3　アンケート集計結果

調査団派遣に先立ちC／Pの技術移転状況を把握するため、別紙1のアンケートを送付し水質課、大気・騒音課、有害物質課のC／P全員を対象に調査を行った。

アンケート回答数は以下のとおり（分子は得られた回答数、分母は在籍数）。

水質課　　8／10　（留学中1）
大気・騒音課　9／11　（長期出張又は休暇中1）
有害物質課　5／10　（長期出張又は休暇中2）
合　計　　22／31　（長期出張等を除く回収率：22／27＝ 81．5%）

I．　C／Pのバックグラウンド

（1）　C／Pの学歴別・専攻別分類

	水質課	大気騒音課	有害物質課	合計
専門学校	1			1
大学	3	5	2	10
生物学	1		1	2
公衆保健学	1			1
化学	1		1	2
物理学		3		3
農学		1		1
衛生化学		1		1
大学院修士	5	3	3	11
生物学	1		1	2
農学	1	1	1	3
土木工学	1			1
海洋科学	1			1
社会科学	1			1
物理化学		1		1
物理学		1		1
科学			1	1
合計	9	8	5	22

（2）前職歴

	水質課	大気騒音課	有害物質課	合計
なし	5	4	2	11
ONEB	1	4	2	7
PCD	1			1
原子力平和利用	1			1
廃水処理		1		1
民間企業			1	1
合計	8	9	5	22

以下、設問IIからVまでの回答内容はC／Pごとに記述する。

なお、C／P名は以下のとおり記号化する。ただし、現在の所属に従っているため、旧所属時代に担当した業務・研究テーマ等が現担当部門の中に一部混在する。

W（水質課）

W 1 : Ms.Pornthip Pancharoen
W 2 : Mr.Meesak Milinthawisamai
W 3 : Mr.Piya Sansanayuth
W 5 : Mr.Pancha Yaithaworn
W6 : Ms.Cheeranan Pantachak
W 7 : Mr.Assamol Limsakul
W8 : Ms.Valika Sawateyothin
W9 : Ms.Peerapong Sunthondecha

A（大気・騒音課、大気担当）

A 1 : Ms.Phaka Sukkaseam
A 2 : Ms.Hatairatana Garevait
A 4 : Ms.Wanna Laowakul
A 7 : Mr.Veerathep Keeratitadaniyom
A 8 : Mr.Virat Auesongthaun

N（大気・騒音課、騒音担当）

N 5 : Mr.Nattapong Jansombat
N 6 : Mr.Tanaphan Sukusa-ad
N 9 : Mr.Tanawut Norat
N 10 : Ms.Daise Moknoy

T（有害物質課）

T 1 : Ms.Sukanya Boonchaleamkit
T 2 : Ms.Juthathip Yooyen
T 4 : Ms.Ruchaya Boonyatummanon
T 5 : Mr.Janewit Wongsanoon
T 7 : Ms.Chaunpit Boonyoy

Ⅱ．　ＪＩＣＡ専門家からの技術移転

（1）水質部門

C/P	研究テーマ	学習内容	自己評価
W1.	産業廃水による地下水汚染	ＶＯＣによる汚染	B
	廃水処理技術	人工湿地による生活排水の処理	B
W2.	地下水汚染	地下水の動きと汚染源の測定法	A
	地球物理学	電磁波による地表下構造の測定法	A
	地下水のモデル化	地下水とその汚染の動きのｼﾐｭﾚｰｼｮﾝ	A
	(JICA 専門家へのｺﾒﾝﾄ：地球物理学始め一部の短期専門家は派遣期間が短すぎた。)		
W3.	人工湿地による生活排水処理	水質分析技術及び結果の解析	B
		人工湿地のモデルによる実装置の設計	A
W5.	実験室廃水の管理及び処理		B
	(JICA 専門家へのｺﾒﾝﾄ：原生動物、ﾍﾞﾝﾄｽの専門家の派遣)		
W6.	埋立地からの浸出水の予備試験	ｶﾞｽｸﾛによる廃水分析	B
	実験室廃水の管理及び処理		B
	VOC による地下水の汚染	ﾎﾟｰﾀﾌﾞﾙGC による分析	B
W7.	有害廃棄物による地下水の汚染	ﾎﾟｰﾀﾌﾞﾙGC,GC-MS による分析	B
		土壌ガス分析装置を用いた分析	B
	地球物理学	地下水管理及び電磁波による地表下の測定法	A
	地下水汚染のモデル化	地下水及び汚染物質の移動ｼﾐｭﾚｰｼｮﾝ技術	B
W8.	実験室廃水の処理	重金属含有廃水の処理	B
W9.	砒素分析法	水素化砒素発生装置	B

（2）大気部門

C/P	研究テーマ	学習内容	自己評価
A1.	貯水池の重金属の同定	水、魚、底質汚泥等の試料前処理	B
		ＧＣ，ＡＡＳを用いた分析	B
	交通騒音のモデルによる研究	音響理論、騒音測定、騒音拡散予測の研究	B
A2.	ｶﾞｿﾘﾝｴﾝｼﾞﾝ排気中 HC の測定	排ガスのｻﾝﾌﾟﾘﾝｸﾞ、GC/FID による分析	
		データの評価	B
	PAH による大気汚染の研究	論文作成技術の移転、HPLC,ｱﾝﾀﾞｰｾﾝｻﾝﾌﾟﾗｰ	
		を用いた大気運搬 PAH の分析、SPM 配分法	B
A4.	ｶﾞｿﾘﾝｴﾝｼﾞﾝ排気中炭化水素	ｻﾝﾌﾟﾘﾝｸﾞ、分析、ﾃﾞｰﾀの評価技術とﾉｳﾊｳ	
	の分析	ｼｬｰｼｰﾀﾞｲﾅﾓを用いてのｻﾝﾌﾟﾘﾝｸﾞ計画法	B
	PAH による大気汚染の研究	論文の書き方	B

PAH 汚染ﾃﾞｰﾀの統計的解析法	SPM 分配法のｿﾌﾄｳｪｱ研究	A
	SPSS 及び多重回帰要素解析法	A
PAH の分析技術	HPLC を用いた大気中 PAH の分析	A
A7. 大気環境質のﾓﾆﾀﾘﾝｸﾞ	ﾊﾞｯｼﾌﾞｻﾝﾌﾟﾗｰの改善と機器のﾒﾝﾃﾅﾝｽ	B
A8. 大気環境質のﾓﾆﾀﾘﾝｸﾞ	ﾊﾞｯｼﾌﾞｻﾝﾌﾟﾗｰの改善と機器のﾒﾝﾃﾅﾝｽ	B
酸性雨	酸性雨のｻﾝﾌﾟﾘﾝｸﾞ及び分析	B

（3）騒音部門

C/P　研究テーマ	学習内容	自己評価
N5. 空港近辺の航空騒音の測定	測定技術、測定点の選定、ﾃﾞｰﾀ解析	B
ﾊﾞﾝｺｸ首都圏の騒音測定	測定技術、測定点の選定、ﾚﾍﾞﾙﾏｯﾌﾟの作成	A
N6. 道路騒音予測ﾓﾃﾞﾙ	道路交通騒音測定技術、予測ﾓﾃﾞﾙの理論	A
航空機騒音予測ﾓﾃﾞﾙ	航空機騒音測定技術、INM-V40 予測ﾓﾃﾞﾙ	A
N9. 工場騒音予測ﾓﾃﾞﾙ	工場騒音測定技術、ﾃﾞｰﾀ解析、予測ﾓﾃﾞﾙ	B
N10.ﾊﾞﾝｺｸ首都圏の騒音測定	測定技術、測定点の選定、ﾚﾍﾞﾙﾏｯﾌﾟの作成	A

（4）有害物質部門

C/P　研究テーマ	学習内容	自己評価
T1. 生物試料採取による砒素汚染の	研究計画作作成、現地調査計画作成・試料採取、	
ﾓﾆﾀﾘﾝｸﾞ方法論の研究	分析及びﾃﾞｰﾀの評価法、報告書・論文作成法	A
T4. PAH の分析	GC-MS による分析、ﾃﾞｰﾀ処理・解釈法	A
分析機器のﾒﾝﾃﾅﾝｽ	日本電子 GC-MS の点検及び基礎的ﾒﾝﾃﾅﾝｽ	A
T5. 海洋及び陸上の砒素汚染	試料採取計画作成、重金属分析、ﾃﾞｰﾀ解析、	
	報告書作成法	B
T6. PAH の食物連鎖における分布	文献調査、研究計画作成法	B
T7. PAH の食物連鎖における分布	文献調査、研究計画作成法	B

Ⅲ．　日本派遣研修

C/P　研修受入機関	研修内容	自己評価
W１．環境庁	ﾓﾆﾀﾘﾝｸﾞ技術、ﾈｯﾄﾜｰｸの構築、ﾃﾞｰﾀの評価、	B
W３．国立環境研究所	嫌気性汚泥による生活排水処理技術	
	低ｺｽﾄ廃水処理技術、人工湿地による排水処理技術	C
W４．東京都環境科学研究所	大気汚染物質、悪臭、自動車排ガスのｻﾝﾌﾟﾘﾝｸﾞ	
	大気汚染物質の先端技術による分析法	B

(ｺﾒﾝﾄ：幾つかのラボでは英語での意志疎通がやや難しかった)

Ｗ５．	国立環境研究所	生物指標による水質の評価法、最適生物指標の選定法、水質の変化をｱｾｽするための生物指標ﾃﾞｰﾀの解析法	B
Ｗ６．	愛媛大学	有機錫含有物の量定、分析法	B
Ａ１．	国立衛生研究所	電子顕微鏡によるｱｽﾍﾞｽﾄの分析	A
	愛媛大学	原子吸光分析装置による重金属分析	A
Ａ２．	国立環境研究所	ｴｱﾛｿﾞﾙの要素の分析	A
		標準物質関係の学習	A
	環境研修センター	環境試料中の構成要素の分析技術	A
Ａ７．	香川県環境研究ｾﾝﾀｰ	大気環境ﾓﾆﾀﾘﾝｸﾞ、煙道ｻﾝﾌﾟﾘﾝｸﾞ、ﾊﾟｯｼﾌﾞｻﾝﾌﾟﾗｰ	B

(ｺﾒﾝﾄ：非常に興味深いﾃｰﾏだが、時間が短かすぎたため詳細に入れなかった)

Ｎ５．	広島市	都市の騒音・振動環境	B
	千葉県	成田空港の騒音管理	B
	国立環境研究所	無響室における研究活動	B
Ｔ１．	環境庁、東京都	環境技術研修のｶﾘｷｭﾗﾑ開発、会議のｱﾚﾝｼﾞ	B
Ｔ４．	広島県環境保健研究所	底質汚泥、魚等の有機錫の HPLC による分析	A
	福岡市公衆衛生研究所	大気運搬粒子中 PAH の HPLC による分析	B
	愛媛大学	有機錫分析技術ｽに関するﾃﾞｨｽｶｯｼｮﾝ	B
Ｔ５．	山梨県公衆衛生研究所	生物指標による環境ﾓﾆﾀﾘﾝｸﾞ技術	B
	愛知県環境研究所	大気、水、音のﾓﾆﾀﾘﾝｸﾞ、水質ﾃﾞｰﾀの処理	C

Ⅳ-1.2. 研究論文発表：（ ）内は学会発表したもの

Ｗ１．タイ４大河川の水質に関する研究
ソンクラ湖の水質汚染問題
ﾊﾟﾄﾝﾀﾆ県における環境問題と管理に関する事例研究（学会発表）

Ｗ２　ＥＲＴＣ式置ける廃水処理システム（ＡＡＷＭ第３回ｱｼﾞｱｼﾝﾎﾟｼﾞｳﾑにおいて発表）

Ｗ３　えび養殖排水：汚染問題と人工湿地による処理(国際的学会誌に掲載、ＩＡＷＱ国際会議において発表)

Ｗ８　タイの主要河川における水質と底質汚泥の分布と相関に関する研究

Ａ１　むらさき貝監視法によるタイ湾における重金属ﾓﾆﾀﾘﾝｸﾞ（環境科学誌に掲載、国際会議において発表）

Ａ２　熱帯の都市(ﾊﾞﾝｺｸ)におけるＰＡＨによる大気汚染の研究

Ａ４　４ｽﾄﾛｰｸｶﾞｿﾘﾝｴﾝｼﾞﾝ排気中の炭化水素構成の測定

Ｎ５　タイの空港付近における航空騒音の測定（1991 9月　INCEｼﾝﾎﾟで発表）

ﾊﾞﾝｺｸの環境騒音測定のための短時間測定法のﾌｨｰｼﾞﾋﾞﾘﾃｨｰｽﾀﾃﾞｨｰ(1996年9月に京都で開催されたINCEｼﾝﾎﾟで発表)

N６　道路交通騒音予測ﾓﾃﾞﾙの開発（1994年8月 ｲﾝﾀｰﾉｲｽﾞ'94で発表）

Ｔ１　ﾊﾞｸ・ﾊﾞﾅﾑ湾における砒素汚染の研究(1996年1月ﾏﾚｰｼｱでEOPCｱｼﾞｱ海洋環境管理会議において発表)

ﾊﾞﾄﾝﾀﾆ県におけるﾊﾞｯﾃﾘｰ工場からの鉛残留物による汚染の毛髪を用いた研究

Ｔ４　ﾁｬｵﾌﾟﾗﾔ川の有機塩素系農薬の濃度分布(1996年6月ｼﾝｶﾞﾎﾟｰﾙで開催された第1回ｱｼﾞｱﾊﾟｼﾌｨｯｸ農薬ﾜｰｸｼｮｯﾌﾟにおいて発表)

水質ｻﾝﾌﾟﾙ中の有機塩素系農薬分析のためのﾘｶﾊﾞﾘｰﾌｧｸﾀｰの開発（1996年9月米国で開催されたﾘｶﾊﾞﾘｰﾌｧｸﾀｰの使用に関する国際的一致を目指す第7回ｼﾝﾎﾟｼﾞｳﾑにおいて発表）

Ｔ５　ﾊﾞｸ・ﾊﾞﾅﾑ湾における砒素汚染の研究

Ⅳ-3.　ERTC研修各コースで指導員を務めたＣ／Ｐ

コース名	Ｃ／Ｐ
水質汚濁管理コース	Ｗ１，
水･排水分析ｺｰｽ	Ｗ２，Ｗ３，Ｗ６，Ｗ７，Ｗ８，Ａ１，
排水処理技術コース	Ａ１，
大気汚染管理ｺｰｽ	Ａ７，
工場排ガス分析	Ｗ４，Ａ２，Ａ８，
重金属分析コース	Ｗ６，Ａ１，Ｔ１，Ｔ５，
廃棄物分析コース	Ｗ６，
騒音公害コース	Ｎ５，Ｎ６，Ｎ９，Ｎ１０
環境ﾓﾆﾀﾘﾝｸﾞｺｰｽ	Ｎ５，Ｎ６，Ｎ１０
環境ｱｾｽﾒﾝﾄｺｰｽ	Ｎ６
有害物質分析コース	Ｔ１，Ｔ４，Ｔ５，

Ⅴ-1.　Ｃ／Ｐの分析実務能力（カッコ内は使用する機器・装置名）

C/P	分析実務内容	自己評価
Ｗ１．	現在は分析作業は行っていない。	
Ｗ２．	TCE,TCA,PCBなどのVOC分析	b
Ｗ３．	一般項目の分析	

W５．有機塩素系農薬分析（ＧＣ）	b
W６．水質一般分析	
重金属分析（ＡＡＳ）	a
W７．TCE,TCA,PCBなどのVOC分析	a
W８．ｱﾆｵﾝ、ｶﾁｵﾝの分析（ｲｵﾝｸﾛﾏﾄｸﾞﾗﾌ）	a
地下水中のＶＯＣ分析(ﾊﾟｰｼﾞﾀﾌﾟﾙＧＣ)	a
水質一般項目の分析	a
ｻﾝﾌﾟﾘﾝｸﾞ	b
W９．重金属分析（ＡＡＳ）	a
Ａ１．水、土壌、生物試料中の重金属分析（ＡＡＳ）	a
騒音測定	a
固体試料中のＣＨＮ分析（ＣＨＮｱﾅﾗｲｻﾞｰ）	a
ｱｽﾍﾞｽﾄの分析(電子顕微鏡)	a
Ａ２．4ｽﾄﾛｰｸｶﾞｿﾘﾝｴﾝｼﾞﾝ排気中の炭化水素分析(GC/FD)	a
空気運搬粒子中のＰＡＨ分析（HPLC）	a
環境試料中の構成要素分析（ＡＡＳ）	b
大気環境中の２酸化硫黄分析（UV/VIS）	
Ａ４．自動車排気の炭化水素分析（ＧＣ）	b
空気運搬粒子のＰＡＨ分析（ＨＰＬＣ）	b
窒素酸化物分析（ＵＶ－ＶＩＳ）	a
Ａ７．ｽﾃｰｷｻﾝﾌﾟﾘﾝｸﾞ法（ｽﾃｰｷｻﾝﾌﾟﾘﾝｸﾞﾕﾆｯﾄ）	b
Ａ８．無機物質の分析(ｲｵﾝｸﾛﾏﾄｸﾞﾗﾌ)	b
Ｎ５．騒音ﾃﾞｰﾀ解析（騒音ﾚﾍﾞﾙ計、ﾘｱﾙﾀｲﾑｱﾅﾗｲｻﾞｰ）	a
Ｎ６．周波数解析（1/8ｵｸﾀｰﾌﾞﾊﾞﾝﾄﾞｱﾅﾗｲｻﾞｰ）	a
Ｎ９．騒音測定、ﾃﾞｰﾀ収集、解析(騒音ﾚﾍﾞﾙ計、1/8ｵｸﾀｰﾌﾞﾊﾞﾝﾄﾞｱﾅﾗｲｻﾞｰ、ﾚｺｰﾀﾞｰ)	a
N10．騒音測定、ﾃﾞｰﾀ収集、解析(騒音ﾚﾍﾞﾙ計、1/8ｵｸﾀｰﾌﾞﾊﾞﾝﾄﾞｱﾅﾗｲｻﾞｰ、ﾚｺｰﾀﾞｰ)	a
Ｔ１．現在は分析作業に従事していないので記述しない	
Ｔ４．有機塩素系農薬、PAH，PCB分析（GC-MS/ECD/NPD/FPD, HPLC）	a
Ｔ５．水質一般項目の分析	a
重金属分析（ＡＡＳ）	b
Ｔ６．水中、底質汚泥中の重金属分析（ＡＡＳ）	b
Ｔ７．水中、底質汚泥中のＰＡＨ分析（ＨＰＬＣ）	b

V-2.　研究能力

	テーマ選定	計画	実施	結果解析	報告書作成
a	2	4	4	2	1
b	12	11	12	11	14
c	8	7	6	9	7

V-3.　研修指導能力

	計画	カリキュラム作成	テキスト作成	指導員
a	5	2	4	8
b	11	14	9	8
c	6	6	9	6

VI. 考　察

各分野の技術移転状況について専門技術別に要約すれば以下のとおり。

（1）水質部門

ＪＩＣＡ専門家から技術移転された研究テーマは、有機物質による地下水汚染、人工湿地による排水処理技術等のテーマ、及びこれに関連した種々の派生テーマについて研究を行い、また、フィールドにおけるデータ収集を行うなど地道な活動を行っている。これらの研究結果を踏まえて提出された研究論文は１８を数え、そのうち国内の学会あるいは国際会議に発表したものは８本であった。

分析技術については、水質一般項目の分析は全員がマスターしており、また重金属分析はＡＡＳ、有機系農薬やＶＯＣ等有機物分析はＧＣ、アニオン及びカチオンの分析はイオンクロマトグラフィをそれぞれ用いて分析を行っている。ただし、ＨＰＬＣやＧＣ／ＭＳを用いた特殊な分析は有害物質課の支援を得ている。

ＥＲＴＣ研修の分析実習コースにおいては、グループ中比較的若手のスタッフが講師として任命されており、これらコースが基礎コースであることを差し引いても十分役割を果たしている。

（2）大気部門

ＪＩＣＡ専門家から技術移転された研究テーマは、ＰＡＨによる大気汚染、４ストロークガソリンエンジン排気中炭化水素の分析、パッシブサンプラーの使用による大気汚

染モニタリング、酸性雨のサンプリング・分析等であり、これらの基礎となるデータ解析及び評価、統計的手法の応用、機器のメンテナンス及び改良等の技術についても徐々にマスターしてきている。これらの研究結果を踏まえて１７本の論文が提出され、６本の論文は国内又は国際学会において発表された。

分析技術については、ＡＡＳによる重金属分析はもとより、ＧＣ／ＦＤを用いたガス中の炭化水素分析、ＨＰＬＣを用いたＰＡＨの分析、その他ＵＶ－ＶＩＳ、ＣＨＮアナライザー、イオンクロマトグラフの使用も一部のスタッフは可能である。

ＥＲＴＣ研修の分析実習コースにおいては、グループ中比較的若手のスタッフが講師として任命されており、これらコースが基礎的コースであることを差し引いても十分役割を果たしている。

（3）騒音部門

ＪＩＣＡ専門家から技術移転された研究テーマは、空港周辺の航空騒音の測定、首都圏の環境騒音測定、道路騒音予測モデルの検証、航空騒音予測モデルの検証、工場騒音予測モデルの検証等比較的高度であり、夜間測定等を含めよくやっていると評価できる。しかし、今後は必要な予測モデルを自ら手配し、自ら技術的解釈を行わねばならないことを覚悟する必要がある。これらの研究結果を踏まえて、３本の研究論文が国際学界（インターノイズ）で発表された。

測定技術については、騒音レベル計はもとより、１／８オクターブバンドアナライザー等を用いた騒音測定及び周波数解析を行っている。また、これらに伴う騒音マップの作成等パソコンの活用についても相当なレベルに達している。

ＥＲＴＣ研修の講師としては、騒音公害コースに参加したほか、環境モニタリングコース、環境アセスメントコースにも参加し、十分役割を果たしている。

（4）有害物質部門

ＪＩＣＡ専門家から技術移転された研究テーマは、砒素汚染のモニタリング（生物試料、海上及び陸上）、PAH の分析（大気、水質、食物連鎖）等であり、関連する基礎的技術である研究計画作成法、現地調査計画法、分析及びデータの評価法、報告書・論文作成法についても学習が行われた。これら研究結果を踏まえて、２８本の論文が提出され、このうち４本が国内又は国際学会において発表された。

分析技術については、水質一般項目やＡＡＳを用いた重金属分析はもとより、一部のスタッフはＧＣ／ＭＳによる有機塩素系農薬分析、ＰＣＢ分析、ＨＰＬＣによるＰＡＨ分析が可能である。また、生態試料や底質汚泥分析に伴なう試料の前処理についても一応のレベルに達している。

ＥＲＴＣ研修の分析実習コースにおいては、グループ中比較的若手のスタッフが講師として任命されており、これらコースが基礎的コースであることを差し引いても十分役

割を果たしている。

(5) 総合評価

以上のとおり、研究、分析技術、研修指導の各分野においてＪＩＣＡ専門家の適切な指導により順調に技術移転が行われた結果、ＥＲＴＣスタッフによる活動の成果がタイ環境行政にとって十分評価できるレベルにあり、また、研究結果等が基礎資料として活用されていることから、ＥＲＴＣが独立した研究・研修機関として持つべき基礎は十分備わったと評価できる。

プロジェクト終了後もＥＲＴＣが自立して発展を続けるためには、研究テーマの選定、計画の作成能力をさらに高める必要があるが、今まで専門家から技術移転された基礎知識をさらに展開し、また、大学や他の研究機関等との交流を進めることにより培っていくことが望ましい。

また、分析機器や薬品等の維持管理については、工具、予備品、薬品の適正管理といった基礎的な問題から、トラブルシューティングや機器メーカーとのコンタクト等のノウハウまでについて残された半年間に技術移転の仕上げが行われる必要があろう。

(別紙1)

ERTC c/p Evaluation Results of Training & Technology Transfer (Sheet No.1) Sept. 1996

I	Name	First:	Middle:	Family:		Year of Birth:	Mr. Mrs. Miss			
	Education	Name of University		Faculty		Majored in		Year of Grad.		
		Graduate School		Faculty		Majored in		Year of Grad.		Master, PhD
	Work History	Previous Work Place		Duration		Job Description				
		Present Position		From		Job Description				
	Foreign Language Ability	English	Reading: A B C D	Writing: A B C D	Speaking: A B C D					
			Reading: A B C D	Writing: A B C D	Speaking: A B C D					

II Technology Transfer from JICA Experts (Long Term Expert and Short Term Expert)

Research Subject(Theme)	Name of the Expert (L:long, S:short)	What have you learned ?	Analytical & other instrument utilized	Result of T.T. (Self Evaluation)
	L or S			A B C D
	L or S			A B C D
	L or S			A B C D
	L or S			A B C D

Any Comments, Requests and Suggestions for the Technology Transfer from the Japanese Experts:

III	Traning in Japan	Subject (Theme)		Targets	1. 2. 3.	Year	

Name of Trained Institution	Name of Trainer	Trained Technology	Analytical & other instrument utilized	Result of Training (Self Evaluation)
				A B C D

Remarks: A - Excellent B - Good C - Fair D - Poor

(continue to Sheet No.2)

(Sheet No. 2)

				A B C D
				A B C D
Comments:				

IV	Others
1. Titles of Research Papers you produced in the ERTC	
2. Presentation of Research Paper in Conference or Academy	
3. How have you served as Trainer in the ERTC Training Course? (times, name of course)	
V	How high is your present Technology Level?

1. Practice of Analysis(including Sampling and Pre-treatment of Samples)

What can you analyze utilyzing Analytical and other Instruments?	Name of Instrument utilized	Level of Skill (Self Evaluation)
		a b c
		a b c
		a b c
		a b c

2. Research Ability	Identification of Theme	a b c	Planning	a b c	Execution	a b c	Result Analysis	a b c	Report Writing	a b c			
3. Training Ability	Planning	a b c	Curriculum Formation	a b c	Text Production	a b c	As Trainer	a b c					
Comments:													

Remarks: a = Able to do by oneself b = Need a little support by other person c = Need further training

4　タイ環境問題の抜本的解決のための一考察

１９９６年１０月２５日
ＪＩＣＡ/ＥＲＴＣ評価調査団

１．環境汚染にタイする基本的認識

過去１０年間の高度経済成長により、タイの経済活動は倍増（ＧＤＰベースで２．４倍）したにもかかわらず、環境対策の抜本的な改革はなおざりにされたため、バンコクの大気汚染に代表されるようにタイの環境汚染のレベルは危機的な状況にあり、今後更に悪化することが懸念される。

２．環境問題解決のボトルネック

タイの環境汚染問題の抜本的な改善のためには、以下の４つのボトルネックの克服に留意する必要。

（１）環境汚染の全貌が明らかでないこと

環境汚染の実態が必ずしも定量的に明らかにされていないため、漠然とした不安は関係者の間に存在するものの、国民、政府、経済界ともに、この問題の重要性及び深刻さを十分に認識しておらず、結果的に対応が先送りされている。

（２）制度的に不備であること

１９９２年に環境法が大幅に改正されたが、依然、環境汚染対策の立案及び実施に関する責任と権限の所在が曖昧であり、環境対策は業所管省庁の業に係る行政のごく一部として実施されているに過ぎず、総合的、包括的な対策が実施できない状況にあり、悪化する問題に対して制度的に極めて不備である。

（３）技術及び人材が不足していること

環境汚染の状況を把握するためのモニタリング技術、環境規制の適正な実施を担保するための検査技術、これらの技術を身につけた技術者の数が圧倒的に不足しているため、既存の制度ですら、必ずしも適正には実施されていない。

また、政府（中央、地方とも）、民間を問わず、環境保全（管理）に対する包括的な知識を有する者が不足していることが、開発政策や個別の産業立地、工場

稼働等における環境配慮を不十分なものとしている。

（４）コストの負担に積極的でないこと

環境対策の実施は、中長期的にみれば経済的にペイすることは世界的に認知されているものの、短期的には経済発展の阻害や社会投資の増大等の痛みを伴うことから、これまでのところ、これらのコストを負担してまで環境対策を進めるとのコンセンサスは形成されていない。

３．ＥＲＴＣの果たす（果たした）役割

日本の本格的な環境援助の第１号であるＥＲＴＣは、援助の目的にも明記されているように、環境汚染に係る研究、研修及びモニタリングを通じて、タイの環境保全施策の実施を支援することを目指したものである。

具体的には、上記「２」の４つのボトルネックのうち、（１）及び（３）の解決に貢献。（１）に関しては、研究活動を通じて、先進国等で問題となっているがタイではその実態が全く不明であった汚染の把握等にパイオニア的な役割を果たしている。また、（３）に関しては、関係省庁、特殊法人、地方政府、民間等広範囲な分野の環境関係者を対象として、環境管理から分析技術に至るまでの幅広い研修を実施することにより、質、量共に人材の育成に貢献している。

４．日本が今後果たすべき役割

ＥＲＴＣを通じた日本の援助は、タイの環境問題の解決に一定の役割は果たしたものの、環境対策は緒についたばかりであり、ＥＲＴＣプロジェクトに対する日・タイ双方の相当の努力にも係わらず、悪化する環境汚染を前にすると無力感は否めない。

「２」で述べたボトルネックに留意し、今後、日本がタイの環境問題の解決に対して、一歩踏み込んだ支援をする場合には、以下のことが考えられる。

（１）環境汚染状況の総点検調査の実施

バンコク等一部の都市で、一部の汚染物質による汚染状況はモニタリングされているものの、タイ全土の汚染状況は未だ定量的には明らかでない。

このため、環境汚染総点検調査を実施し、全国の汚染状況及び将来動向を明らかにし、これを国民及び政・官・財全てに知らしめることにより、環境汚染問題に関し自国の将来をどのようにするのかを、自らが真剣に考える材料を提供する。

（２）環境保全制度改善に係る高級アドバイザーの派遣

タイの現在の環境保全制度は、問題の実態からみて明らかに不備である。本来、国内的な制度はその国自身で決めるべきものであるが、タイの現在の制度的状況は日本の公害国会（１９７０年）以前の状況と類似点が多いことから、日本の公害国会以降の制度的な構築の経験を踏まえると、日本は今後のタイの望ましい環境保全制度のあり方を提示しやすい立場にある。

このため、制度改革に関して、関係省庁全体への指導ができるよう、例えば、タイ首相直属の高級アドバイザーの派遣が考えられる。

（３）地方環境センターの設立

環境汚染はすぐれて地域密着の問題でもあるため、環境モニタリング、環境規制の施行等の環境対策は地方政府が担当することが効率的かつ現実的である。このことは日本を含め本格的な環境対策を実施している先進国の実態が如実に物語っているところである。

タイは、現在、中央政府が全国を直接担当する行政制度であるが、いずれ環境モニタリングや規制は地方政府へ権限委譲がなされるものと考えられるため、地方政府での環境対策の実施を担保するために、各地方に小規模な環境センターの設置を促し、日本がこれを支援する。

（４）環境保全資金の供与

タイが抜本的な環境保全制度の改善に沿って、各種の環境対策を実施する場合には、必要な資金の一部を円借款で支援する。例えば、

ア．社会投資的な環境保全対策である、下水道、ゴミ処理施設等の整備を支援。

イ．民間部門が環境規制を遵守するために脱硫装置、排水処理装置等の設置のための公害防止投資に対して、円借款を活用した２ステップローンにより、低利資金を融資する。

（５）ＮＧＯに対する支援

現在、タイの環境分野ではＮＧＯの活動が活発となっており、環境法においてもその重要性、役割等が明らかにされているところである。これらＮＧＯの活動に対して積極的に支援する。

（６）近隣諸国への環境技術の移転の支援

近年、タイはインドシナ諸国等への支援を強化しつつあるが、今後、タイと同様の環境問題を抱えると考えられる近隣諸国に対して、ＥＲＴＣ等を活用してタ

イ政府が実施する環境援助を支援する。

5．おわりに

環境汚染問題に対してタイ国がどのような選択をするかは、独立国であるタイ国自らが決定すべきものであることは当然である。しかし、仮に、既にこの問題で陰と光とを共に経験した日本が、取るべき方策の実施に必ずしも前向きでないタイ国に対して、いわば苦いけれども良く効く薬を患者に飲ませる医者の立場から、「善意の押し売り」をするとすれば、その方法として以下のことが想定される。

（1）環境対策は、結局は自国の繁栄にプラスであることを、あらゆる機会に説明し、適正な政策の導入を促す。

（2）この場合、環境問題は社会経済のあり方と密接不可分であり、このためその解決は環境の場のみの議論では一般に進展が困難であるとの特性を踏まえると、日本はタイに対する包括的な外交的影響力を動員して、アメとムチの両面から、上記の「善意の押し売り」を進めるべきである。アメとしては「4」で述べた支援が考えられる。ムチとしては、例えば次のことが考えられる。

ア．環境汚染を放置する国に対しては、セキュリティの問題と同様に、いずれ環境汚染を理由に外国からの投資は減少すること（例えば、メキシコの大気汚染、特に鉛汚染により幼児の脳の発育障害が懸念されることから、先進国の者はメキシコ現地法人での勤務を敬遠している。）。

イ．環境汚染を放置すると、いずれ一次産品（農水産物等）の汚染が進行し、輸出が困難になること（例えば、以前タイ産の水産物中の汚染物質濃度がＥＣの食品基準を超過したためＥＣへの輸出が不可となった。）。

ウ．環境汚染を放置することは、観光資源としての環境の価値を損なうことであり、いずれ日本等からの観光客の減少につながること（例えば、フランス政府はバンコクの環境汚染を理由に１２歳以下のフランス人のバンコクへの渡航の自粛を呼びかけている）。

エ．環境汚染は自国にとどまらず、越境汚染として近隣諸国を侵害することと

なりインドシナ半島の要たる地位を模索するタイの国際的な名声を危うくするものであること。

5　延長時R／Dおよびミニッツ

THE RECORD OF DISCUSSIONS
ON THE EXTENSION OF THE DURATION
OF THE JAPANESE TECHNICAL COOPERATION
FOR
THE ENVIRONMENTAL RESEARCH AND TRAINING CENTER PROJECT

With regard to the extension of the duration of the Japanese technical cooperation for The Environmental Research and Training Center Project (hereinafter referred to as "the Project") based on the Record of Discussions signed in Bangkok on March 29, 1990, Mr. Shinichiro Omote, Resident Representative of the Japan International Cooperation Agency (hereinafter referred to as "JICA") in the Kingdom of Thailand, held a series of discussions with the Thailand authorities concerned. The discussions were in accordance with the results of the joint evaluation by the Japanese and Thai team conducted in Bangkok on December 13, 1994.

As a result of discussions, both sides agreed to recommend to their respective Governments the implementation of the extension of the duration of the Japanese technical cooperation for the Project along the lines described in the document attached hereto.

Bangkok, March 8, 1995

Mr. Shinichiro Omote
Resident Representative,
JICA Thailand Office,
Japan International Cooperation
Agency (JICA), Japan

Mr. Kasem Snidvongs
Permanent Secretary
Ministry of Science,
Technology and Environment
The Kingdom of Thailand

THE ATTACHED DOCUMENT

I. THE EXTENSION PERIOD OF TECHNICAL COOPERATION

From April 1, 1995 to March 31, 1997

II. DISPATCH OF JAPANESE EXPERTS

The Government of Japan will provide the services of Japanese Experts as listed below ;

1. Long-term Experts
   (1) Chief Advisor
   (2) Senior Advisor
   (3) Coordinator
   (4) Expert in the field of Water Pollution
   (5) Expert in the field of Air Pollution
   (6) Expert in the field of Noise and Vibration
   (7) Expert in the field of Toxic Substances

2. Short-term Experts

   Short-term Experts will be dispatched, when necessity arises, for smooth implementation of the Project

III. ADMINISTRATION OF THE PROJECT

1. Director General, Department of Environmental Quality Promotion (hereinafter referred to as "DEQP"), as the Project Director, will bear overall responsibility for the administration and implementation of the Project.

2. Director of The Environmental Research and Training Center (hereinafter referred to as "ERTC"), as the Project Manager, will be responsible for the managerial and technical matters of the Project.

3. The Japanese Chief Advisor and Senior Advisor will provide necessary recommendations and advice to the Project Director and the Project Manager on any matters pertaining to the implementation of the Project.

4. The Japanese experts will give necessary technical guidance and advice to the Thai counterpart personnel on technical matters pertaining to the implementation of the Project.

5. For the effective and successful implementation of technical cooperation for the Project, a Joint Coordinating Committee will be established whose functions and composition are described in Annex I.

6. The organization chart of the Project is shown in Annex II.

IV. All matters other than those mentioned above will be treated in the same manner as prescribed in the Articles of the Record of Discussions signed in Bangkok on March 29, 1990.

ANNEX1 JOINT COORDINATING COMMITTEE

1. Functions

The Joint Coordinating Committee will meet at least once a year and whenever necessity arises, and work :

(1) To formulate the Annual Plan of the Project in line with the Tentative Schedule of Implementation formulated under the framework of this Record of Discussions;
(2) To review the overall progress of the technical cooperation program as well as the achievements of the above-mentioned Annual Work Plan;
(3) To review and exchange views on major issues arising from or in connection with the technical cooperation program.

2. Composition

(1) Chairman :

Deputy Permanent Secretary of MOSTE

(2) Thai side :

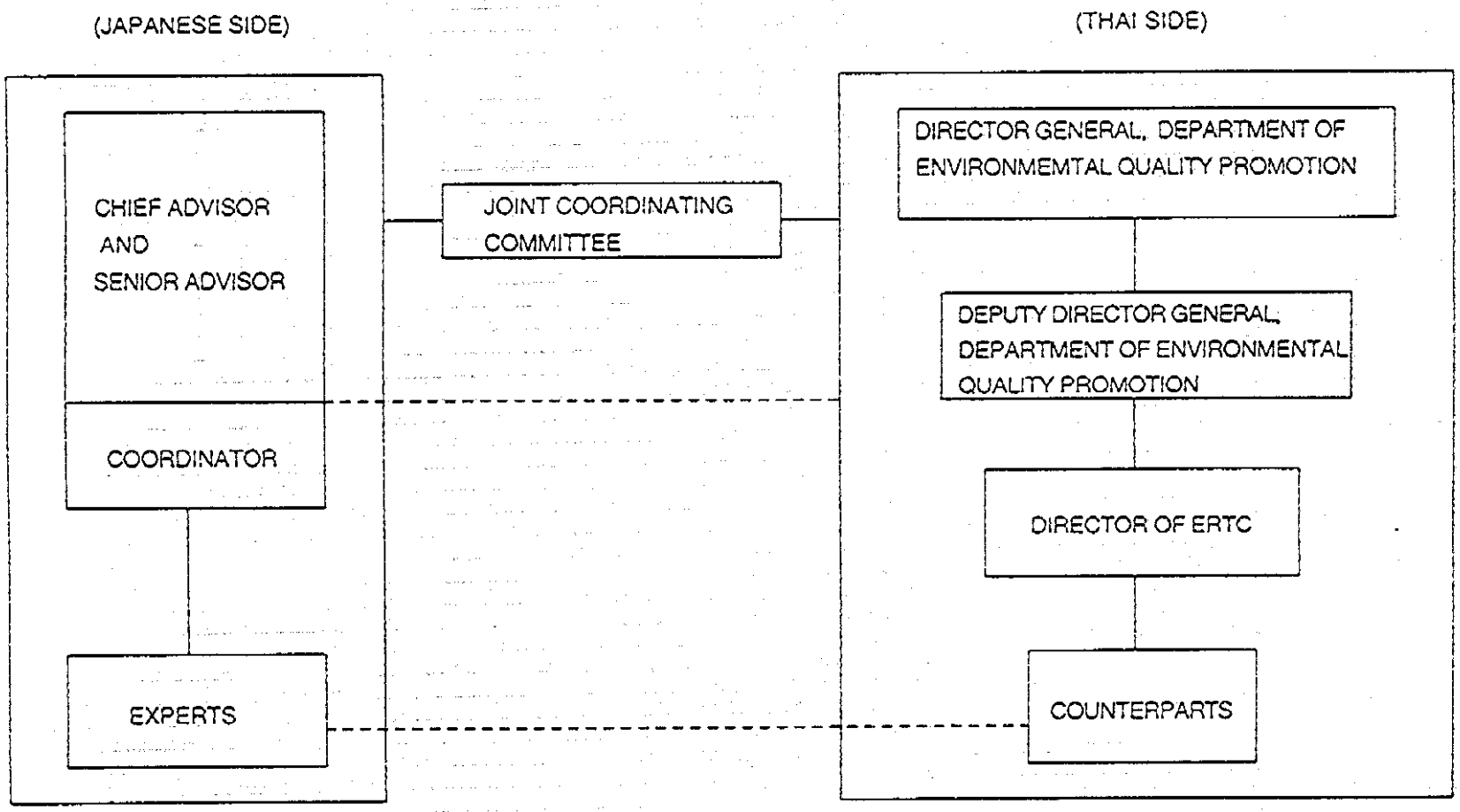
1) Director General of Department of Environmental Quality Promotion
2) Deputy Director General of Department of Environmental Quality Promotion
3) Director of ERTC
4) Representative of Department of Technical and Economic Cooperation
5) Personnel concerned with the Project to be designated by the Chairman

(3) Japanese side :

1) Chief Advisor
2) Senior Advisor
3) Coordinator
4) Japanese experts designated by the Chief Advisor
5) Resident Representative of JICA in the Kingdom of Thailand
6) Personnel concerned with the Project to be dispatched by JICA, if necessary

Note: Officials of the Embassy of Japan in the Kingdom of Thailand may attend the Joint Coordinating Committee meetings as observers, if necessary.

ANNEX II ORGANIZATION CHART OF THE PROJECT



THE MINUTES OF MEETING
ON THE EXTENSION OF THE DURATION
OF THE JAPANESE TECHNICAL COOPERATION
FOR
THE ENVIRONMENTAL RESEARCH AND TRAINING CENTER PROJECT

Mr. Shinichiro Omote, Resident Representative of the Japan International Cooperation Agency (hereinafter referred to as "JICA") in the Kingdom of Thailand, and Thailand authorities concerned had a series of discussions and jointly agreed upon the "Record of Discussions" to establish the basis for technical cooperation for "The Extension of the Duration of the Japanese Technical Cooperation for the Environmental Research and Training Center Project". For the smooth and effective implementation of the Project, both sides further agreed upon the matters mutually concerned as attached hereto.

Bangkok, March 8, 1995

Mr. Shinichiro Omote
Resident Representative,
JICA Thailand Office,
Japan International Cooperation
Agency (JICA), Japan

Mr. Kasem Snidvongs
Permanent Secretary
Ministry of Science,
Technology and Environment
The Kingdom of Thailand

THE ATTACHED DOCUMENT

1. Objective of Technical Cooperation

The objective of Technical Cooperation for extended for two years is to enhance the ERTC capacity consolidating the basis as a full-fledged institution for environmental research, training and monitoring and thus support the environmental administration.

In order to realize the objective, priority has to be placed on the following during the extended two years.

1) Research activities

Continued efforts should be made to enhance further the ERTC capacity in identifying research of higher priority, developing and implementing research programs, and publicizing research results effectively.

2) Training activities

Continued efforts should be made further to improve the ERTC potential for developing and implementing technical training programs on environmental quality measurements and management.

3) Monitoring activities

Priority should be placed on enhancement of the ERTC capability in responding and providing appropriate technical advises and recommendations on improvement of the environmental monitoring.

2. Design of the activities

The activities during the extended two years will be clearly identified and designed within the Project Design Matrix (PDM) for the Project as shown in Annex I.

3. Tentative Schedule of Implementation

Tentative schedule of Implementation is shown in Annex II.

PROJECT DESIGN MATRIX (POM)

ANNEX I

ENVIRONMENTAL RESEARCH AND TRAINING CENTER PROJECT (EXTENSION)

Narrative Summary	Verifiable Indication	Means of Verification	Important Assumptions
<Overall Goal> Develop research, and monitoring activities to improve the quality of environment in Thailand	Research and development Human resources development	MOSTE Report	<NECESSARY CONDITIONS FOR SUSTAINABILITY> Government of Thailand will persist the Environmental policy as described in 7th National Economic and Social Development Plan
<PROJECT PURPOSE> Enhance ERTC capacity in research, training and monitoring to support environmental administration	Research results Training results Monitoring technology development results	OEQP Technical Report	MOSTE will enhance the environmental policy Inter-departmental Committee coordinates 3 departments for strengthening ERTC capacity
<OUTPUT> General . The Results of ERTC activities are publicized Research . Research themes of higher priority are identified, the identified research themes are implemented according to the research plan and the results are publicized Training . Environmental management and laboratory technology training courses are implemented . Trainer's Training Programs for MOSTE staff on technical training are arranged Monitoring . Technical advices and recommendations on improvement of environmental monitoring are provided	General No. of publications in periodicals, journals, newsletters and annual reports on ERTC Activities, No. of seminars on ERTC activities Research No. of technical reports on research results, No. of presentations at technical conferences and meetings Training No. of training courses/trainees, No. of trainer's training programs for MOSTE staff on technical training Monitoring No. of advices and recommendations on improvement of environmental monitoring, No. of technical reports on research results	ERTC Annual Report & Newsletters Technical reports of Research, Training and Monitoring activities	ERTC will enhance plan of Research, Training and Monitoring
<PROJECT ACTIVITIES> General . Publish annual reports and newsletters on ERTC activities . Hold seminars on ERTC activities Research Themes Research on four technical fields (ie., Water Pollution, Air Pollution, Noise and Vibration and Toxic Substances) will be continued. 1. Study on Polycyclic Aromatic Hydrocarbons (PAHs) Distribution in Environment 1) Environmental sample methodology development 2) Determination of composition of PAHs from particulate matters in urban areas 3) Study on the distribution of PAHs in food chains of water resource of urban and industrial areas 2. Noise Pollution 1) Study on prediction model of road traffic noise (elevated road) and airport noise 2) Study on noise problem from stationary source 3. Water Pollution Study on groundwater contamination by hazardous waste from industry in Pathumtani Province 4. Wastewater Treatment Technology	<INPUT> Japanese side Dispatch Japanese experts Long term experts : Approximately 7 persons / year Short term experts (When necessary) Provide equipment Accept Thai counterparts in training in Japan : At least 3 persons / year Thai side Assign counterparts for Project Allocate budget for operational costs, personnel expenses and supporting staff Maintain Project facilities and equipment	Increase ERTC permanent staff Organization of ERTC, such as administration section, maintenance section and etc., to be expanded
	Training . Develop curriculum and text for courses . Implement training courses . Evaluate results of the training and make report . Trainer's training programs for technical training are implemented Monitoring Develop methodology of monitoring . Make technical report on methodology of monitoring . Continue ASEAN Network on Environmental Monitoring (ASNEM) activities	<PRECONDITIONS>

ANNEX II

TENTATIVE SCHEDULE OF IMPLEMENTATION

YEAR	1995	1996	1997
Extension period of technical cooperation	4		3
JAPANESE SIDE			
1. Dispatch of Japanese Experts			
(1) Long-term experts			
1) Chief Advisor			
2) Senior Advisor			
3) Coordinator			
4) Expert in the filed of Water Pollution			
5) Expert in the filed of Air Pollution			
6) Expert in the field of Noise and Vibration			
7) Expert in the field of Toxic Substances			
(2) Short-term expert (when necessity arises)			
2. Training of Thai Personnel in Japan			
3. Provision of Machinery and Equipment			
4. Dispatch of Mutual Consultation Team			
THAI SIDE			
1. Assignment of Counterpart Personnel			
2. Allocation of Local Cost			

Note. The Tentative Schedule of Implementation is subject to change within the framework of the Record of Discussions.

6　収集資料

（１） 組織、人員、予算

Fig. Organization of Environmental Department on Ministry of Science Technology and Environment in Thailand 1 October,1996

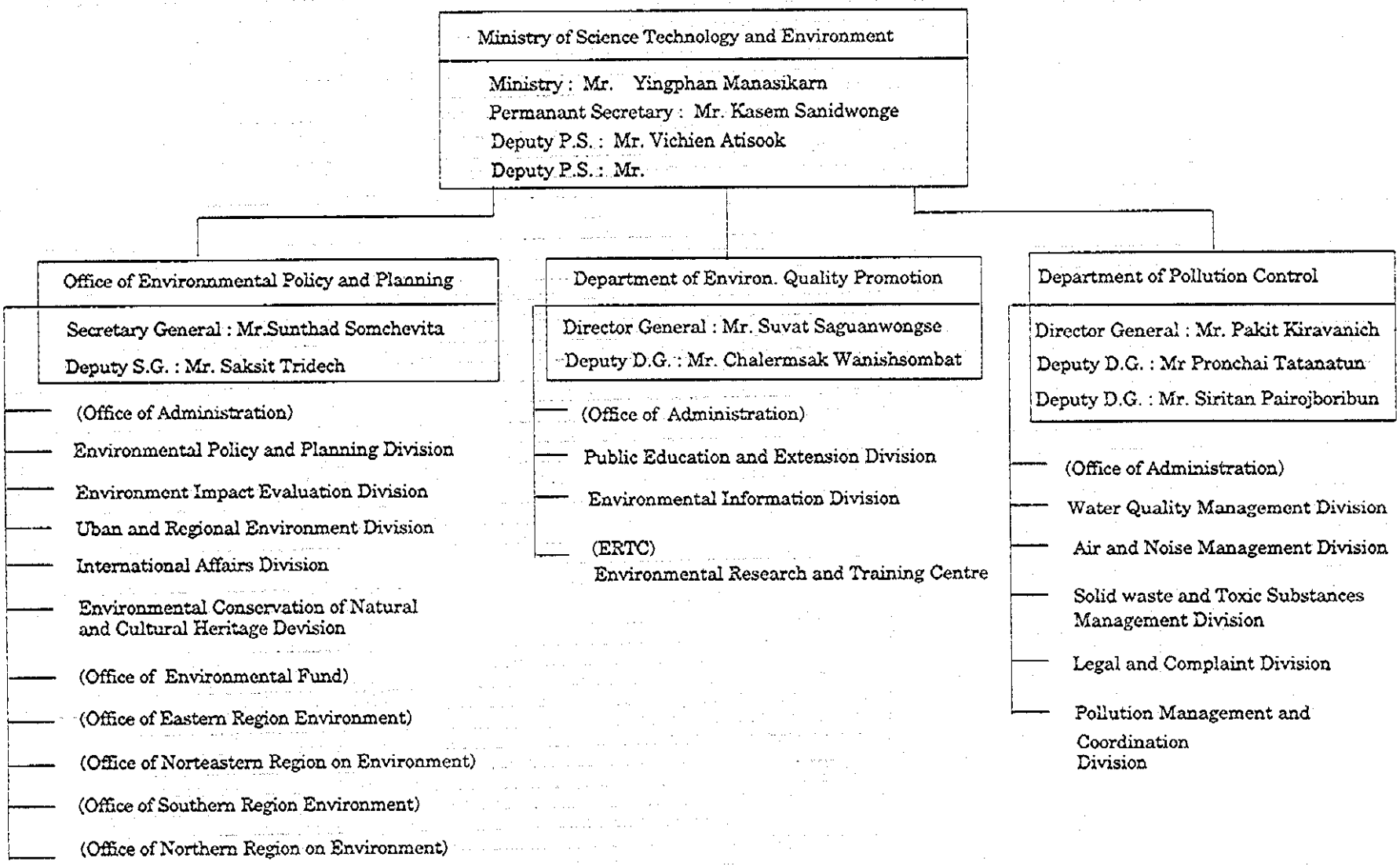


Figure : Organization and Staff of The Environmental Research and Training Centre (ERTC)

Director of ERTC
Ms. Monthip Sriratana Tabucanon

(In arrangements on Sept. 1996)

Administration Section	Environmental Technology Transfer Section	Water Quality Research and Development Section	Air Quality Noise and Vibration Research and Development Section	Toxic Substance Research and Development Section	Environmental Measurement Certification Section
(1)- Mr. Manit Uraken	(1)- Mr. Somchai Vinichnantharat	(1)- Ms. Pornthip Pancharoen	(1)- Ms. Phaka Sukhasem	(1)- Ms. Sukanya Boonchalearmkij	(1)- Mr. Soros Kunkrue
(2)- Ms. Patcharee Navarat	(2)- Mr.Vuttiphan Sthitthaworn	(2)- Mr. Meesak Milinthawisamai	(2)- Ms. Hathiratana Carevej	(2)- Ms. Juthathip Yooyen	(2)- Ms. Orasai Intharapanit
(3)- Mr. Sumate Suwanrod	(3)- Ms. Mitravarun Kaewchada	(3)- Mr. Piya Sansayuth	(3)- Ms. Dutsane Khunsopa	(3)- Ms. Nittaya Nakranad	(3)- Ms. Sirinapha Srithongtim
(4)- Ms. Siriluk Hengchaiyo	(4)- Ms. Anong Dechachart	(4)- Ms. Fairda Malem	(4)- Ms. Wanna Laowakul	(4)- Ms. Ruchaya Boonyatummanon	(4)- Mr. Prapatsit Siriphoe
(5)- Ms. Pavana Pansuwan	(5)- Mr. Rat Ruangchotwit	(5)- Mr. Pancha Yaithavorn	(5)- Mr. Nattapong Jansombat	(5)- Mr. Janewit Wongsanon	(5)- Ms. Vimolrat Rojpratak
	(6)- Ms. Jindarat Khwanphairoj	(6)- Ms. Cheeranun Phanthujak	(6)- Mr. Thanaphan Suksaad	(6)- Ms. Wanvimol Phatrasiriwong	(6)- Ms. Supranee Boonruangrungthana
	(7)- Ms. Budhsaba Abay	(7)- Mr. Ussamol Limsakul	(7)- Mr. Veerathep Keeratitadaniyom	(7)- Ms. Chounpit Boonyoy	(7)- Ms. Chayanis Naaiyuong
	(8)- Mr. Vichan Suksawang	(8)- Ms. Varika Sawateyothin	(8)- Ms. Teranut Charasai	(8)- Mr.Sutiep Sriachai	(8)- Ms. Araya Thiparak
	(9)- Ms. Sriwan Prongthong	(9)- Mr. Peerapong Sunthondecha	(9)- Mr. Virat Auesongtham	(9)- Ms. Areerat Jakskul	(9)- Mr. Sunthon Ngodngam
	(10)- Ms. Amraporn Phadungcheep	(10)- Mr. Aonchan Kutepong	(10)- Mr. Thanavut Norat	(10)- Mr. Panomporn Jangpan	
	(11)- Mr. Apiwat Piromruen		(11)- Ms. Daise Moknoy		
	(12)- Mr. Sawan Chankrajang				
Actual Staff 5	12	10	11	10	9
Approved No. of Staff 5	13	12	12	11	9

(Note 1) Actual Staffs : 58 (Including Director)

(Note 2) Approved No. of Staff is 63 Persons on Fiscal Year, 1996 (Including Director)

1. Administration Duty as follow

1. Responsibility about general administration and archivist in ERTC
2. To undertake for Administer and Secretary in ERTC, Finance, Account, Supplies, Building, Vehicle, Evaluation, Libraly, Maintainance, Equipment Science and Audiovisual aid
3. General Practice in duty that is not responsible in either Section
4. To support and collaborate with any section that have involed or assigned

1.1 Administration works

1. Secretary to administrator
2. To cooperate with various section in Domestic and International
3. To monitoring the data plan and interesting project for Director including communication ,conclusion and analyses matter for make up consider
4. To support and collaborate with any section that have involed or assigned

1.2 Planing, Budget, Supplies works

1. To collect and practice plan for ERTC
2. To collect and coordinate the budget plan and practice plan in ERTC
3. To follow for assessment and making report about practice plan under the project
4. To defrayment and making supplies list
5. To support and collaborate with any section that nave involed or assigned

1.3 Archivist, Building, Vihicle works

1. Dispatch, Storage, Follow the official letter
2. Correspondence and official letter that is not response in any Section
3. Photo copier, mimeograph
4. Typing and verify the official letter
5. Administration practice in ERTC
6. Controller about maintenance, sale the automobile officer in ERTC
7. Controller about maintenance the building in ERTC
8. To support and collaborate with any section that have involed or assigned

1.4 Maintenance the Equipment Sience and Audiovisual aid works

1. Controller, take care, maintenance the equipment science and audiovisual

2. Controller, take care, maintenance and facilitate in ERTC such as Electric system, Airconditions, Treatment system, Distilled water system ect. including Instrument

3. To support and collaborate with any section that have involed or assigned

1.6 Data service and Libraly works

1. Controller, data service information, Training about Envi.
2. Libraly service
3. News letter, promote, information
4. To support and collaborate with any section that have involed or assigned

2. Environmental Technology Tranfer Section duty as follow

1. To progress on curriculum development and training course about Environmental Technology
2. Monitoring and to assessment the Training course by design, training, assess development for trainee
3. Meeting or seminar for staff level about Environmental Technology
4. To support and collaborate with any section that have involedor assigned

2.1 Curriculum development and Training couros about Envi. Technology works

1. To undertako curriculum development and Training course
2. To undertake manual, hand book
3. Plan for training, curriculum, evaluation
4. Substituter for meeting or seminar about Envi, Technology
5. To support and collaborato with any section that have involed or assigned

2.2 Monitoring and Evaluation works

1. Design and assessment the curriculum
2. Development form and evaluation the trainoo
3. Make the activities out of curriculum for relationship between trainee
4. To revivo the activity after Training
5. To support and collaborate with any section that have involed or assigned

2.3 Meeting and Seminar works

1. Dispose of the siminar about Environmental Technology
2. Present the facilities to trainee
3. Dispose of the place
4. Making Report and various proceeding
5. To support and collaborate with any section that have involed or assigned

2.4 Administration works

1. Responsible about general and archivist in Section
2. Official letter
3. Typing, Copy, Mimeograph
4. Primary budget
5. Storage
6. Audiovisual aid in Section
7. Meeting report
8. Delivery official document
9. To cooperate and Information with various section
10. Other by assignment

3. Water Quality Research and Development Section duty as follow

1. To undertake Water Quality Monitoring Research and Development
2. To undertake Waste Water Quality Analysis and Research development and to give advice to use equipment science and demonstration menthod
3. To undertake Research about Water pollution impact
4. To undertake waste water treatment and development technology form source
5. To undertake study about research and development Biological technology in the Environment by suitable
6. Study and research about the Ecosystems had been changed causing from the Environment
7. To support and collaborate with any section that have involed or assigned

3.1 Water analysis and development works

1. To undertake research and development technology for water quality monitoring from all source
2. To undertake research and analysis the water sampling by suitable in the environment in Domestic and International
3. To support and collaborate with any section that have involed or assigned

3.2 Water Pollution Impact Research works

1. Study and Research the Water pollution impact to water, soil, marine animal, water cress
2. Study and Research the water impact to economic and social
3. To support and collaborate with any section that have involed or assigned

3.3 Water Treatment Technology Research and Development works

1. To undertake study and research for development about Waste water treatment from source
2. To give advice and demonstration method about Waste water treatment technology by suitable
3. To support and collaborate with any section that have involed or assigned

3.4 Biological in the Environment Research works

1. Stydy and Research the Biological Technology in provincial
2. Study and Research Ecological condition from Envi. problem
3. To support and collaborate with any section that have involed or assigned

3.5 Administration general works

1. Responsible about general and archivist in Section
2. Official letter
3. Typing, Copy, Mimeograph
4. Primary budget in section
5. Storage
6. Audiovisual aid in Section
7. Meeting report
8. Delivery official documont
9. To cooperate and Information with various section
10. Other by assignment

4. Air and Noise Research and Development Section duty as follow

1. To undertake Air Quality Research and Development
2. To undertake Noise & Vibration Research
3. To undertake Atmosphere problem analysis and development
4. To cooperation with organize between forign
5. To undertake research and development the Air pollution impact to health
6. To support and collaborate with any section that have involed or assigned

4.1 Air Quality Research and Development works

1. To undertake Air Quality Monitoring in Atmospere Research and Development from source
2. To undertake Air Quality Analysis Research and Development by suitable in Domestic and International
3. Study on Air pollution impact to Ecological including economic and social
4. To support and collaborate with any section that have involed or assigned

4.2 Noise Pollution Research works

1. Study on Noise problem analysis Research and Development
2. Study on Noise pollution impact to health and living matter
3. To support and collaborate with any section that have involed or assigned

4.3 Vibration Research works

1. To undertake the Vibration Analysis Research and Development
2. Research on vibration problem impact to remaining ancient building as well as healthy
3. To support and collaborate with any section that have involed or assigned

4.4 Air Pollution Treatment Technology Research & Development works

1. To Research and collect data about Air Pollution Treatment Technology
2. Research and Development Technology
3. To give advice and practice to involed section
4. To support and collaborate with any section that have involed or assigned

4.5 Research problem on climate to be changed (alter) works

1. Study and development method about air pollution problem to be changed in climate
2. To cooperate on problem with various section in Domestic and International

3. To support and collaborate with any section that have involed or assigned

4.6 Administration general works

1. Responsible about general and archivist in Section
2. Official letter
3. Typing, Copy, Mimeograph
4. Primary budget in section
5. Storage
6. Audiovisual aid in Section
7. Meeting report
8. Delivery official document
9. To cooperate and Information with various section
10. Other by assignment

5. Toxic subtance Environmental Technology Research and Development works

1. To undertake Solid waste Research and Development Technology
2. To undertake Hazadous waste Research and Development Technology
3. To undertake Danger material impact research
4. To undertake Toxicological Research
5. To undertake Utilize the Solid waste and material matter research and development
6. To support and collaborate with any section that have involedor assigned

5.1 Solid Waste Researc and Development Technology works

1. To undertake Solid waste research and development technology
2. To give advice on the use of technology
3. To support and collaborate with any section that have involed or assigned

5.2 Hazadous waste impact Research works

1. To undertake research and development solid waste recycling Techniqu
2. To undertake research for recycle
3. To undertake research and development technology for recuce the solid waste
4. To support and collaborate with any section that have involed or assigned

5.5 Adminisstion general works

1. Responsible about general and archivist in Section
2. Official letter
3. Typing, Copy, Mimeograph
4. Primary budget in section
5. Storage
6. Audiovisual aid in Section
7. Meeting report
8. Delivery official document
9. To cooperate and Information with various section
10. Other by assignment

6. Environmental Measurement Certification Section duty as follow

1. To undertake sample analysis standard method variou category in Envi as well as produce dample standard for reference
2. To coordinater and checking data of polllition from laborlatory by trustworthy as well as in domestic and international
3. Analysis and to correct the data by trustworthy
4. Making measurement certification report although to give advice for standard as well as data analysis of pollutant from labolatory
5. To support and collaborate with any section that have involed or assigned

6.1 Checking and testing works

1. To undertake research and collect data about development standard of analysis method for checking and testing in domestic and internaational
2. To coordinater for checking and test the data about situation on pollution from laboratory as well as in domestic and international
3. To make the manual for exactly data about situation on pollution form laboratory as well as in domestic and international
4. To support and collaborate with any section that have involedor assigned

6.2 Quality standare development works

1. Study and development standard, checking and test exactly data from laboratory
2. To give advice on the use of scientific instrument for data analysis from laboratory by exactly
3. To coodinater and to give advico for develop inethod and test exactly data on problem
4. Information and promote academic about measurement certification in the environment
5. To support and collaborate with any section that have involed or assigned

6.3 Statistic compile works

1. To collect standard analysis method various type
2. To undertake data compile for checked and test exactly data about situation on pollution from laboratory as well as certification standard from laboratory
3. Measurement the data and report
4. To support and collaborate with any section that have involed or assigned

6.4 Administration general works

1. Responsiblo about general and archivist in section
2. Official letter
3. Typing, Copy, Mimeograph
4. Primary budget in section
5. Storago
6. Audiovisual aid in Section
7. Meeting report
8. Delivery official document
9. To cooperate and Information with various section
10. Other by assignment

Revised on Oct.1, 1996

ERTC's Budget in Brief

Department of Environmental Quality Promotion

Baht

Fiscal year	Baht	% increase
DEQP'S		
1992	80,125,700	-
1993	116,225,500	45
1994	162,369,600	39.7
1995	226,161,700	39.3
1996	327,706,400	50.5
1997	342,587,300	9.55
ERTC'S		
1991	10,579,400	-
1992	11,253,200	6.3
1993	20,385,900	81.2
1994	25,645,100	25.8
1995	41,398,600	61.4
1996	61,541,800	48.0
1997	53,805,900	-12.57

Ministry of Science, Technology and Environment (MOSTE)

Million Baht

Year	1991	1992	1993	1994	1995	1996	1997
MOSTE	5,703.9	6,699.7	7,037.0	8,320.6	8,361.2	10,766.0	10,064.0

ERTC's Budget FY. 1995-1997

Object of Expenditures	YEAR		
	1995	1996	1997
Salaries	※ -	6,996,600	7,812,000
Temporary Wages	1,890,900	5,752,100	5,926,000
Remuneration, Services other than Personal, and Supplies (※※※)	7,344,700	15,272,000	15,009,000
Public Utilities	1,920,000	1,917,000	2,000,000
Equipments, Properties, and Construction	17,073,000	21,954,100	18,808,900
Others	13,170,000	9,650,000	4,250,000
Monitoring	5,000,000		
Technology Transfer	1,700,000	2,000,000	
Training in Local Area	6,200,000	7,650,000	4,250,000
Supervise for Construction	270,000		
TOTAL (BAHT)	**41,398,600**	**61,541,800**	**53,805,900**

※

ERTC's Budget in Brief

Fiscal year	BAHT	% increase
1992	11,253,200	-
1993	20,385,900	81.2
1994	25,645,100	25.8
1995	41,398,600	61.4
1996	61,541,800	48.7
1997	53,805,900	(12.6)

	1992	1993	1994	1995	1996
MOSTE (million Baht)	6,699.7	7,037.0	8,320.6	8,057.5	11,176.0

Expenditure for service in ERTC cost/year

Item	Total Baht	Staff
1. Security system	1,642,500	30
2. Cleaning	1,448,940	29
3. Garden service	1,200,000	13
4. Air-condition maintenance	96,720	-
5. elevator maintenance	25,000	-
Total	4,413,160	

List Number of Staffs and Budget of ERTC/DEQP

Fiscal Year	Permanent Staffs	Temporaly Staffs	Total	Budgets (Bahts)	Remarks
1990	36	2	38	10,597,400.00	EOSD/ONEB
1991 1991	38 29	54 62	92 91	19,949,700.00	EOSD/ONEB ERTC/ONEB
1992	35 (40)	62	97	20,385,900.00	ERTC/ONEB
1993	51 (63)	63	114	25,645,100.00	Including Construction Budgets for Facility for (Dormitory for staffs)
1994	53 (63)	63	116	41,400,000.00	Facility (Dormitory for Trainer)
1995	58 (63)	88	146	62,320,000.00	Facility (Sport Center)
1996	57 (63)	77	134	53,805,900.00	-

（2） 投入実績

供与機材

Oct. 1996

供与年度	供与金額（千円）	主要機材
平成３年度	39,000	プラズマリアクター ガスクロマトグラフ　他
平成４年度	50,400	廃棄物焼却炉 サインノイズ信号発生器　他
平成５年度	37,000	騒音振動用移動観測車 ガスクロマトグラフ　他
平成６年度	12,440	ガスクロアクセサリー 数値表／データブック
平成７年度	27,930	イオンクロマトグラフ　他
平成8年度	32,800	高感度土壌ガス分析装置　他
計	199,570	

Table. Training in Japan under JICA Programe
(Individual Course)

Oct.1, 1996

No	Trainee Name	Term
1	Ms. Monthip Sriratana Tabucanon	1990.03.31 - 1990.04.15
2	Ms. Suthep Ruangwises	1990.09.11 - 1990.10.21
3	Ms. Orasai Intarapanich	1990.09.11 - 1990.12.21
4	Mr. Suvat Sguanwongse	1990.09.27 - 1990.10.10
5	Ms. Hathairatana Garivait	1990.10.08 - 1991.02.03
6	Mr. Somnuk Rubthong	1990.10.28 - 1991.12.11
7	Mr. Soros Khunkure	1990.11.19 - 1991.03.19
8	Mr. Kanog Suksomsunk	1991.02.15 - 1991.06.27
9	Ms. Sukanya Boonchaloermkit	1991.07.30 - 1991.11.13
10	Ms. Juthatip Yooyen	1991.07.30 - 1191.11.13
11	Mr. Nattapong Chansombat	1991.07.30 - 1991.11.13
12	Ms. Cholada Prinyanusorn	1991.07.30 - 1991.11.13
13	Ms. Cherdchan Siriwong	1991.07.30 - 1991.11.27
14	Mr. Manit Uraken	1991.10.15 - 1991.11.27
15	Ms. Anong Tejajati	1991.10.15 - 1992.02.12
16	Mr. Sumate Suwannarod	1992.03.27 - 1992.05.19
17	Mr. Janewit Wongsanoon	1992.03.27 - 1992.07.19
18	Ms. Pornthip Puncharoen	1993.01.03 - 1993.03.03
19	Ms. Naraporn Sritragul	1993.01.03 - 1993.04.21
20	Ms. Wanna Laowagul	1993.01.03 - 1993.04.21
21	Ms. Ruchaya Boonyatumanond	1993.01.03 - 1993.04.28
22	Mr. Somchai Vinitnantharat	1993.05.09 - 1993.06.23
23	Ms. Phaka Sukasem	1993.05.13 - 1993.06.23
24	Ms. Sirinapha Srithongtin	1993.08. . - 1993.10. .
25	Ms. Somjai Soimachaya	1994.01. . - 1994.04. .
26	Mr. Vuttiphan Sthitthaworn	1995.02.12 - 1995.03.30
27	Mr. Piya Sansanayuth	1995.08.28 - 1995.11.25
28	Mr. Weratep Geeratithadaniyom	1995.08.28 - 1995.11.30
29	Ms. Cheeranan Pantachak	1995.08.28 - 1995.11.30
30	Mr. Chalermsak Wanichsombat	1996.03.24 - 1996.04.04
31	Mr. Pancha Yaithaworn	1996.09.01 - 1996.09.28
32	Ms. Wanwimol Phattarasiriwong	1996.09.02 - 1996.11.02
33	Ms. Daisy Moknoi	1996.09.24 - 1996.12.21

* Note : Revised on Oct. 1, 1996

Oct. 1, 1996

LIST OF JICA LONG-TERM EXPERTS

Team Leader		
1. K. Nakajima	Environmental Agency	Oct. 11. 90 - Oct. 10. 92
2. T. Okuno	Ryogo Pref.	Oct. 1. 92 - Mar. 31. 94
*3. S. Kuriki *	JICA	Mar. 15. 94 - Mar. 31. 97
Senior Advisor		
4. K. Otani	JICA	Dec. 5. 91 - Dec. 4. 93
*5. Y. Hirni *	Japan Environmental Sanitary Center,	Mar. 5. 94 - Mar. 31. 96
*6. T. Hamada	EX. Corporation	Mar. 11.96 - Mar. 31. 97
Co-ordinator		
7. M. Ando	JICA	Oct. 11. 90 - Oct. 10. 92
8. M. Soejima	JICA	Sep. 27. 92 - Mar. 31. 95
*9. T. Hidaka	JICA	Mar. 16. 95 - Mar. 31. 97
Water Pollution		
10. Y. Matsui	Nagoya. Pref.	Jan. 17. 91 - Jan. 16. 93
11. M. Mizobuchi	Nara, Pref.	Jan. 6. 93 - Jan. 5. 95
*12. H. Hoshino	Saitama Pref.	May.16. 95 - Mar. 31. 97
Air Pollution		
13. M. Sakata	JICA (Shimazu Co.,LTD.	Nov. 5. 90 - Nov. 4. 93
*14. K. Kume	Shizuoka Pref.	Apr. 1. 94 - Mar. 31. 96
*15. I. Yajima	JICA (EX. Kanagawa Pref.)	Apr. 1. 96 - Mar. 31. 97
Noise & Vibration		
16. I. Aoi	Osaka Municipal	Jan. 17. 91 - Jan. 16. 93
17. K. Shirai	Tokyo Metropolitan	Jan. 10. 93 - Mar. 31. 95
18. H. Tanaka	Osaka Pref.	Jun. 28. 95 - Mar. 31. 97
Solid Waste		
19. H. Murata	Kanagawa Pref.	Jan. 17. 91 - Jan. 16. 93
Toxic Substances		
20. S. Watanabe	JICA (Ehime Univ.)	Oct. 11. 90 - Oct. 10. 94
21. M. Fukuda	Mitsui Mineral Dept. Eng. Co.,LTD.	May.16. 95 - Mar. 31. 97

* Note : Revised Oct. 1, 1996

Oct. 1, 1996

LIST OF JICA SHORT-TERM EXPERTS

Fiscal Year '91 (9 persons)			
1. S. Goto	Environmental Agency	(Management)	May. 9 - May. 25. 91
2. T. Miyazu	Nishi Tokyo Chemical Univ.	Statistics	Aug. 28 - Sep. 12. 91
3. S. Nakamura	JICA	(Management)	Sep. 19 - Sep. 22. 91
4. H. Kato	JICA	(Management)	Sep. 19 - Sep. 22. 91
5. T. Yoshinaga	Kumamoto Pref.	Monitoring (Water)	Oct. 21 - Nov. 16. 91
6. K. Kuwata	Osaka Municipal	Instrument Analysis II	Oct. 29 - Dec. 28. 91
7. K. Hayakawa	Aichi Pref.	Instrument Analysis III	Feb. 13 - Mar. 17. 92
8. T. Nakano	Hyogo Pref.	Instrument Analysis I	Feb. 29 - Mar. 27. 92
9. S. Okamoto	Tokyo Joho Univ.	Monitoring (Air)	Feb. 19 - Mar. 17. 92
Fiscal Year '92 (7 persons)			
10. H. Kooi	Osaka Municipal	Noise	Jun. 29 - Jul. 10. 92
11. K. Hirano	Yokohama City	Measurement Method	Jun. 29 - Aug. 9. 92
12. S. Tanaka	Keio Univ.	Acid Rain	Jun. 29 - Aug. 23. 92
13. N. Ohashi	Tokyo Metropolitan	Toxic Substances	Aug. 10 - Sep. 4. 92
14. T. Urabe	Yokohama Univ.	Solid Waste	Aug. 12 - Sep. 1. 92
15. H. Morishita	Osaka City	Waste Water	Aug. 28 - Oct. 27. 92
16. M. Shioda	Tobishima Co.,LTD.	Vibration	Dec. 7 - Dec. 25. 92
Fiscal Year '93 (12 persons)			
17. K. Kadokami	Kitakyushu City	Solid Waste	May. 20 - Nov. 30. 93
18. M. Matsui	Nagano Pref.	Waste Water	Jul. 1 - Sep. 30. 93
19. Y. Takenaga	Tokyo Metropolitan	Auto. Exhaust Gas	Jul. 5 - Jul. 30. 93
20. Y. Ambe	Tokyo Noko Univ.	Quality Assurance	Jul. 29 - Aug. 25. 93
21. K. Yoshizumi	Kyoritsu Women Univ.	Perticulate Science	Jul. 29 - Aug. 26. 93
22. T. Kenmotsu	Okayama PRef.	Carbamate Pesticide	Sep. 6 - Oct. 2. 93
23. S. Ichiki	Shiga Pref.	EIA	Oct. 19 - Nov. 12. 93
24. Y. Yochiyasu	Kyoto Municipal Univ.	Aquatic Biology	Oct. 19. - Nov. 30. 93
25. M. Ohmiya	Nagoya City	Noise Monitoring	Nov. 1 - Nov. 29. 93
26. A. Ishii	Chiba Pref.	Noise Analysis	Dec. 6 - Dec. 28. 93
27. T. Kawaraya	Osaka City	Air Pollution	Dec.17 - Apr. 7. 94
28. Y. Watanabe	Yachiyo Engi. Co,.LTD	Training Program	Mar. 28. - Apr. 10. 94
Fiscal Year '94 (7 persons)			
29. A. Shirai	JICA (Chiba Pref.)	Information System	Oct. 11. - Jan. 20. 95
30. H. Tanaka	Osaka Municipal	Noise & Vibration	Dec. 6. - Jeb. 3. 95
31. T. Okamoto	Hiroshima Pref.	Toxic Substances	Jan. 10 - Mar. 31. 95
32. T. Amagai	Shizuoka Univ.	Air Pollution	Jan. 23 - Mar. 23. 95
33. H. Ando	Tokyo Metropolitan	Wastewater Treatment of Lab.	Feb. 20 - Mar. 17. 95
34. Y. Yoshiyasu	Kyoto Municipal Univ.	Aquatic Biology	Mar. 6. - Mar. 31. 95
35. E. Miyake	Shimazu. Kyoto Co., LTD.	X Ray-Fluorescence	Apr. 10 - Apr. 22. 95

Fiscal Year '95			
36. I. Tanaka	Kyoto Shimadzu	Instrumental Analysis	Nov. 2 - Nov. 29.95
37. S. Kakutani	JEOL Datum Ltd.	Maintenance and Application of GC/MS ann Electron	Nov. 13 - Nov. 26.95
38. F. Sano	Tokyo Metropolitan	Computer System Noise	Jan. 12. 96 - Mar. 28. 96
39. T. Fujita	Bureaux Generaux Co.,Ltd	Domestic Waste Water-treatment	Jan. 22. 96 - Apr. 19. 96
40. T. Amagai	University of Shizuoka	PAHs Analysis	Feb. 21. 96 - Mar. 14. 96
41. I. Yajima	Kanagawa Pref.	PAHs Analysis	Mar.03. 96 - Mar. 13. 96
Fiscal Year '96			
42. T. Oya	Mitsui Mineral Dept. Eng. Co.,Ltd.	Geophysical Survey	May.13. 96 - Jun. 08. 96
43. N. Asada	Mitsui Mineral Dept. Eng. Co.,Ltd.	Groundwater Contamination Transport Modeling	Jun. 10. 96 - Jul. 13. 96
44. Sh.Okamoto	Tokyo University of Information Science	Statistical Analysis for PAHs	Aug. 15. 96 - Sep. 22. 96

* Note : Revised on Oct. 1, 1996

（3） 活動・投入・カウンターパート一覧表

活動実績一覧表

平成８年度第３四半期

活動項目	予算年	平成７年度（1995）	平成８年度（1996）	平成　年度（　）	平成　年度（　）	平成　年度（　）
	月	4　7　10　1	4　7　10　1	4　7　10　1	4　7　10　1	4　7　10　1
研究：水質汚濁 大気汚染 騒音振動 有害物質		========== 水質--５テーマ 大気--２テーマ 騒音振動--２テーマ 有害物質--７テーマ	========== 水質--５テーマ 大気--２テーマ 騒音振動--２テーマ 有害物質--７テーマ			
研修：		========== ３０コース 合計１１６４名受講	========== １９コース 合計６８９名受講			
セミナー等		インハウスセミナー（６回開催） ========== 環境騒音セミナー(1/16) 道路騒音セミナー(1/23) 航空機騒音セミナー(1/23) ASNEM ワークショップ (2/26-3/10)	========== インハウスセミナー５回開催 ASNEMワークショップ (2/下)			
その他：		水質中の重金属分析研修 11/13---11/17 環境騒音測定研修（事前調査） 11/27--1130 環境騒音測定研修（本調査） 2/12---2/23 分析精度のクロスチェック ==========	地下水汚染探査研修 （１１月～１２月） ========== 分析精度クロスチェック			

（注１）活動項目欄は、調査活動、訓練コース、セミナー等の内容別に分類の上、ここの具体的活動を適宜記入。
（注２）各年度の実績欄は、原則としてバーチャート方式により、可能なものは始点、終点の日付を付して記入（短期間のものは点で可）。

6. 日本側／相手国側投入実績一覧表　　（調整員氏名　飛高正志　　　　　）

6—1.　専門家派遣及び機材供与

平成　年度　第３四半期

予算年 細目　月		1995年（H7年） 4 5 6　7 8 9　10 11 12　1 2 3	1996年（H8年） 4 5 6　7 8 9　10 11 12　1 2 3	年（H　年） 456　789　101112　123	年（H　年） 456　789　101112　123	年（H　年） 456　789　101112　123
専門家派遣	長期	――――栗城俊之―――（	リーダー）――――――3/31			
		氷見康二（シ.アドバイザー）3/31	3/11濱田隆郎――――――3/31			
		3/15――――――飛高正志（	調整員）――――――3/31			
		久米一成（大気）――――3/31	4/1矢島毅――――――3/31			
		5/16――――――星野弘志（	水質汚濁）――――――3/31			
		5/16――――――福田宗弘（	有害物質）――――――3/31			
		6/28――――――田中秀穂（	騒音振動）――――――3/31			
	短期	三宅英司 （蛍光x線） 4/10–4/22 田中勲 （島津機器） 11/2–11/29 白谷成実 （日本電子機器） 11/13-11/26 佐野藤治 騒音シュミ） 1/12–3/28 藤田恒夫 （生活排水） 1/22–4/19 雨谷敬史 （PAH分析） 2/21-3/14	大屋峻 （物理探査） 5/13-6/8 浅田素子 （地下水汚染シュミ） 6/10-7/13 岡本眞一 （PAH統計解析） 8/15-9/22 金城 （工場騒音） 11/上–12/上 花田 （底質PAH分析） 11/中-12/上 大内山 （生活排水） 11/中–2/中			
機材	機材供与　当年度	○ 7841千円 （騒音振動測定器） △ 19372千円 （地下水探査機器）	△ 32800千円 （土壌ガス分析）			
	機材供与　繰越					
	携行機材	○　○　○　　○　○　○○○ 計3491千円 （パソコン、スペアパーツ）	○　○　○ 計1167千円 （ソフト／ワープロ）			

（注１）長期専門家、短期専門家とも氏名、指導科目、派遣期間（日付入りバーチャート）を記入。
（注２）機材の欄には、本邦調達分（○）と現地調達分（△）に分けて年度毎の合計金額及び主要品目名を記入。

6−2　研修員受入、現地活動経費、相手国側投入実績、その他

平成　年度　第３四半期現在

細目 ＼ 予算年 月	1995 年（H7 年） 4 5 6 7 8 9 10 11 12 1 2 3	1996 年（H8年） 4 5 6 7 8 9 10 11 12 1 2 3	年（H 年） 4 5 6 7 8 9 10 11 12 1 2 3	年（H 年） 4 5 6 7 8 9 10 11 12 1 2 3	年（H 年） 4 5 6 7 8 9 10 11 12 1 2 3
C／P 日本研修	Piya Sansanayutb 8/28------11/25 （排水処理） Cheeranan Pantachak 8/28------11/30 （水質汚濁） Weratep Geeratithadaniyom 8/28--------11/30 （大気汚染） Chalermsak Wanichsombut 3/ ---4/ （環境行政、研究）	Mr.Panja Yaithavorn 7/1-----9/28 （水質汚濁） Ms.Vanvimol Patarasiriwong 9/2------11/2 （微量環境汚染物質分析） Ms.Daisy Morknoy 9/24−12/21 （PAHS分析）			
現地活動費	（現地）14.694千円 （実施） 9.600千円	（現地）13.167千円 （実施）12.037千円			
相手国側 投入実績	職員定数：６３名 臨時職員：７２名 C/P者数：３０名 予算：B62.3M（約2.6億）	職員定数：６３名 臨時職員数：77名 C/P者数：３０名 予算：			
調査団		終了時評価調査団（６名） 10/16−10/26			
リーダー会議	栄城俊之助 2/1----2/9 東京				
調整員会議	飛高正志 10/26---11/1 パリ				
国内委員会					

無償資金協力概要　(1) 内容：タイ国の環境問題に係わる研究費および設備費の整備の為の研究、研修センター
(2) E/N時期：　(3) 金額：23.14億円　(4) 完了時期：1991年11月

（注1）C／P日本研修の欄には、氏名、研修科目、受入期間（日付入りバーチャート）を記入。
（注2）現地活動費経費欄には、現地業務費及び実施計画指導の年度毎の合計金額を各々上段、下段に記入。
（注3）相手国側投入実績欄には、C／Pを含む部門毎の職員配属人数、支出予算額、主要な調達資機材等を記入。
（注4）調査団の欄には、調査団名、人数、派遣期間（日付入りバーチャート）記入。
（注5）リーダー会議、調整員会議の欄には、出席者名、開催場所、開催期間（日付入りバーチャート）を記入。
（注6）国内会議等の欄は、本部で記入。

7. C／P配置一覧表　　（調整員氏名：飛高正志）　　平成 8年度 第3四半期現在

分野	予算年 C／P名 月	配置状況										年度	主な研修先	備考 （注）技術移転／技術習得状況等に関するコメント等
		1995 年				1996 年				年					
		4	7	10	1	4	7	10	1	4 7 10 1	4 7 10 1	4 7 10 1			
運営管理	Mr. Suvat	----------				----------							2	視察（政策）	局長としてプロジェクトの運営管理の総責任者
	Mr. Chalermsak	----------			=	----------							7	視察（行政）	局次長として局長を補佐
	Ms. Monthip	----------				----------							2	視察（行政）	ERTC所長としてプロジェクトの実施責任者
総務	Mr.Manit	------				----------							3		95/10より総務課長
大気汚染	Ms. Phaka	------				----------							5	京都大学	95/10より大気騒音課長 課内の研究管理を総括
	Ms. Hathiratana	----------				----------							2	国環研	基本知識はほぼ習得
	Ms.Dusane	----------				----------									酸性雨に関し基本技術は、ほぼ、習得
	Ms. Wannna	----------				----------							4	都環研	発生源調査について習得中
	Mr. Veerathep	----------			=	----------							7	香川環研	大気モニターリングに関する技術は、ほぼ修得
	Ms. Teranut	----------				----------									大気モニターリング及び酸性雨調査技術を習得中
	Ms. Daise	----------				----------			=				8	静岡県立大	環境資料採取技術をほぼ習得

（注1）配置状況はバーチャート方式により記入（ ＿＿ 配置実績、 ＝＝＝ 本邦研修 ）。
（注2）分野は原則として、日本人専門家の担当分野（指導科目）に対応させる。

7. C／P配置一覧表　　(調整員氏名　飛高正志)　　平成　8年度　第3四半期現在

分野	予算年 C／P名 月	配置状況 1995 年				1996 年				年				年				年度	主な研修先	備考 (注) 技術移転／技術習得状況等に関するコメント等
		4	7	10	1	4	7	10	1	4	7	10	1	4	7	10	1			
航空騒音	Ms. Phaka	-------				----------												5	京都大学	大気騒音課課長、
	Mr. Natapong	-------				----------												3	千葉、広島	環境騒音測定技術習得済み
	Mr. Thanaphan	----------				----------														航空機及び道路交通騒音担当。測定技術等習得済み
	Mr. Wirach	----------				----------														工場騒音担当。測定技術習得済み
	Mr. Thanavut	----------				----------														環境騒音担当。技術習得中
精度管理	Mr. Soros	----------				----------												2		95/10より精度管理課長
	Ms. Orassi	----------				----------												2		
	Ms. Sirinapa	----------				----------												5		
研修	Mr. Somchai	----------				----------												5		研修課長
	Ms. Anong	----------				----------												3		横浜国大留学中

(注1) 配置状況にバーチャート方式により記入 (　＿＿　配置実績、　＝＝＝　本邦研修　)。
(注2) 分野は原則として、日本人専門家の担当分野 (指導科目) に対応させる。

7. C／P配置一覧表　　（調整員氏名　飛高正志）　　平成　8年度　第3四半期現在

分野	予算年 C／P名 月	配置状況 1995　年	1996　年	年	年	年	年度	主な研修先	備考 （注）技術移転／技術習得状況等に関するコメント等
		4 7 10 1	4 7 10 1	4 7 10 1	4 7 10 1	4 7 10 1			
水質排水処理	Ms. Phaka	----------					5	京都大学	95/10月より大気騒音課長
	Ms. Pornthip	----------	----------				4	横浜、大阪等	95/10月より水質課長
	Mr. Piya	----------	----------				7	国環研	排水処理に関する研究手法、分析技術を相当習得した
	Ms. Amraporn	----------	----						96/7より研修課に移動
	Mr. Aonchan	---------							採水などの基礎技術修得済み。95/6より研修課に移動
水質PAH									
	Ms. Sukanya	----------					3		95/10に有害物質課長に昇進。
	Ms. Wanvimol	----------	----------				8	化学品検査協会／北九州市	原子吸光、HPLCの分析技術習得済。PAH研究法修得中
	Ms. Chunpit	----------	----------						原子吸光、HPLCの分析技術をマスターしている
	Mr. Pancha	----------	----------				8	国環研	河川水質調査技術習得済み生物的調査技術習得中

（注1）配置状況はバーチャート方式により記入（ ＿＿ 配置実績、 ═══ 本邦研修 ）。

（注2）分野は原則として、日本人専門家の担当分野（指導科目）に対応させる。

7. C／P配置一覧表　　(調整員氏名　飛高正志)　　平成　8年度　第3四半期現在

分野	予算年 C／P名 月	配置状況 1995 年	1996 年	年	年	年	年度	主な研修先	備考 (注) 技術移転／技術習得状況等に関するコメント等
		4 7 10 1	4 7 10 1	4 7 10 1	4 7 10 1	4 7 10 1			
地下水汚染	Ms. Pornthip	----------	----------				4	横浜、大阪等	水質課長
	Mr.Meesak	----------	----------						地下水研究総括
	Mr. Arsamol	----------	----------						分析/現地作業の主戦力
	Mr. Peerapong	----------	----------						
	Ms.Valika		----------						現地ラボ分析に習熟
	Ms. Jeeranun	----------	----------				7	愛媛大学	
	Ms. Faida	----------							95.12米国大学院留学中
有害物質	Ms. Sukanya	----------	----------				3		有害物質課長
	Mr. Janewit	----------	----------				4	山梨市、愛知県等	現地作業主戦力
	Mr.Sutiep		----------						
	Ms. Ruchaya	----------	----				3		タイ国内留学中
	Ms. Pornpan	----------	--						96.5退職

(注1) 配置状況にバーチャート方式により記入 (　＿＿　配置実績、　＝＝＝　本邦研修　)。
(注2) 分野は原則として、日本人専門家の担当分野 (指導科目) に対応させる。

（4） 研修事業実績

THE NUMBER OF PARTICIPANTS FOR TRAINING COURSES 1992 -1996

YEARS	CENTRAL GOVERN	LOCAL GOVERN	PRIVATE SECTOR	EDUCATED INSTITUTE	TOTAL
1992	39	20	22	-	81
1993	119	227	38	60	444
1994	129	212	51	95	487
1995	105	171	88	133	497
1996	110	168	78	100	456
TOTAL	502	798	277	388	1,965

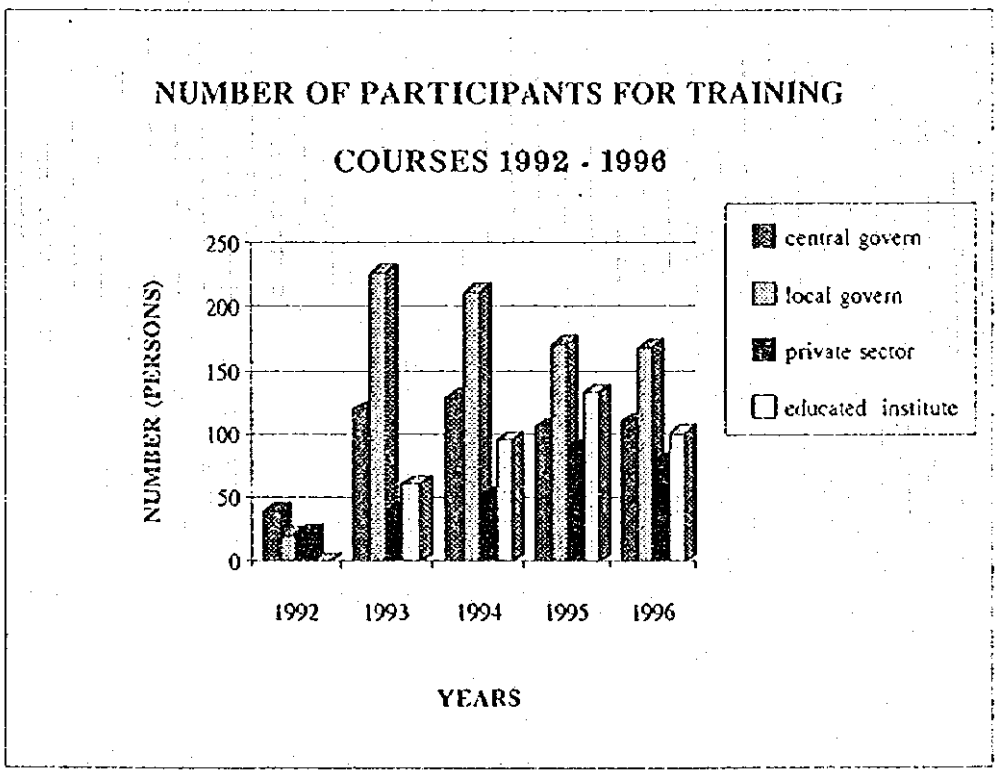


Table 1 to Show the Training Courses and the Number of Trainees (1992-1996)

No	Training Course	Govt	Semi Govt	NGO	Private Sector	Total
1	Basic Analysis of Heavy Metals	35	29	15	18	97
2	Waste Water Treatment Technology	46	119	51	15	231
3	Solid waste analysis	22	67	10	40	106
4	Environmental Management Plan	26	28	4	8	66
5	Air Quality Management	41	56	35	14	146
6	Environmental Management Plan	44	66	11	51	172
7	Noise Pollution	53	37	27	9	126
8	Environmental Education	6	13	1	55	75
9	GIS and Natural Resources and Environmental Management	13	8	1	1	23
10	Water Pollution management	32	57	19	17	125
11	Environment Impacts Evaluation	25	28	10	40	103
12	Water and Waste Water Analysis	29	51	16	58	154
13	Solid Waste and Sewage Management	20	105	20	4	149
14	Air Quality Analysis from Industry	20	25	28	1	74
15	Treatment of Waste from Laboratories	-	-	-	37	37
16	Toxic Substances Analysis (Orga-nochlorine Pesticides)	14	10	7	10	41
17	Toxic Substance Management (Agriculture, industries) (class 2)	17	23	2	12	54
18	Natural Resources and Environ-mental Administration (class 2)	15	25	2	12	54
19	Ambient Air Quality Analysis	12	11	5	3	31
20	Toxic Substance Analysis (Orga-nophosphorus Pesticides)	15	14	2	12	43
21	Air Pollution Analysis of Industries and Automobile Exhausted Gas	6	6	6	2	20
22	Natural Resources Management (soil,water,forest, coastal resources)	7	13	1	-	21
23	Noise Pollution and Vibration Management	4	7	4	2	17
24	Evaluation and Management Plan	195	-	-	-	195
25	Cost Analysis	192	-	-	-	192
26	Environmental Engineering Technic	280	-	-	-	280
27	Community Waste Management	48	-	-	-	48
28	Waste Water and Solid Waste Management	55	-	-	-	55
29	Environmental Management	70	-	-	-	70
30	Natural Resource Management	60	-	-	-	60
	Total	1,402	798	277	388	2,865

Table 2 to Show the Training Courses with Laboratory and the Number of Trainees (1992-1996)

No.	Training Course	Govt.	Semi Govt.	NGO	Private Sector	Total
1	Basic Analysis of Heavy Metals	35	29	15	18	97
2	Solid waste analysis	22	67	10	40	106
3	Noise Pollution	53	37	27	9	126
4	GIS and Natural Resources and Environmental Management	13	8	1	1	23
5	Water and Waste Water Analysis	29	51	16	58	154
6	Air Quality Analysis from Industry	20	25	28	1	74
7	Treatment of Waste from Laboratories	-	-	-	37	37
8	Toxic Substances Analysis (Orga-nochlorine Pesticides)	14	10	7	10	41
9	Ambient Air Quality Analysis	12	11	5	3	31
10	Toxic Substance Analysis (Orga-nophosphorus Pesticides)	15	14	2	12	43
11	Air Pollution Analysis of Industries and Automobile Exhausted Gas	6	6	6	2	20
	Total	219	288	117	191	762

Table 3 to Show the Training Courses without Laboratory and Number of Trainees (1992-1996)

No.	Training Courses	Govt.	Private	Co-operation	Total
1	Waste Water Treatment Technology	46	119	51	15	231
2	Environmental Management Plan	26	28	4	8	66
3	Air Quality Management	41	56	35	14	146
4	Environmental Management Plan	44	66	11	51	172
5	Environmental Education	6	13	1	55	75
6	Water Pollution management	32	57	19	17	125
7	Environment Impacts Evaluation	25	28	10	40	103
8	Solid Waste and Sewage Management	20	105	20	4	149
9	Toxic Substance Management (Agriculture, industries) (class 2)	17	23	2	12	54
10	Natural Resources and Environ-mental Administration (class 2)	15	25	2	12	54
11	Natural Resources Management (soil,water,forest, coastal resources)	7	13	1	-	21
12	Noise Pollution and Vibration Management	4	7	4	2	17
13	Evaluation and Management Plan	195	-	-	-	195
14	Cost Analysis	192	-	-	-	192
15	Environmental Engineering Technic	280	-	-	-	280
16	Community Waste Management	48	-	-	-	48
17	Waste Water and Solid Waste Management	55	-	-	-	55
18	Environmental Management	70	-	-	-	70
19	Natural Resource Management	60	-	-	-	60
	Total	1,183	540	160	230	2,113

資料1

1. ＥＲＴＣの環境研修コースにおける研修員統合（実績）

（１９９２年度）

研修コース	政府機関	地方機関	企業等	研修人数	研修日数
1 水質汚濁（水処理技術）	6	1	7	14	10
2 大気汚染（環境大気質分析）	9	2	4	15	15
3. 騒音汚染	9	1	8	18	5
4. 有害物質（[illegible] PCB）	9	5	3	17	9
5. 廃棄物分析	5	12	0	17	10
研修員総数（％）	38 （47）	21 （26）	22 （27）	81 （100）	49

（注１）研修期間．１９９２年４月から８月まで

（注２）ＥＲＴＣ研修管理部：１９９２年１０月設立

（１９９３年度）

（'92.10～'93.9）

研修コース	政府機関	地方機関	企業等	[illegible]	[illegible]
1．汚水処理簡易技術（クラス１）	13	22	7	42	[illegible]
2．汚水分析簡易技術（クラス１）	8	11	3	22	[illegible]
3．汚水分析簡易技術（クラス２）	3	10	1	14	[illegible]
4．汚水分析簡易技術（クラス３）	1	11	—	12	[illegible]
5．汚水分析簡易技術（クラス４）	8	6	—	14	[illegible]
6．大気質分析の実習	7	7	2	16	[illegible]
7．騒音汚染	14	6	3	23	[illegible]
8．汚水処理簡易技術（クラス２）	6	17	1	24	[illegible]
9．底質分析（有機塩素系農薬）	8	10	1	19	[illegible]
10．大気質分析（自動車・産業）	6	8	6	20	[illegible]
11．廃棄物管理	8	20	2	30	[illegible]
12．資源と環境管理	10	10	1	21	[illegible]
13．環境質管理計画	12	20	—	32	[illegible]
14．土壌・水・森林・海岸資源管理	9	11	1	21	[illegible]
15．水質汚濁管理	11	7	—	18	[illegible]
16．大気質管理	13	8	4	25	[illegible]
17．廃棄物分析	5	13	1	19	[illegible]
18．騒音・振動管理	10	3	4	17	[illegible]
19．有害物質管理（農業・産業）	5	16	1	22	[illegible]
20．環境影響評価	15	9	4	28	[illegible]
研修員総数（％）	172 （39）	225 （51）	42 （10）	439 （100）	[illegible]

THE NUMBER OF PARTICIPANTS IN FISCAL YEAR 1994 ('93.10~ '94. 9)

COURSES	CENTRAL GOVERN	LOCAL GOVERN	PRIVATE SECTOR	EDUCATED INSTITUTE	TOTAL
AT ERTC					
1.WASTE WATER TREATMENT TECHNOLOGY (CLASS 3-4)	16	47	9	5	77
2.ENVIRONMENTAL QUALITY MANAGEMENT PLAN (CLASS 2-3)	21	32	2	15	70
3.WASTE WATER ANALYSIS (SPECIAL CLASS)	-	-	-	35	35
4.WATER POLLUTION MANAGEMENT (CLASS 2)	5	23	3	6	37
5.TOXIC SUBSTANCE ANALYSIS (ORGANOPHOSPHORUS PESTICIDES) (CLASS 2)	10	8	1	5	24
6.AIR QUALITY MANAGEMENT (CLASS 2)	18	15	5	1	39
7.NOISE POLLUTION (CLASS 3)	13	9	1	3	26
8.TOXIC SUBSTANCE MANAGEMENT (AGRICULTURE, INDUSTRIES) (CLASS 2)	13	11	1	7	32
9.NATURAL RESOURCES AND ENVIRONMENTAL ADMINISTRATION (CLASS 2)	8	14	1	10	33
10.AIR QUALITY ANLYSIS FOR INDUSTRIES (CLASS 1)	7	6	15	1	29
11.BASIC ANALYSIS OF HEAVY METALS (CLASS 1)	6	10	4	3	23
12.SOLID WASTE ANALYSIS (CLASS 3)	5	14	2	3	24
13.SOLID WASTE AND SEWAGE MANAGEMENT (CLASS 2)	7	23	7	1	38
TOTAL	129	212	51	95	487
OUTSIDE ERTC					
14.WATER POLLUTION : WASTE WATER ANALYSIS (CLASS I) AT CHONBURI	3	33	-	1	37
15.WATER POLLUTION : WASTE WATER ANALYSIS (CLASS II) AT PHUKET	-	15	14	3	32
16.WATER POLLUTION : WASTE WATER ANALYSIS (CLASS III) AT SONGKHLA	-	19	3	18	40
TOTAL	132	279	68	117	596
PERCENTAGE (%)	22	47	11	20	100

THE NUMBER OF PARTICIPANTS IN FISCAL YEAR 1995 ('94. 10~ '95. 9)

At. ERTC

COURSES	CENTRAL GOVERN	LOCAL GOVERN	PRIVATE SECTOR	EDUCATED INSTITUTE	TOTAL
1.ENVIRONMENTAL QUALITY MANAGEMENT PLAN	11	15	9	2	37
2.WASTE WATER TREATMENT TECHNOLOGY	8	14	11	2	35
3.SOLID WASTE AND SEWAGE MANAGEMENT	4	28	6	1	39
4.ENVIRONMENTAL LAWS	13	17	3	2	40
5.ENVIRONMENTAL IMPACTS EVALUATION	-	-	-	36	36
6.TREATMENT OF WASTES FROM LABORATORIES	-	-	-	37	37
7.AIR QUALITY MANAGEMENT	10	17	13	4	44
8.WATER POLLUTION MANAGEMENT	7	18	8	4	37
9.ENVIRONMENTAL EDUCATION	4	11	1	22	38
10.NOISE POLLUTION	11	10	8	1	30
11.BASIC ANALYSIS OF HEAVY METALS	8	7	5	7	27
12.WATER AND WASTE WATER ANALYSIS	9	5	9	3	26
13. AIR QUALITY ANALYSIS FROM INDUSTRY	6	11	8	-	25
14.SOLID WASTE ANALYSIS	5	12	3	2	22
15.TOXIC SUBSTANCES ANALYSIS (ORGANOCHLORINE PESTICIDES)	4	6	4	10	24
TOTAL	105	171	88	133	497
PERCENTAGE (%)	21	34	18	27	100

Outside ERTC

โครงการเพิ่มสมรรถนะบุคลากรในการจัดการคุณภาพสิ่งแวดล้อม ประจำปีงบประมาณ 2538 (1995)

(ENVIRONMENTAL QUALITY MANAGEMENT OF GOVERNMENTAL OFFICIAL PROJECT)

หลักสูตร(COURSES)	จำนวนคน PARTICIPANTS	ระหว่างวันที่ DURATION	วัน DAYS
1.การวางแผนและติดตามผล รุ่น 1 (EVALUATION AND MANAGEMENT PLAN CLASS 1)	21	8-11 ส.ค.38(8-11 Aug,1995)	4
2.การวิเคราะห์ทางการเงิน รุ่น 1 (COST ANALYSIS CLASS 1)	20	22-25 ส.ค.38(22-25 Aug,1995)	4
3.เทคนิควิศวกรรมสิ่งแวดล้อม 1 (ENVIRONMENTAL ENGINEERING TECHNIC CLASS 1)	21	4-8 ก.ย.38(4-8 Sept,1995)	5
4.การวางแผนและติดตามผล 2 (EVALUATION AND MANAGEMENT PLAN CLASS 2)	39	7-10 พ.ย.38(7-10 Nov,1995)	4
5.การวิเคราะห์ทางการเงิน 2 (COST ANALYSIS CLASS 2)	40	14-17 พ.ย.38(14-17 Nov,1995)	4
6.เทคนิควิศวกรรมสิ่งแวดล้อม 2(ENVIRONMENTAL ENGINEERING TECHNIC CLASS 2)	59	20-24 พ.ย.38(20-24 Nov,1995)	5
7.การวางแผนและติดตามผล 3(EVALUATION AND MANAGEMENT PLAN CLASS 3)	35	12-15 ธ.ค.38(12-15 Dec,1995)	4
8.การวิเคราะห์ทางการเงิน 3(COST ANALYSIS CLASS 3)	35	19-22 ธ.ค.38(19-22 Dec,1995)	4
9.เทคนิควิศวกรรมสิ่งแวดล้อม 3(ENVIRONMENTAL ENGINEERING TECHNIC CLASS 3)	66	25-29 ธ.ค.38(26-29 Dec,1995)	5
10.การวางแผนและติดตามผล 4(EVALUATION AND MANAGEMENT PLAN CLASS4)	61	9 -12 ม.ค.39(9-12 Jan,1996)	4
11.การวิเคราะห์ทางการเงิน 4 (COST ANALYSIS CLASS 4)	57	10-19 ม.ค.39(10-19 Jan,1996)	4
12.เทคนิควิศวกรรมสิ่งแวดล้อม 4(ENVIRONMENTAL ENGINEERING TECHNIC CLASS 4)	75	22-26 ม.ค.39(22-26 Jan,1996)	5
13.การวางแผนและติดตามผล 5(EVALUATION AND MANAGEMENT PLAN CLASS 5)	39	30 ม.ค.-2 ก.พ.39(30Jan-2 Feb,1996)	4
14.การวิเคราะห์ทางการเงิน 5(COST ANALYSIS CLASS 5)	40	6-9 ก.พ.39(6Feb-9Feb,1996)	4
15.เทคนิควิศวกรรมสิ่งแวดล้อม 5(ENVIRONMENTAL ENGINEERING TECHNIC CLASS 5)	59	12-16 ก.พ.39(12Feb-16Feb,1996)	5
รวม(TOTAL)	667	AUG 1995-Feb 1996	65

หลักสูตร 1 ภาคกลาง (CLASS 1 FOR CENTRAL REGION)

หลักสูตร 2 ภาคตะวันออกเฉียงเหนือ (CLASS 2 FOR NORTH EAST REGION)

หลักสูตร 3 ภาคใต้ (CLASS 3 FOR SOUTH REGION)

หลักสูตร 4 ภาคตะวันออก (CLASS 4 FOR EAST REGION)

หลักสูตร 5 ภาคเหนือ (CLASS 5 FOR NORTH REGION)

At. ERTC

THE NUMBER OF PARTICIPANTS IN FISCAL YEAR 1996 ('95. 10~ '96. 9)

COURSES	CENTRAL GOVERN	LOCAL GOVERN	PRIVATE SECTOR	EDUCATED INSTITUTE	TOTAL
1. BASIC ANALYSIS OF HEAVY METALS	9	6	-	4	19
2. WASTE WATER TREATMENT TECHNOLOGY	2	20	16	1	39
3. SOLID WASTE ANALYSIS	2	16	4	2	24
4. ENVIRONMENTAL LAWS	8	11	1	6	26
5. AIR QUALITY MANAGEMENT	6	16	14	2	38
6. ENVIRONMENTAL MANAGEMENT PLAN	-	-	-	32	32
7. NOISE POLLUTION	10	11	7	1	29
8. ENVIRONMENTAL EDUCATION	2	2	-	33	37
9. GIS AND NATURAL RESOURCES AND ENVIRONMENTAL MANAGEMENT	13	8	1	1	23
10. WATER POLLUTION MANAGEMENT	12	7	8	6	33
11. ENVIRONMENTAL IMPACTS EVALUATION	12	19	6	2	39
12. WATER AND WASTE WATER ANALYSIS	12	9	5	5	31
13. BASIC ANALYSIS OF HEAVY METALS	12	6	6	4	28
14. SOLID WASTE AND SEWAGE MANAGEMENT	3	29	5	1	38
15. AIR QUALITY ANALYSIS FROM INDUSTRY	7	8	5	-	20
TOTAL	110	168	78	100	456
PERSENTAGE (%)	24	37	17	22	100

โครงการถ่ายทอดเทคโนโลยีสิ่งแวดล้อมสู่ภูมิภาค ประจำปีงบประมาณ 2539 (1996)

ENVIRONMENTAL TECHNOLOGY TRANSFER FOR REGIONAL PROGECT

Outside ERTC

หลักสูตร(COURSES)	จำนวน (PARTICIPANTS)	วัน(DAYS)	ระหว่างวันที่ (DURATION)
1 การจัดการของเสียชุมชน (COMMUNITY WASTE MANAGEMENT) (สถาบันราชภัฏพิบูลสงคราม พิษณุโลก AT PIBOONSONGKLAM RAJABHAT INSTITUTE)	48	4	6 - 9 พฤษภาคม 2539, 6 - 9 MAY 1996
2 การจัดการน้ำเสียและมูลฝอย (WASTE WATER AND SOLID WASTE MANAGEMENT) (สถาบันราชภัฏอุดรธานี AT UDONTHANEE RAJABHAT INSTITUTE)	55	4	25 - 28 มิถุนายน 2539, 25 - 28 JUNE 1996
3 การจัดการคุณภาพสิ่งแวดล้อม (ENVIRONMENTAL MANAGEMENT) (สถาบันราชภัฏสงขลา AT SONGKHA RAJABHAT INSTITUTE)	70	4	23 - 26 กรกฎาคม 2539, 23 - 26 JULY 1996
4 การจัดการทรัพยากรธรรมชาติ (NATURAL RESOURCE MANAGEMENT) (สถาบันราชภัฏรำไพพรรณี AT RAMPHIPANNEE RAJABHAT INSTITUTE)	60	4	20 - 23 สิงหาคม 2539, 20 - 23 AUGUST 1996
รวม (TOTAL)	233	16	MAY 1996 - AUGUST 1996

2 NUMBER OF TRAINING NEEDS FOR FISCAL YEAR 1995

COURSES	AGENCIES	TRAINEE
1.ENVIRONMENTAL MANAGEMENT PLAN	727	4517
2.SOLID WASTE MANAGEMENT	637	3830
3.PUBLIC AWARENESS ON NATURAL RESOURCES AND ENVIRONMENT	574	4992
4.ENVIRONMENTAL LAWS	563	3380
5.ENVIRONMENTAL IMPACTS ASSESSMENT	541	3012
6.ENVIRONMENT AND DEVELOPMENT	525	4077
7.WASTE WATER TREATMENT TECHNOLOGY (I)	514	2604
8.MAN AND THE ENVIRONMENT	513	4283
9.ENVIRONMENTAL INFORMATION MANAGEMENT (I)	502	2937
10.WATER POLLUTION MANAGEMENT	465	2637
11.WATER RESOURCES DEVELOPMENT (I)	450	2612
12.AGRICULTURAL TOXIC SUBSTANCE MANAGEMENT(I)	446	3215
13.WATER AND WASTE WATER ANALYSIS	417	1788
14.FOREST RESOURCE DEVELOPMENT AND THE ENVIRONMENT (I)	401	2680
15.ENVIRONMENTAL EDUCATION	382	3473
16.ENVIRONMENTAL INFORMATION MANAGEMENT (II)	349	1424
17.INDUSTRIAL SAFETY AND WORKING EQUIPMENT(I)	348	1681
18.WASTE WATER TREATMENT TECHNOLOGY (II)	341	1241
19.WATER RESOURCES DEVELOPMENT (II)	322	1183
20.TOXIC SUBSTANCES ANALYSIS	314	2425
21.GIS AND LAND USE PLANNING (I)	304	1391
22.SOLID WASTE ANALYSIS	289	1840
23.NOISE POLLUTION CONTROL (I)	274	1193
24.FOREST RESOURCE DEVELOPMENT AND THE ENVIRONMENT (I)	272	1232
25.AIR QUALITY ANALYSIS	255	1116
26.GIS AND LAND USE PLANNING(II)	245	732
27.INSTRUMENTATION MANAGEMENT OF ENVIRONMENTAL LABORATORIES	238	783
28.INDUSTRIAL TOXIC SUBSTANCE MANAGEMENT(I)	233	1063
29.AGRICULTURAL TOXIC SUBSTANCE MANAGEMENT(II)	218	838
30.ANALYSIS OF THE QUALITY OF AIR EMITTED FROM INDUSTRIAL FACTORIES	214	609
31.AIR QUALITY MANAGEMENT	189	561
32.INDUSTRIAL TOXIC SUBSTANCE MANAGEMENT(II)	169	618
33.INSTRUMENTION MANAGEMENT OF ENVIRONMENTAL LABORATORIES	168	624
34.COASTAL RESOURCES MANAGEMENT	164	797
35.NOISE POLLUTION CONTROL (II)	164	586
36.BASIC ANALYSIS OF HEAVY METALS	157	504
37.FISHERY RESOURCES MANAGEMENT	155	824
TOTAL	-	73302

研修計画（３の１）

Environmental Training Course Planning Fiscal Year 1997 ('96. Oct～ '97. Sep)

at ERTC

Training Course	1996			1997									Trainee Amount	Day
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep		
1. Environmental Monitoring and Methodology	1-4												35	4 days
2. Environmental Monitoring	15-18												35	4 days
3. Water Quality Mathematics Model	21-24												35	4 days
4. Public Hearing		5-8											35	4 days
5. Noise Pollution			16-20										25	5 days
6. Environmental Laws				6-10									40	5 days
7. Solid Waste Management				20-24									40	5 days
8. Water and Waste Water Analysis					3-7								25	5 days
9. Situation on Environmental Monitoring and Methodology					23-28	1-8							15	14 days
10. Environmental Impact Analysis Report						10-14							40	5 days
11. Water Pollution Management						24-28							40	5 days
12. Toxic Substance Analysis							21-25						25	5 days
13. Solid Waste Analysis								26-30					25	5 days
14. Air Quality Management									9-13				40	5 days
15. Air Quality Analysis									23-27				25	5 days
16. Environmental Management Plan										7-11			40	5 days
17. Waste Water Treatment Technology										21-25			40	5 days
18. GIS and Natural Resource and Environment											18-29		20	12 days
19. Heavy Metals Analysis												8-12	25	5 days
Total	12days	4 days	5 days	10days	11days	18days	5 days	5 days	10days	10days	12days	5 days	605days	107days

Note : For Course Item 1-4 Cooperation by Department of Environmental Quality Promotion & CIDA

For Course Item 9 for International Curriculum

研修計画（3の2）

Environmental Training Course Planning Technology Project to Region 1997

at Outside

Training Course	1996			1994					Trainee Amount	Day
	Oct	Nov	Dec	Jan	Feb	—	—	Sep		
1. Environmental Training Management (Northern Region)									100	4
2. Environmental Training Management (Southern Region)									100	4
3. Environmental Training Management (Eastern Region)									100	4
4. Environmental Training Management (Northern Eastern Region)									100	4
									400	16 days

研修計画（３の３）

Environmental Trainin_ Course Project on Human Strenghthen Capacity a_ at Environmental Quality Management in Provincial on Fiacal year

at Outside

Training Course	1996			1997					Trainee Amount	Day	Place
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May			
1. Monitoring Plan (Eastern Region)	2-4								51		
2. Economic Analysis (Eastern Region)	2-4								31	3 days	Phuket
3. Environmental Technique Engineering (Easten Region)	2-4								41 (123)		
4. Monitoring Plan (Central Region)		6-8							77		
5. Economic Analysis (Central Region)		6-8							47	3 days	Bangkok
6. Environmental Technique Engineering (Central Region)		6-8							62 (186)		
7. Monitoring Plan (Southern Region)			11-13						71		
8. Economic Analysis (Southern Region)			11-13						43	3 days	Suratthani
9. Environmental Technique Engineering (Southern Region)			11-13						57 (171)		
10. Monitoring Plan (North Region)				6-8					86		
11. Economic Analysis (North Region)				6-8					52	3 days	Phitsanulok
12. Environmental Technique Engineering (North Region)				6-8					69 (207)		
13. Monitoring Plan (North Eastern Region)					3-5				96		
14. Economic Analysis (North Eastern Region)					3-5				58	3 days	Khonkhen
15. Environmental Technique Engineering (North Easten Region)					3-5				77 (231)		
Total	3 days	3 days	3 days	3 days	3 days				981	15 days	

Note : The Proceeding Project for Incresass Capacity on Fiscal Year 1996 have to Employ N.Y. Consultant Co., Ltd. to make Training Program During October 1996 - February 1997

Table 4 : Shows the Outline of Training Courses at ERTC

Course	Main Topic of Training	Purpose of Training
1. Environmental Management Plan	- Principles of environmental analysis - Principles in evaluating environmental conditions - Methods in developing principles to countermeasure environmental problems - Methodology practice in developing management programmes and developing mechanical management - Monitoring systems in checking and evaluating results - Basic methodology practice in formulating management programmes	- To develop knowledge and understanding of environmental management - To train on environmental management - To produce knowledgable and skilled personnel with capabilities to implement environmental management
2. Environmental Impact Assessment	- Basic principles and continuous studies in evaluating environmental impacts - Project implementation and developing TOR - Technical proposals - Analysis of environmental systems and evaluating conditions - Methods to evaluate environmental impacts - Plans to solve environmental impacts - Developing systematic solutions and evaluation of results	- To develop knowledge and understanding on evaluation of environmental impacts - To train how to evaluate environmental impacts - To produce knowledgeable and skilled personnel with capabilities to implement evaluation of environmental impacts

Course	Main Topic of Training	Purpose of Training
3. Environmental Information Management (I)	- The environment and conservation of each type of natural resources - The present environmental situation in Thailand and throughout the world - Environmental quality standards - Environmental laws - Moral conduct towards the environment - Different types of media communications - Types of target group in Thailand - Ways of producing different means of media	- To understand present environmental conditions - To understand the principle environmental conservation - To produce communication appropriate for the specific goal of each group
4. Environmental Information Management (II)	- The environment and the principles and importance of environmental information - Environmental quality standards - Environmental laws - Anticipated environmental problems of Thailand in the future - Policy and environmental information planning - Principle and importance of environmental information	- To understand present environmental conditions. - To formulate policy and make plans for dissemination of environmental information in Thailand - To understand the priority and importance of environmental problems in Thailand for providing environmental information
5. GIS and Land Use Planning (I)	- Land use and its environmental impact - Application of GIS in land use planning and evaluation of environmental impacts - Land use planning	- To provide knowledge in technology and is application in land use planning and in evaluating environmental impacts - To modify ideas in the application of GIS to various work on the environment

Course	Main Topic of Training	Purpose of Training
6. GIS and Land Use Planning (II)	- Land use and its environmental impacts - Evaluation of environmental impacts - GIS in land use planning - Case studies in use of GIS and environmental impacts (Demo)	- To be familiar with the latest technological instruments to help evaluate environmental impacts - To know the mechanical and electrical properties of GIS and to prepare personnel and instruments that would accept GIS technology appropriate for specific departments and throughout the planning stage
7. Forest Resource Development and the Environment (I)	- General knowledge in ecosystems and forest ecology - Forest and factors in the origination of forests in Thailand - National forest policies and forest laws - Principles in zoning natural resources and forest land	- To know the importance and uses of forest resources - To know the present problems and conditions of forest resources - To know the effects of forest abuse towards the environment
8. Forest Resource Development and the Environment (II)	- Ecosystems and the role of forestry to the environment - Present condition of forest resources - Problems and causes of deforestation - Policies and guidelines in forests	- To know the present problems and condition of forest resources - To know the effects of forest resources abuse towards the environment - To know the policies and trends in forestry development and to be able to make plans for forestry development
9. Water Resource Development (I)	- Water situation in Thailand - Flood and drought - Solutions to water pollution - Water management and the environment - Guidelines in water resources management	- To give practitioners the opportunity to gain additional knowledge and to exchange knowledge and understanding between other practitioners in the various agencies - To enable those working in water resources understand their duties and responsibilities towards the

Course	Main Topic of Training	Purpose of Training
		environment
10. Water Resource Development (II)	- Situation and importance of water in Thailand - Conservation of water and water demand - Flood disasters and droughts and their solution - Water pollution and its solution - Real estate development and water demand - Water resources management and its environmental impacts	- To give basic knowledge in water resources management to senior government and private sector water resources personnel - To increase better understanding between water resources management in accordance with government development policy
11. Fisher Resources Management	- Status of fishery resources and fishery laws - Different factors affecting fishery resources - Concept used in the management of fishery resources - Fishing industry impacts - Theory used in resources management - Principles in fishery management through biochemical species - Management of fishery resources in Thailand - Measures on fishery resources management	- To consider the importance of the various fishery resources and to manage these resources in such a way that they are always in abundant supply
12. Coastal Resource Management	- Coastal resources (soil, water, forests, wildlife, aquatic animals and human beings) - Coastal ecosystems - Economic value of coastal resources, its uses and impacts - Management of coastal resources for sustainable development	- To create a system to promote a basic understanding of coastal ecosystems and management by administrative personnel in both the public and private sectors - To create a better understanding between coastal resources administrative management in

Course	Main Topic of Training	Purpose of Training
		response to the government's development policies for the country - To install a deeper understanding amongst coastal resources management administrators
13. Industrial Safety and Working Equipment (I)	- Mankind's working conditions and the environment - Knowledge regarding environmental laws and other relevant laws - Causes of different types of accidents - Knowledge on the different kinds of equipment used in various factories - Prevention of the different types of personal hazards - Fire prevention in working areas - Health measures within working areas	- To enable trainees to know and understand : - The general environment in industrial factories - The various instruments and equipment in industrial factories - Safety precautions in handling and using equipment and instruments in industrial factories - Ways of maintaining instruments as well as security measures, preparedness, and solutions to problems regarding safety
14. Industrial Safety and Working Equipment (II)	- Environmental laws and other relevant laws - Prevention of personal hazards and plans in emergency and dangerous situations - Enhancement of the atmosphere and environment in working areas of industrial factories - Formulate plans to prevent accidents	- The enable trainees to know and understand : - The general environment in industrial factories - Safety in using instruments - Ways to administer management and planning during emergency situations
15. Waste Water Treatment Technology (I)	- Water and waste water conditions in Thailand - Technological principles in water treatment	- To know the condition and to understand the importance of water and waste water in Thailand - To know the technological

Course	Main Topic of Training	Purpose of Training
	- Principles in computing the amount of polluted water and waste in waste water - Considerations taken in using materials, equipment and choosing simple technologies	principles of simple waste water treatment - To know the principles in designing waste water treatment systems
16. Waste Water Treatment Technology (II)	- Water and waste water conditions in Thailand - Basic knowledge regarding waste water - Technological principles in waste water treatment - Ways to choose simple technology - Designing and planning simple waste water treatment	- To know the conditions of water and waste water in Thailand - To know and understand the principles of simple waste water treatment systems - To be able to formulate waste water treatment plans and management policies
17. Water and Waste Water Analysis	- Basic knowledge and understanding of waste water - Technical preparation of glassware and equipment and selection of stations for collecting water samples and preservation of water samples - Fieldwork methodology analysis - Laboratory analysis	- To understand the importance of water and the need to treat waste water - To be able to perform water analysis both in the laboratory and field
18. Solid Waste Management	- Basic knowledge of solid waste - Analysis of the composition of solid waste - Separation and transferring of solid waste - Considerations in selecting appropriates locations for solid waste eradication - Technologies in eradicating solid waste	- To impart knowledge and understanding on solid waste and dirt and its environmental impacts - To know and understand the technology on the eradication of solid waste - To be able to select the appropriate technology to eradicate solid waste

Course	Main Topic of Training	Purpose of Training
	- Considerations used in selecting appropriate technologies on solid waste	
19. Instrumentation Management of Environmental Laboratories	- Classification of instruments, chemicals and testing methods used in laboratories and fieldwork - Care and maintenance of instruments when/when not in use - Storage of chemicals and laboratory equipments - Area design plan specifying the position of instruments, electrical, waste water, chemical disposal and ventilation systems	- To understand the classification of instruments, chemicals and methods used in the laboratory - To understand how to store chemicals and other materials used in laboratories and how to maintain the various equipment - To understand laboratory management so as to perform analysis efficiently and safely
20. Water Pollution Management	- Basic knowledge on water sources and water pollution - Regulations to set standards - Relevant environmental laws - Technological waste water treatment - Analysis of environmental systems and evaluation of environmental impacts - Management plans	- To know the condition of water and water pollution - To know the present environmental laws concerning water pollution - To be able to adopt plans for the management of water pollution on the on the policy and operational planning level
21. Air Quality Analysis	- Basic knowledge in air and air pollution - Situation regarding air pollution - Air sampling techniques - Solutions and preventive measures and guidelines in air pollution	- To know the air pollution situation - To be able to check the quality of air
22. Air Quality Management	- Situation regarding air pollution - Principles in air sampling and methodological analysis - Air pollution control	- To know the present situation of air pollution - To understand the methods in checking and control of air

Course	Main Topic of Training	Purpose of Training
	- Management and solution to problems on air pollution	pollution and its application
23. Noise Pollution Control (I)	- The condition of noise pollution - Basic principles of sound waves - Calculation of noise level - Measurement of noise level and analysis of results - Technical control of noise pollution - Measures in noise pollution control	- To have basic knowledge about noise - To know the laboratory principles measuring and decreasing noise level efficiently
24. Noise Pollution Control (II)	- Basic principles of sound waves - Measurement of noise level - Noise pollution control - Assessing the effects of noise pollution - Control measures on noise pollution	- To gain basic knowledge in noise and its hazards - To learn ways on planning controls to minimize noise pollution
25. Solid Waste Analysis	- Situation and importance of problems of solid waste - Sampling and analysis of solid waste - Classification of different types of solid waste - Analysis of chemical solid waste	- To learn how to conduct analysis of solid waste - To gain basic knowledge and situation of solid waste
26. Toxic Substances Analysis	- Situation of toxic substances - Principles in sampling and extraction of toxic substances form agricultural products, soil, water and biochemical species	- To understand the importance of toxic substances in a modern agricultural production system - To know the principles in the analysis of toxic substance and to gain analysis experience
27. Agricultural Toxic Substance Management (I)	- The importance of using toxic substances in agriculture - Poison and treatment of persons affected by toxic substances in	- To understand the importance of using chemicals in agriculture - To understand the proper use of chemicals in agriculture

Course	Main Topic of Training	Purpose of Training
	agriculture - Contamination of agricultural products with toxic substances - Principles in prevention and eradication of insects through non-use of artificial toxic substances - Principles of harmonious insect management	- To understand the principles in the management of plant insects
28. Agricultural Toxic Substance Management (II)	- Situation of toxic substance in agriculture in Thailand - Toxicology and its treatment - Principles in the use of agricultural chemicals and translation of data - Principles of environmental management in agriculture - Principles of harmonious insect management	- To know the situation of toxic substances in agriculture in Thailand - To know the principles of toxic substances management in agriculture - To be able to conduct appropriate policy planning and implementation
29. Industrial Toxic Substance Management (I)	- Production process - Prevention and treatment of liquid waste - Prevention and treatment of solid waste - Air and its treatment - Toxic substances and their treatment - Laws and standardization of industrial toxic substances - Monitoring the results of waste treatment in factories	- To let practitioners understand their duties and responsibilities - To understand the methods in the analysis of important toxic substances in industry - To understand management methods of toxic substances in industry - To understand the standard and methods in checking the standards of industrial toxic substances
30. Industrial Toxic Substance Management (II)	- Impacts of toxic substances to life and health - Methods to reduce and eradicate toxic substances - Government plans and policies	- To understand the duties and responsibilities of administrative personnel - To understand the problems and causes and the procedures to carry

Course	Main Topic of Training	Purpose of Training
	- Problems facing factories	out solutions - To exchange ideas and opinions and to understand the problems that occur in specific factories
31. Treatment of Wastes from Laboratories	- Managing conditions within the laboratories, and the control and storage of waste form laboratories - Collection and removal of dry waste and contaminated substances form laboratories - Treatment/management of liquid waste form laboratories - Considering how to choose a waste treatment system for a laboratory - How to solve problems regarding waste from laboratories	- To understand the methods in treating waste from laboratories - To be able to choose a treatment system for waste from laboratories - To be able to solve waste problems form laboratories
32. Man and the Environment	- General knowledge of the environment and its physical, biochemical and social aspects - Ways to solve problems on the bilateral relationship between man and the environment - Guidelines and developing techniques and the dissemination of information regarding the life-style in a society where there is a bilateral relationship between man and the environment	- To let trainees know and understand : - That human beings as a part of society should live harmoniously together - That human being as a part of the environment, must give to, as well as use the environment - The types of relationships and problems between mankind and the environment and ways to find solutions
33. Public Awareness on Natural Resources and Environment	- General environmental situation - Life in a society where a bilateral relationship causes no problems - Guidelines and mid-line policies in developing understanding on the conservation of resources	- To let trainees know and understand : - That human beings, as a part of society, should live harmoniously together - Living with and using natural

Course	Main Topic of Training	Purpose of Training
	- Training how to develop a full understanding and to disseminate information	resources - The development of deeper understanding in the conservation of natural resources
34. Environmental Education	- Basic knowledge of environmental science - Basic knowledge on evaluating environment impacts - Basic knowledge on environmental management - Principles of environmental education - Environmental technology - Environmental education programmes	- To enable teachers to understand the environment correctly - To be able to use the knowledge acquired to improve learning and teaching procedures in their respective units - To be able to disseminate the knowledge acquired to high density populations in their respective areas
35. Environment and Development	- Environmental situation in Thailand - Basic knowledge of ecology and the environment - Principles of ecology - Studies on environmental impacts and how to monitor it	- To understand the present environmental situation in Thailand - To understand the principles of ecology - To understand the relationship between the environment and its development
36. Environmental Laws	- Government policy regarding promotion of environmental quality and pollution control - National Environmental Promotion and Conservation Act 1992 - Other relevant laws	- To understand the government's policies on conservation of environmental quality and pollution control - To understand the principles of the new Environmental Promotion and Conservation Law
37. Industrial Air Pollution Quality Analysis	- Principles of analysis and techniques in testing polluted air from factories - Practical training in collecting samples and analyzing air from factories	- To understand the principles of analyzing polluted air from factories - To be able to monitor and analyze the quality of air from factories

Course	Main Topic of Training	Purpose of Training
	- Tools and equipment used in preventing pollution	
38. Heavy Metals Analysis	- Principles and practical training in collecting samples of heavy metals - Principles and analysis of heavy metals - Data analysis	- To understand the techniques in preparing equipment and preserving samples - To obtain practice in the analysis of heavy metals

（5） 研究三課：研究・モニタリング事業総括

Research Theme of Each Section (1995/1996)

1. Water Quality Research and Development Section

Theme of Research	Researcher	JICA Expert	Publication
1. Study on distribution and correlation of some water and sediment quality in main rivers of Thailand	Mr. Pornthip P. Mr. Mesak M. Ms. Faida M. Ms. Variga S. Ms. Jeeranon P.	Mr. Hoshino	
2. Study on toxic substance contamination in ground water in Pathumthani Province	Ms. Pornthip P. Mr. Mesak M. Mr. Atsamon L. Mr. Peerapong S. Ms. Jeeranon P.	Mr. M.Fukuda	
3. Surface water quality monitoring in Pathumthani Province	Ms. Pornthip P. Mr. Mesak M. Mr. Atsamon L. Ms. Variga S.		Seminar on the Role of ERTC in the Environmental Quality Development

Research Theme of Each Section (1995/1996)

1. Water Quality Research and Development Section

Theme of Research	Researcher	JICA Expert	Publication
4. Study on development of domestic wastewater treatment by constructed wetland	Ms. Pornthip P. Mr. Piya S. Mr. Panja Y. Mr. Ornchan	Mr. Hoshino	
5. Pesticides monitoring in Mekong river basin of Thailand	Ms. Pornthip P. Mr. Panja Y.		Report on Water Quality Monitoring Network in the Lower Mekong River Basin By Mokong River Conmission
6. Management of wastewater in ERTC	Dr. Monthip T. Ms. Pornthip P. Mr. Mesak M. Mr. Piya S. Mr. Panja Y. Ms. Jeeramen P. Mr. Peerapong S.	Mr. Hoshino	The Third Asian Symposium on Academic Activity for Waste Management (AAWM)

search Theme of Each Section (1995/1996,

2) Air Quality Noise and Vibration Researcha and Development Section

Theme of Research	Researcher	JICA Expert	Publication
1. Determination of Composition of Polycyclic Aromatic Hydrocabon (PAHs) from particulate matters in urban areas in Thailand	1. Ms. Hathairatana G. 2. Ms. Wanna L.	1. Dr. K. Kume ('96) 2. Dr. S. Okamoto ('96) 3. Mr. I. Yajima ('94-'95)	
2. Study on Status of Acidic deposition in Thailand	1. Ms. Dusanee J. 2. Ms. Daisy M. 3. Ms. Theeranuch C. 4. Mr. Veerathep G.	1. Dr. K. Kume 2. Mr. I. Yajima	Presented at International Conference on Acid Deposition in East Asia, Taiwan 1996
3. Road Traffic Noise Prediction Model for Elevated Road	1. Ms. Phaka S. 2. Mr. Thanaphan S. 3. Mr. Thanavut N.	1. Mr. H. Tanaka ('95-'96)	

...search Theme of Each Section (1995/1996)

2) Air Quality Noise and Vibration Researcha and Development Section

Theme of Research	Researcher	JICA Expert	Publication
4. Development of Factory of Noise Prediction Model	1. Mr. Wirat A. 2. Mr. Nattapong C.	1. Mr. H. Tanaka ('95-'96)	
5. Environmental Noise Measurement in Bangkok	1. Mr. Nattapong C. 2. Mr. Thanaphan S. 3. Mr. Wirat A. 4. Mr. Thanawut N.	1. Mr. H. Tanaka ('95-'96)	Presented at Annual Symposium of Institute of Noise Control Engineering (INCE), Kyoto Japan,10-11 Sep'96
6. The Development of Aircraft Noise Prediction Model	1. Mr. Thanaphan 2. Mr. Nattapong 3. Mr. Wirat A. 4. Mr. Thanavut N.	1. Mr. H. Tanaka 2. Mr. F. Sano	

Research Theme of Each Section (1995 / 1996)

3. Toxic Substance Research and Development Section

Theme of Research	Researcher	JICA Expert	Publication
1. Studied and developed on the Methodology of arsenic residue monitoring at Pak Pa - Nang by using biological sample	Ms. Sukanya B. Mr. Janevit W. Mr. Sutiab S.	Mr. FUKUDA	Paper " A study of Arsenic contamination in Pak Pa - Nang bay, Nakorn Sri-Tammarat province, Thailand was presented in EOPC conference on ASEAN Marine Environmental Management, Penang Malaysia June 24-27'1996 and published in the proceeding

Research Theme of Each Section (1995 / 1996)

3. Toxic Substance Research and Development Section

Theme of Research	Researcher	JICA Expert	Publication
2. Studied and developed on the Methodology of pesticide residue monitoring in the rice field.	Ms. Sukanya B. Mr. Panomporn V.	Mr. FUKUDA	
3. Studied and developed on the Methodology of Toxic chemical residue monitoring at Coastal zone by using Green Mussel	1. Ms. Sukanya B. 2. Ms. Ruchaya B. 3. Mr. Sutiab S.		
4. Studied on the distribution of polycyclic Aromatic hydrocarbons (PAHs) in water resource of Urban and industrial areas	1. Ms. Vanvimol P. 2. Ms. Chuanpit B.	Mr. HOSHINO	

Research Theme of Each Section (1995 / 1996)

3. Toxic Substance Research and Development Section

Theme of Research	Researcher	JICA Expert	Publication
5. Developed analytical method of organochlorine pesticide by using micro - extraction technique.	1. Ms. Ruchaya B. 2. Ms. Areerat J.		Paper " Development of recovery factor for analysis of organochlorine pesticide in water sample by using micro-extraction technique was presented in USA. florida 4-5 Sep 1996
6. Intercalibration Laboratory at PAHs in ASEAN - CANADA Cooperative Programme.	1. Ms. Ruchaya B. 2. Ms. Areerat J.		
7. The study on the role of Sulfur reducing bacteria in polluted water	1. Ms. Juthatip Y. 2. Mr. Aonchun K.		

ERTC capacity Development schedule 3 years plan

Water section

1. Study on emession and relation of water quality and sedimentary to main river
2. Study on contaminate of Hazadous waste in water and soil at Pathumthani
3. Study on Toxic residue a kind of weed killer in Khong river and branch river
4. Water quality monitoring in source of water surface Pathumthani province
5. Research and development method the waste water treatment from community to apply the constructed wetlands system
6. Research and development method waste water treatment from shrimp farm

Air & Noise section

1. Research for chimical element components in the rain
2. Study on ambient noise by mathematics model
3. air quality monitoring particular place
4. Study on Toxic substance in climate by use passive sampler
5. ASNEM project
6. Study on chemical element component of PAHs from dust in the city
7. Research and development mathemetic model for prediction Noise on Toll way

Toxic substance section

1. Monitoring development method Aresenic residue by use of Biological sampler at Pak-pa-nang bay
2. Research and monitoring development method the chemical residue in paddy and impact to environment by Biological sampler
3. Research and monitoring development and the chemical contaminate in sea mussel at thoughout of seashore
4. Research and monitoring mented the Lead residue from battery factory at Pathumthani by Biological method
5. Study the Toxic omission Polycyclic Aromatic Hydrocarbon (PAHs) in the link of food at the water source in city and indusstrial
6. Study the poisonous toxic have contaminate in the environment Ping river Wang river, Yom river ,Nan river

（6） 水質課：実績・将来計画

Water research and Technology Development Section

Work Plan on Research Activities

Themes	Objectives	Activities	Work Plan							
			1995			1996				1997
			Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar
1. Study on the ionic species distribution and water quality of the major rivers in central basin	- To study the distribution pattern of ionic species in Chao Phraya river, Tha-Chin river Mae-Klong river and Bangpakong river - To study the water quality of the major rivers - To develop analytical technique for ionic species nonitoring	- Review literature - Sampling design - Sample collection and analysis by useing Ion Chromatography - Data analysis and interpretation								

Themes	Objectives	Activities	Work Plan							
			1995			1996				1997
			Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar
2. Study on the accumulation of heavy metals in river sediments and benthic organisms	- To identify the contamination level of heavy metals in river sediment - To identify the contamination level of heavy metals in benthic organisms - To develop analytical technique for heavy metals by using x-ray Fluorescence (XRF) - To develop bioindicator for environmental quality assessment in water resources - To develop analytical technique for particle size measurement	- Review literature and collect basic data of pollutant loading - Study the mechanism of sediment accumulation - Study the composition of sediment - Sampling design - Sample collection - Sample analysis by using XRF - Dato analysis and interpretation								

Themes	Objectives	Activities	Work Plan							
			1995			1996				1997
			Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar
	of sediment by using electron microscope scanning (EMS)									
3. Surface water quality monitoring in Pathumthani province	- To monitor and evaluate the current status of water quality in the receiving water in Pathumthani	- Sampling design/ sample collection and analysis - Data analysis - Report								
4. Study on ground water contamination by hazardous waste in industrial area.	1. To study and evaluate the current status of toxic substance contamination in ground water with emphasis on chlorinated hydrocarbon. 2. To establish concept and future strategy to prevent and control ground water contamination.	**1. Preliminary study** - Study of volatile organic compounds utilization by distributing questionnaires to obtain data of chemical uses from some factories in Pathumthani. - Literature survey for hydrogeology to make conception frame work for hydrogeology of the study area. - Application of water chemistry for aquifer classification.								

Themes	Objectives	Activities	Work Plan							
			1995			1996				1997
			Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar
	3. To develop the monitoring methodology of toxic substances in ground water.	**2. Methodology development and study** - Development of analysis and storage methodology for ground water samples - Development of sampling methodology of ground water samples. - Development of soil gas technique - Development of new analytical technique. **3. Laboratory and theoretical study** - Geophysics and logging training by Mr. Takashi Ohya - Ground water contamination model simulation training by Miss. Noriko Asada								

Themes	Objectives	Activities	Work Plan							
			1995			1996				1997
			Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar
		- Application of Isotope -Laboratory column experiment of volatile organic compounds diffusion and penetration in clay layer. **4. Field survey** - Groundwater sampling and survey - Soil gas survey - Geological sketch during drilling survey of studying well-drill procedure. **5. Workshop/ Training** - Development of training material (virtual survey model) for ground water contamination.				—	—	—	—	—

Themes	Objectives	Activities	Work Plan							
			1995			1996				1997
			Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar
		- Workshop on ground water contamination by volatile organic compounds and control - Training on virtual survey model for ground water contamination								
5. Study on Development of Wastewater Treatment for Shrimp-Farming Discharge	- To develop a wastewater treatment system for shrimp-farming operation	- Literature Review - Laboratory experiment: Study on efficiencies of a laboratory-scale treatment model set up at ERTC - Field experiment: Study on efficiencies of an experimental-scale treatment model set up at shrimp-farming area - Data analysis and report preparation								

Themes	Objectives	Activities	Work Plan							
			1995			1996				1997
			Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar
6. Study on Development of Constructed Wetlands for Domestic Wastewater Treatment	- To develop an appropriate wastewater treatment for domestic wastewater - To develop the optimum design criteria for constructed wetland system in Thailand	- Review literature and collect basic data for domestic wastewater and its treatment. - Study the situation and characteristic ofdomestic wastewater in Thailand. - Study the design criteria of constructed wetland for domestic wastewater treatment in Thailand - Study the characteristics and efficiency of operating wetland systems in Thailand - Disign and construct an experiment model at ERTC - Study the performance and pollutant removal efficiency of an experimental model								

Themes	Objectives	Activities	Work Plan							
			1995			1996				1997
			Apr-Jun	Jul-Sep	Oct-Dec	Jun-Mar	Apr-Jun	Jul-Sep	Oct-Dec	Jun-Mar
		- Study the role of microorganisms on the efficiency of constructed wetland system								—
7. Pesticide monitoring in Mekong river basin of Thailand	- To monitor the pesticide residue in fish and water - To evaluate the possible impact of toxic substances in different species of fish at various location - To predict possible effect of pesticide contaminated water and fish to the public health	- Data collection on pesticide use - Field survey/Sample collection - Sample analysis - Data analysis and report presentation	—	—	—	—	—	—	—	—
				—	—	—	—	—	—	—
					—	—	—	—	—	—
					—	—	—	—	—	—

Themes	Objectives	Activities	Work Plan							
			1995			1996				1997
			Apr-Jun	Jul-Sep	Oct-Dec	Jun-Mar	Apr-Jun	Jul-Sep	Oct-Dec	Jun-Mar
	- To establish a system to provide early recognition of water problems arising from the current and future development activities									
8. Wastewater Management in ERTC	1. Development of guidelines and criteria for wastewater management in ERTC 2. Organizing body for handling wastewater management system in ERTC 3. Implementation of wastewater management system in ERTC according to the guidelines and criteria.	1. Data collection for wastewater sources in both laboratory and domestic activities. 2. Study on the characteristics of laboratories wastewater and treatment. 3. Set up the working group and sub-working group to handle for wastewater management in ERTC as follows. - Segregation and storage wastewater group.								

Themes	Objectives	Activities	Work Plan							
			1995			1996				1997
			Apr-Jun	Jul-Sep	Oct-Dec	Jun-Mar	Apr-Jun	Jul-Sep	Oct-Dec	Jun-Mar
	4. Investigation of wastewater treatment system in ERTC	- Wastewater treatment group. - Wastewater quality monitoring group. - Auditing group. 4. Monitoring and evalutation to develop wastewater treatment system in ERTC								

Water Research and Technology Development Section (WRTD) / ERTC

Output of Research, Monitoring and Training

Items	Titles	Researchers[1]/ Trainers[2] Organizers[3]	Year	Place/ Institutions
1. Technical reports & Publication	1. Study on environmental quality in Pathumthani Province	Pornthip P.	1995	Seminar on the Role of ERTC in Environmental Quality Development
	2. Study on ionic species distribution in the Chao Phraya river	Orasai I.	1995	Seminar on the Role of ERTC in Environmental Quality Development
	3. Study on possibility and appropriateness of using "EARTHTEC" and its impacts on environment	Piya S.	1995	DEQP Technical report
	4. Monitoring of organochlorine pesticides residue in water and fish in Mekong river basin, Thailand	Panja Y.	1995	Technical report submitted to Mekong River Commission under Water Quality Network in the Lower Mekong Basin Project
	5. Study on Shrimp pond effluent: Pollution problems and treatment by constructed wetland.	Piya S.	23-28 June 1996	18th IAWQ Biennial International Conference at Singapore.
	6. The Management of Wastewater in ERTC	Mesak M.	27-29 August 1996	The Third ASIAN Symposium on Academic Activity for Waste Management at Bangkok

Items	Titles	Researchers[1]/ Trainers[2] Organizers[3]	Year	Place/ Institutions
	7. Investigation of volatile organic compound (VOCs) in ground water in Pathumthani province	Asamon L.	1996	DEQP Technical Report
	8. Case study on environmental problems and management of Pathumthani province, Thailand	Pornthip P.	7-10 Jan 1997	International Seminar on Resources, Production, Environment and Trade at Pulau Seribu, Indonesia.
2. Technical Advices	1. Training on water and wastewater monitoring and analysis	WRTD Staffs	1995	Training program for student practices of universities and technical college
	2. Training for staffs of Pathum thani administrative organization on Environment and Natural Resources Management in Pathumthani province	Pornthip P.	1995	Prathumthani province
	3. Training on water quality monitoring technique	Pornthip P.	1995	For lecturer of Rachapat Institute
	4. Training course on water pollution management	Pornthip P.	1995	ERTC

Items	Tittle	Researchers[1]/ Trainers[2] Organizers[3]	Year	Place/ Institutions
	5. Training for staffs of Interior Ministry on environmrnt and natural resources management in Thailand	Pornthip P.	1995-96	Training program for administrative staffs of Interior Ministry held by Institute of Administration Department
	6. Training Course for Regional Trainer on Environment and Natural Resources	Piya S.	1995	Royal River Hotel Thailand.
	7. Training on fundamental panameters for water and wastewater analysis	WRTD Staffs	1996	Training couse on fundamental parameters for water and wastewater analysis at ERTC
	8. Training for provincial staff and NGOs on determination of water quality by simple analysis technique	Asamon L.	1996	Training program at Srisaget province
	9. Training for provincial staff and NGOs on determination of water quality by simple analysis technique	Perapong	1996	Training program at Singburi province
	10. Training on laboratory Wastewater treatment	Mesak M., Panja Y.	1996	Training course on Environmental Auditing at ERTC

Items	Tittle	Researchers[1]/ Trainers[2] Organizers[3]	Year	Place/ Institutions
3. Work shop/ Symposium/ Training Course	1. Training Course on Analysis of Pesticides Residues in Fish and Water Samples for the riparian countries in the Lower Mekong Basin	WRTD	15-26 May 1995	ERTC
	2. The Third Asian Symposium on Academic Activity for Waste Management (AAWM)	WRTD	27-29 August 1996	Imperial Hotel, Bangkok
	3. Workshop on Development of Virtual Survey Model for Ground Water Contamination in Thailand.	WRTD	Jan 1997	Princess Hotel, Bangkok
	4. Training course on ground water contamination survey	WRTD	Feb 1997	ERTC

Water Research and Technology Development Section (WRTD) / ERTC

Activities in 1995/ 1996

Items/Fields	Surface Water Survey	Ground Water Survey	Wastewater Treatment	Biological Survey
Adviser	Dr. Monthip S.T. (Director, ERTC)			
Project leader	Ms. Pornthip P. (Chief, WRTD Section)			
Main researchers	Mr. Meesak M. Ms. Valika S. Ms. Cheeranun	Mr. Asamol L. Mr. Peerapong S. Ms. Fairda M.	Mr. Piya S. Mr. On-chan K.	Mr. Panja Y. Mr. Seehanart
Long-term expert	(Mr. Mizobuchi)	Mr. Fukuda	(Dr. Matsui) Mr. Hoshino	-
Short-term expert	(Mr. Yoshinaga)	Dr. Ohya/ geophysics and logging Ms. Asada/ ground water contamination modeling	(Mr. Matsusi) (Mr. Morishita) (Mr. Ando/ Laboratory wastewater treatment) Mr. Fujita (Wastewater Engineering)	(Dr. Yoshiyasu) Dr. Ohuchiyama
Current research Themes	1. Study on water quality and ionic species distribution in the major rivers 2. Surface water quality monitoring in Pathumthani province 3. Study on the accumulation of heavy metal in water sediment of the major rivers	Study on the contamination of volatile organic compound (VOCs) in ground water	1. Study on development of wastewater treatment of shrimp farm by constructed wetland 2. Study on development of domestic wastewater treatment by constructed wetland	1. Monitoring of pesticides residue in water and fishes in Mekong river basin of Thailand. 2. Study on the role of micro organisms in constructed wetland for domestic wastewater treatment

Items/Fields	Surface Water Survey	Ground Water Survey	Wastewater Treatment	Biological Survey
Output **: Technical report**	1. Water Quality Monitoring in the major rivers 2. Ionic Species distribution in the major rivers 3. Surface water quality monitoring in Pathumthani province	1. Development of sampling, storage and analytical methodology of volatile organic compounds (VOCs) contamination in ground water 2. Investigation of VOCs contamination in ground water in Pathumthani province 3. Development of soil gas technique for ground water contamination survey 4. Application of istope for ground water study in arsenic contaminated area, Ron-Piboon, Nakorn Srithammarat province 5. Development of training material (virtual survey model) for ground water contamination 6. Investigation of VOCs contamination in ground water in the northern industrial estate area	1. Shrimp pond effluent: Pollution problems and treatment by constructed wetland 2. Possibility and appropriateness of using ERTHTEC and its impacts on environment 3. The characteristic of domestic wastewater in Thailand 4. The efficiency of constructed wetland system at Institute of Administration Development (IAD) 5. Development of design criteria of constructed wetland system for domestic wastewater treatment in Thailand	1. Monitoring of organochlorine pesticides residue in water and fish in Mekong river basin, Thailand. 2. Role of microorganisms on the efficiency of domestic wastewater treatment by constructed wetland system.

Items/Fields	Surface Water Survey	Ground Water Survey	Wastewater Treatment	Biological Survey
		7. Application of water chemistry for aquifer classificatian 8. Application of ground water contamination model		
: Technical advice and recommendations through individual training and training course	Surface water quality monitoring and analytical techniques	Sampling and analytical technique of ground water contamination-	Wastewater sampling and analytical techniques	Analytical technique of organochlorine pesticides in water and fish samples.
: Organizing for Workshop/ Symposium/ Training course		1. Workshop on Development of Training Material (Virtual Survey Model) for Groundwater Contamination in Thailand. 2. Training Course on Groundwater Contamination Survey	The Third Asian Symposium on Academic Activity for Waste Management (AAWM)	Training Course on Analysis of Pesticides Residues in Fish and Water Samples for the Riparian Countries in the Lower Mekong Basin
Future Plan	Application of environmental isotopes and other techniques for water quality study	Research and development on remediation techniques for ground water contamination	- Application of biotechnology for wastewater treatment - Research and development on wastewater recycling - Research and development on clean technology	Research and development on - Biodiversity survey - Environmental Biotechnology

（7） 大気・騒音振動課：実績・将来計画

Air Quality, Noise and vibration Research and Development Section

1. Responsibilities

1.1 To undertake practical research programmes on environmental management particularly in the fields of;

- air pollution
- noise
- vibration

1.2 To promote and encourage research activities on environmental quality in cooperation with other agencies

2. Staffs

Section	No. of staff		
	Permanent	Temporary	Total
- Chief	1	-	1
- Air Pollution	6 (1)	6 (1)	12 (2)
- Noise and Vibration	4	1 (1)	5 (1)
- Secretariat	-	3	3
Total	11 (1)	10 (2)	21 (3)

( ) non occupy

Research in 1995-1996

Research Theme	Researcher	JICA Expert	Publication/Output
1. Determination of Composition of Polycyclic Aromatic Hydrocarbon (PAHs) from particulate matters in urban areas in Thailand Objective 1. The evaluate profiles and distributional characteristic of selected PAHs with respect to gas-particle partition and the size of particle with which they are associated in a tropical environment. 2. To demonstrate the relative importance of source of airborne particulates contributed to ambient urban air by using multivariate analysis	1. Ms. Hathairatana G. 2. Ms. Wanna L.	1. Dr. K. KUME ('94-'95) 2. Mr. YAJIMA ('96) 3. Dr. OKAMOTO ('96) 4. Dr. AMAGAI ('95)	-Presented to the meeting of Sub-Committee on Air Pollution Control in Bangkok with emphasis on Airborne Particulate 1996 -The results of this study could be used as reference for the assessment of the air pollution due to these carcinogenic and mutagenic substances present in ambient urban area

Research Theme	Researcher	JICA Expert	Publication/Output
2. Study on Status of Acidic deposition in Thailand Objectives - This rainwater monitoring programme is used to determine acidic deposition in Thailand. It is expected that the results from this monitoring will be used to formulate the mathematical modelling for predicting acid rain problems.	1. Ms. Dusanee J. 2. Ms. Daisy M. 3. Ms. Teeranuth C. 4. Mr. Weeratep G.	1. Dr. K. KUME ('94 - '95) 2. Mr. I. YAJIMA ('96)	Presented at International Conference on Acid Deposition in East Asia, Taiwan, 1996

Research Theme	Researcher	JICA Expert	Publication/Output
3. Road Traffic Noise Prediction Model for Elevated Road Objectives - To develop road traffic noise prediction model for elevated road	1. Ms. Phaka S. 2. Mr. Thanaphan S. 3. Mr. Thanavut N.	1. Mr. H. TANAKA ('95-'96)	-These models can be used as a tool for Environmental Impact Assessment in Thailand
4. Development of Factory Noise Prediction Model Objectives - To develop factory noise prediction model	1. Mr. Wirat A. 2. Mr. Nattapong C.	1. Mr. H. TANAKA ('95-'96)	- ditto
5. The Development of Aircraft Noise Prediction Model Objectives - To develop aircraft noise prediction model	1. Mr. Thanaphan S. 2. Mr. Nattapong C. 3. Mr. Wirat A. 4. Mr. Thanavut N.	1. Mr. H. TANAKA ('95-'96) 2. Mr. SANO ('96)	- ditto-

Research Theme	Researcher	JICA Expert	Publication /output
6. Environmental Noise Measurement in Bangkok Objectives - To make noise level map of Bangkok area.	1. Mr. Nattapong C. 2. Mr. Thanaphan S. 3. Mr. Wirat A. 4. Mr. Thanavut N.	1. Mr. H. TANAKA ('95-'96)	Presented at Annual Symposium of Institute of Noise Control Engineering (INCE), Kyoto, Japan 10-11 September , 1996