Technical cooperation on

The Development of Basic Schemes for PRTR System in the Kingdom of Thailand

Progress Report No. 8

March 2015

Pollution Control Department, MONRE
Department of Industrial Works, MOI
Industrial Estate Authority of Thailand, MOI

Japan International Cooperation Agency

Abbreviation

AIT	Asian Institute of Technology
AQNMB	Air Quality and Noise Management Bureau (PCD)
CMR	Carcinogenicity, Mutagenicity, Reproductive Toxicity
CRJA	Chonburi Rayong Japanese Association
C/P	Counterpart Personnel
DG	Director-General
DDG	Deputy Director-General
DEQP	Department of Environmental Quality Promotion
DOA	Department of Agriculture
DIW	Department of Industrial Works
DLA	Department of Local Administration (Ministry of Interior)
EARTH	Ecological Alert and Remediation for Thailand (NGO)
ECNEQ	Enhancement and Conservation of National Environmental Quality Act
EF	Emission Factor
ERTC	Environmental Research and Training Center
ESIE	Eastern Seaboard Industrial Estate (Rayong)
EQLD	Environmental Quality and Laboratory Division (PCD)
FTI	Federation of Thai Industry
GDP	Gross Domestic Product
GSEI	Good Governance for Sustainable Environment Institute (NGO)
GPP	Green Partnership Program
HAPs	Hazardous Air Pollutants
HSB	Hazardous Substances Bureau (DIW)
IET	Institute of Environmental Training
IEAT	Industrial Estate Authority of Thailand
IRIS	Integrated Risk Information System (US EPA)
ITD	IT Division (PCD, DIW)
IWETB	Industrial Water and Environmental Technology Bureau (DIW)
JCC	Joint Coordination Committee
JpCC	Japanese Chamber of Commerce
JICA	Japan International Cooperation Agency
M/M	Man/Month
MONRE	Ministry of Natural Resources and Environment
MOI	Ministry of Industry
MOT	Ministry of Transport
MOA	Ministry of Agriculture
MSDS	Material Safety Data Sheet
NEB	National Environmental Board
NESDB	National Economic and Social Development Board
ONEP	Office of the Natural Resources and Environmental Policy and Planning
OTP	Office of Traffic and Transport Policy and Planning
PCC	Pollution Control Committee
PCD	Pollution Control Department
PDM	Project Design Matrix
PRTR	Pollutant Release and Transfer Register
PSB/MOPH	Policy and Strategy Bureau/Ministry of Public Health
R/D	Record of Discussion
SAICM	Strategic Approach for International Chemical Management
TEI	Thailand Environment Institute (NGO)
TF	Task Force
TAIA	Thai Automotive Industry Association
TAPMA	Thai Autoparts Manufacturers Association
TCPA	Thai Crop Protection Association
TPMA	Thai Paint Manufacturer's Association
UNEP	United Nations Environment Program
US EPA	United States Environmental Protection Agency

VOCs	Volatile Organic Compounds
WHO	World Health Organization
WHSMB	Waste and Hazardous Substances Management Bureau (PCD)
WQMB	Water Quality Management Bureau (PCD)

Table of Content

1. General

1.1. Project Outline

- **Title of the project**
  The Development of Basic Schemes for PRTR System in Kingdom of Thailand

- **Overall Goal**
  Model of PRTR system for Thailand is established

- **Project Purpose**
  Capacity of PCD, DIW and IEAT's staff for implementation of PRTR pilot project is strengthened

- **Project period**
  5 years (March 6th, 2011 – March 5th, 2016) Extension was proposed and approved in 2014.

- **Implementing agency**
  Pollution Control Department, Ministry of Natural Resources and Environment
  Department of Industrial Works, Ministry of Industry
  Industrial Estate Authority of Thailand, Ministry of Industry

- **Outputs**
  (Output 6 noted below was approved at Joint Coordination Committee meeting held on July 12, 2013.)

  1. Basic design of PRTR system in Thailand is established
  2. Emission reporting scheme of industry is developed
  3. Capacity of estimation of emission and transfer for point source is strengthened.
  4. Capacity of emission estimation for non point source is strengthened.
  5. Importance of use of PRTR data including initial assessment is understood
  6. Implementation structure of risk communication is developed in the pilot area.

- **Activities of the Project**
  (Activity of the project noted below was approved at Joint Coordination Committee meeting held on July 12, 2013.)

  Activity for output 1
  1-1. Formulation of basic strategy
  1-2. Organizational set up inside government and with other stakeholders
  1-3. Development of project work plan
  1-4. Development of criteria for target substance selection
  1-5. Draft target substance list and revision
  1-6. Draft basic design of PRTR system

1-7. Development of PRTR database and Web site
1-8. Draft pilot project implementation plan and set up organization
1-9. Organizing awareness raising and training workshop for pilot project
1-10. Collection of data and disclosure for pilot project
1-11. Organizing risk communication meeting for pilot project
1-12. Obtaining feedback from stakeholders for pilot project
1-13. Final design of PRTR system and prepare action plan
1-14. Preparation of final report of output 1

Activity for output 2

2-1. Collection of available data for preparing point source definition
2-2. Development of point source definition (reporting thresholds)
2-3. Development of reporting form
2-4. identifying reporting procedure from point sources
2-5. Listing of candidate point sources and sending reporting form to them
2-6. Collecting reports from point sources
2-7. Verification of point source data
2-8. Compilation of point source data
2-9. Revision of point source definition and reporting form
2-10. Preparation of final report of output 2

Activity for output 3

3-1. Establishment of task forces on development of release estimation manuals for specific industries
3-2. Development of draft release estimation manuals for specific industries
3-3. Conducting model studies for industries for which release estimation manuals are not prepared
3-4. Organizing workshop on point source release estimation for governmental officials and relevant agencies
3-5. Organizing workshop on point source release estimation for factories/facilities
3-6. Organizing consultation for factories/facilities to estimate releases by site visit
3-7. Responding to questions (via phone, e-mail) on release estimation from factories/facilities and preparing FAQs
3-8. Revision of release estimation manuals for specific industries
3-9. Preparation of final report of output 3

Activity for output 4

4-1. Establishment of basic idea for estimation of emissions from non-point sources (NPS)
4-2. Survey of availability of activity data and emission factors (EFs) necessary to estimate
4-3. Selection of target categories and target chemicals for NPS and responsible bodies to estimate

4-4. Validation of data used for estimation; activity data and EF
4-5. Establishment of estimation method in each target category
4-6. Preparation for drafts of estimation manuals
4-7. Collection such data used for estimation as activity data and EF
4-8. Estimation of emission amounts from NPS at pilot project area and Compilation of disclosed data
4-9. Collection of information, data necessary for revising estimation manuals and revision of estimation manuals
4-10. Implementation of workshop for estimation of emissions from non-point sources for government officials and relevant agencies
4-11. Preparation of final report of output 4

Activity for output 5

5-1. Introduction of domestic and overseas case studies on use of PRTR data including initial assessment of exposure risk to target substances
5-2. Utilization and possible development of model or tools for uses of PRTR data e.g. concentration estimating model
5-3. Implementation of case studies for use of PRTR data including initial assessment
5-4. Training for use of PRTR data including initial assessment for both government and private sectors
5-5. Preparation of final report of output 5

Activity for output 6

6-1. Development of basic strategy for promoting risk communication
6-2. Organizational set up inside government and with other stakeholders for promoting risk communication
6-3. Awareness raisings for risk communication importance for relevant agencies, relevant local governments and participating companies.
6-4. Development of training curriculum for facilitator and pilot project implementation of training course
6-5. Review of facilitator training course and follow-up for trainee
6-6. Development of the Handbook for risk communication
6-7. Planning the registration system of chemical advisor for supporting risk communication.
6-8.Development of the implementation plan, and pilot project organization of risk communication meeting with community people of Rayong
6-9. Preparation of final report of output 6

- **Project area**

Major activities of the project will be at Bangkok and surrounding area where the office of the implementing agencies are located. In addition, activities will be at area selected for pilot project.

1.2. Project work plan for 5 years (Activities indicated by **bold underline** are on-going or completed as of March 2015)

Year	2011	2012	2013	2014	2015
Major work	• **Capacity assessment**	• **Capacity assessment**	• **Capacity assessment**	• **Capacity assessment**	• Capacity assessment
Output 1	• **Clarification on organizational matters, policy priority** • **Designing the element of basic PRTR system** • **Basic survey and listing of target chemical substances** • **Preparation for pilot project**	• **PRTR design paper (draft) will be prepared.** • **Preparation for pilot project action plan**	• **Designing the element of basic PRTR system.** • **Implementation of pilot project**	• **Compilation of the pilot project data** •	• Implement questionnaire survey • Design of PRTR system for nationwide application
Output 2	• **Selection of target business and size** • **Review of existing reporting system** • **Design of PRTR reporting system.**	• **Design of PRTR reporting system**	• **Direct support to industry for PRTR reporting** • **Verification, compilation of reported data**	• **Direct support to industry for PRTR reporting** • **Verification, compilation of reported data** • **Disclosure of PRTR data from pilot project**	• Design of reporting system and format for nationwide PRTR system
Output 3	• **Preparation of industry specific emission estimation manual from point source**	• **Preparation of industry specific emission estimation manual from point source. Draft manual will be prepared in English and then translated to Thai.**	• **Continue Preparation of industry specific emission estimation manual from point source. Draft manual will be prepared in English and then translated to Thai.**	•	• Revision of manual for point source estimation
Output 4	• **Selection of target business and activity** • **Advice on emission factor experiment**	• **Advice on emission factor experiment** • **Preparation of emission estimation method from**	• **Implement pilot project Estimate emission from non point source in pilot project area**	• **Implement pilot project Estimate emission from non point**	• Revision of manual for non point source estimation

	• **Preparation of emission estimation manual from non-point source**	**non-point source. Draft method document will be prepared.**	**(Including mobile source and pesticide).** • **Preparation of emission estimation manual from non-point source. Revise manual**	**source in pilot project area (Including mobile source and pesticide).** •	
Output 5		• **Preparation of case study of PRTR data utilization**		• **Preparation of case study of PRTR data utilization** • **Application of models and tools for PRTR data utilization**	•
Output 6	• **Review of current situation and design of human resource development** • **Planning and development of risk communication training course**	• **Organization of training course for risk communication**	• **Support for training of risk communication**	• **Support for training of risk communication**	•
Training (study visit)		**Training in Japan (study visit)**	**Training in Japan(study visit**)		
Evaluation		**Mid-term review**			Final evaluation
Seminar/Workshop	• **JCC** • **1st PRTR seminar**	• **JCC** • **2nd PRTR seminar** • **Seminar for PRTR awareness raising to industry**	• **JCC** • **3rd PRTR seminar** • **Point source estimation workshop for government officer** • **Point source estimation workshop for industries**	• **Point source estimation workshop for industries** • **Non point source estimation workshop**	• JCC • 4th PRTR seminar • PRTR data utilization & risk communication workshop
Sub-contract	• **Basic survey for chemical substance** • **PRTR Web site development**	**Data availability survey for non point source**	**Direct factory support for pilot project** **Traffic survey in Rayong**	**Direct factory support for pilot project** **Traffic survey in Rayong**	

Plan of Operation

Activities	2011												2012												2013												2014												2015												2016		
	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
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1-13-a Design role of relevant organization in non point source estimation																																																											
1-13-b Design role of local government in risk communication																																																											
1-13-c Design inclusion of PRTR system in eco industrial town program																																																											
1-13-d Prepare action plan to implement PRTR on regular basis																																																											
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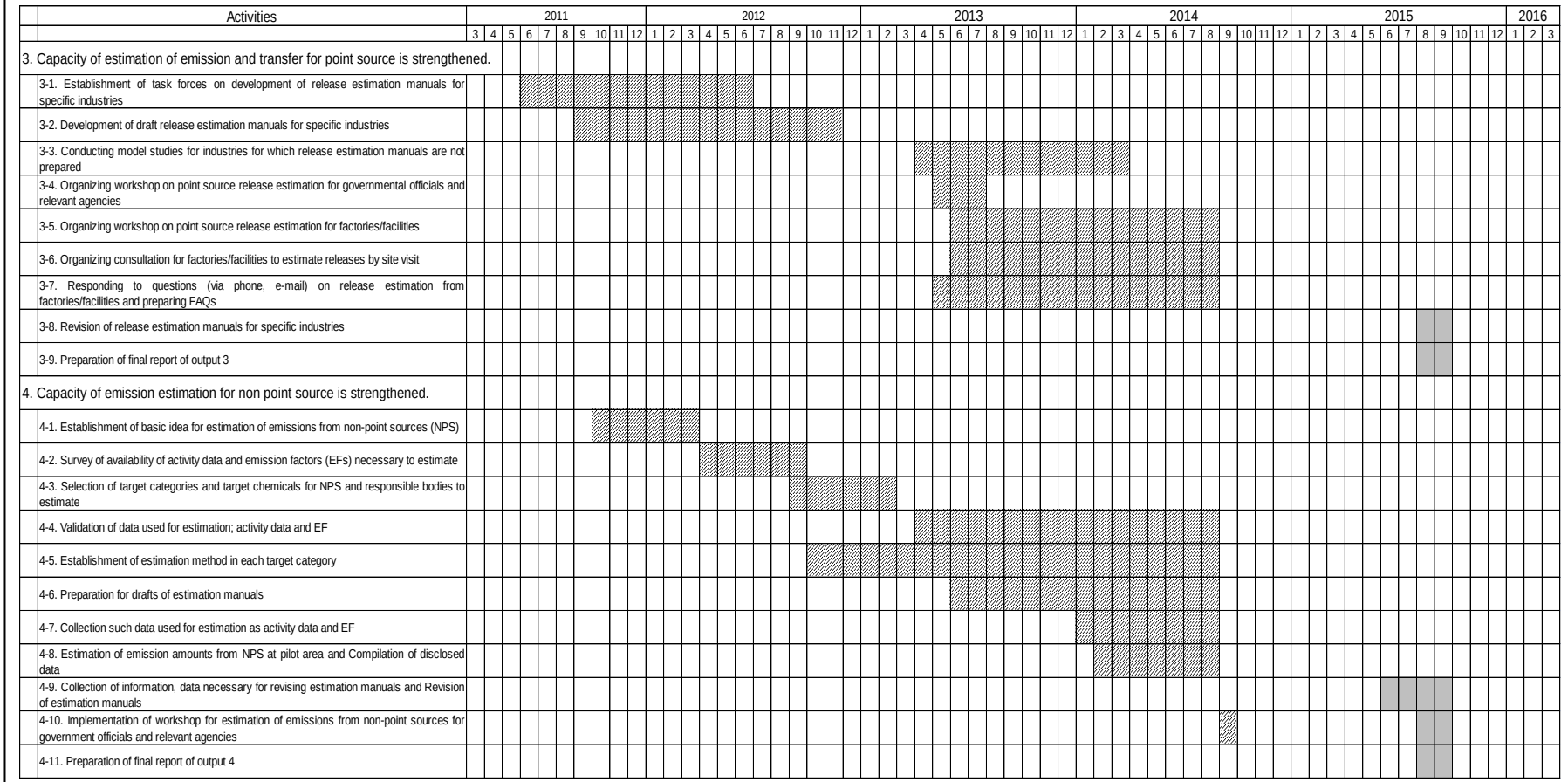
Activities
2011
2012
2013
2014
2015
2016
3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11 12 1 2 3
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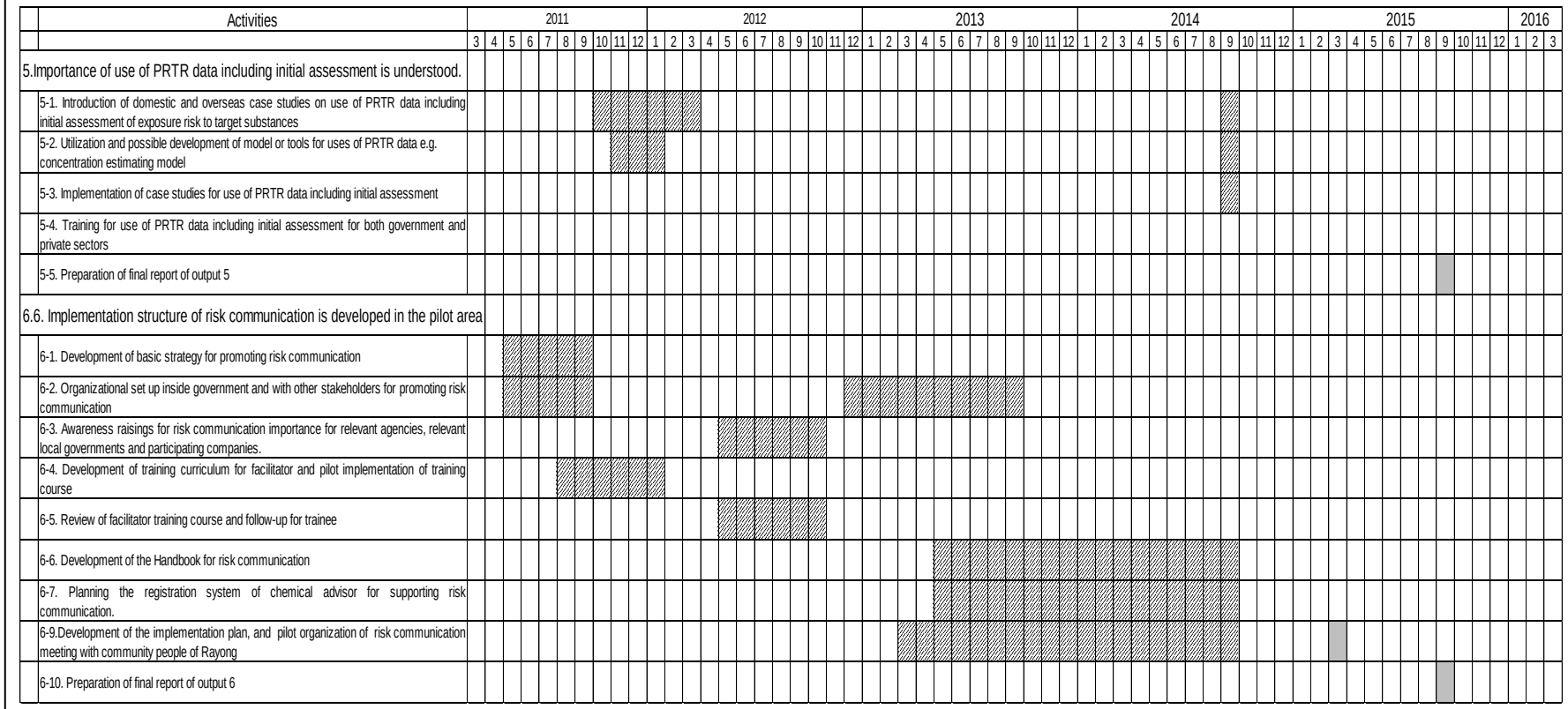
Activities
2011
2012
2013
2014
2015
2016
3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11 12 1 2 3
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5-3. Implementation of case studies for use of PRTR data including initial assessment
5-4. Training for use of PRTR data including initial assessment for both government and private sectors
5-5. Preparation of final report of output 5
6.6. Implementation structure of risk communication is developed in the pilot area
6-1. Development of basic strategy for promoting risk communication
6-2. Organizational set up inside government and with other stakeholders for promoting risk communication
6-3. Awareness raisings for risk communication importance for relevant agencies, relevant local governments and participating companies.
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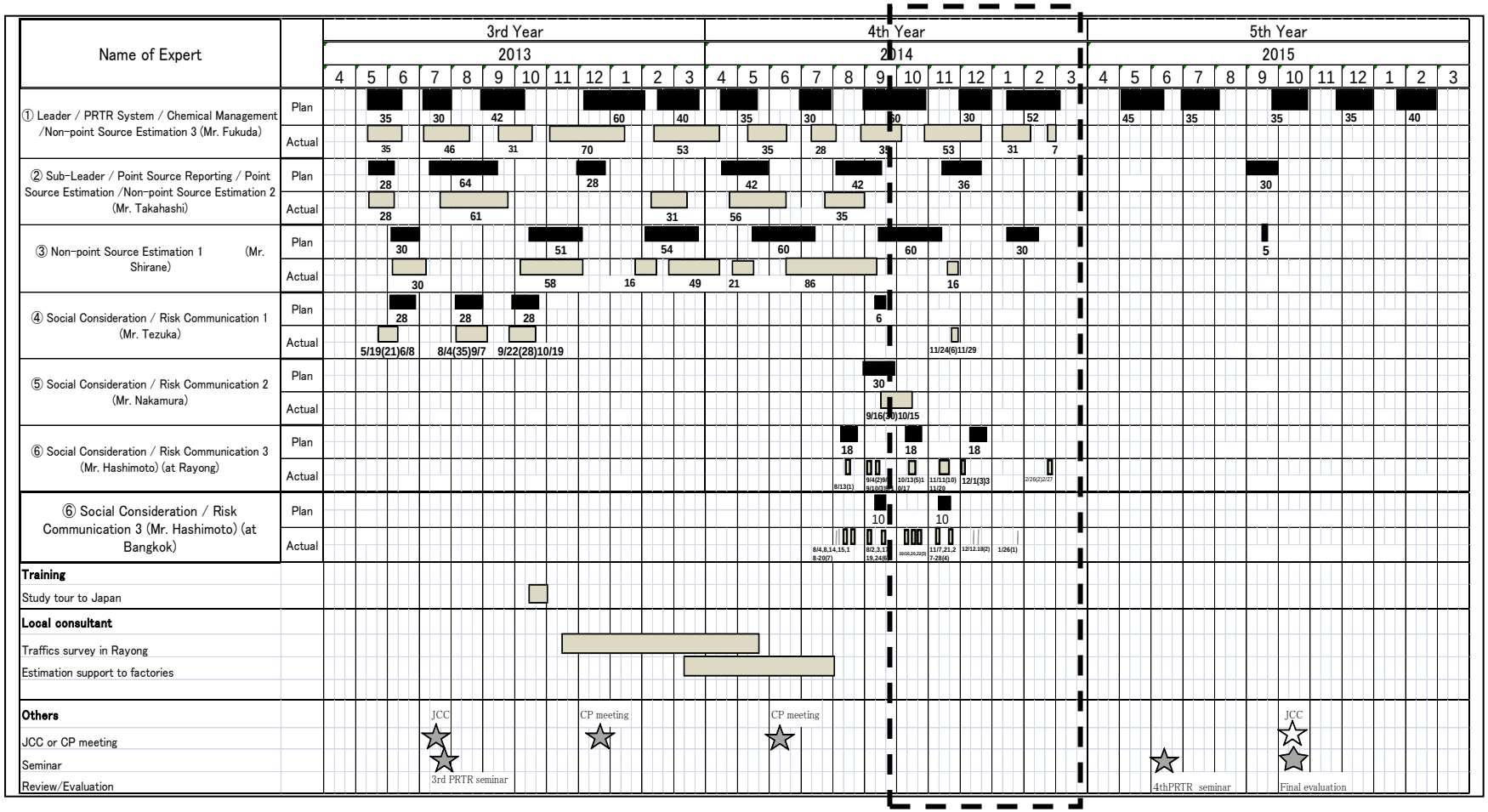
6-6. Development of the Handbook for risk communication
6-7. Planning the registration system of chemical advisor for supporting risk communication.
6-9.Development of the implementation plan, and pilot organization of risk communication meeting with community people of Rayong
6-10. Preparation of final report of output 6

1.3. Input and Plan for 2013 and 2014



* Period covered by this progress report is indicated by the rectangular box in dotted line.

Input of the JICA side is as follows.

- For the period of this progress report
  - Expert assignment was shown in following table.

Expert	Assignment period
Munehiro Fukuda	9/28 -10/4/2014 10/29 – 12/20/2014 1/8 – 2/7/2015 2/22 – 3/31/2015
Yoshiharu Shirane	11/19 – 11/28/2014
Kazuhiko Tezuka	11/24 – 11/29/2014
Akira Nakamura	9/16 – 10/15/2015
Shinya Hashimoto	9/4 -9/5/2014 9/10 - 9/12/2014 9/2,3,17-19,24/2014 10/13 - 10/17/2014 10/10,20,22/2014 11/11 - 11/20/2014 11/7,21,27-28/2014 12/1 – 12/3/2014 12/12.18/2014 1/26/2015 2/26 - 2/27/2015

  - Organization of awareness raising activity for public
  - Participation to PRTR session of International Conference on Asian Environmental Chemistry, November 2014.
  - Implementation of facilitator follow-up training.
  - Organization of PRTR data disclosure and risk communication meeting

- Plan for next six months
  - Continue the expert assignment. Approx. 5M/M is expected in (April-September 2015).
  - Complete PRTR data disclosure and risk communication meeting.
  - Implement questionnaire survey for feedback of pilot project.
  - Revise point source and non-point source estimation manuals
  - Start final design of PRTR system

2. Summary of progress (overall)

2.1. Summary sheet

Summary	All pilot data were collected, checked and compiled for entre PRTR data book. Various consultations were made to prepare data disclosure of PRTR. To prepare for risk communication meeting, follow up training of facilitators as well as appointment of senior facilitators and chemical advisers were done. In late February, meeting with general public for PRTR data explanation and risk communication started at Map Ta Phut. Project activities were reported in International Conference of Asian Environmental Chemistry in Nov. 2014.
Major Activity	● All data were compiled and PRTR data book was prepared. ● Facilitator follow up training was implemented. ● Facilitators (including senior facilitators) and chemical advisers were selected and appointed. ● Risk communication meetings with PRTR data explanation were planned and being implemented. ● Project activities were reported at special PRTR session in International Conference of Asian Environmental Chemistry 2014.
Major Paper/report prepared	● Handbook for risk communication facilitators (Final draft) ● Training materials for follow up training of facilitators. ● PRTR data book. ● Updated pilot project progress report No.5. ● Progress Report No.8
Plan	● Continue risk communication meeting. ● Implement feedback survey for final PRTR design

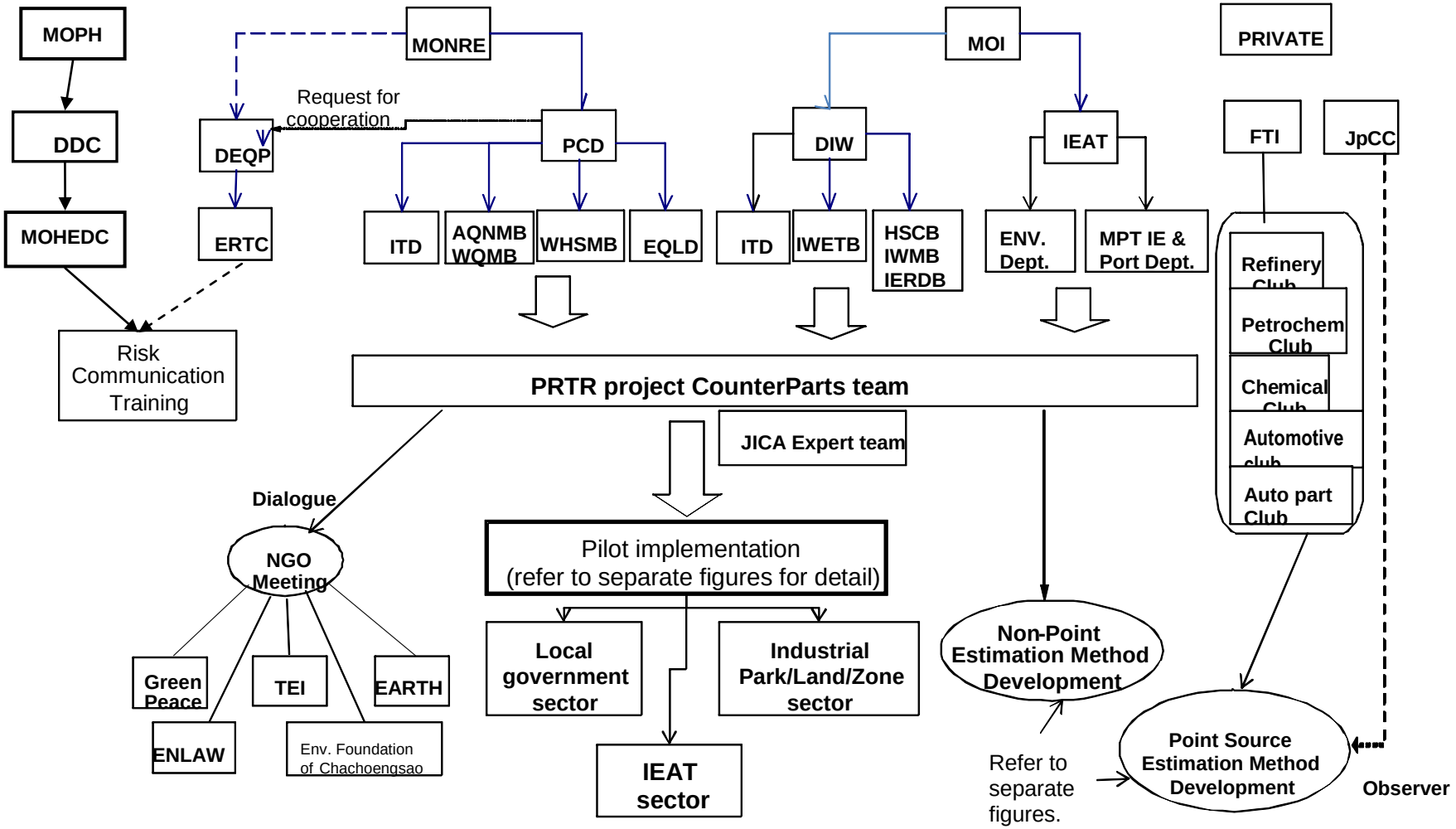
2.2. Organization structure

Diagrams in next pages show organization structure of the project and the relationship with various stakeholders as of March 2015. MOHEDC (Map Ta Phut Occupational Health and Environment Development Center) under Department of Disease Control, Ministry of Public Health enter the diagram as a partner organization to implement follow up training of risk communication facilitators.

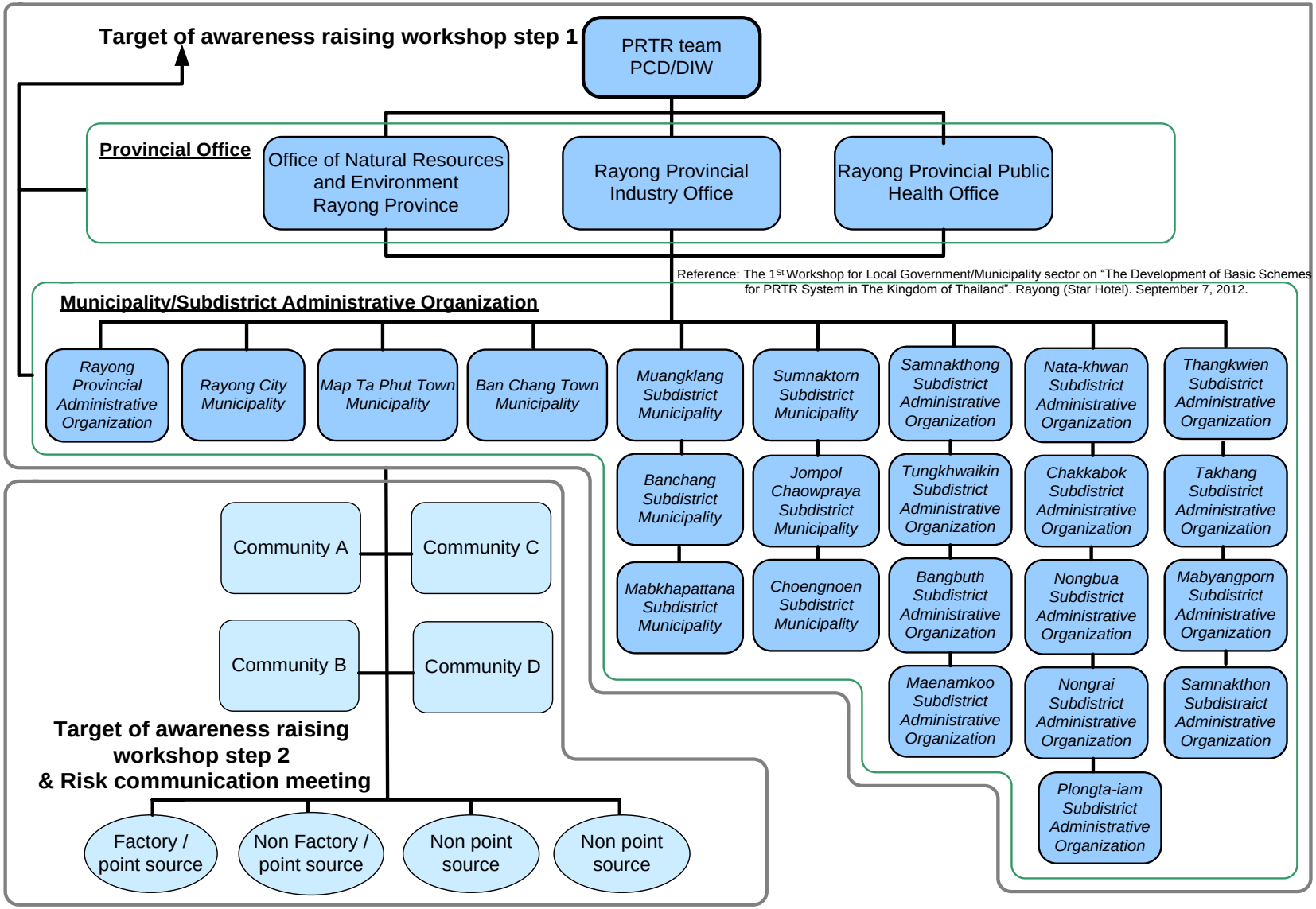
2.3 Major Issues and problem

- Extension of the project for one year was finalized.
- Chemical adviser registration system could not be materialized in time due to administrative difficulty for MOU arrangement.
- Sustainability of project outcome and direction towards system establishment is yet to be clarified and agreed.

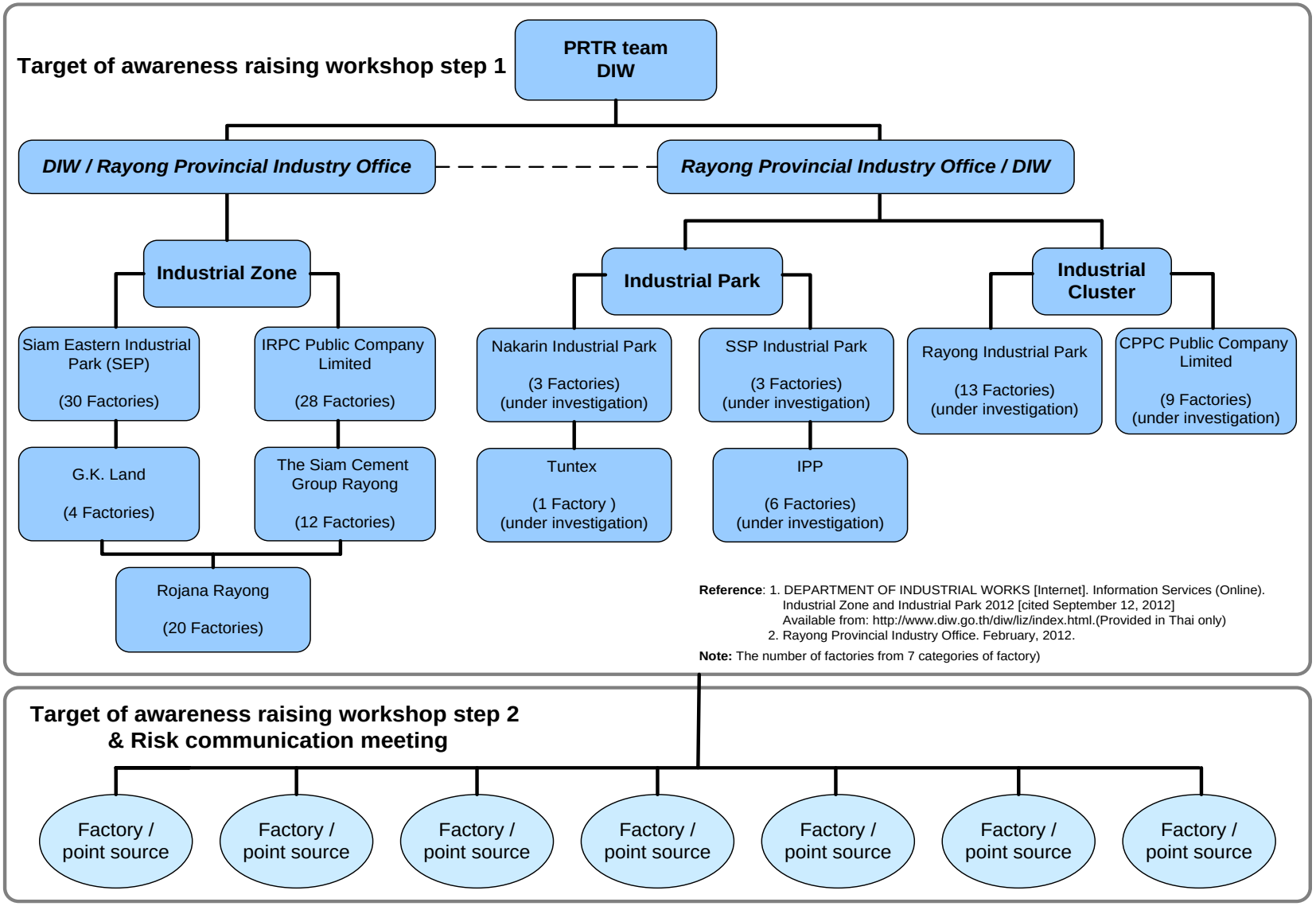
Organization structure of the project and relation with stakeholders



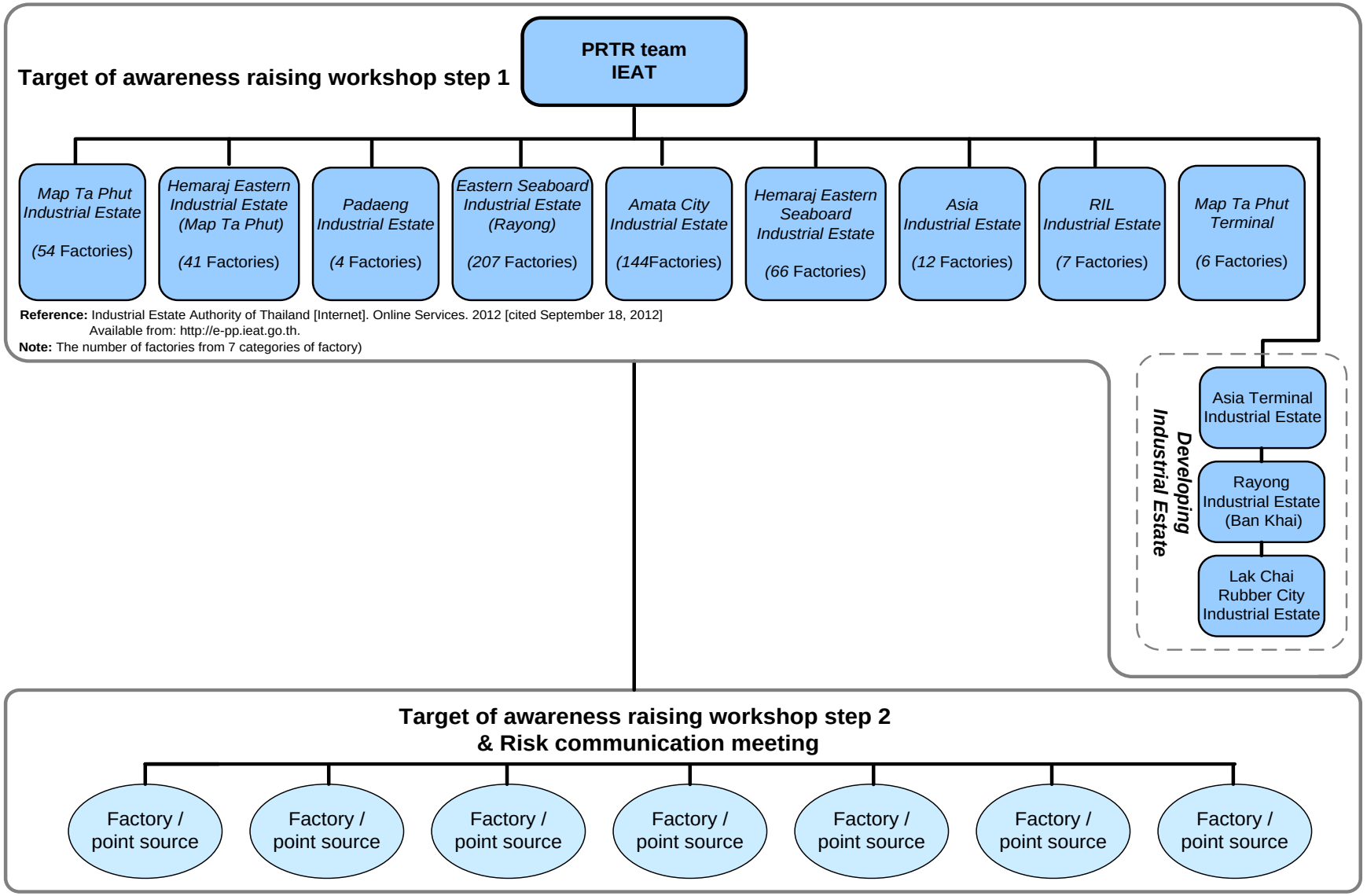
Implementation structure of Local government sector

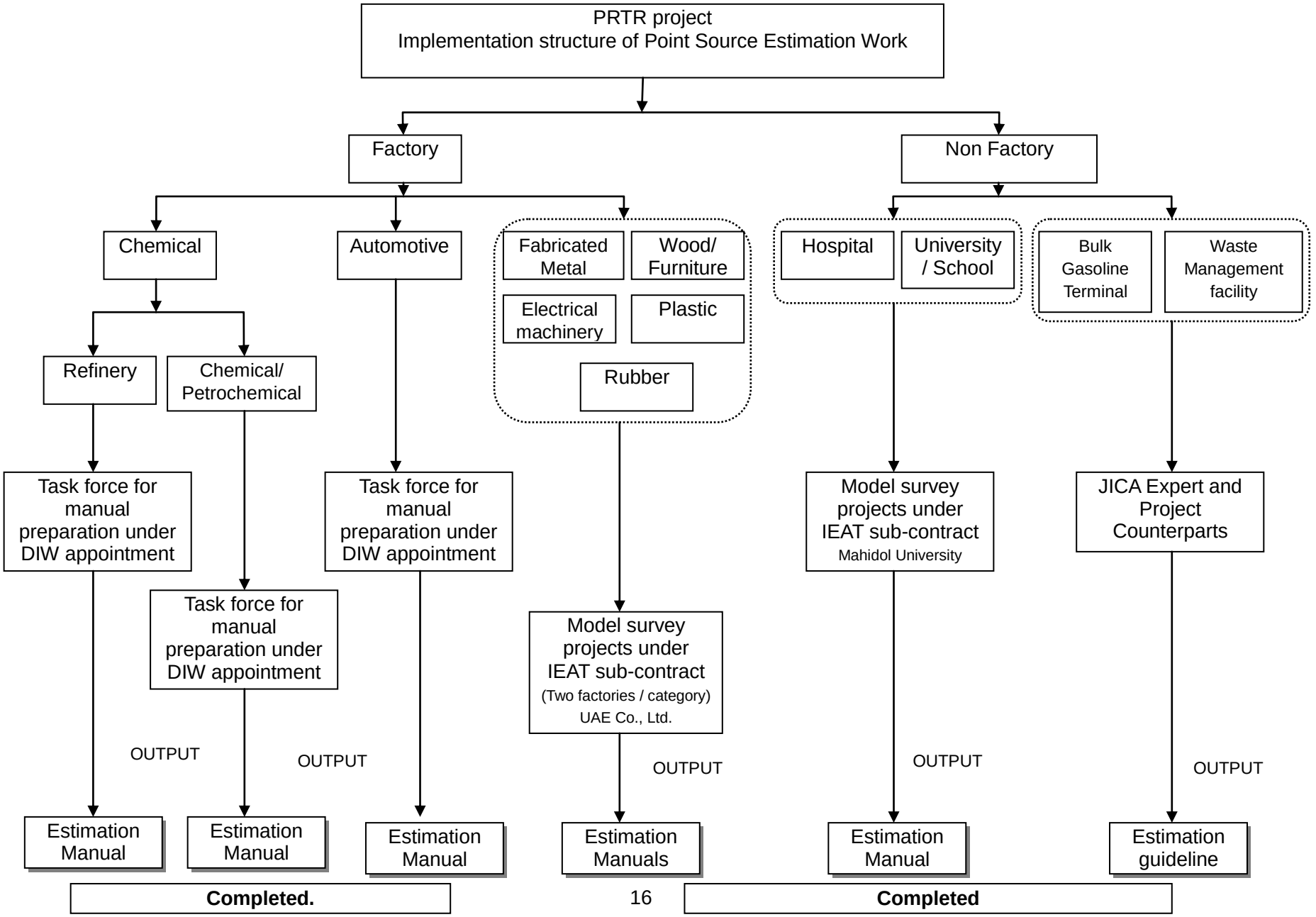


Implementation structure of Industrial Zone/Park/Cluster sector

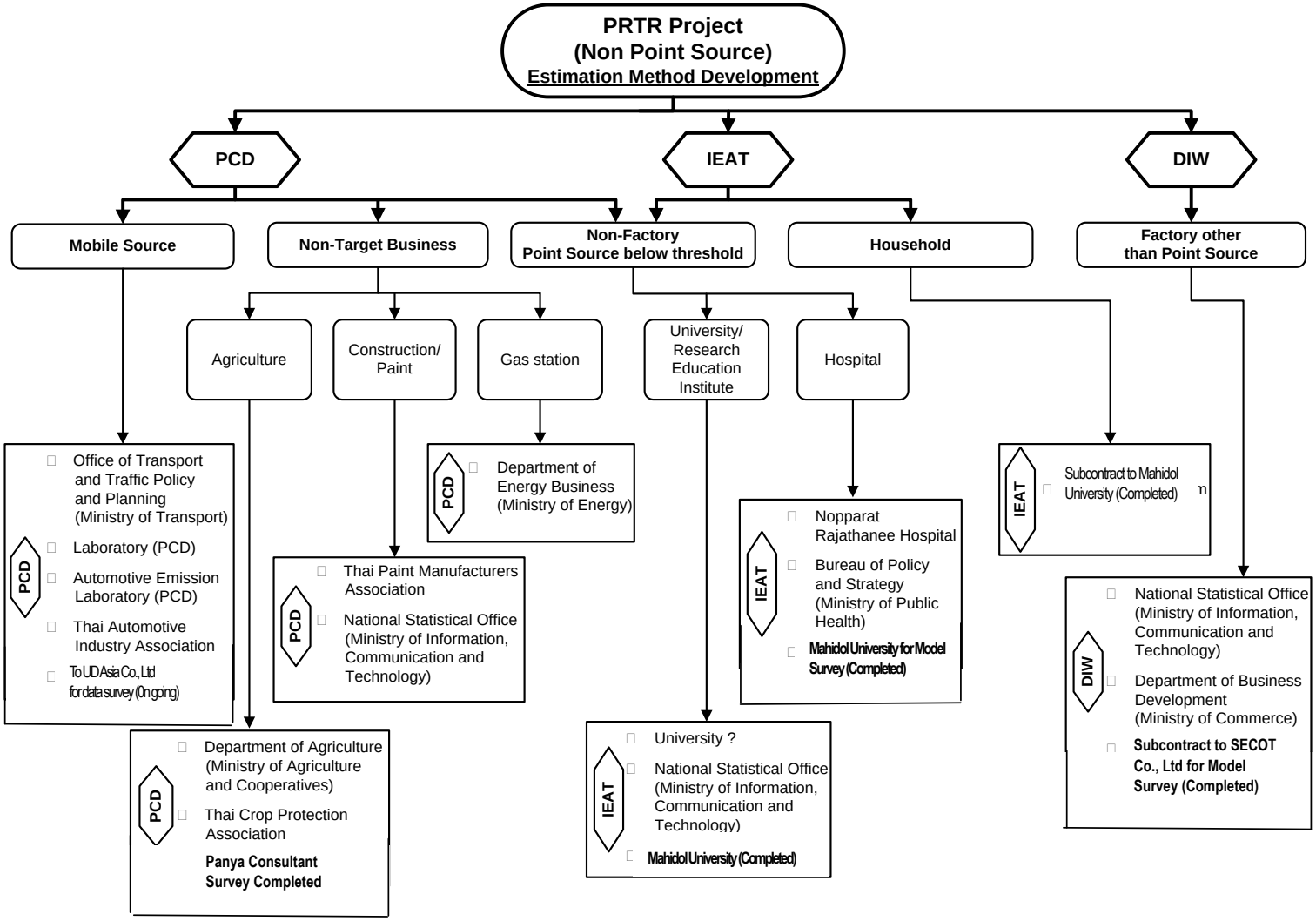


Implementation structure of Industrial Estate (IEAT) sector

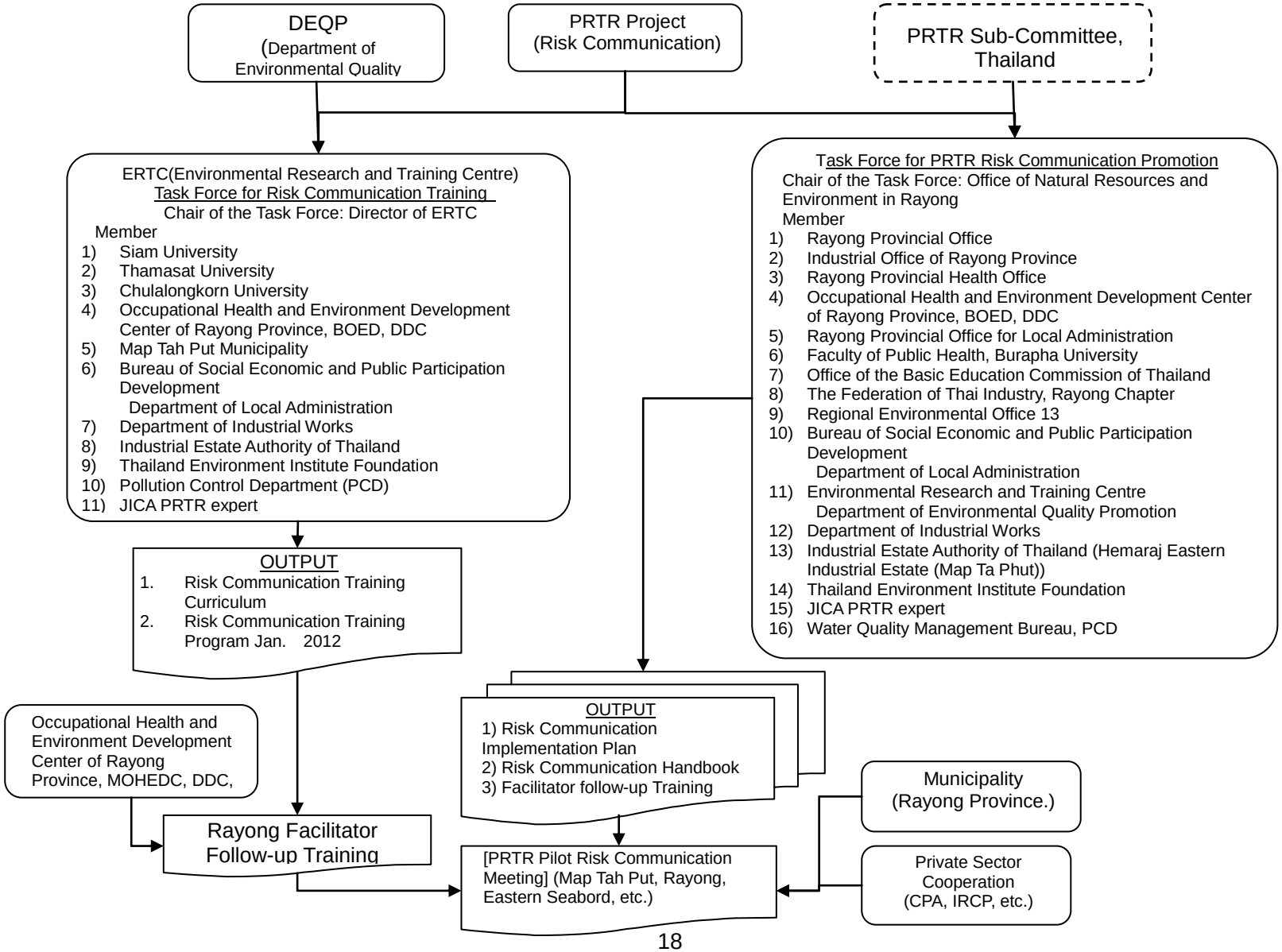



PRTR project
Implementation structure of Point Source Estimation Work
Factory
Non Factory
Chemical
Automotive
Fabricated Metal
Wood/ Furniture
Electrical machinery
Plastic
Rubber
Hospital
University / School
Bulk Gasoline Terminal
Waste Management facility
Refinery
Chemical/ Petrochemical
Task force for manual preparation under DIW appointment
Task force for manual preparation under DIW appointment
Task force for manual preparation under DIW appointment
Model survey projects under IEAT sub-contract
(Two factories / category)
UAE Co., Ltd.
Model survey projects under IEAT sub-contract
Mahidol University
JICA Expert and Project Counterparts
OUTPUT
OUTPUT
OUTPUT
OUTPUT
OUTPUT
Estimation Manual
Estimation Manual
Estimation Manual
Estimation Manuals
Estimation Manual
Estimation guideline
Completed.
Completed

Organization Chart of Non Point Source



Implementation structure of Risk Communication work



3. Progress of each output

3.1 Output 1 Design of PRTR system	
Summary	All PRTR data from pilot was compiled and data book was prepared. Consultation meetings were held with stakeholders for data disclosure. Progress of the PRTR project was presented by the counterpart and collaborating private companies at the special PRTR session of the International Conference for Asian Environmental Chemistry, Nov. 24th, 2014. PRTR data explanation and risk communication meeting with general public started. (Overall indicator of the progress) Out of 14 activities listed under OUTPUT 1 in the plan, 9 activities completed, 2 on-going, 3 yet to be done.
Activity	● Consultation meetings were held with the stakeholders about data disclosure. ● PRTR data book was prepared. ● Present PRTR project in the special PRTR session of the International Conference for Asian Environmental Chemistry (ICAEC), Nov. 24th, 2014. ● PRTR project and progress of pilot was presented 4th PRTR seminar organized by Japanese Chamber of Commerce in Bangkok on March 19th, 2015. ● PRTR data explanation and risk communication meetings were held on Feb. 27th, March 13th, 20th , 2015.
Paper/report prepared	● Presentation material at ICAEC, 2014 ● PRTR data book ● Pilot project progress report No.5
Issues	● Measure to secure sustainability of pilot PRTR need to be clarified.
Plan	● Continue PRTR data explanation and risk communication meetings, on March 27th and April 3rd, 2014. ● Plan and implement feedback survey during May – July..

3.2 Output 2 Reporting system from Industry	
Summary	All point source data was validated and compiled for PRTR data book. (Overall indicator of the progress) Out of 10 activity list under OUTPUT 2 in the plan, 8 activities completed, 2 yet to be done.
Activity	● All point source data was validated and compiled for PRTR data book
Paper/report prepared	PRTR data book
Issues	
Plan	● Revise the point source definition after feed back survey.

3.3 Output 3 Estimation from Point Source

Summary	Completed all response for question regarding estimation method from industry. (Overall indicator of the progress) Out of 9 activity list under OUTPUT 3 in the plan, 7 activities completed, 2 yet to be done.
Activity	● Responded question regarding estimation method from industry.
Paper/report prepared	● None
Issues	
Plan	● Revise the estimation manuals after feed back survey.

3.4 Output 4 Estimation from Non Point Source	
Summary	All data was compiled for PRTR data book. (Overall indicator of the progress) Out of 11 activity list under OUTPUT 4 in the plan, 8 activities completed, 1 on-going, 2 yet to be done.
Activity	All data was compiled.
Paper/report prepared	None
Issues	Data and methodology yet to be approved at PRTR subcommittee.
Plan	● Revise the estimation manuals after feed back survey.

3.5 Output 5 Utilization of PRTR data	
Summary	Training workshop was organized for PRTR data utilization and air modeling. (Overall indicator of the progress) Out of 5 activity list under OUTPUT 5 in the plan, 4 activities completed, 1 yet to be done.
Activity	● Training workshop was organized for PRTR data utilization and air modeling during Sept 18 – Oct 10, 2014. Case study using Benzene was done.
Paper/report prepared	● Training material for workshop for PRTR data utilization.
Issues	No specific issue.
Plan	No plan

3.6 Output 6 Risk Communication	
Summary	Preparation for risk communication meeting was completed, including development of basic strategy, meeting scenario, compilation and preparation of PRTR data book, completion of facilitator handbook and follow up training of facilitators, appointment of senior facilitator and chemical advisers.

	(Overall indicator of the progress) Out of 9 activity list under OUTPUT 6 in the plan, 7 activities completed, 1 on-going, 1 yet to be done.
Activity	● Handbook for risk communication facilitators completed in Thai. ● PRTR data book completed in Thai. ● Data disclosure by WEB being prepared. ● Consultations with stakeholders were done for data disclosure. ● Follow up training for facilitators was organized in Jan. 27-29, 2015 ● Risk communication meetings were planned and being implemented on Feb. 27th, March 13th and 20th, 2015.
Paper/report prepared	● Handbook for risk communication facilitators completed in Thai. ● PRTR data book in Thai. ● Training material for follow up of facilitators.
Issues	● Registration system for chemical adviser shall be set up. Basic agreement was reached with Mahidol University but problem in administrative process caused delay in process.
Plan	● Continue risk communication meeting on March 27th and April 3rd, 2015 ● PRTR data shall be uploaded to PCD web site. ● Organize two seminars (one in Rayong, one in Bangkok) on June to report PRTR pilot to public and get feed back.

ANNEX

1. **List of CP and task forces**
   - PRTR project CP list
   - Risk Communication Promotion Task Force

2. **Paper/Report prepared**
   - Pilot project Implementation 5th Progress report
   - Presentation material at ICAEC, 2014
   - Training materials for risk communication facilitators (follow up)
   - Handbook of risk communication facilitators.
   - PRTR data book

3. **Meeting/Visit/workshop memo**

4. **JICA PRTR website and newsletters**