

資 料

[資料]

1. 調査団員・氏名

(1) 基本設計調査時

氏名	担当	所属	現地調査期間
三角 幸子	団長 / 総括	独立行政法人国際協力機構 パキスタン事務所	2月21日～ 2月26日
久下 勝也	調整員	独立行政法人国際協力機構 無償資金協力部 業務第二グループ 農業・環境・防災チーム	2月20日～ 2月26日
野田 典宏	業務主任 / 環境モニタリング計画	株式会社 建設技研インターナショナル	2月20日～ 3月21日
新井 文雄	環境施設計画	株式会社 山下設計	2月20日～ 3月18日
岡崎 亮男	設備計画 / 施設積算	株式会社 建設技研インターナショナル	2月20日～ 3月21日
越智 俊治	環境モニタリング機材計画	グリーンブルー 株式会社	2月20日～ 3月21日
平尾 実	分析機材計画 / 機材積算	株式会社 オオスミ	2月20日～ 3月18日
小沼 崇史	業務調整	株式会社 建設技研インターナショナル	2月20日～ 3月18日

(2) ドラフト説明時

氏名	担当	所属	現地調査期間
福田 義夫	団長 / 総括	独立行政法人国際協力機構 無償資金協力部 業務第三グループ 水資源・環境チーム	6月1日～ 6月9日
野田 典宏	業務主任 / 環境モニタリング計画	株式会社 建設技研インターナショナル	5月31日～ 6月9日
新井 文雄	環境施設計画	株式会社 山下設計	5月31日～ 6月9日
越智 俊治	環境モニタリング機材計画	グリーンブルー 株式会社	5月31日～ 6月9日

2. 調査日程

(1)基本設計調査時

No.	日付	調査内容
1	2/20 (日)	東京発(TG647/11:00) バンコク発(TG505/20:00) カラチ着(22:40)
2	2/21 (月)	カラチ 発(PK300/07:00) イスラマバード着(08:55) JICA 事務所にて打合せ / EAD へ表敬訪問 / Pak-EPA 事務所において、インセプションレポートの説明
3	2/22 (火)	Pak-EPA 事務所において、パキスタン、シンド、パンジャブ、NWFP、バロチスタンの各 EPA にインセプションレポートの説明/JICA 事務所にて打合せ
4	2/23 (水)	JICA 事務所にて打合せ / 環境省へ表敬訪問
5	2/24 (木)	Pak-EPA 新研究所建設予定地視察
6	2/25 (金)	Pak-EPA において分析機材調査及び協議
7	2/26 (土)	団長：JICA 事務所にて調印 / 団員：NWFP 州ベシャワールにおいて EPA Lab 機材調査及び固定大気観測所候補地点視察
8	2/27 (日)	団内打合せ
9	2/28 (月)	イスラマバード発(PK363/9:45) クエッタ着(11:30) / パロチスタン州クエッタにおいて EPA Lab 機材調査及び固定大気観測所候補地点視察
10	3/1 (火)	クエッタ市内の固定大気観測所候補地点視察 / ホテルにて Zasghoon 町長に説明 / QUETTA 市長へ説明 / クエッタ発(PK311/16:45) カラチ着(18:00)
11	3/2 (水)	シンド州カラチにおいて EPA Lab 機材調査及び固定大気観測所候補地点視察(記念公園、図書館、軍モニタリングセンター等) / カラチ発(PK306/19:00) ラホール着(21:30)
12	3/3 (木)	パンジャブ州ラホールにおいて EPD Lab 機材調査及び固定大気観測所候補地点視察 / ラホール発(PK388/20:20) イスラマバード着(21:40)
13	3/4 (金)	JICA 事務所にて経過報告 / Pak-EPA 事務所において、データ整理
14	3/5 (土)	Pak-EPA 事務所において、データ整理
15	3/6 (日)	イスラマバード内現地視察
16	3/7 (月)	Pak-EPA 事務所において、データ整理
17	3/8 (火)	Pak-EPA 事務所において、データ整理
18	3/9 (水)	Pak-EPA 事務所において、データ整理
19	3/10 (木)	野田、越智、岡崎団員イスラマバード発 (PK301/10:00) カラチ着(12:30)関係機関(スバルコ,PCSIR)訪問 / 新井、平尾、小沼団員データ整理
20	3/11 (金)	野田、越智、岡崎団員カラチ発 (PK308/16:00) イスラマバード着(18:30) / 新井、平尾、小沼団員データ整理
21	3/12 (土)	野田、新井、岡崎団員ベシャワールにおいて大気観測所建設候補地点確認 / 越智、平尾、小沼団員データ整理
22	3/13 (日)	団内打合せ / データ整理
23	3/14 (月)	越智、岡崎団員イスラマバード発 (PK363/10:30) クエッタ着(12:00)関係機関調査 クエッタ発(PK352/16:30) イスラマバード着(18:00)
24	3/15 (火)	JICA 事務所にて Technical Note 案打合せ / データ整理
25	3/16 (水)	Pak-EPA 事務所にて Pak-EPA と協議
26	3/17 (木)	Technical Note 調印 イスラマバード発 (PK319/22:30) カラチ着(1:00) (新井/平尾/小沼)
27	3/18 (金)	JICA/EPJ にて報告・打合 カラチ発(TG508/3:35) バンコク発 (TG640/11:20) 東京着(19:30) (新井/平尾/小沼)
28	3/19 (土)	データ整理
29	3/20 (日)	イスラマバード発 (PK852 / 22:55) (野田/越智/岡崎)
30	3/21 (月)	東京着 (野田/越智/岡崎)

(2) ドラフト説明時

No.	日付	調査内容
1	5/31 (火)	東京発(JL717/11:00) バンコク発(TG505/20:00) ラホール着(22:40) (野田/新井/越智)
2	6/1 (水)	ラホール発(PK356/08:00) イスラマバード着(08:50) (野田/新井/越智) JICA 事務所/ 日本大使館/ EAD / MOE / Pak-EPA 事務所へ表敬訪問
3	6/2 (木)	Pak-EPA 事務所において、MOE と最終レポートの説明と議論 福田総括 (東京発(JL717/11:00) バンコク発(TG505/20:00) ラホール着(22:40))
4	6/3 (金)	福田総括合流 (ラホール発(PK356/08:00) イスラマバード着(08:50)) ミニッツについて議論
5	6/4 (土)	ミニッツについて議論
6	6/5 (日)	
7	6/6 (月)	MOE、Pak-EPA、EAD とミニッツに調印
8	6/7 (火)	JICA ラオス事務所、日本大使館に報告 イスラマバード発 (PK381/19:30) ラホール発(TG506/23:50) バンコク着 (6:20)
9	6/8 (水)	バンコク発 (JL708/8:35) 東京着(16:35)

3. 関係者・面会者リスト

氏名	役職	所属
<u>Government of Pakistan Pakistan</u>		
<u>Ministry of Environment</u>		
Mr. Arif Alauddin	Manager Director	National Energy Conservation Center
Mr. Abdul Waheed	Director General	Ministry of Environment
Mr. Khalid Masood Ahmed	Joint Secretary	Ministry of Environment
<u>Ministry of Water & Power</u>		
Dr. Abudul Hameed Qureshi	Senior Joint Secretary	Ministry of Water & Power
<u>Ministry of Finance & Economic Affairs</u>		
Mr. Muhammad Ashraf Khan	Joint Secretary	Economic Affaires Division
Ms. Yasmin Masood	Deputy Director	Economic Affaires Division
<u>Ministry of Science & Technology</u>		
Mr. G. H. Shaikh	Principal Scientific Officer	PCSIR Laboratories Complex Karachi
Mr. Akhtar Shareef	Scientific Officer	PCSIR Laboratories Complex Karachi
<u>Ministry of Petroleum and Natural Resources & Power</u>		
Mr. Rizla Zareen	General Manager	Suparco
Mr. Muhammad Ashiq	General Manager	Suparco
Mr. Rahmatullah Jilani	General Manager	Suparco
Dr. Badar Munir Khan Ghori	Deputy Chief Manager	Suparco
<u>Pakistan Space & Upper Atmosphere Reseach Commission</u>		
Mr. Muhammad Sakhwat	Chief Geophysicist	Geological Survey of Pakistan
<u>Pakistan Environmental Protection Agency</u>		
Mr. Asif S Khan	Director General	Pak-EPA
Mr. Zia-ul-Islam	Director	Pak-EPA
Dr Javed Iqbal	Director	Pak-EPA
Mr. M.Fahim Riaz Khan	Director	Pak-EPA
Mr. Zia-ud-din- Khattak	Deputy Director	Pak-EPA
Mr. Mis Sajjad Hussaim talpur	Deputy Director	Pak-EPA
Mr. Zaigham Abbas	Assistant Inspector	Pak-EPA
Mr. Imran Ali Malik	Assistant Inspector	Pak-EPA
Mr. Sajid Mahmood	Laboratory Assistant	Pak-EPA
Mr. M. Irfan Saeed Alrai	Programme Manager	United Nations Development Programme
Dr. Z.H.Lodhi	Chief Chemist	Pak-EPA/JICA
Mr. Masashi Ito	JICA Expert	Pak-EPA/ JICA
Mr. Satoru Narahara	JICA Expert	Pak-EPA/ JICA
Mr. Koich Kuwano	JICA SU	Pak-EPA/ JICA
Mr. Nadia Aftab	Technical assistant	Pak-EPA/ JICA

Government of Sindh

Mr. Iqbal Nafees Khan	Director	EPA Sindh
Mr. Irfanullah Tunio	Deputy Director	EPA Sindh
Mr. A.H.K. Yousufzai	Water Quality Specialist	EPA Sindh
Mr. Ashique Alilangah	Scientific Officer	EPA Sindh

Government of Punjab

Mr. Iqbal Shaikh	Secretary	EPA Punjab
Dr. Shaguhta Shahjahan	Director	EPA Punjab
Mr. Shenic Khoursheed Kunka	Deputy Director	EPA Punjab
Mr. Shahid Hassan	Deputy Director	EPA Punjab

Government of N.W.F.P.

Mr. Shaukat Zaman	Director General	EPA NWFP
Dr. M.Bashir Khan	Director	EPA NWFP
Dr. Muhammad Bashir Khan	Director	EPA NWFP
Dr. Hussan Ahamed	Deputy Director	EPA NWFP
Mr. Shamsur Rehman	Chief Analyst	EPA NWFP

Government of Balochistan

Mr. M.K.Uthman Khail	Engineer	EPA Balochistan
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City District Government Lahore

Mr. Tariq Zaman Khan	District Officer	City District Government ,Lahore
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City District Government Karachi

Dr. M. Tahir Soomro P.E.	Executive District Officer	Transport & Communication Department
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Government of Quetta

Mr. M. Muhammad Rahim Kakar	Nazim City District	Quetta City
Mr. Abdul Qahar Wadan	Nazim Zarghoon Town	Quetta City

在巴基斯坦日本国大使馆

志村 和信	二等書記官
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JICA パキスタン事務所

山浦 信幸	所長
三角 幸子	次長
Mr. Mitsunobu Inaba	次長
Mr. Keiji Isigame	所員

4. 討議議事録 (M/D) 等

(1) M/D (基本設計時)

MINUTES OF DISCUSSIONS
ON
THE BASIC DESIGN STUDY
ON
THE PROJECT FOR ESTABLISHMENT OF
ENVIRONMENTAL MONITORING SYSTEM
IN
ISLAMIC REPUBLIC OF PAKISTAN

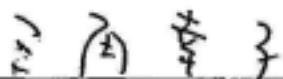
Based on the results of the Preparatory Study, the Government of Japan decided to conduct a Basic Design Study on the Project for Establishment of Environmental Monitoring System (hereinafter referred to as "the Project") and entrusted the study to the Japan International Cooperation Agency (hereinafter referred to as "JICA").

JICA sent to Islamic Republic of Pakistan (hereinafter referred to as "Pakistan") the Basic Design Study Team (hereinafter referred to as "the Team"), which is headed by Ms. Sachiko MISUMI, Senior Deputy Resident Representative, JICA Pakistan Office, and is scheduled to stay in the country from 20 February to 20 March, 2005.

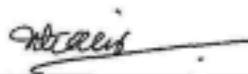
The Team held discussions with the officials concerned of the Government of Pakistan and conducted field survey at the study area.

In the course of discussions, both sides agreed that keeping in view the sustainability of the project and capacity of the EPAs the PC-1 will be implemented in two stages i.e. priority I components and priority II components. The Government of Japan will take priority I components and the remaining priority II components may be implemented through some other donor, Government of Japan or providing local resources. The priority I components are described on the attached sheets. The Team will proceed to further works including field survey and prepare the Basic Design Study Report on the priority I components. Both sides further agreed to seek concurrence of Planning and Development Division of the Government of Pakistan on the implementation arrangement of the PC-1 as proposed (Priority Component I, Priority Component II)

Islamabad, 26 February, 2005



Sachiko MISUMI
Leader
Basic Design Study Team
Japan International Cooperation Agency
Japan



Khalid Masood Ahmed
Joint Secretary
Ministry of Environment
Islamic Republic of Pakistan



Muhammed Ashraf Khan
Joint Secretary
Ministry of Economic Affairs & Statistics
Islamic Republic of Pakistan



Asif S. Khan
Director General
Pakistan Environment Protection Agency
Islamic Republic of Pakistan

ATTACHMENT

1. Objectives of the Project

The objective of the Project is to establish the environmental monitoring system and to contribute to the extension of the self-sustaining capacity for the environmental management and monitoring in Pakistan. Japan's Grant Aid was requested to support the Project with provision of environmental monitoring equipment and facilities.

2. Project Site

The sites of the Project are Islamabad, Karachi, Peshawar, Lahore and Quetta.

3. Japan's Grant Aid Scheme

The Pakistani side understood the Japan's Grant Aid Scheme and the necessary measures to be taken by the Government of Pakistan as explained by the Preparatory Study Team, as described in ANNEX-1 and 2 of the Minutes of Discussions signed by both parties on 29 January, 2004.

4. Responsible and Implementing Agency

4-1 The Responsible Agency is Pakistan Environmental Protection Agency, (hereinafter referred to as "Pak-EPA").

4-2 The Implementing Agency is Pak -EPA in collaboration with

- (a) Environmental Protection Agency, NWFP
- (b) Environmental Protection Department, Punjab
- (c) Environmental Protection Agency, Balochistan and
- (d) Environmental Protection Agency, Sind

5. Project Steering Committee

5-1 The Pakistani side shall establish the Project Steering Committee (hereinafter referred to as "the PSC") for smooth implementation and operation/maintenance for the Project.

5-2 The PSC consists of the representatives of following agencies.

<Chairman>

- Secretary, Ministry of Environment

< Members>

- Director General, Pak-EPA (Member/Secretary)

- Director General, NWFP- EPA

- Director General, Punjab-EPD

- Director General, Baluchistan-EPA

- Director General, Sind-EPA

- Representative, Economic Affairs Division

- Representative, Planning & Development Division

<Observer>

- JICA

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5-3 The Pakistani side shall invite JICA as an observer to the PSC meetings in which items of agenda concerning Japan's Grant Aid or Technical Cooperation are to be discussed.

6. Policy of Basic Design

6-1 The Team explained the results of the Preparatory Study, as shown in Annex-1.

6-2 Both sides confirmed that the objectives of the Project were shared by both sides.

6-3 As the Pakistani side expressed their regret about the reduced scope to be covered in the Japan's Grant Aid by the proposal of the Preparatory Study, the Team pointed out that the balance between equipment and capacity of operation and maintenance should be realistically considered for the system sustainability and that the capacity building should be given priority at this time for steadily development of the environmental monitoring system.

6-4 It was mentioned that a proposal for expending the Pak-EPA is under active consideration of the Government and additional staff is being recruited for the project in accordance with the PC-1

6-5 In particular, the Pakistani side explained that the air pollution is severe all major cities. Both side agreed that the number of the fixed automatic air monitoring stations in Lahore and Karachi shall be further considered in Japan if the Pakistani side prepared the distribution maps of air pollution and submitted them to JICA Pakistan Office by the end of March, 2005.

6.6 Pakistani side showed concern on the deletion of the fixed mobile water monitoring system from the Grant Aid as water pollution is a serious issue of Pakistan.

6-7 Both side agreed that the basic design of this Grant Aid would be carried out based on the components shown in Annex-2, which will partially meet requirement of EPAs as envisaged in the PC-1. The final components shall be further considered and decided in Japan.

7. Schedule of the Study

7-1 The Team will proceed to further survey and study in Pakistan until 20 March, 2005.

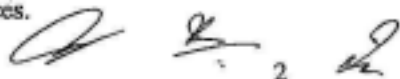
7-2 JICA will prepare the draft report in English and dispatch a mission in order to explain its contents on the condition that;

- the PSC described in No.5 of this Minutes of Discussions will work as a counterpart body of JICA (the Team and JICA Pakistan Office)
- staff training plan in the year 2004-2005 and 2005-2006 will be presented to JICA Pakistan Office by the end of April, 2005.

7-3 In case that the contents of the report are accepted in principle by the Government of Pakistan, JICA will complete the final report and send it to the Government of Pakistan in two months after the explanation on the draft final report.

8. PC-1

8-1 Both sides agreed that, Japanese Grant Aid will contribute to partially implementing PC-1 and the remaining components of the project will be implemented by involving some other donor or providing local resources.



8-2 The Team requested that if the approved PC-1 should be revised as necessary procedure of Government of Pakistan, the Pakistani side would report it to JICA Pakistan office by the end of March 2005 and explained that the approval of the revised PC-1 by Executive Committee of National Economic Council (hereinafter referred to as "ECNEC") would be one of the inevitable conditions for the cabinet approval of this Grant Aid in Japan.

8-3 The Pakistani side confirmed that it was not necessary to revise the approved PC-1 at this stage.

9. Training Plan for Staff

9-1 The Pakistani side explained the newly employment plan (number of each EPA, academic background, field, expenditure), as shown in PC-1.

9-2 The Pakistani side explained that Pak-EPA was responsible for arrangement and budgetary measures of local training of all EPA's staff.

9-3 The Pakistani side already secured the training expenditure including travel and lodging expenses in the PC-1 as the portion borne by Pakistani side.

10. Requested Facilities in Islamabad

10-1 The Pakistani side additionally requested a laboratory for Pak-EPA in Islamabad because the existing laboratory is located in a part of commercial building and its condition is not suitable for analysis work.

10-2 The Pakistani side understood that the land acquisition by the mid of May, 2005, is one of the inevitable conditions for the cabinet approval of this Grant Aid in Japan. If it is not completed by the deadline, the construction of facilities in Islamabad may be considered for exclusion from this Grant Aid.

11. Other Relevant Issues

11-1 The Pakistani side shall commission private sector to perform periodic inspection and maintenance for equipment for which budget is provided in PC-1.

11-2 The Pakistani side requested technical cooperation to realize approved PC-1 from the view point of capacity building of EPA staff. A separate request in this regard shall be submitted to the Government of Japan.

11-3 The Pakistani side promised to hand in the all answers for the questionnaire of the Study to the Team by 15 March, 2005.

Summary of the Preparatory Study
on
the Project for Establishment of Environmental Monitoring System

1. Necessity of the support for the relevant fields.

In Pakistan, while the air pollution and water pollution are becoming more serious, environmental policies and administration such as the start of SMART (voluntary environmental impact evaluation report) system operation are being implemented. However, due to insufficient monitoring plan and equipment and materials that comply with the world standards, it is difficult to provide business establishments with adequate basis for regulation and it hinders the promotion of environmental policies and administration.

In order to improve such situation, although Ministry of Environment and the respective state environmental protection agencies have to achieve the following six items and build an environmental policy and monitoring system as shown in the next page, they face a shortage of funds and experiences.

On the other hand, our country has the world-leading knowledge in the relevant field and also has had experiences of providing support to China, Thailand, Egypt, etc.

In view of this, Japan's Grant Aid to the relevant field in Pakistan will be considered to make great contribution to the promotion of environmental policies and administration and its implementation is considered highly significant.

- 1) Recognition of the importance of environmental monitoring by each EPA management class
- 2) Investigation on health condition due to environment pollution
- 3) Implementation of the high-quality and sustainable environmental and source origin monitoring
- 4) Establishment and review of the environmental and source origin standard value
- 5) Reinforcement of laws and regulations and the enforcement system
- 6) Disclosure of environmental information

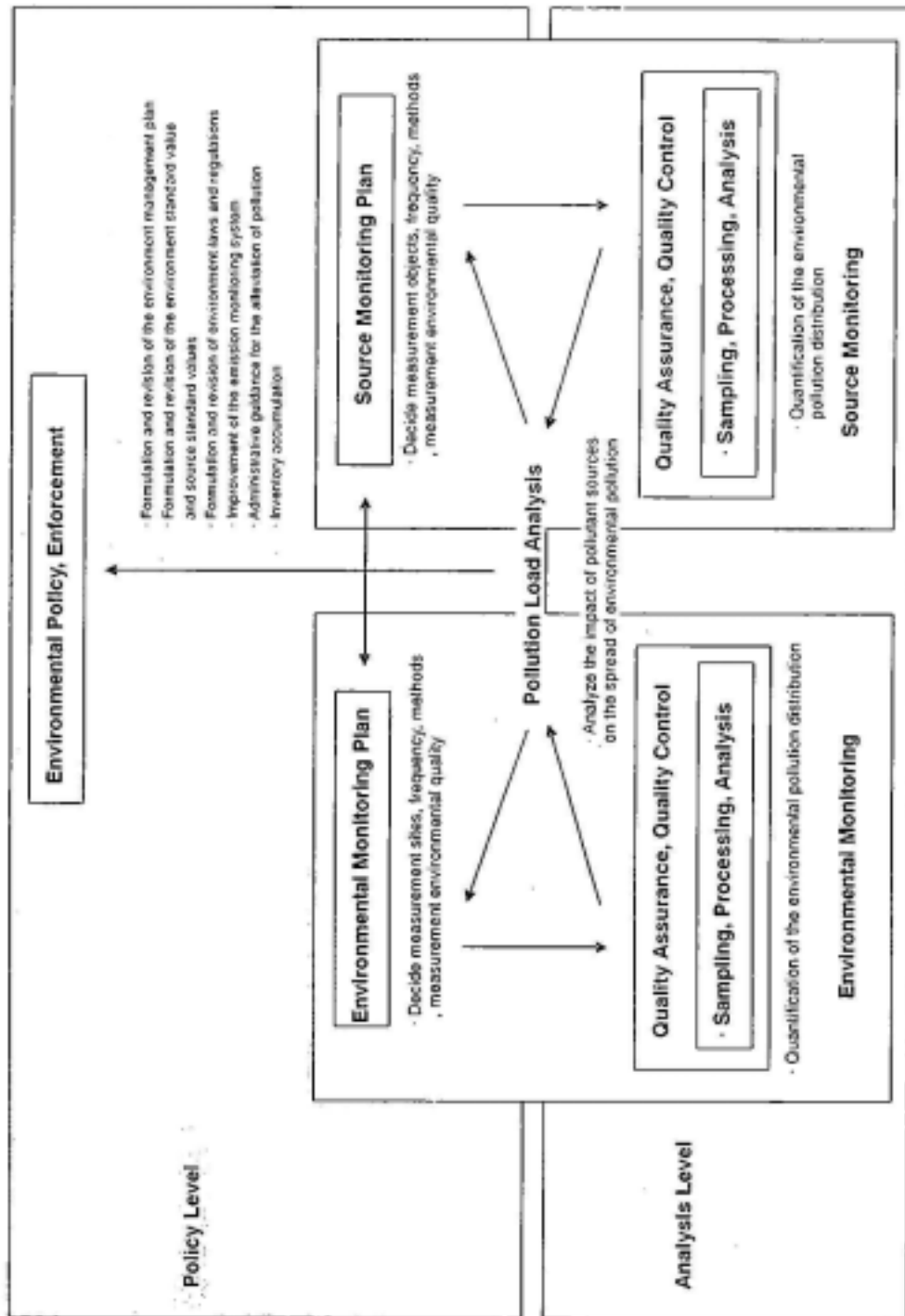


Figure 1 Environmental policy, Monitoring System

2. Summary of the Current Conditions and Problems of the Relevant Fields

The table and graph in the following pages were prepared to summarize the current conditions and problems of the relevant area mentioned previously.

		Current condition and problems
Analysis level	Laboratory Analysis	<ul style="list-style-type: none"> - Analysis equipment and methods conforming to the international standards aren't used and accuracy and reproducibility of the analysis results are not secured enough. At the same time, rigorous comparative analysis with the pollution data from other country can't be performed. - Due to the lack of standardized national analysis method, the analysis results between Pakistan government and EPA of each Province can't be compared rigorously. - Analysis data isn't managed and accumulated systematically.
	Environmental Monitoring	<ul style="list-style-type: none"> - Although source monitoring is conducted, environmental monitoring is hardly done and the environmental pollution distribution by region, season and time isn't quantified. - Monitoring equipment conforming to the international standard isn't established and it's impossible to make an analysis with secured accuracy and reproducibility. - Environmental monitoring plan (measurement items, frequency, time, site, etc) isn't formulated.





	Source Monitoring	<ul style="list-style-type: none"> Monitoring equipment and methods conforming to the international standards aren't used and accuracy and reproducibility of the analysis results are not secured enough. In spite of the emission and effluent control standard, its analysis method isn't established. Source monitoring plan (measurement object, frequency, time, etc) isn't formulated and the accuracy and reproducibility of the monitoring results are not secured enough. Continuous source monitoring isn't conducted and the pollutant source distribution and seasonal and time changes in the emission and effluent of the environmental quality area isn't quantified. Systems Management, Analysis, and Reporting network (SMART) system obliging a business proprietor to self-report of the environmental quality emission and effluent is being implemented, measurement items aren't developed sufficiently and pollutant source distribution can't be quantified.
	Monitoring Data Analysis	<ul style="list-style-type: none"> Environmental quality and source monitoring data aren't analyzed and the impact of the source on the environmental pollution distribution isn't reported to the policy decision level.
		Current condition and problems
Environmental Policy Level	Environmental load analysis	<ul style="list-style-type: none"> Environmental load analysis grasping the correlation of environmental quality and emission density and their relationship with the changes of emission isn't performed and the environmental policy and monitoring plan considering the correlation between the scientifically analyzed source and the environmental pollution distribution aren't proposed and formulated. Consequently, the emission regulation best suited to the real world and economy isn't enforced.
	Environmental standard value	<ul style="list-style-type: none"> Environmental standard values aren't formulated except for NOx and the target value of the environmental quality density isn't established.

	Source Regulation	<ul style="list-style-type: none"> · Although surcharge is imposed on business establishments exceeding the emission standard value at on-the-spot inspection, government guidance and advisory activities toward their efforts to reduce the environmental quality emission aren't provided. · Emission standard value is uniformed nationally and the source regulations that meet actual conditions of society and economy including the situation of individual source density by region and size of each business proprietor aren't implemented. At the same time, the source standard value itself is established loosely. · Environmental metrology assay system isn't prepared fully and its results are not fully reliable.
	Cooperation Among the Relevant Organizations including each EPA	<ul style="list-style-type: none"> · Due to insufficient cooperation among Pakistan government and each provincial EPA and other relevant organizations, environment related data isn't managed uniformly and utilized effectively.
	Cooperation with the Industries	<ul style="list-style-type: none"> · Due to the lack of cooperation with industries, regulations such as SMART aren't fully understood and they don't show a good effect.
		Current condition and problems
Information Disclosure	Environmental Information Disclosure	<ul style="list-style-type: none"> · Information is not disclosed and provided and the citizens can't be informed about the state of environmental pollution.
	State of Health Hazard due to Environmental Pollution	<ul style="list-style-type: none"> · The state of health hazard due to environmental pollution isn't analyzed and the necessity to promote environmental policy and environmental monitoring isn't thoroughly recognized by the citizens

3. Scope of cooperation of grant aid (plan)

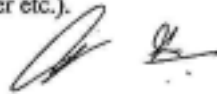
The table 4 in the Inception Report summarizes the tentative scope of cooperation of the Grant Aid. The tentative scope of cooperation proposed by the Preparatory Study should be further examined on the Basic Design Study. Pakistani side has a plan for increasing

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budget and personnel. However, the basic design for the Project at this stage should not be prepared on the future improvement of the skill for the operation and maintenance excessively because the improvement of the skill needs time.

For the training center requested to be built in the premises of Pakistan Environmental Protection Agency, since the training plan for the analysis members including 64 newly employed by Pakistan government isn't definite, necessity for a training center and its size should be examined upon confirmation of the same plan (training content, site, instructor supplier etc.).



Comparison between the Request of Pakistanis Side and the Result of the Preparatory Study

	Name of equipment	Pakistanis Side					
		The Preparatory Study mark* ; to be examined by the Basic Study					
A	Air quality monitoring	Pak	Shindh	Punjab	NWFP	Balo	Total
1	Fixed automatic air quality monitoring station	1	4	4	2	2	13
		1	1*	1*	1	1	5
2	Portable air sampler	0	0	0	0	0	0
		5*	15*	15*	10*	5*	50*
3	Mobile automatic air quality monitoring station	1	1	1	0	1	4
		1	1	1	0*	0*	3
4	Stationary source (flue gas) measuring instrument and vehicle	2	5	5	2	3	17
		1	1	1	1	1	5
B	Water quality monitoring	Pak	Shindh	Punjab	NWFP	Balo	Total
1	Fixed automatic continuous water quality monitoring station	1	2	3	1	0	7
		0	0	0	0	0	0
2	Water quality monitoring vehicle	1	1	1	0	1	4
		0*	0*	0*	0*	0*	0*
3	Portable water quality monitoring, water, sludge sampling equipment	0	0	0	0	0	0
		2	15	15	10	5	47
C	Major laboratory Equipment	Pak	Shindh	Punjab	NWFP	Balo	Total
1	A set of atomic absorption spectrophotometer	1	1	1	1	1	5
		1	0	1	0	1	3
2	Accessories to the atomic absorption spectrophotometer	0	0	0	0	0	0
		0	1	0	1	0	2
3	UV-VIS spectrophotometer	1	1	1	1	1	5
		1	1	0	0	0	2
4	Gas chromatograph (ECD+FID*)	1	1	1	0	0	3
		1	1	1	1	1	5
5	Ion chromatograph	1	1	1	0	0	3
		1	1	1	1	1	5
6	COD automatic analyzer	0	0	0	0	0	0
		1	1	1	1	1	5
7	TOC automatic analyzer	0	0	1	1	1	5
		0*	0	0	0	0	0
8	Sulfur content in fuel analyzer	1	1	1	1	1	5
		1	0	0	0	0	1
9	Oil content meter	1	1	1	0	0	3
		1	1	1	1	1	5
10	High-pressure liquid chromatograph	1	1	1	0	0	3
		0	0	0	0	0	0
11	ICP spectrophotometer	1	1	1	0	0	3
		0	0	0	0	0	0

	Name of equipment	Pakistanis Side					
		The Preparatory Study mark* ; to be examined by the Basic Study					
12	X-ray fluorescence analyzer	1	1	1	1	1	5
		0	0	0	0	0	0
13	Electrophoresis equipment	1	1	1	1	1	5
		0	0	0	0	0	0
D	Supporting laboratory equipment and others	Pak	Shindh	Punjab	NWFP	Balo	Total
1	pH, EC, and DO meters	1	1	1	0	0	3
		1	1	1	1	1	5
2	Pure water supply unit	1	1	1	1	1	5
		1	1	1	1	1	5
3	High volume air sampler	1	1	1	1	1	5
		2	2	2	2	2	10
4	Andersen air sampler	1	1	1	1	1	5
		1	1	1	1	1	5
5	Others						
E	Data Center equipment	Pak	Shindh	Punjab	NWFP	Balo	Total
1	Data collection - analysis related equipment (For the Data Control Center of Pak-EPA)	1	0	0	0	0	1
		1	0	0	0	0	1
2	Data collection - analysis related equipment (for each province)	0	1	1	1	1	4
		0	1	1	1	1	4
F	Buildings	Pak	Shindh	Punjab	NWFP	Balo	Total
1	Training center	1	0	0	0	0	1
		1	0	0	0	0	1
2	Data surveillance center	1	0	0	0	0	1
		1	0	0	0	0	1
3	Laboratory (new)	1	0	0	0	0	1
		1	0	0	0	0	1
4	Laboratory (rehabilitation)	0	0	1	1	1	3
		0	1	1	1	1	4
5	Fixed air monitoring compartment	1	4	4	2	2	13
		1	1	1	1	1	5
6	Mobile air monitoring station garage	0	0	0	0	0	0
		2	2	2	1	1	8
G	Equipment	Pak	Shindh	Punjab	NWFP	Balo	Total
1	Wastewater treatment equipment	0	0	0	0	0	0
		1	0	0	0	0	0
2	Wastewater treatment equipment (simple type)	0	0	0	0	0	0
		0	1	1	1	1	4
3	Flue gas treatment equipment (draft chamber with scrubber)	0	0	0	0	0	0
		2	1	1	1	1	6