

APPENDICES

1. Member List of the Study Team

(1) Field Study of the Basic Design

| Name | Designation | Affiliation |
|--------------------|---|---|
| Ms. Sachiko Misumi | Team Leader | Japan International Cooperation Agency Pakistan Office |
| Mr. Katuya Kuge | Project Coordinator | Japan International Cooperation Agency |
| Mr. Norihiro Noda | Project Manager/ Environmental Monitoring Planning | CTI Engineering International Co., Ltd. |
| Mr. Humio Arai | Environmental Facilities Planning | YAMASHITA SEKKEI INC. |
| Mr. Akio Okazaki | Facility Planning / Quality Survey on Planning | CTI Engineering International Co., Ltd. |
| Mr. Toshiharu Ochi | Environmental Monitoring Equipment Planning | Green Blue Corporation |
| Mr. Minoru Hirao | Laboratory Analysis Equipment Planning / Quality Survey on Planning | OOSUMI Co., Ltd. |
| Mr. Takashi Onuma | Coordinator on Consultant Team | CTI Engineering International Co., Ltd. |

(2) Briefing of Draft Basic Design Report

| Name | Designation | Affiliation |
|--------------------|--|---|
| Mr. Yoshio Hukuda | Team Leader | Japan International Cooperation Agency |
| Mr. Norihiro Noda | Project Manager/ Environmental Monitoring Planning | CTI Engineering International Co., Ltd. |
| Mr. Humio Arai | Environmental Facilities Planning | YAMASHITA SEKKEI INC. |
| Mr. Toshiharu Ochi | Environmental Monitoring Equipment Planning | Green Blue Corporation |

2. Study Schedule

(1) Field Study of the Basic Design Study

| No. | Date | Day | Activity |
|-----|------|-----|--|
| 1 | 2/20 | Sun | Tokyo (TG647/11:00) Bangkok (TG505/20:00) Karachi (22:40) |
| 2 | 2/21 | Mon | Karachi (PK300/07:00) Islamabad(08:55) Meeting in JICA Office / Courtesy Call to EAD / Explanation of Inception Report in Pak-EPA Office |
| 3 | 2/22 | Tue | Explanation of Inception Report for Pakistan , Sindh , Punjab , NWFP and Balochistan EPA in Pak-EPA Office / Meeting in JICA Office |
| 4 | 2/23 | Wed | Meeting in JICA Office / Courtesy Call to Ministry of Environment |
| 5 | 2/24 | Thu | Field Survey on Construction Site of Pak-EPA New Laboratory |
| 6 | 2/25 | Fri | Laboratory Equipment Survey and Discussion in Pak-EPA |
| 7 | 2/26 | Sat | Signing to M/D / Other Member : Survey on Laboratory Equipment and Fixed Air Monitoring Station Site in Peshawar |
| 8 | 2/27 | Sun | Internal Meeting |
| 9 | 2/28 | Mon | Islamabad (PK363/9:45) Quetta(11:30) / Survey on Laboratory Equipment and Fixed Air Monitoring Station Site in Quetta |
| 10 | 3/1 | Tue | Survey on Fixed Air Monitoring Station Site in Quetta / Explanation to Town Nazim Zasghoon in Hotel / Explanation to Quetta City District / Quetta (PK311/16:45) Karachi (18:00) |
| 11 | 3/2 | Wed | Survey on Laboratory Equipment and Fixed Air Monitoring Station Site in Karachi (Memorial Park, Library. Army Monitoring Center etc.) / Karachi(PK306/19:00) Lahore (21:30) |
| 12 | 3/3 | Thu | Survey on Laboratory Equipment and Fixed Air Monitoring Station Site in Lahore / Lahore (PK388/20:20) Islamabad (21:40) |
| 13 | 3/4 | Fri | Report to JICA / Data collection on Pak-EPA Office |
| 14 | 3/5 | Sat | Data collection on Pak-EPA Office |
| 15 | 3/6 | Sun | Field Survey in Islamabad |
| 16 | 3/7 | Mon | Data collection on Pak-EPA Office |
| 17 | 3/8 | Tue | Data collection on Pak-EPA Office |
| 18 | 3/9 | Wed | Data collection on Pak-EPA Office |
| 19 | 3/10 | Thu | Islamabad (PK301/10:00) Karachi(12:30) Visite to SUPARCO and PCSIR (Noda , Ochi and Okazaki) / Data Collection (Arai , Hirao and Onuma) |
| 20 | 3/11 | Fri | Karachi (PK308/16:00) Islamabad(18:30) (Noda , Ochi and Okazaki) / Data Collection (Arai , Hirao and Onuma) |
| 21 | 3/12 | Sat | Survey on Fixed Air Monitoring Station Site in Peshawar (Noda , Arai and Okazaki) / Data collection on Pak-EPA Office (Ochi , Hirao and Onuma) |
| 22 | 3/13 | Sun | Internal Meeting / Data Arrangement |
| 23 | 3/14 | Mon | Islamabad (PK363/10:30) Quetta(12:00) Survey to the Related Agency (Mr. Ochi and Mr. Okazaki) / Quetta (PK352/16:30) Islamabad (18:00) |
| 24 | 3/15 | Tue | Meeting about Technical Note on JICA Office / Data collection |
| 25 | 3/16 | Wed | Discussion with Pak-EPA |
| 26 | 3/17 | Thu | Signing of Technical Note Islamabad (PK319/22:30) Karachi(1:00) (Arai , Hirao and Onuma) |
| 27 | 3/18 | Fri | Report and Meeting in JICA/EOJ Karachi(TG508/3:35) Bangkok (TG640/11:20) Tokyo (19:30) (Arai , Hirao and Onuma) |
| 28 | 3/19 | Sat | Data arrangement in Pak-EPA Office |
| 29 | 3/20 | Sun | Islamabad (PK852 / 22:55) (Noda , Ochi and Okazaki) |
| 30 | 3/21 | Mon | Tokyo (Noda , Ochi and Okazaki) |

(2) Briefing of Draft Basic Design Report

| No. | Date | Day | Activity |
|-----|------|-----|---|
| 1 | 5/31 | Tue | Tokyo (JL717/11:00) Bangkok(TG505/20:00) Lahore(22:40) (Noda/Arai/Ochi) |
| 2 | 6/1 | Wed | Lahore (PK356/08:00) Islamabad (08:50) (Noda/Arai/Ochi) JICA Office/ Courtesy Call to Embassy of Japan, Economic Affairs Division, Ministry of Economic Affairs & Statistics (EAD), Ministry of Environment(MOE), Pakistan Environment Protection Agency (Pak-EPA) |
| 3 | 6/2 | Thu | Explanation and Discussion about Draft Final Report to MOE on Pak-EPA Office Mr. Fukuda (Tokyo (JL717/11:00) Bangkok (TG505/20:00) Lahore (22:40)) |
| 4 | 6/3 | Fri | Mr. Fukuda (Lahore (PK356/08:00) Islamabad (08:50)) Discussion about Minutes of Discussions (M/D) |
| 5 | 6/4 | Sat | Discussion about Minutes of Discussions (M/D) |
| 6 | 6/5 | Sun | Internal Meeting |
| 7 | 6/6 | Mon | Signing of M/D with MOE , Pak-EPA and EAD |
| 8 | 6/7 | Tue | Report to JICA Pakistan Office and Embassy of Japan Islamabad (PK381/19:30) Lahore (TG506/23:50) Bangkok (6:20) |
| 9 | 6/8 | Wed | Bangkok (JL708/8:35) Tokyo (16:35) |

3. List of Parties Concerned in the Recipient Country

| Name | Designation | Affiliation |
|--|------------------------------|--------------------------------------|
| <u>Government of 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 |
|----------------------|----------|-----------------|

City District Government Lahore

| | | |
|----------------------|------------------|----------------------------------|
| Mr. Tariq Zaman Khan | District Officer | City District Government ,Lahore |
|----------------------|------------------|----------------------------------|

City District Government Karachi

| | | |
|--------------------------|----------------------------|--------------------------------------|
| Dr. M. Tahir Soomro P.E. | Executive District Officer | Transport & Communication Department |
|--------------------------|----------------------------|--------------------------------------|

Government of Quetta

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

Embassy of Japan

| | |
|----------------------|------------------|
| Mr. Kazunobu SHIMURA | Second Secretary |
|----------------------|------------------|

JICA Pakistan Office

| | |
|----------------------|--------------------------------|
| Mr. Nobuyuki Yamaura | Resident Representative |
| Ms. Sachiko Misumi | Deputy Resident Representative |
| Mr. Mitsunobu Inaba | Deputy Resident Representative |
| Mr. Keiji Isigame | Staff |

4. Minutes of Discussion

- (1) Field Study of the Basic Design

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

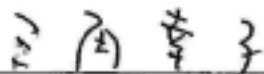
Based on the results of the Preparatory Study, the Government of Japan decided to conduct a Basic Design Study on the Project for Establishment of Environmental Monitoring System (hereinafter referred to as "the Project") and entrusted the study to the Japan International Cooperation Agency (hereinafter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

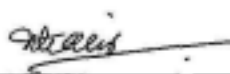
The Team held discussions with the officials concerned of the Government of Pakistan and conducted field survey at the study area.

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-I 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



JICA

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 expanding 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;

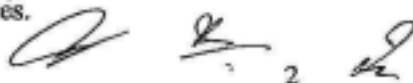
- the PSC described in No.5 of this Minutes of Discussions will work as a counterpart body of JICA (the Team and JICA Pakistan Office)

- 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



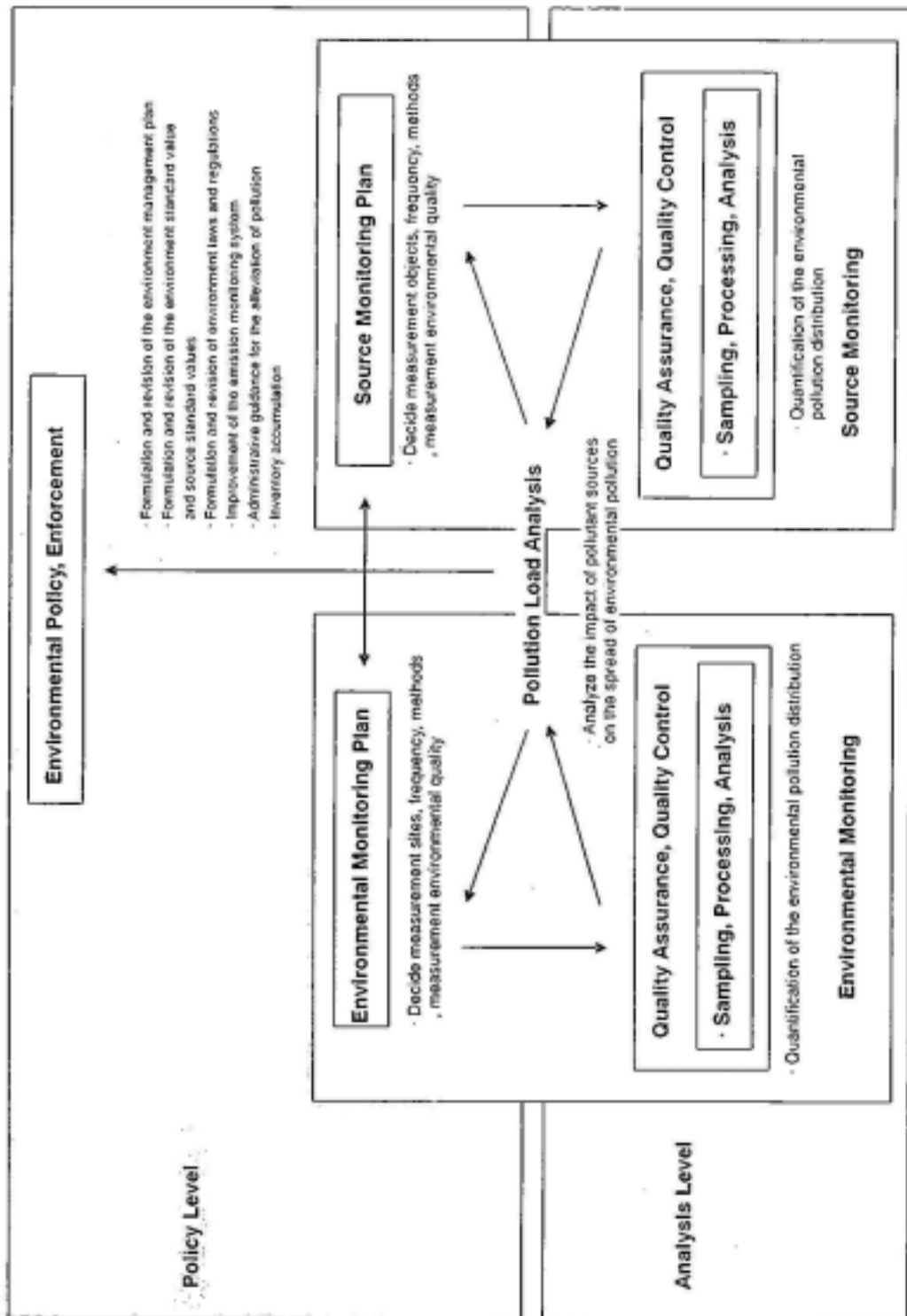


Figure 1 Environmental policy, Monitoring System

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'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 area'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. |

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|--------------------------------|---|---|
| | 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

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 | 3 |
| | | 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 | Sindh | 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 | Sindh | 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 | Sindh | 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 | Sindh | 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 |