming up near the Base which was attracting large birds into the flight path of the aircraft thus posing great threat to men and aircraft. Later the participants were taken in a helicopter to show the garbage dumps from the air and the threat that it posed to the Defence equipment around PAF Bases Masroor & Faisal and Pakistan Navy Base Mehran. The Sub Committee again met in Islamabad on 10th, 22nd and 28th May 2007 to finalize its Report. The present Report is thus the outcome of intense deliberations of the last two months which were attended by the following:

- | | |
|----------------------------------|---------------------------|
| 1. Senator Nisar A. Memon | Chairman |
| 2. Senator Engr. Rukhsana Zuberi | Member |
| 3. Senator Asif Jatoi | Member |
| 4. Mr. Sami Khilji | Additional Secretary, MOE |
| 5. Vice Admiral(R) A. Hayat | Chairman, KPT |

6. Rear Admiral Muhammad Shafi	COM LOG
7. Rear Admiral M. Asif Sandila	DG, MSA
8. Rear Admiral Syed Afzal	DG, Ports & Shipping
9. Air Vice Marshal, Rao Qamar Suleman	AOC South PAF
10. Mr. Muhammad Ali Afridi	Joint Secretary, MOD
11. Air Commodore Najam Ul Asar	Base Commander, Masroor
12. Air Commodore M. Hanif Khan	PAF, Faisal Base
13. Air Commodore Muhammad Hanif Khan	Base Commander, PAF Base Faisal
14. Commodore Saleem Akhtar	MD, PN Dockyard
15. Syed Ahsan Zaidi	JS Ports & Shipping
16. Mr. Asif Shuja Khan	DG, PAK EPA
17. Mr. Javed Ali Khan	DG, MOE
18. Ghulam Arif Khan	MD, KW&SB
19. Brig. Kamran Aziz Qazi	DHA, Karachi
20. Brig. Iftikhar Haider	MD, KW&SB
21. Brig. Javed Ashraf	DHA, Special Projects
22. Mr. Shamsuddin Sahito	Chief Engineer, SITE
23. Capt. Zafar Iqbal	Commander Dockyard, Karachi
24. Capt. Khalid Pervaiz	PNS, Mehran
25. Capt. M. Azhar PN	DCP, NHQ, Islamabad
26. Capt. S. M. Shahzad PN	DMA & EC NHQ Islamabad
27. Mr. Banat Khan Masud	Director ML&C, Karachi
28. Mr. Iftikhar Ahmed Mir	CEO, Clifton
29. Mr. Rashid Ahmed Sheikh	DS, MOD
30. Mr. Arshad Jamil	ACE, CB, Clifton
31. Mr. Fahim Riaz Khan	EPA
32. WG Cdr. Shakil Ghazanfar	PAF Base Masroor
33. Mr. Ardeshir Cowasjee	SHEHRI
34. Mrs. Amber Alibhai	SHEHRI
35. Mr. Roland de Souza	SHEHRI
36. Ghulam Muhammad Mahar	DG, Livestock & Fisheries, Sindh
37. Mr. Rashid Yahya Usmani	Manager KPT
38. Prof. Dr. Javed Mustaqim	Director Centre of Marine Biology
39. Majyd Aziz	President KCCI
40. Agha Shahab A. Khan	KCCI
41. Mr. Gulzar Firoz	FPCCI
42. Mr. Wahid Ahmed	Acting MD, KFHA
43. Dr. A. R. Tabrez	NIO, Karachi
44. Cdr Tariq Muneeb PN	EPO HQs COM LOG
45. Cdr Said Rahim PN	DMA & EC, NHQ
46. Cdr S.M.A. Hussain Gardezi PN	JAG, Deptt. PN, Islamabad
47. Cdr Ovais Hyder PN	MSA, Karachi
48. Lt Cdr Nasir Ahmed PN	EPO, PN, Dockyard
51. Mr. Irfan Tariq	Architect, MOE

vii) The Report of the Sub-Committee was presented to the full Committee on 30th May 2007 in the presence of some of the stakeholders for comments and suggestions to be sent to the Secretary of the Committee by 5th June, 2007. The final meeting was attended by the following:

1.	Senator Nisar Ahmed Memon	Chairman
2.	Senator Syed Dilawar Abbas	Member
3.	Senator Naeem Hussain Chattha	Member
4.	Senator Sardar Mahtab Ahmed	Member
5.	Senator Mrs. Rukhsana Zuberi	Member
6.	Mr. Ali Asjad Malhi, Minister of State for Defence	Ex-Officio Member
7.	Rear Admiral Muhammad Shafi	COM LOG
8.	Mr. Javed Ali Khan	DG, MOE
9.	Air Vice Marshal, Rao Qamar Suleman	KOC SAC PAF
10.	Mr. Muhammad Ali Afridi	JS Ministry of Defence
11.	S.M. Hasan Zaidi	JS Ministry of Ports & Shipping
12.	Capt. Shahid Wain	DDG, MSA, Karachi
13.	Capt. Zafar Iqbal	Commander Dockyard, Karachi
14.	Capt. Khalid Pervaiz	PNS, Mehran
15.	Capt. S. M. Shahzad PN	DMA & EC NHQ Islamabad
16.	Cdr. Said Rahim	DMA & EC, NHQ
17.	Cdr S.M.A. Hussain Gardezi PN	JAG, Deptt. PN, Islamabad
18.	Cdr. Tariq Muneeb, EPO	HQ COM LOG (Harbour)
19.	Flt. Lt. Shehzad Ali	ADC to AOC, South
20.	Lt. Kamran Jabbar	Flag Lt. to COM LOG
21.	Rasheed Ahmed Shaikh	C/A

viii) The Report of the Committee is preceded by an Executive Summary given in the following pages.

III. STAKEHOLDERS POINT OF VIEW

1. PAKISTAN NAVY

i) Pakistan's coast spreads 990 Km from Sir Creek in the east to Gwadar Bay in the west. Most of the coast is thinly populated and is almost free from pollution. However, marine pollution is localized to Karachi and its adjoining areas, as the city has 10% of the country's population and 60% of country's industries. The coastline of Karachi, especially Karachi Harbour is facing serious threats due to marine pollution from various industrial and municipal activities and discharges to Harbour.

ii) The major source of pollution in the Karachi Harbour is via Lyari River, which drains huge quantity of untreated mixture of industrial/municipal wastewater into it. Due to natural geographical situation of Karachi harbour, marine pollutants are not completely flushed out into the open sea that makes the harbour waters hazardous from many aspects. Marine pollution can be discussed under two heading i.e. wastewater and solid waste.

- a. **Wastewater** Karachi generates more than 350 million-gallon per day (MGD) of wastewater. The Wastewater having ingredients of solid and industrial wastes containing heavy metals ultimately reaches the coastal waters through public sewers, streams and rivers. The treatment capabilities of existing wastewater treatment plants are insufficient to treat the bulk of wastewater as per National Environmental Quality Standards (NEQS) set by the Government in 1996. The existing wastewater treatment plants have been designed for the primary treatment i.e. for removal of suspended solids only and not the chemicals or biological impurities. By ensuring that industries treat their effluents at the source of generation the on ground situation can improve.
- b. **Solid Waste** Karachi is producing about 8,000 tons of solid waste every day. Collection and safe disposal of solid waste falls under the purview of the City District Government Karachi (CDGK). However, a substantial portion of uncollected solid waste mixes up with wastewater and ends up into the Karachi Harbour. It spreads in the harbour and accumulates in different bents, along the ships, jetties, inlets, compounding the existing problem.

iii) Laboratory results of recently collected seawater samples from various locations of Karachi Harbour show variation from standard values. It is evident from the chart below that the basic composition of seawater has changed

S.No.	Tests	Standard Value of Seawater	Results
a.	PH	8.2	7.2
b.	Conductivity	52,000 m Mho/Cm	47,000 m Mho/Cm
c.	Chloride	19,350 ppm	21,200 ppm
d.	Sulphate	2,712 ppm	3,200 ppm
e.	Sodium	10,760 ppm	12,300 ppm
f.	Potassium	387 ppm	290 ppm
g.	Calcium	413 ppm	370 ppm
h.	Magnesium	1,294 ppm	1,270 ppm
j.	Alkalinity	142 ppm	210 ppm (590 ppm at the Lyari inlet)

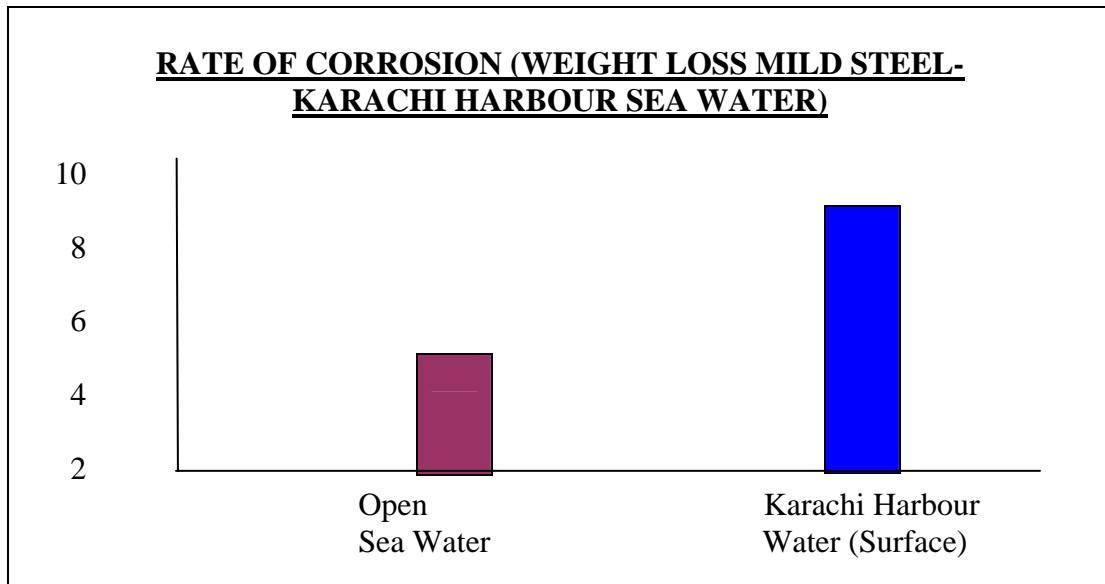
iv) All PN platforms including Surface Ships, S/Ms, Fleet Tankers, Mine Hunters, Missile Boats and Auxiliary craft are berthed at Karachi upper harbour and PIDC channel at PN Dockyard. Besides negative effects on human health and marine ecology, the polluted harbour water is seriously affecting the life of these platforms. In addition, it also results into frequent repair/maintenance problems. It becomes difficult to quantify indirect losses to these platforms due to lot of variables involved. However effort has been made to arrive upon an estimated value to have an idea of indirect loss to national exchequer and highlight seriousness of the problem. The same is being explained in subsequent paragraphs.

v) The change in chemical composition of seawater causes damage to PN harbour assets and infrastructure as indicated below:

- a. Conductivity of Karachi harbour seawater is 47,000 m Mho/Cm against the 52,000. The low conductivity reduces effectiveness of cathodic protection.
- b. Increased chloride value 21,200 ppm against the standard value of 19,350 ppm enhances the rate of corrosion especially pitting of hulls/structures which is harmful for ships and submarine hulls in longer run.
- c. Increased values of Sulphate causes growth of certain organisms, unsuitable for marine life. It also leads to production of corrosive H₂S gas.

vi) **Reduction in ships Life**

- a. Mild steel is used in the construction of most of PN vessels. The study conducted by PN Dockyard Laboratory on the rate of corrosion of mild steel shows that standard weight loss of mild steel in the open seawater is only 5.48 gram per square meter per day as compared to 9.20 gram per square meter per day in the Karachi harbour waters.



- b. It is evident that corrosion rate is almost doubled in Karachi Harbour. However, due to various hull preservation techniques this can be reduced but 100% preservation is not possible. Therefore, an estimated value of around 33% loss of ship life has been taken to arrive upon an estimated cost to have an idea of indirect loss to PN due to marine pollution in Karachi Harbour.
- c. Generally speaking, price of large naval platform in the international market is around US \$ 300 million. These platforms are usually built for 25-30 years. Loss of 30% ships' life as discussed above would mean loss of about US \$ 70.5-90 million per platform over the life of a ship/submarine. PN maintains 08 large platforms and 06 submarines. Hence more than US \$ One billion is lost due to the pollution problems and as such is a huge burden on the national exchequer. These figures will further increase if we take into account small platforms having total number of 26 at present with PN. In other words, this cost can be saved if we can control the pollution in Karachi Harbour as per defined National Environmental Quality Standards (NEQS).
- d. Increased Hull Preservation Efforts: Hull preservation of any vessel is done by bringing the ship/submarine into the doc, hull cleaning by grid/sand blasting and applying different layers of marine paint having the life of 3-5 years. However due to prevailing condition of Karachi harbour water, it hardly lasts for one and half year to 2 years. Therefore, the expenditure cost for hull preservation is almost doubled. It is for information that the one time cost for hull preservation of one fleet tanker is Rs. 10.50 million and for frigate the cost is 9.00 million.
- e. Enhanced Frequency of Maintenance: Marine pollutants reduce economical life of ships' machinery. Fire and flush pumps, filters, pipes and seals become ineffective and due for frequent replacement resulting into extra expenditure.
- f. Frequent machinery failures occur in seawater-based machinery (i.e. sea suction pumps, fire pumps, DG intakes etc) due to presence of solid waste and plastic bags, thus affecting the efficiency of these systems. This some-time results into failure of some sensitive electronic components which are procured from abroad.
- g. Increased Harbour Infrastructure Repair Cost: Polluted water also reduces the life of harbour infrastructure i.e. jetties and docks etc. Huge amount is spent on regular maintenance and repair of the damaged jetties. For example, at present Rs. 470 million are being spent to refurbish naval jetties along the PIDC channel. It can safely be said that one would have used these berths for another few years had the harbour waters been kept in the defined limits.
- h. Damage from Floating Objects: Presence of the floating material in harbour waters is a potential danger which can cause damage to fast moving platforms. The propeller of newly inducted VBSS high speed boat was damaged in the recent past and the same had to be procured from abroad.

- i. Enhanced Non-Ops Time: The cumulative effects of all the above problems beside the cost factor is, enhanced non-operational time thus affecting the sea worthiness and fighting efficiency of these platforms.

2. PAKISTAN AIR FORCE

i) PAF Faisal Base is located in densely populated location at Shahrah-e-Faisal. It is a joint user Air Field which is hosting six Naval Aviation Squadrons, one Army Aviation Squadron and one C-130 Squadron, which was recently positioned at Faisal. In addition to this, a large number of transit movement as well as VVIP movement by civil, military and foreign aircrafts are a routine matter at Faisal.

ii) The analysis of bird strike of last few months revealed that a lot of bird attractants are present around the airfield in the form of water, food and shelter, which needs to be eliminated on fast track basis. The major source for breeding of birds is dense populated locations i.e. Shah Faisal Colony, Baloch Colony and Korangi Industrial areas around the Airfield. Big waste water *nullah* namely Chakora *nullah* is running through Shah Faisal Colony and coming towards runway. Residents of these localities dump garbage and their wastes along with this *nullah* and with the boundary wall of the base. In addition to this a lot of marriage halls and weekly *Bachat Bazaars* are present in the under shoot of runway. This leftover garbage and waste food by marriage halls attracts birds which is a big hazard for all aircrafts coming on final approach for landing. It poses an eminent threat to the population of this area in case of any major disaster. Same problem is present in localities around Baloch Colony where lots of unattended garbage dumps attract bird. With the passage of time few unauthorized buildings have been erected on approach funnel which is required to be addressed to avoid any unforeseen incident. Chakora *nullah* which meets Malir *Nadi* near Korangi Industrial area is a major source of bird breeding as lot of garbage and industrial waste is dumped on this site. It gives good combination in the form of food and water and provides ideal breeding ground for all birds operating in the localities around Faisal Airfield.

iii) Bird actively is a serious hazard and poses a direct threat to Flight Safety aspects. Bird control has always been a point of concern and merits aggressive and consistent efforts to fight this menace. District administration should be directed for dedicated efforts for cleaning of garbage dumps and proper disposal of industrial waste around Airfield. The remedial measures suggested above, if implemented in true letter and spirit at all levels will eliminate birds around airfield and will give PAF safe skies for Operations. Bird strikes constitute a significant and continuous drain on financial, engineering and manpower resources of PAF. They in fact are the single greatest cause of accidents sustained by the PAF. In financial terms alone the annual bill for aircraft losses and damage is considerable. More importantly, bird strike can cause loss of life both to the pilot and to the innocent people. The majority of bird strikes occur below 1000 ft above ground level (AGL) where bird activity is most concentrated. A significant number of these occur, on or in the immediate vicinity of airfield, where at the focal point of their departure and arrival procedures, aircraft are most vulnerable. Effective measures can be undertaken on the airfield, however to reduce the risk of bird strike incidents, successful bird control techniques need to be devised to control bird activity, when the aircraft are in the air. Since 1993 a total of 2345 birds struck the aircrafts resulting in 15 major accidents in which 15 aircraft crashed. 04 pilots embraced *shahadat* and 204 aircraft received damage.

iv) Last 12 years data of Masroor reveals that bird hits are again on the rise after considerable control over this menace due to substantial increase in population around the airfield and in-effective solid waste management system. When we analyze the trend of bird hits month-wise, it is evident that most of the bird hits occurred during the month of March and from September to December, mostly due to changing wind direction, which pushes the birds from the city towards Masroor, thus it is imperative for us to remain more vigilant in these months. If Pilot only starts to look for birds then virtually there is no time left for other checks to perform inside the cockpit. We have to regard the human limitation also that in time and space, ideal situation may not be achieved. To the West lies PAF Base Masroor. It is surrounded by Mauripur Town to its West, Baldia Town to its North East, SITE Town to the East/South East and Kemari Town to South/South East. All these towns directly affect aircraft flying from Masroor and are required to remain clean and clear of garbage and refuses to deny accumulation to birds.

v) PAF did a survey of the city around Masroor Base and found it pertinent to show what was found. We were basically interested in places where aircraft usually fly at low altitude. Main points revealed during the survey are:-

- a. There are 02 main garbage dumping points in Karachi. Road sides leading to both these points have huge stocks of garbage which is being dumped short of the proper places. This garbage is not being burnt and is a major cause for attracting birds. There is no proper procedure of disposing off the solid waste. It is only being burnt; however, large numbers of birds are being attracted even on the burnt garbage. Main dump-Gond Bass is very close to joining point (Hub Chowki) for Runway-09 whereas main dump (Jam Chakro) is very close to Initials/ST-in-approach pattern of Runway-27.
- b. Long finals point for Runway-27 is exactly over sewerage water treatment plant. The plant has reservoirs over which scores of big birds are seen settled to drink water. Moreover adjacent to the sewerage plant, land is being cultivated which also attracts lot of birds.
- c. A large tract of land adjacent to Manghopir factory, in the X-Wind of Runway-27 circuit has become home of numerous big birds because of trapped sewerage water due to poor water sanitation.
- d. Garbage drums are either non existent or a broken and uncovered in the adjacent towns of Baldia, North Karachi and Kemari. Generally the garbage is seen all around the roads/towns. Moreover the vehicles responsible for dumping the garbage to the dumps are not covered and usually drop the garbage on road side instead of taking it to prescribed dumps. Areas from initials Runway-27 till landing are littered with huge piles of garbage which has not been picked regularly. In line with Runway-09, between long finals and short finals points, a large number of poultry farms have been established. Due to these large flocks of birds are now being faced by pilots especially after take off from Runway-27. This land is basically given on agricultural basis and presence of these poultry farms is illegal in some cases.

3. KARACHI PORT TRUST

i) Lyari River, Nehre Khayam, HPS Drain, Wallace Drain, Habib Public School Drain, Jungle Shah Drain, Karachi fish Harbour, industries in Harbour area and oily waste from

Naval Dockyard and KS&EW were responsible for pollution of Karachi Harbour. Ships calling Karachi Port are potential polluters but they are inspected strictly by the Pollution Control Dept. of KPT in consonance with International Convention MARPOL 73/78. In case they are found to be slack on the required antipollution measures they are issued memo and subsequently penalized in certain cases.

ii) In response to a question KPT informed that the Tasman Spirit Oil Spill occurred at the mouth of the Channel but the impact on ecology within the harbour area was minimal as KPT had sealed the entrance of the channel by Oil containment Boom but Clifton beach was polluted. As yet KPT has not received any compensation KPT would have received \$ 42 millions if Pakistan was signatory to CLC Convention at that time. However the claims of KPT are far higher than this figure for which KPT is in court but decisions on Oil Spill Compensation normally take several years. Much higher compensation would have been available if Pakistan was signatory to FUNDS Convention. In that case the oil handling companies would be required to contribute to the Fund @ US \$ 6 on each 1000 tonnes of imported crude oil. KPT has been maintaining Oil Spill Response Equipment since 1997. These equipments have been supplemented substantially after the Tasman Spirit incidence.

4. MARITIME SECURITY AGENCY

i) The specific sources of marine pollution in Pakistan through land and sea are mentioned in ensuing paragraphs:-

a. **State of Marine Pollution in Pakistan Through Land.** Pakistan shares the Arabian Sea with a coastline of 990 KM. out of this, Baluchistan coastline consists of 745 KM and the rest 245 KM lies with the Sindh. The coastal area along Sindh is heavily populated as compared to Baluchistan. It is thus an obvious fact that the coast along Baluchistan i.e. 745 KM, is very little polluted or virtually free of pollution. Of the coast along Sindh, only 30 KM of coastal water receives a very heavy load of land-based pollution from Karachi alone. The coastal industries in Sindh and Baluchistan are mostly concentrated around Karachi City and the Hub industrial area. the effluents from a variety of industries and various coastal installation are being discharged directly into coastal waters. Depending on the quantum of industrial and urban wastes of different locations along Pakistan coast, the pollution level varies from place to place. Various coastal areas in the vicinity of Karachi and Gadani are heavily polluted whereas the areas such as Indus delta and Makran coast are relatively less polluted. The status of pollution along Pakistan coast has been briefly highlighted below according to their geographical location:

(1) **Karachi Coastal Area.** Karachi, being the largest industrial and densely populated city of Pakistan, generates over 300 mgd of sewage and industrial wastes, which is the main source of marine pollution for the coastal waters. The industrial effluents from more than six thousand industrial units located in Karachi are being discharged into the coastal waters through public sewers, drains streams and rivers.

(2) **Port Qasim Area.** Port Qasim, located in the South of Karachi in the Indus Delta Region, is significantly contributing to the marine pollution

load of the Karachi coastal area. Major sources of pollution in the Port Qasim area are:

- i. Shipping.
- ii. Steel Mills Industry.
- iii. Power Plants.

(3) **Landhi Industrial Trading Estate & Korangi Industrial Area.** These industrial areas are located along South East of the Karachi harbour. The industries are discharging directly all of their waste into the adjacent coastal creek waters, without any treatment. These waste contain all sorts of toxic and non-toxic material, which ultimately becomes part of sea dumping. The major contributing groups of pollution among these industries are:

- i. Textile Industries.
- ii. Metallurgical Industries.
- iii. Auto Engineering Works.
- iv. Machine Tool Factory.
- v. Power Plants.
- vi. Oil Refineries.
- vii. Chemical & Pharmaceutical Industry.
- viii. Cottage Industries.

(4) **Malir River and Gizri Creek Areas.** The main sources responsible for causing marine pollution in the coastal waters particularly near Gizri Creek, Korangi Creek, Bakran Creek and other creeks are untreated industrial and domestic waste. The major sources are:

- i. The domestic sewage.
- ii. Industrial effluent/drain.
- iii. Effluent from Sindh Alkalis Plant at Landhi.
- iv. Wastes from Landhi Cattle Colony.
- v. Fish Harbour, Korangi.

(5) **Lyari River and Sindh Industrial Trading Estate (SITE).** Lyari river enters the main city near new Karachi and passes through Gulshan-e-Iqbal F.B Area, PIB Colony, Garden Area, Golimar, Sher Shah and Mauripur. Lyari river beside is the largest slum of Karachi city consisting of many passively urbanized villages. Lyari river not only brings the domestic sewage waste to Karachi harbour but also the industrial waste discharged from industries scattered around various localities plus several thousand industries located at SITE area. In SITE area there are about 5000 registered industries and several thousand small industries including cottage industries that are even not registered. The effluent which these industries are discharging is almost untreated and being dumped directly into the Arabian Sea through Lyari River.

(6) **Hub Industrial Trading Estate and HUMCO Power Plant Areas.** Hub Industrial Trading Estate (HITE) is the latest fast developing industrial area situated at the border of Sindh and Baluchistan. All kinds of major industries have started their operations in this area and the number is increasing day by day. HUBCO power plant and industrial installation are

discharging the effluent into the Hub River, which again enters into the Arabian Sea.

- (7) **Karachi Harbour and Boat Basin Area.** Karachi Harbour receives various inorganic and organic pollutants including oil from various sources. These sources include mainly heavy shipping traffic through Karachi Port, fishing trawlers, fishing boats, Dockyard Karachi Shipyard and effluent discharge of various industries & installations, through Lyari River. Whereas, the Boat Basin area receives untreated sewage waste from Defence & Clifton area through drains.
- (8) **Baluchistan Coastal Area (Gadani, Pasni, Gwadar & Ormara).** A huge ship breaking industry is flourishing at Gadani area, functioning since over 20 years and causing all sorts of metal/oil pollution in the area. A building of heavy metals has been reported in the sediments from the Gadani coastal area. The fish harbours at Pasni, Gwadar and Ormara are also a source of marine pollution in the region, although the extent of pollution for the time being is not significant. The fishing activities and fishing village at Ormara are also a source of marine pollution along Ormara Coast. However, the extent of this pollution is not significant. A new Naval Port at Ormara is being developed. Thus port activities is taken to check the pollution, in near future, these activities will definitely contribute towards marine pollution in the area.

- b. **State of Marine Pollution in Pakistan Through Sea.** Geographically, Pakistan is situated at the mouth of the Gulf from where more than 80% of the oil is being exported to the rest of world and most of oil-carrying vessels pass through the Exclusive Economic Zone (EEZ) of Pakistan posing a continuous environmental threat to Pakistan. Due to the heavy sea traffic the estimated oil spills and discharge from ships in the ocean comes to about 1.5 million tons per year. The main contributing factors of pollution at sea are:
 - a. Grounding/Stranding of ships.
 - b. Collisions at sea.
 - c. Oil spills from ships.
 - d. Oil wastes from bilge's / engine rooms (transportation losses).
 - e. Dumping of garbage & other refuse material from ships.

5. KARACHI CITY DISTRICT GOVERNMENT

- i) Sewage through 9 nullahs and two rivers is going into the sea. The network is not sufficient to carry all the sewage of the city. The best way is to trap the waste water from the outlets of nullahs and rivers.
- ii) Presently, in Karachi, there are 3 sewage treatment plants with total capacity of 151 MGD, and about 300 MGD untreated waste water escapes into Malir and Lyari Rivers before falling into the sea.
- iii) One of the Sewerage Pumping Station was initially established in 1883 by the then Government of Sindh to cater to the need of sewage disposal through mechanical means for adjoining areas of Kharadar etc. Till 2004 the Pumping Station along with its reserved land for development remained under the custody of KW&SB. But in the year 2004-2005 City

District Government Karachi, during interim period auctioned the reserved land for development to three different parties without the consent of KW&SB. Physical possession has been handed over by Land Department of CDGK to the parties, who have started construction activities on this plot. However, a piece of land along with its room for Ejector has been left to KW&SB for sewage disposal purpose.

6. THE FEDERATION OF PAKISTAN CHAMBERS OF COMMERCE & INDUSTRY

i) At present all the solid waste from industrial units throughout Karachi is being dumped on open lands therefore huge garbage is accumulated. Sometime such solid waste is hazardous waste and therefore is dangerous for human contact. Such solid waste is being dumped into Malir, Lyari and other rivers which is then passed into sea with rain water.

ii) There are different laws with regard to technical specification for manufacturing of polythene bags in all the four provinces of Pakistan. It is a fact that in Punjab, the Environmental Protection Agency is more strict and effective and notices have been issued to industry violating environmental laws. The Sindh Environmental Protection Agency should take notice of industries through out Karachi violating the environmental laws and not meeting the NEQS.

7. KARACHI CANTONMENT BOARDS

i) Cantonments are relatively well kept up areas. Therefore, environmental degradation is also at the lower ebb. However, certain aspects are beyond the control of authorities whereas; in a number of areas services need up-gradation. Formalized coordination between various civic agencies is required and inflow of funds from Federal/Provincial/International donors is to be streamlined. Harmonization with CDGK is need of the hour for master planning and infrastructure up gradation.

ii) There are a total of six Cantonment Boards in Karachi namely Clifton, Karachi, Faisal, Malir, Korangi and Manora covering an Area of 156 Sq. km and a population of 0.75 million. The area under Cantonment jurisdiction is 4.5 percent of the total Karachi area whereas population residing in Cantonment areas is 5 percent of the total area of Karachi.

iii) The total waste generated in Cantonment areas is 427 tons on a daily basis. The landfill site at Surjani is 35 Km. away and the vehicles carrying solid waste make only one trip to dispose of waste.

8. SINDH ENVIRONMENTAL PROTECTION AGENCY

i). The administration of Karachi is divided between 18 towns, 6 cantonments, Karachi Port Trust, Port Qasim Authority and the Export Processing Zones Authority. Karachi also has 7 industrial areas namely: SITE, Korangi Industrial Area, Landhi Industrial Area, North Karachi Industrial Area, F.B. Area Industrial Area, Industries at KPT and Port Qasim Industrial Area.

ii) Major environmental issues of Karachi city pertains to non-availability of a proper collection system for domestic and industrial waste water. Sewers are mostly old and leaking and storm water drains called Nullahs are used for collection of waste water both from

residential as well as industrial areas. The city has 4 water treatment plants with the combined capacity of 87 mgd out of a total of 151 mgd installed capacity. There are no exclusive treatment plants for industrial effluence. The un-treated 297 mgd waste water out of a total of 380 mgd generated goes into the sea. The major outlets of this waste water are Lyari River, Malir River and other Nullahs. Lyari River, which carries about 250 mgd waste water is also a major carrier of solid waste and all this falls into the port causing excessive pollution in the Harbour.

iii) Karachi generates municipal solid waste to the tune of 8000 tones per day. Of this about 30 percent is collected and disposed off at landfill sites in Jam Chakro and Gond Pass. Jam Chakro is spread over an area of 500 acres and receives 2000 tones of solid waste per day while Gond Pass is spread over 150 acres and receives 1200 tones per day. Solid waste ultimately reaches the Harbour and coastal water via Lyari and Malir Rivers and Nullahs. Un-official dumping grounds, which are spread through out the city, ultimately become breeding areas for vectors and insects, which are a potential threat to Aviation due to rise in pollution of birds, especially crows, at dumps in the landing and take off approaches of the aircrafts. All these also have serious adverse impact in the over all environment of the city. Toxic Fumes from the burning of waste causes serious health effects on the exposed population. It also contaminates land, and ground water which are of high risk to human health.

9. KARACHI FISHERIES HARBOUR AUTHORITY

i) Karachi Fish Harbour spread over an area of 84 acres, constructed in 1959 including a harbour channel of 110000 sq. meters. Federal Government transferred Karachi Fish Harbour to the Government of Sindh in 1974. Karachi Fisheries Harbour Authority (KFHA), a Sindh Government Organization came into existence in May, 1984 through the promulgation of KFHA ordinance 1984. KFHA implements federal and provincial governments' policies and instructions. Sindh Government nominates the Chairman KFHA. Objectives of the KFHA are; to implement policies and regulations pertaining to fisheries harbour planning, security, construction, operation, management and maintenance with powers to hold and dispose off property both moveable and immovable.

ii) The majority of the fishermen and people associated with the Harbour are illiterate or possess very little knowledge of the environmental issues of the Harbour thus causing pollution in the Harbour. Under Section-6(2) and 7 of the Pakistan Environmental Protection Act 1997 no body has been summoned for an inquiry or an investigation has been conducted for environmental discrepancy in the Harbour area. Under Section 26, Sindh Environmental Protection Agency has been delegated powers to enforce Pakistan Environmental Protection Act. 1997. Under Section 24 of the said Act Senior Judges of the province are declared as Environmental Magistrates to take cognizes of all these contraventions. The pollution created in the Harbour area due to oil and other chemicals released into the Harbour channels damage infrastructure, boats plying in the Harbour especially to its paints and propellers. Obnoxious and stinking order of the channel water is caused by trash fish drop in the Harbour channel. Residual deposition of oil and injurious chemicals also causes pollution in the Harbour. Fast silting of the Harbour channel bed is taking place due to deposition of un-treated sewerage and solid waste through various sources.

10. PAKISTAN ENVIRONMENTAL PROTECTION AGENCY (PEPA)

i) Toxins from municipal and industrial waste waters run off from farms and urban areas and the erosion of soils are a major source of pollution. These toxins can include naturally occurring chemicals that are present in higher concentration because of human activities as well as new manmade compounds. Oil pollution is one of the highest publicized forms of ocean pollution. The majority of oil pollution is from spills or leakages of oil that originate from land or rivers, which in turn flow to the sea. The more direct form of oil pollution occurs when ships transporting the substance leak or crash. Some of the oil washes up on the shore and becomes tar-like lumps. Toxics waste is the most harmful form of pollution to Marine creatures and human alike. Once a form of toxic waste affects an organism it can be quickly passed along the food chain and might eventually end up as sea food, causing various problems. Sewerage and industrial waste introduce chemical pollutants such as PCB, DDT and Form Chemicals along with heavy metals like Mercury and Zinc. All this has disastrous health effects on human's and marine life. It also damages ships and other plate forms.

11. SHEHRI

i) The land comprising Karachi has approximately the 27 owners, all of whom have their own leases and building rules. These rules are violated with impunity in connivance with local officials and in collusion with KWSB, CDGK, KESC and other related departments.

ii) There is also a multiplicity of municipal agencies responsible for the handling, treating, and disposal of liquid and solid wastes in their jurisdiction. Some of these municipal agencies have sub-contracted the jobs to private parties or CDGK, but cannot ensure that an adequate job is done.

iii) In violation of town-planning schemes and notified land-use, much land is being unlawfully used for industrial, cottage industry, and marketing purposes. The inner city has been partially converted into small factories and industrial units and ware-housing for chemicals, food, textile, machinery etc. among these areas:

- a) Many buildings in Saddar and P.E.C.H.S. have been converted into jewelry and gold workshops. They pump toxic chemicals and fumes into the air and into sewers, and pose a fire/explosion hazard. They also are used for warehousing and re-packing of chemicals, food, and clothing.
- b) Textile and stitching factories are housed all over P.E.C.H.S., Nazimabad, Saddar North Karachi, Landhi, and Malir, to name of the few areas.
- c) Golimar and Pak Colony in SITE Town are home to the largest marble and stone processing factories. They pollute the air, the water, and the nullahs and also dump waste into Gutter Bagicha.
- d) Meat, poultry and fish stalls open on every corner, in blatant violation of municipal regulations, polluting the area with offal and waste, attracting carrion birds.

iv) Notified Katchi Abadis are 539, spread over approximately 12, 445 acres all over Karachi. The un-notified Katchi Abadis are 1100, spread over 20, 000 acres approximately. These Katchi Abadis are housing furniture making, spray, painting, ice factories, plastic

making, toys, rubber slippers, shoes, die-casting units, bleaching, dyeing stitching, small industries, carpet making, hand looms, paper making, chip boards, slaughter houses etc. These units use all kinds of chemicals which are pumped directly into the nullahs and the KWSB sewers which are not equipped to handle this kind of effluent.

v) Approximately 300 mgd of untreated and toxic sewerage finds its way into the ocean. Another 100 mgd pollutes the ground water.

vi) Over 50 percent of solid waste is not collected by the CDGK or the other municipal agencies. Informal recycling (by rag-pickers) manages to rescue some of reusable materials. There is no proper landfill site in the city: Karachi just has dumping grounds at some outskirts.

IV. EXISTING LAWS (SUMMARY)

1. ENVIRONMENTAL PROTECTION ACT 1997

i. Introduction

Section 11, sub-section (1) of the Environmental Protection Act stipulates that “*no person shall discharge or emit or allow the discharge or emission of any effluent or waste or air pollutant or noise in an amount, concentration or level which is in excess of the National Environmental Quality Standards*”. **Clause (f) of sub-section (1) of section 6** of the Act clearly holds the Federal Environmental Protection Agency responsible for the enforcement of the National Environmental Quality Standards: “*(1) The Federal Agency shall – (f) ensure enforcement of the National Environmental Quality Standards*”. Furthermore, **clauses (a) and (c) of sub section (1) of section 6** of the Act hold the Federal Environmental Protection Agency responsible for the administration and implementation of all environmental regulations and policies:

6 – (1) The Federal Agency shall –

(a) Administer and implement the provisions of this Act and the rules and regulations made there under;

(c) take all necessary measures for the implementation of the national environmental policies approved by the Council;

ii. Role and Powers of the Environmental Protection Agency

The Federal Environmental Protection Agency is established under **section 5** of the Act. It is responsible for the administration and implementation of the Act and the enforcement of the National Environmental Quality Standards. **Section 16** of the Act lays out the actions the agency can take against those who violate the environmental regulations laid down in the Act and the National Environmental Quality Standards:

16 – (1) Where the Federal Agency or a Provincial Agency is satisfied that the discharge or emission of any effluent, waste, air pollutant or noise, or the disposal of waste, or the handling of hazardous substances, or any other act or omission is likely to occur, or is occurring or has occurred in violation of the provisions of this Act, rules or regulations or of the conditions of a license, and is likely to cause, or is causing or has caused an adverse environmental effect, the Federal Agency or, as the case may be, the Provincial Agency may, after giving the person responsible for such discharge, emission, disposal, handling, act or omission an opportunity of being heard, by order direct such person to take such measures that the Federal Agency or Provincial Agency may consider necessary within such period as may be specified in the order.

(2) In particular and without prejudice to the generality of the foregoing power, such measures may include:

(a) Immediate stoppage, preventing, lessening or controlling the discharge, emission, disposal, handling, act or omission, or to minimize or remedy the adverse environmental effect;

(b) installation, replacement or alteration of any equipment or thing to eliminate or control or abate on a permanent or temporary basis, such discharge, emission, disposal, handling, act or omission;

(c) action to remove or otherwise dispose of the effluent, waste, air pollutant, noise, or hazardous substances; and

(d) action to restore the environment to the condition existing prior to such discharge, disposal, handling, act or omission, or as close to such condition as may be reasonable in the circumstances, to the satisfaction of the Federal Agency or Provincial Agency.

(3) Where the person, to whom directions under sub-section (1) are given, does not comply therewith, the Federal Agency or Provincial Agency may, in addition to the proceeding initiated against him under this Act or the rules and regulations, itself take or cause to be taken such measures specified in the order as it may deem necessary, and may recover the costs of taking such measures from such person as arrears of land revenue.

iii. Violations by Government Agencies

Section 19 of the Act lays down the consequences of violations of environmental regulations by Government Agencies, local authorities or local councils:

19. Where any contravention of this Act has been committed by any Government Agency, local authority or local council, and it is proved that such contravention has been committed with the consent or connivance of, or is attributable to any negligence on the part of the Head or any other officer of the Government Agency, local authority or local council, such Head or other officer shall also be deemed guilty of such contravention along with the Government Agency, local authority or local council and shall be liable to be proceeded against and punished accordingly.

iv. Environmental Tribunals

Section 20 directs the Federal Government to establish multiple Environmental Tribunals with specific territorial jurisdictions. **Section 21** stipulates that violations of environmental regulations are exclusively trial able by an Environmental tribunal. It can only take cognizance of an offence on the complaint of the Federal Environmental Protection Agency or any Government Agency or local council, or any aggrieved person who has given notice of not less than thirty days to the Federal or Provincial EPA detailing the alleged contravention and of his intention to make a complaint to the Environmental Tribunal. In exercise of its criminal jurisdiction, the Environmental Tribunal shall have the same powers as are vested in the Court of Session under the Code of Criminal Procedure, 1898 (Act V of 1898). In exercise of the appellate jurisdiction under section 22 the Environmental Tribunal shall have the same powers and shall follow the same procedure as an appellate court in the Code of Civil Procedure, 1908 (Act V of 1908). In all matters with respect to which no procedure has been provided for in the Act, the Environmental Tribunal shall follow the procedure laid down in the Code of Civil Procedure, 1908 (Act V of 1908).

2. National Environment Quality Standards 2001

i) As per NEQS 2001, all installations are required to emit liquid effluents into the public sewers only in conformance with NEQS standards. Consequently, industrial and other

locations generating toxic/aggressive effluents have to provide special in-house treatment before dumping into the public sewer. This practice is virtually non-existent (except for some multi-nationals).

ii) Additionally, NEQS 2001 prohibits discharge of any kind of effluent (even if it is in accordance with NEQS standards for the sea) into the sea within 10 miles of mangroves or important estuaries (like Chinna Greek or Korangi Greek, etc). Consequently, the discharge of all liquid effluent from treatment plants into the sea within 10 miles of Karachi is unlawful. The simple implementation of this rule would save all defence installations in Karachi harbour.

3. Karachi Port Trust Act 1886

i) KPT board is responsible for maintaining clean marine environment in the port area of KPT and ensuring that there is no discharge of waste or oily or noxious substances. Under KPT Act, Section -90 penalty of up to Rs. 10 million can be imposed on any polluter in the harbour. Other legal instruments which are also applicable in Karachi include Ports Act 1908, P.E.P.A. 1997, MARPOL 73/78, PMSO 2001 & CLC-92.

ii) All ship calling Karachi are inspected by MPCD of KPT in accordance with International Convention MARPOL 73/78. Through this inspection it is ensured that the ship does not cause any pollution in the Harbour.

4. Maritime Security Agency Act 1994

Section 3 of the act constitutes the Maritime Security Agency for carrying out the purpose of this act.

Section 10 lays out the powers and functions of the agency. It stipulates that the agency is responsible for the regulation and protection of the maritime interests of Pakistan and to assert and enforce national jurisdiction and sovereignty in the Maritime Zones.

The functions of the agency pertaining to pollution of the marine environment include:

- a) Enforce the international laws, agreements and conventions on and under the water in the Maritime Zones.
- b) Assist other departments and agencies of the Government to maintain and preserve the quality of marine life and to prevent and control the effects of marine disasters including maritime pollution in and around the ports, harbours, coastal areas, estuaries, and other areas of Maritime Zones.
- c) Assist other departments and agencies of the Government in safe-guarding and protecting artificial islands, offshore terminals, installations and other structures and devices in Maritime Zones.

According to **Section 12** of the Act, in exercise of powers and performance of their functions under this Act, the officers and members of the staff may make inquiries, examinations, inspections, investigation, searches, seizures, and arrests for prevention, detection, and suppression of contravention of any law for the time being in force within the Maritime

Zones and for that purpose, the officers and members of the staff may board any vessel except ships, vessels or crafts of the Pakistan Armed Forces.

5. Pakistan Merchant Shipping Ordinance

Section 554 Chapter 43 Part XIV of the Ordinance stipulates that the discharge of sewage and disposal of garbage into the sea is prohibited. According to sub-section (4) of section 554, if sewage or garbage is discharged or disposed of into the sea, the master or the owner of the ship shall be liable to a fine which may extend to ten thousand US dollars.

Section 555 Chapter 43 Part XIV of the Ordinance stipulates that no oil or oily mixture or harmful substance can be discharged into the sea from any Pakistani or foreign ship. According to subsection (3), if oil or oily mixture or harmful substance is discharged the master or the owner of the ship shall be liable to imprisonment which shall not be less than two years and fine which shall not be less than fifty thousand US dollars but may extend to 1 million US dollars. In the case of continuing contravention, an additional fine may be imposed which may extend to fifty thousand US dollars for every day after the first during which such contravention or failure continues.

Section 556 Chapter 43 Part XIV of the Ordinance stipulates that no noxious liquid substances shall be discharged into the sea from a Pakistani ship or foreign ship. According to subsection (2), if noxious liquid substances or their residues are discharged the master or the owner of the ship shall be liable to imprisonment which shall not be less than two years and fine which shall not be less than fifty thousand US dollars but may extend to 1 million US dollars.

Section 562 Chapter 43 Part XIV of the Ordinance stipulates that a surveyor or any person appointed by the Federal Government may, at any reasonable time, go on board a ship for the purpose of ensuring that the prohibitions, restrictions and obligations imposed by or under the convention are complied with.

Section 568 Chapter 43 Part XIV of the Ordinance stipulates that the dumping of wastes or other matter prescribed as such is prohibited and any person acting in contravention of this section shall be liable to imprisonment which shall not be less than two years and fine which may extend to one million US dollars.

The implementing agency would be the Ministry of Ports & Shipping, Govt. of Pakistan.

6. MARPOL 73/78

The International Convention for the prevention of pollution from ships (MARPOL 73/78) makes it mandatory for all ships to be in possession of three certificates to confirm their pollution prevention measures. The first one is Oil Pollution Prevention Certificate (IOPP); the second is the International Pollution Prevention Certificate for the carriage of Noxious Liquid Substances in Bulk; and the third is the International Sewage Pollution Prevention Certificate (1973). In Pakistan, the MARPOL 73/78 Convention has gone into effect from 22 February 1995. The government has also provided checklists to the Mercantile Marine Department and the Shipping Companies to ensure effective implementation of this Convention.

A summary of MARPOL 73/78:

- a. **Prevention of Pollution by Oil (Annex I).** Tankers above 150 tonnes and other ships above 400 gross tonnes are subject to survey and certification. Discharge of oil or oily mixtures from the machinery spaces of ships of greater than 400 gross tonnes is prohibited under certain conditions.
- b. **Ships Carrying Dangerous Liquid (Annex II).** Annex II regulations apply to ships carrying dangerous liquid chemicals in bulk. The regulations contain requirements for ship design and for equipment fitted on board chemical tankers. The chemicals carried on board these ships are classified into four categories of pollution hazard. Those ships carrying chemicals with the greatest hazard are subject to the most stringent design controls and equipment requirements.
- c. **Harmful Substances Carried by Sea (Annex III).** These regulations contain mandatory requirements for preventing pollution by harmful substances carried by sea in packaged form. These provisions demand minimum standards for the packaging, labelling, documentation, quantities, stowage and reporting.
- d. **Discharge of Sewage from Ships (Annex IV).** This annex is not yet internationally approved, although a number of countries have agreed to implement these regulations. The regulations introduce controls on the discharge of sewage from ships at sea and ensure that sewage treatment plants fitted onboard ships and adequately treat the sewage before it is discharged to the sea.
- e. **Prevention of Pollution by Garbage from Ships (Annex V).** Annex V applies to all vessels regardless of size including yachts, fishing vessels, tankers and offshore platforms. Under the regulations of this Annex, the discharge of garbage into the sea is prohibited or restricted.
- f. **Prevention of Air Pollution from Ships (Annex VI).** A new Annex VI of MARPOL 73/78 has been proposed to address the problems of air pollution from ships.

Compliance of Marpol 73/78 is ensured by M/o P&S. The National Contingency Plan for Oil/Chemical Spill called as NCP (Pollution) has been made a part of National Marine Disaster contingency Plan (NMDCP) on the guidelines of OPRC. Concerned ministries have been requested to implement provisions of UNCLOS-82 in true spirit. Similarly, strict monitoring of industrial units is ensured to prevent trans-boundary movement of hazardous substances as per the requirement of Basel Convention.

7. United Nations Convention on Law of the Sea

Part XII of the convention deals with Protection and Preservation of the Marine Environment.

Article 194 of the convention enumerates measures to prevent, control, and reduce pollution in a marine environment.

Article 195 of the convention stipulates that in order to reduce or control pollution of the marine environment, States shall not act so as to transfer damage or hazards from one area to another or transform one type of pollution into other areas.

Articles 207 to 212 of the convention stipulates that States shall promulgate and adopt laws and regulations to prevent, reduce and control pollution caused by land-based, atmospheric, seabed, dumping, and vessel-related activities.

Section 6 of Part XII of the convention deals with enforcement.

Articles 213 through 216 of the convention stipulate that States shall develop measures to enforce the laws and regulations pertaining to pollution from land-based, seabed, and dumping activities adopted under **Section 6**.

Article 217 of the convention stipulates States shall ensure compliance by vessels flying their flag or of their registry with applicable international rules and standards adopted in accordance with this Convention for the prevention, reduction and control of pollution of the marine environment from vessels and shall accordingly adopt laws and regulations and take other measures necessary for their implementation. Flag States shall provide for the effective enforcement of such rules, standards, laws and regulations, irrespective of where a violation occurs.

According to **Section 4 of Article 217** of the convention, if a vessel commits a violation of rules and standards established through the competent international organization or general diplomatic conference, the flag State, without prejudice to articles 218, 220 and 228, shall provide for immediate investigation and where appropriate institute proceedings in respect of the alleged violation irrespective of where the violation occurred or where the pollution caused by such violation has occurred or has been spotted.

Article 218 stipulates that when a vessel is voluntarily within a port or at an off-shore terminal of a State, that State may undertake investigations and, where the evidence so warrants, institute proceedings in respect of any discharge from that vessel outside the internal waters, territorial sea or exclusive economic zone of that State in violation of applicable international rules and standards established through the competent international organization or general diplomatic conference.

8. Fisheries Act, 1897

Section 5 of the Act stipulates that if any person puts any poison, lime or obnoxious material into any water with intent thereby to catch or destroy any fish, he shall be punishable with imprisonment for a term which may extend to two months or with fine which may extend to two hundred rupees.

9. The Ports Act, 1908

Section 54 of Chapter VII of the Act stipulates that if any person disobeys any rule or order which a Government has made in pursuance of the act and for the punishment of disobedience to which express provision has not been made elsewhere in the Act, he shall be punishable for every such offence with fine which may extend to fifty thousand rupees.

The implementing authority would be Director General, Ministry of Ports & Shipping.

10. Pakistan Penal Code 1860

Section 20. “Court of Justice”. --- The words “Court of Justice” denote a Judge who is empowered by law to Act judicially alone, or a body of Judges which is empowered by law to act judicially as a body, when such Judge or body of Judges is acting judicially.

Section 277. Fouling water of public spring or reservoir. --- Whoever voluntarily corrupts or fouls the water of any public spring or reservoir, so as to render it less fit for the purpose for which it is ordinarily used, shall be punished with imprisonment of either description for a term which may extend to three months, or with fine which may extend to [one thousand five hundred rupees], or with both.

Section 278. Making atmosphere noxious to health. --- Whoever voluntarily vitiates the atmosphere in any place so as to make it noxious to the health of persons in general dwelling or carrying on business in the neighborhood or passing along a public way shall be punished with fine which may extend to [one thousand five hundred rupees].

Section 285. Negligent Conduct with respect to fire or combustible matter. --- Whoever does, with fire or any combustible matter, any act so harshly or negligently so as to endanger human life, or to be likely to cause hurt or injury to any other person, or knowingly or negligently omits to take such order with any fire, or any combustible matter in his possession as is sufficient to guard against any probable danger to human life from such fire or combustible matter, shall be punished with imprisonment of either description for a term which may extend to six months, or with fine which may extend to [three thousand rupees] or both.

Section 431. Mischief by injury to public road, bridge, river or channel. --- Whoever commits mischief by doing any act which renders or which he knows to be likely to render any public road, bridge, navigable river or channel, natural or artificial, impassable or less safe for traveling or conveying property, shall be punished with imprisonment of either description for a term which may extend to five years, or with fine, or with both.

11. Pakistan Territorial Water and Maritime Zone Act 1976.

Section 14 of the Pakistan Territorial Water and maritime Zone Act 1976 gives the Federal Government the power to make rules for preservation and protection of marine environment and control of marine pollution.

12. Convention on Civil Liability for Oil Pollution Damage (CLC).

CLC deals with the liability of tanker owners. International Convention for establishment of an International Fund for Compensation for Oil Pollution Damage called FUND for which contributions are made by the oil importers. The tanker owners are strictly liable for the costs of reasonable clean up operations. The tanker owners may escape liability only if they can prove that one of a limited number of exceptional circumstances caused the damage. Exceptional circumstances means and includes; war or acts of God; pollution

wholly caused by act or omission of third party with the intention to cause damage and wholly or partially caused by the negligence or other wrongful act of the Government or other authority responsible for the maintenance of lights or navigational aids.

13. International Convention on Oil Pollution Preparedness, Response and Cooperation 1990 (OPRC).

The basic purpose of OPRC is to preserve the human environment in general and the marine environment in particular. It recognizes the serious threat posed to the marine environment by all oil pollution incidents involving ships, offshore units, seaports and oil handling facilities. It is mindful of the importance of precautionary measures and prevention in avoiding oil pollution in the first instance, and the need for strict application of existing international instruments dealing with maritime safety and marine pollution prevention, particularly the International Convention for the Safety of Life at Sea, 1974, as amended, and the International Convention for the Prevention of Pollution from Ships, 1974, as modified by the Protocol of 1978 relating thereto, as amended, and also the speedy development of enhanced standards for the design, operation and maintenance of ships carrying oil, and of offshore units. It also recognizes the importance of mutual assistance and international cooperation.

V. ACTIONS, PLANS AND ORGANIZATIONAL STRUCTURE

1. Pakistan Navy

- i) NHQ has been approaching the concerned authorities / agencies from time to time to improve the marine pollution situation.
- ii) Countering marine pollution measures remained on agenda of the Marine Pollution Control Board during the period when it was functioning under the chairmanship of CNS.
- iii) Earlier on, draft National oil spill contingency plan was prepared by NHQ & MSA and forwarded to Ministry of Environment in year 2000. The same is still awaiting approval.
- iv) All PN Ships and units have been directed not to throw any material, solid or liquid, in the harbour. There is a proper system for management of solid waste, bilges, gray waters etc at jetties. Instructions in this regard have been issued in the form of PBR-75 for compliance. The same is also being monitored by Commander Dockyard.
- v) A visit of Federal Minister of environment Major (R) Tahir Iqbal to Karachi Harbour was arranged in June 2003 by NHQs. The Minister along with his team was taken to different parts of Karachi Harbour and was briefed about the seriousness of situation.
- vi) Draft National Marine Disaster Contingency Plan has been formulated by NHQs to handle all types of marine disasters under the overall control of Pakistan Navy. The same has been forwarded to Ministry of Defence for Government approval.
- vii) Pakistan Navy established the Directorate of Maritime Affairs and Environmental Control at Naval Headquarters on 11th Aug, 1994. It is responsible for the following important functions concerning Environment Protection:-
 - a. Assist VCNS with his duties as member of National Maritime Affairs Coordination Committee (NMACC) and also the DCNS (O) as member of Pakistan Environment Protection Council (PEPC).
 - b. Deal with all matters concerning environmental management at Naval Headquarters.
- viii) Initially Directorate of MA&EC issued instructions concerning environment protection through Policy letters and a directive to all Administrative authorities dated 19th Aug. 96. Later Fleet Order A-3/98 on 'Environment Protection in Pakistan Navy' was issued on 27th Apr 98. Now with a view to consolidate all the instructions issued to date on the subject by NHQ and provide comprehensive reference material concerning Environment Protection, PBR is being issued.

2. Pakistan Air Force (PAF)

Low level flying training area has been demarcated for the flying of aircraft, where there are less changes of bird strikers. Bird infested areas are marked and pilots avoid flying over there. Mobile bird shooting parties reach the intense bird activity area and shoot down the birds where required. Fire crackers are used to repel the birds and poison baiting is done

with all safety precautions to kill the birds inside the base and we pay extreme caution while exercising both these options.

3. Cantonment Boards

- i) CBC Pilot Project initiated. Three sectors outsourced 75 vehicles, 9 mechanical sweepers, 750 workers and 30 compactors for door to door collection of garbage.
- ii) Green Walk, Tree Plantation, Workshop and Seminars and Training Courses.

4. Karachi Port Trust

i) In realization of its responsibility to address the menace KPT has adopted stringent measures. Initially a comprehensive Environmental Impact Study was conducted under KPT's Harbour Pollution Management Programme. The study spelled out most of the environmental aspects including pollution parameters in Karachi Harbour, pollution sources with particular reference to land and marine based pollution, remediation, etc. Karachi Port Trust has translated the study into practical efforts in letter and spirit. However, the efforts of KPT are marred due to influx of large volume of land based untreated industrial and municipal effluents on the which the civic agencies appear to have no control due to their financial and administrative constraints.

ii) A world class Marine Pollution Control Centre has been set up by KPT which is equipped for oil spill response, debris collection and a laboratory for water quality monitoring. The staff is trained for activities covering all aspects of Marine Pollution Control. The manager Marine Pollution Control Dept. (MPCD) works as a liaison with the Environmental Protection Agency (EPA) and other agencies on environmental issues. He reports to the General Manager (Operations) within the organization. The Manager (MPCD) is supported by two Deputy Manager. Deputy Manager Pollution Control Unit (PCU) is assisted by Station Superintendent. Other staff reports to station superintendent. While lab attendant and clerical staff reports directly to Deputy Manager Marine Environment Unit (MEU).

iii) Removal of debris from Harbour water surface is being conducted on daily maintenance basis by four hired boats. In addition one Debris Collection Boat, built for the purpose has been acquired by KPT. Furthermore solid floatation Booms are deployed at strategic locations to arrest floating debris.

iv) All ship calling Karachi are inspected by MPCD of KPT in accordance with International Convention MARPOL73/78. Through this inspection it is ensured that the ship does not cause any pollution in the Harbour.

v) Under a Mangrove Rehabilitation Programme MPCD has setup 2 Nurseries in Chinnah Greek Island. Saplings produced out of seeds are transplanted to the denuded areas of islands in Chinnah's Greek. A new technique of sowing seeds in plastic bottles has been quite successful and plants developed are flourishing well.

5. Karachi Fish Harbour Authority

- i) Sindh Environmental Protection Agency that is SEPA has been delegated powers to enforce Environmental Protection Act 1997 under Section 26.
- ii) Under Section 24 of the Act, Provincial Government Senior Judges are declared as environmental magistrates to take cognizance of all contraventions.

6. Karachi City District Government

- i) Greater Karachi Sewerage Plan (S-III)-(Umbrella PC-I)
- ii) The project plans to construct interceptions along with Malir and Lyari Rivers a new sewage treatment plant of 200 mgd capacity, and to double the capacity of existing 3 STPs, besides laying sewer-networks upto the treatment plants, capable of meeting the requirement even beyond Phase 1 of K-IV Greater Karachi Water Supply Scheme.
- iii) The discharge of treated wastewater into the sea will clean the beaches and sea front, besides protection of the environment and would maintain ecological balance.
- iv) PC-1 is approved by PDWP GOS and had been placed before CDWP, but the funding has not yet been decided pending directives from President or Prime Minister of Pakistan.
- v) Funding either through ADB (Asian Development Bank) or GOP has to be arranged at the earliest.
- vi) In the meeting of Senate Committee held in the office of Commander Karachi Navy it was decided that component of managing sewerage through Lyari River will be given first priority as the continuous discharge of raw sewage into the sea from this source is severely affecting the marine life, ships / boat and overall polluting the sea.

7. Pakistan EPA

- i) Marine Pollution Control Board (MPCB) constituted with representation of concerned departments including PN, MSA, MOC, MOE, KPT, PQA, SEPA, KSWB, Fisheries department. MPCB could not setup its fund for project execution and was disbanded.
- ii) KPT established Marine Pollution Control Authority.
- iii) Maritime Security Agency (MSA) built its capacity and conducted emergency drills on oil spill.
- iv) Powers under PEPA 1997 delegated to MSA and SEPA.
- v) A Marine Pollution Monitoring Center has been established at NIO.
- vi) Oil spill contingency plan was drafted.

Composition of Marine Pollution Control Board (MPCB)

1.	Minister for Environment	Chairman
2.	Director General (PAK, EPA)	Coordinator
3.	D G (Ports & Shipping), Ministry of Ports & Shipping, Karachi	Member
4.	Deputy Chief of Naval Staff (Operations), Naval HQ, Islamabad	Member
5.	Additional Secretary Ministry of Finance	Member
6.	Additional Secretary Law Justice & Human Rights Division Islamabad	Member
7.	Joint Secretary (Fisheries) Ministry of Agriculture Islamabad	Member
8.	Secretary Fisheries & Live Stock (Sindh) Karachi	Member
9.	Secretary Fisheries & Live Stock (Balochistan) Quetta	Member
10.	Director General Environment Protection Agency (Sindh) Karachi.	Member
11.	Director General Environment Protection Agency (Balochistan) Quetta.	Member
12.	General Manager (Operations) Karachi Port Trust Karachi	Member
13.	General Manager (Operations) Port Qasim Authority Karachi	Member
14.	Director General Maritime Security Agency Karachi	Member
15.	Director General National Institute of oceanography Karachi	Member
16.	Nazim City District Government Karachi	Member
17.	Chairman Karachi Municipal Authority	Member
18.	Chairman Federation of Pakistan chamber of Commerce & Industry Karachi	Member
19.	Managing Director SITE Karachi	Member
20.	Managing Director Korangi Industrial Area Karachi	Member

VI. RECOMMENDATIONS OF STAKEHOLDERS

1. Navy's Recommendations

- i) The seriousness of situation warrants that the contents of PEPA-97 are implemented in letter and spirit and on war footing. This includes enforcement of NEQS for the waste water at Karachi by relevant agencies.
- ii) Pakistan Navy should strengthen its environment protection organization and should create additional post of a Commodore to be known as Assistant Chief of Naval Staff, Maritime Affairs and Environmental Control at Naval Headquarters, Islamabad. Moreover one post of Captain and two posts of Commander may also be created to strengthen the existing set up both at Islamabad and Karachi.
- iii) Regular meetings of NECC, be held to control pollution of Karachi Harbour. NECC be directed to submit quarterly progress report on control of harbour pollution to the Standing Committee on Defence and Defence Production.
- iv) DG Pak EPA may be asked for a presentation on the measures being initiated for effective control of marine pollution in Karachi harbour and adjoining areas in an early time frame or in the next meeting.
- v) It is proposed that habitability conditions of Shah Faisal colony area should be improved. The Colony may be declared as a 'Model Town' and funds may be allocated to the CDGK for improvement in habitability which should include a foolproof drainage system, effective and efficient garbage/waste disposal, improvement in sanitary conditions and public awareness programme.
- vi) Sewerage system of areas in surroundings of the airfield may be improved. All the drainage should be covered and drained properly to avoid formation of stagnant pool of water. Malir Nallah be declared as non garbage dumping site and a strict ban is to be ensured by the CDGK. All the heaps of waste need to be cleared at the earliest.
- vii) Owners of food processing factories at KORANGI industrial area should be asked to properly cover or remove their waste and install treatment plants if already not held. Owners of the Marriage Lawns in the vicinity of the airfield should also be directed to properly dispose of their remnant food items on completion of marriage ceremony. DPOs of the area may be entrusted with this responsibility of ensuring the same through spot checks and introducing penalties for the defaulters.
- viii) Public awareness program w.r.t hygiene/ dumping of trash at kuchra kundies and overall cleanliness of the houses and localities may be introduced utilizing media channels or Cable TV network.
- ix) DPOs and Town Nazims of the area in the vicinity of airfields may be directed to ensure strict banning of Pigeon flying, fire works and celebratory firing in the area. Owners of marriage lawns in the vicinity may also be directed to strictly comply with the instructions.

2. Air Force's Recommendations

- i) All garbage dumps should be removed especially around Masroor.
- ii) A comprehensive garbage disposal plan should be prepared around Masroor.
- iii) PAF should be taken as a major stake holder in the development projects of Karachi particularly in adjacent areas of PAF Base Masroor. The city Government agreed to this point in BHCC meeting held in Dec. 2005; however no further action has been taken in this regard till date. Moreover it is worth mentioning that no progress on any of the points agreed by City Nazim is observed despite repeated reminders. Therefore it was strongly felt that the administrative level needs to be increased for proper implementation of solid waste management system of Karachi city and allocation of designed places for garbage disposal.
- iv) A new Town (Musharaf Colony) is planned and the construction is in progress in under-shoot of Runway 09. Bird activity will categorically increase in the vicinity of Base and the issue needs to be addressed urgently at appropriate level.

3. Karachi Port Trust's Recommendations

- i) Septic tanks for at-source biological treatment of sewage may be made compulsory for all buildings.
- ii) Rehabilitation/laying of sewerage lines in Nehre Khayam. Laying of additional rising main from CPS to STPII. Diversion of HPS drain to CPS.
- iii) Capacity enhancement of all three sewage treatment plants. Diversion of STP I effluent to Western Back-water of Karachi harbour.
- iv) Setting up of a new STP of 100 mgd at the seaward end of Lyari Riverside. Industries may be persuaded to participate in setting up of this plant under WTO requirement.
- v) Enforcement of NEQS. Introduction of Low-tech and cost effective pre treatment plants. Participation in Bio-technological research. Compact sewage treatment units similar to those fitted on board ships may be fabricated to indigenously and installed in each industrial unit. Batches of industrial units may install common unit.
- vi) The solid waste management is an expensive assignment and can be addressed through the application of proper technology. Quantum can be reduced through 4-R policy. Segregation of garbage policy should be adopted. Setting up of compost fertilizer plants under private sector. Ban on less than 30 micron thickness plastic shoppers.
- vii) Promotion of awareness among general public.

4. Marine Security Agency's Recommendations:

- i) Implementation of National Environmental Quality Standards (NEQS) for discharges from installations be ensured as per international conventions/standards.

- ii) A major marine pollution source is land-based pollution, which is being dumped into the sea without any treatment. Strict measures be adopted and enforced to reduce the industrial/domestic pollution.
- iii) Port reception facilities be established at ports, as in the absence of such facilities in Pakistan, a large amount of garbage/effluent is being dumped from ships.
- iv) To reduce the marine pollution, strict compliance of laws be ensured.
- v) As Maritime Security Agency is responsible for offshore marine pollution, therefore, its requirements and needs with respect to capacity building are to be fulfilled at priority basis.
- vi) Many oil spills result in pollution of shorelines despite efforts to combat the oil at sea and to protect the coastal area. Therefore, shore protection arrangements be adopted on priority basis as in our country we are already lacking in controlling the oil spills due to inadequate facilities and equipment.

5. Karachi Fish Harbour Authority's Recommendations:

a. Short Terms Measures

- i) Pollution control cell needs to be set up in Karachi Fisheries Harbour Authority to implement EPA Act 1997.
- ii) An executive committee needs to be formed comprising of 3 to 4 active members who should frequently take stock of situations and prepare and approve work plans for appropriate measures for restoration strategy.
- iii) Proper policing should be done in the harbour to check and curb any further pollution in the channel.
- iv) To create a fund entitled "Karachi fish harbour channel cleaning and maintenance fund".
- v) Daily monitoring of pollution parameters may be set up.
- vi) The fishermen will be educated regarding the environmental pollution. Imposition of penalty on polluters should also be introduced.
- vii) Collection of floating garbage is being done on daily maintenance basis.

b. Long Term Measures

- i) Small oil skimmer may be procured for Karachi Fish Harbour to skim minor oil spills which are a matter of routine.
- ii) Fixation of oil collection booms on the mouth of the channel.

- iii) Fixation of some grills at the mouth of the Lyari River to stop the solid waste in the channel.
- iv) All waste water flowing into the channel and backwaters of Arabian Sea must be treated before dumping into the sea.
- v) A sewerage water treatment plant to treat the sewerage water to the extent of re-use for washing of auction halls and roads.
- vi) An incinerator to dispose off the solid waste of the processing plants.

6. Cantonment Board's Recommendations

- i) Introduction of Modern Integrated Waste Management System (IWMS).
- ii) Enhance / Institutional Resource Mobilization both Human and Financial.
- iii) Institutionalized Coordination b/w Different Civic Bodies of the city.
- iv) Setting up right priority for environment at National Level.
- v) Allocation of Commensurate Resources for achieving the targets.
- vi) Consultancy Services for Environmental Projects.
- vii) Enhanced environmental friendly greenery in Cantonments through massive campaigns.
- viii) Special Focus on Environmental Up-gradation of Beaches.

7. Pakistan EPA's Recommendations

- i) Revival of Marine Pollution Control Board with statutory powers to direct any department to take action to control pollution affecting sea water quality.
- ii) Establishment of Sea Water Quality Standards.
- iii) Preparation and implementation of Harbour Management Plan. The HMP/Rule may focus on the following six areas and assign specific tasks and goals to the responsible authorities:-

Polluted runoff	-	Industry, EPA, KSWB
Solid waste	-	City + Local Govt.
Liquid effluent	-	KSWB
Petroleum leaks & spills	-	Oil Companies, EPA
Ship effluent	-	Coast Guards, Ports
Vessel cleaning	-	Ports
Boat operation management	-	Ports

iv) Seek guidance from Report on Karachi Waste Management “A Challenge for Progress” by Senator Nisar A. Memon.

8. SHEHRI's Recommendations

i) All land owners and municipal agencies of the city must adhere and strictly follow their lease conditions and zoning/land use rules.

ii) Industrial parks must be established and all illegal small and large industries be shifted to these parks. These industrial parks must have their collective treatment plants, and each industry must be made to comply with NEQS 2001.

iii) The existing industries established in SITE, KITE, Landhi Industrial area, Federal ‘B’ Area Industrial Area, and North Karachi Industrial Area must have collective treatment plants, and monitor the compliance of their individual industries with NEQS 2001.

iv) A public education campaign (‘safai nisf iman hai’) must be mounted for at least ten years to reduce the buildup of public pollution and garbage all over the city. This is specially so with regards to food and related items.

v) Unlicensed and unhygienic food outlets and meat/poultry/fish stalls must be shut down.

vi) The sitting of locations (industrial areas, markets, etc) that generate excessive solid waste must be made keeping in view the flight path of defence and other aircraft.

vii) The establishment of proper landfill sites, and the setting up of an effective garbage collection system (probably in the private sector) is required immediately. Since ‘garbage is gold’ this should not be impossible.

viii) To reduce volume of solid waste manufacturing units which supply goods in cartons should use plastic cartons which are reusable. This will cut costs and make goods cheaper.

ix) Garbage should be colour coded for proper disposal. After segregation some solid waste can be turned into manure which can be used for gardens and plants. In Europe segregation is done at the house hood level where bottles, organic and paper related garbage are disposed off separately. Recyclable waste is recycled while organic waste is compost and the rest is taken to landfill. Every pit has a life of 50 to 100 years from biogas is produced which can be sold. Second hand clothes can be recycled into car seat covers etc.

x) Landfill sites should be carefully selected. These should not be too near to the populated areas and the airports and not too far away to discourage garbage trucks to travel far off distance in which case most of these vehicles make one trip a day saving fuel of the department or contractor.

xi) Decision makers must see Al Gore’s movie, “An Inconvenient Truth”

VII. MAJOR ISSUES

1. Non-implementation of Laws.

i) As stated in Section III of this report there are a number of laws which deal with the issue of environment. Separate laws exist for environment protection on land and for the port harbour and the fishing harbour and there is no dearth of laws on the subject. However non implementation of the Laws has led to the present situation warranting intervention of the Standing Committee on Defence. A close scrutiny of these laws suggest that there is no loop hole in any of these laws and if implemented in letter and spirit there is no reason that there should be any cause of concern about pollution. It is quite evident that the subject of environment has taken a back seat and is not a priority area with governments. Section V of the Environmental Protection Act of 1997 establishes the Federal Environmental Protection Agency, which is responsible for the administration and implementation of the Act and the enforcement of the National Environmental Quality Standards. Section 16 lays out the actions the agency can take against those who violate the environmental regulations laid down in the act and the NEQS. Section 19 of the Act lays down the consequences of violations of environmental regulations by Government Agencies, Local Authorities or Local Counsels. Section 20 directs the Federal Government to establish multiple Environmental Tribunals with specific territorial jurisdictions. Section 21 stipulates that violations of environmental regulations are exclusively trial able by Environmental Tribunal. It can only take cognizance of an offence on the complaint of the Federal Environmental Protection Agency or any Government Agency or Local Counsel or any aggrieved person who has given notice of not less than 30 days to the Federal or Provincial EPA detailing the alleged contravention and of his intention to make a complaint to the Environmental Tribunal. In exercise of its criminal jurisdiction the Environmental Tribunal shall have the same powers as are vested in the Court of Session under the Code of Criminal Procedure 1898 (Act V of 1898).

ii) As per National Environment Quality Standards 2001 all installations are required to emit liquid effluents into the public sewers only in conformance with NEQS. Consequently industrial and other locations generating toxic effluents have to provide special in house treatment before dumping into the public sewer. This practice is virtually non-existent except in the case of some multinationals. Additionally NEQS 2001 prohibits discharge of any kind of effluent, even if it is in accordance with NEQS for the Sea, into the sea within 10 miles of mangroves or important estuaries. Consequently the discharge of all liquid effluent from treatment plants into the sea within 10 miles of Karachi is un-lawful.

iii) Section 10 of the Maritime Security Agency Act 1994 stipulates that the agency is responsible for the regulation and protection of the Maritime interests of Pakistan and to assert and enforce national jurisdiction and sovereignty in the Maritime zones. The functions of the Agency include enforcement of international laws, agreements and conventions on and under the water in the Maritime zones. It is responsible to assist other departments and agencies of the Government to maintain and preserve the quality of Marine life and to prevent and control a Marine disasters including Maritime pollution in and around the ports, harbours, costal areas, estuaries and other areas of Maritime zones. Under Section 12 of this Act the officers and members of the staff may make inquiries, examinations, inspections, investigations, searches, seizures and arrests for prevention, detection and suppression of contravention of any law for the time being enforce within the Maritime zones. Powers under

Pakistan Environmental Protection Act 1997 have also been delegated to Maritime Security Agency to check the environment at the Harbour.

iv) Section 554 of Pakistan Merchant Shipping Ordinance 2001 stipulates that the discharge of sewage and disposal of garbage into the sea is prohibited. According to Sub-Section of (4) of Section 554 if sewage of garbage is discharged or disposed off into the sea, the mater or the owner of the ship shall be liable to a fine, which may extent 10000 US\$. Similarly, Section 555, 556, 562 and 568 discuss in detail the penalties and fines for polluting the waters in the harbour. The Ministry of Ports and Shipping is the implementing agency of this Act, which needs to rise to the occasion and implement the Act. Similarly, the Ports Act of 1908 is implemented by the Ministry of Ports and Shipping whereunder Section 54 stipulates that if any person disobeys any rule or order, which a Government has made in pursuance of the Act and for the punishment of disobedience to which, express provision has not been made elsewhere in the act, he shall be punishable for every such offence with fine which may extent to Rs. 50, 000.

v) Part XII of the United Nations Convention of Law of the Sea deals with Protection and Preservation of the Marine Environment. Article 194 of the said convention enumerates measures to prevent, control and reduce pollution in a Maritime Environment. The Fisheries Act of 1897 also deals with environment degradation of the fishing areas.

vi) However, fines on defaulters mentioned in some of the laws need to be updated according to the present financial situation.

2. Absence of coordination mechanism.

The present undesirable situation regarding environment degradation on land is the result of lack of coordination between EPA, Karachi City District Government, FPCCI, KCCI, DHA and Cantonment Boards as far as the situation on land is concerned. Similarly, lack of coordination between Pakistan Navy, Karachi Port Trust, Karachi Fishing Harbour and MSA has resulted in the degradation of the environment of the Harbour and dockyard area. A Marine Pollution Control Board was established in June 1994 functioning under the Chairmanship of Chief of Naval Staff was transferred to the Ministry of Communications in 1999 and remained functional under the chairmanship of Minister for Communications till September 2001. These after that Board was disbanded and its functions were assigned to National Environmental Coordination Committee (NECC), which is headed by DG Pakistan EPA. Not a single meeting of this Committee has been held so far because of bureaucratic wrangling among the members of the Committee. Presently DG MSA and DG Ports and Shipping, who are members of the Committee and are two star officers of Pakistan Navy, may not like to sit in a Committee headed by a BS-20 officer. Therefore, whatever minimum coordination was available due to the NECC is presently non existent resulting in overall environmental degradation. In addition Pakistan Environmental Protection Council which is headed by Prime Minister of Pakistan has not met very frequently to address environment as a national issue.

3. Absence of conflict resolution mechanism/ Responsibilities and Role.

It is quite apparent from the above that the Pakistan Environmental Protection Council, which is the only forum competent to resolve conflicts between numerous agencies responsible for controlling environmental degradation, has not performed that function

leading to the disbandment of the Marine Pollution Control Board and the non-operation of the National Environmental Coordination Committee. In order to establish a proper conflict resolution mechanism some agencies at the federal, provincial and the local level need to be entrusted this role so that any conflict of interest or conflict of duty is resolved amicably. It is also quite evident that too many agencies are involved in trying to improve the environment and many a times their duties and responsibilities overlap whereby responsibility is shifted between agencies and the polluters in this case are at an advantage. Proper delineation of responsibilities and duties has to be done so that accountability of the agency and punishment of the polluter is made transparent. Multiple agency approach would not be in the interest of the problem at hand. Pakistan EPA, MSA and Port Authorities should be entrusted the policing duty in their respective jurisdictions.

4. Resources.

The question of resources available to the agencies responsible for improving the environment was never raised in the meetings by any stakeholder except for FPCCI, which complained that funds promised by the Ministry of Industries for setting up five industrial effluent treatment plants were not provided. However, the Ministry of Finance was asked to inform the Committee as to how much funds were allocated to the Ministry of Environment in the PSDP during the last four years. The Ministry of Finance provided the following information:

2003-04	445.386 million
2004-05	355.254 million
2005-06	2930.648 million
2006-07	5804.175 million

VIII. RECOMMENDATIONS OF THE COMMITTEE

- i) The Prime Minister of Pakistan should at his earliest convenience call a meeting of Pakistan Environmental Protection Council to consider this report and direct all concerns to implement the acceptable recommendations of the report.
- ii) Marine Pollution Control Board (MPCB) should be revived with Minister for Environment as the Chairman in place of Minister for Communication as was previously the case. The composition of the proposed Board is given at page 34 of this report.
- iii) National Environmental Coordination Committee (NECC), which has been given the mandate to control marine pollution, is presently headed by Director General Pakistan Environmental Protection Agency (BS-20). The level of the Chairman of this Committee should be elevated preferably to that of Secretary Environment and Pakistan Navy and Pakistan Air Force (PAF) should be included as Members in the Committee.
- iv) Ministry of Environment should invoke the Clauses of Pakistan Environmental Protection Act 1997 in letter and spirit and on war footing. This includes enforcement of National Environmental Quality Standards for the wastewater at Karachi by relevant agencies. The Ministry should hold quarterly meetings with Provincial Environmental Protection Agencies to monitor the situation of environmental conditions of the country. National Environmental Coordination Committee should submit quarterly progress report regarding Harbour pollution to the Senate Standing Committee on Environment.
- v) Pakistan Navy should improve its environment protection organization by creating an additional post of a Commodore to be known as Assistant Chief of Naval Staff, Maritime Affairs and Environmental Control at Naval Headquarters, Islamabad. Moreover one post of Captain and two posts of Commander may also be created to strengthen the existing set up both at Islamabad and Karachi.
- vi) Ministry of Defence should declare Masroor Air Base and its surroundings as Cantonment area.
- vii) The Karachi City Government should submit a quarterly report to the said Committee on the steps taken regarding solid waste collection / garbage disposal around Pakistan Navy Base PNS Mehran and PAF Bases Masroor and Faisal.
- viii) Karachi Water & Sewerage Board should set up wastewater treatment plants at appropriate places so that treated water reaches the sea. Wastewater treatment plants are also very essential to stop solid waste from going to the Harbour. Metallic grills of suitable mesh size should also be installed at the mouth of Lyari River and all Nullahs opening in the Sea.
- ix) An effective solid waste management system should be evolved by Karachi City District Government including ear marking of proper landfill sites. Moreover the City Government should ensure that industrial waste is not disposed of in the land fills of municipal solid waste. Segregation of municipal waste in to compost-able and recycle- able categories should be adopted. Non biodegradable plastic shoppers with thickness of less than 30 micron should be banned.

- x) Karachi City Government should ensure provision of septic tanks for biological treatment of sewage in large commercial buildings prior to the approval of building plans.
- xi) Environmental Protection Agency (Sindh) should check that wastewater is treated as per the National Environmental Quality Standards and industrial wastewater according to WTO requirements.
- xii) Ministry of Ports and Shipping should ensure the implementation of all international conventions including MARPOL 73/78, United Nations Convention on Laws of the Seas (UNCLOS 1982), International Convention for Oil Pollution Preparedness & Response (OPRC) 90.
- xiii) All existing industrial areas of Karachi like Sindh Industrial & Trading Estate (SITE), Korangi Industrial & Trading Estate (KITE), Landhi Industrial Area, Federal B. Industrial Area and North Karachi Industrial Area should have provision for collective treatment plants in compliance of National Environmental Quality Standards 2001. Federation of Pakistan Chambers of Commerce and Industry (FPCCI) and Karachi Chamber of Commerce and Industry (KCCI) should facilitate the setting up of such treatment plants while Environment Protection Agency (Sindh) should monitor implementation of National Environmental Quality Standards (NEQS).
- xiv) Provincial Fisheries Departments should ensure hygienic conditions of fish harbours as per international standards and disposal of solid waste on daily basis.
- xv) Ministry of Environment should launch a public awareness campaign on electronic media about adverse effects of environmental pollution.
- xvi) Maritime Security Agency (MSA) be assigned a special responsibility to control pollutants' discharge into the sea.
- xvii) FPCCI and KCCI should encourage manufacturers to supply their goods in re-useable plastic packing to decrease the volume of solid waste.
- xviii) In addition to the above recommendations stakeholders should implement their suggested recommendations as detailed in Section-V of this report.
- xix) The Standing Committee on Defence and Defence Production will review progress of implementation of the above recommendations every 6 months.

IFTIKHARULLAH BABAR
Secretary Committee/Addl. Secy.

SENATOR NISAR. A. MEMON
Chairman Committee

IX. ANNEXURE (All Presentations)