THE KINGDOM OF CAMBODIA
MINISTRY OF ENVIRONMENT

THE PROJECT FOR EFFECTIVE IMPLEMENTATION OF EIA AND POLLUTION CONTROL THROUGH THE CAPACITY DEVELOPMENT OF MOE

PROJECT COMPLETION REPORT

DECEMBER 2021

JAPAN INTERNATIONAL COOPERATION AGENCY
CTI ENGINEERING INTERNATIONAL CO., LTD.
ENVIRONMENT AND SOCIAL INFRASTRUCTURE CONSULTANT CO., LTD.
EX RESEARCH INSTITUTE LTD.

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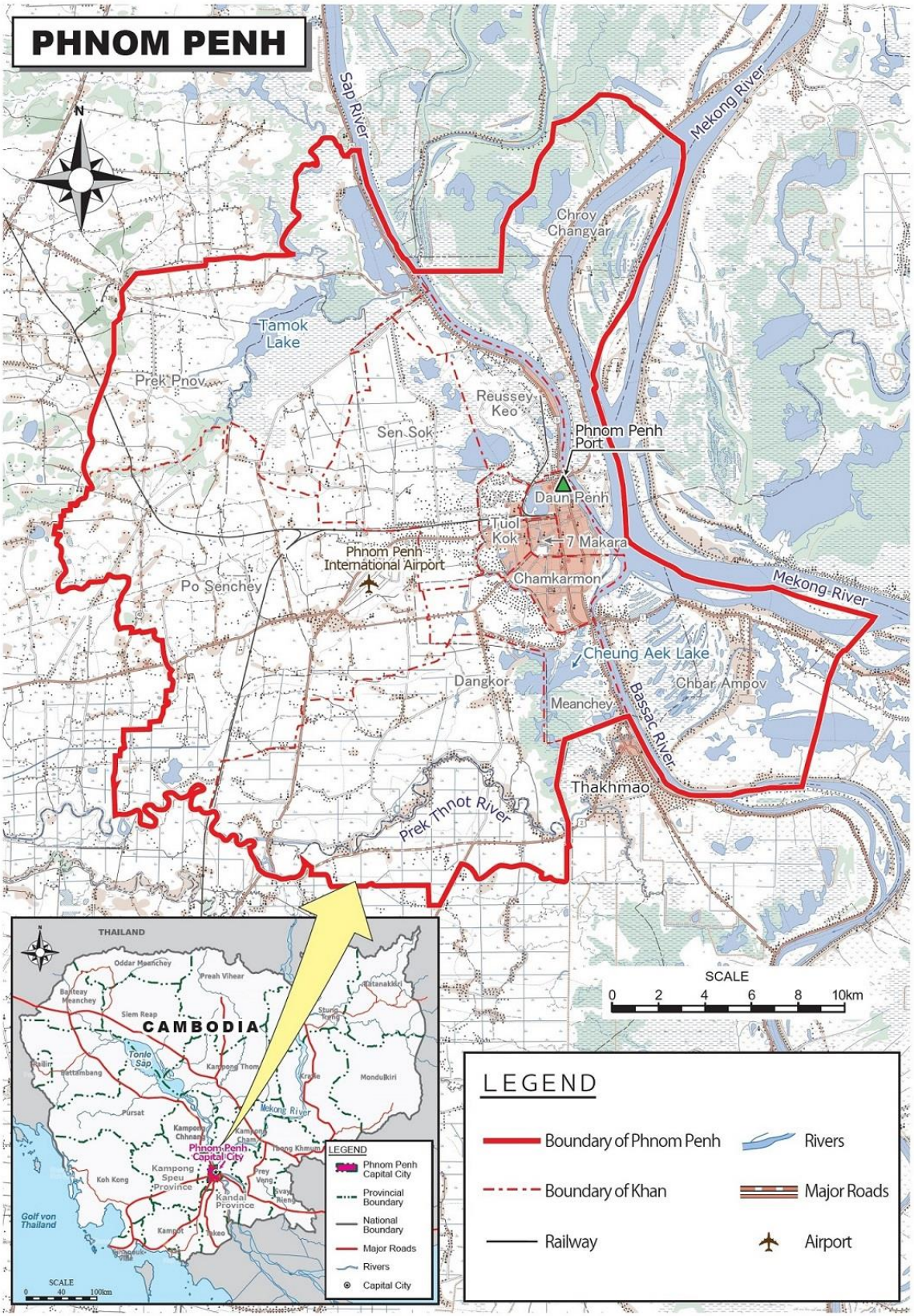
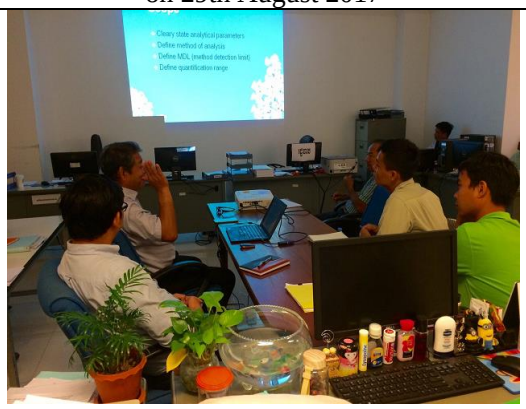


Project Map – Phnom Penh

Photos on the Project (1/2)

H.E Eang Sophalleth delivering an opening remark at the occasion of the first JCC meeting on 29th August 2017

A consultation meeting with JBAC on 25th August 2017



A training session on quality control of private laboratories on 27t September 2017

A Taskforce Meeting on EIA on 29th September 2017

Inspection Exercise on 26th October 2017

A visit of a factory in Svay Rieng on 5th December 2019

PM Monitoring on 16th May 2019

The seminar on PM h on 18th October 2019.

Photos on the Project (2/2)

Meeting with Directors (14 July 2017)

Fifth Task Force Meeting on EIA on 29th January 2018

A public Consultation meeting on EIA on 19th March 2019

Pollution Source Survey (a clothing factory) on 28th May 2019

A Public Consultation Meeting on the EIA Sectoral Guidelines on Road and Railway convened on 19th March 2019

Delivery of pH meter and initial instruction by the supplier on 17th December 2019

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TABLE OF CONTENTS

Page

LIST OF TABLES

LIST OF FIGURES

ANNEX

Annex Volume I

Annex II Volume II

ABBREVIATIONS AND ACRONYMS

ADB	Asian Development Bank
BOD	Biochemical oxygen demand
C/P	Counterpart
CCC	Cambodian Chamber of Commerce
CD	Capacity Development
CDC	The Council for Development of Cambodia
COD	Chemical Oxygen Demand
COVID-19	Coronavirus disease 2019
CTII	CTI Engineering International Co., Ltd.
DEIA	Department of EIA
DONRE	Department of Natural Resources and Environment
DPWT	Department of Public Works and Transport
EC	Electrical Conductivity
EGR	Environmental Governance Reform
EIA	Environmental Impact Assessment
EIA-RM	EIA Review Manual
EIA-SGs	EIA Sectoral Guidelines
EMCC	Environmental Monitoring & Control Centre.
ENR Codes	The Environment and Natural Resource Codes
EPL	Environmental Protection License
ESIA	Environmental and Social Impact Assessment
ESIC	Environment and Social Infrastructure Consultant Co., Ltd.
EU	European Union
EX	EX Research Institute Ltd.
GDEP	General Directorate of Environmental Protection
GIS	Geographic Information System
GMAC	Garment Manufacturing Association in Cambodia
IAIA	International Association for Impact Assessment
IC/R	Inception Report
IEIA	Initial Environmental Impact Assessment
ISO	International Organization for Standardization
ITC	Institute of Technology of Cambodia
ITU	Information Technology Unit
JBAC	Japanese Business Association of Cambodia
JCC	Joint Coordination Committee
JICA	Japan International Cooperation Agency
JV	Joint Venture
MEF	Ministry of Economy and Finance
MIH*	Ministry of Industry and Handicraft
MISTI	Ministry of Industry, Science, Technology and Innovation
MLMUPC	Ministry of Land Management, Urban Planning and Construction
MM	Man-month
MOE	Ministry of Environment
MONRE	Ministry of Natural Resources and Environment
MPWT	Ministry of Public Works and Transport
NGO	Non-governmental organization
ODA	Official Development Assistance
OJT	On-the-Job Training
P/R	Progress report
PCB	Poly Chlorinated Biphenyl
PDM	Project Design Matrix

PM	Particulate matter
PO	Plan of Operation
POPs	Persistent Organic Pollutants
PPC	Provincial People's Committee
PPP	Public–Private Partnership
PPWSA	Phnom Penh Water Supply Authority
PRTR	Pollutant Release and Transfer Register
RGC	Royal Government of Cambodia
R/D	Record of Discussion
ROW	Right of Way
SATREPS	Science and Technology Research Partnership for Sustainable Development
SDGs	Sustainable Development Goals
SEA	Strategic Environmental Assessment
SEZ	Special Economic Zone
SMEs	Small and medium-sized enterprises
SUMAI	Sustainable Urban Mobility for All Initiative Project
TDS	Total Dissolved Solids
TOT	Training of Trainers
T-P	Total Phosphorus
UNDP	United Nations Development Programme
VEA	Vietnam Environment Administration
WBS	Work Breakdown Structure

* The Ministry of Industry and Handicraft is now called the Ministry of Industry, Science, Technology and Innovation (MISTI). The name of MISTI is used to make it consistent in this report.

CHAPTER 1. PROJECT BACGROUND

1.1 BACKGROUND

The Kingdom of Cambodia (hereinafter "Cambodia") has experienced robust economic growth despite the impacts of the financial crisis of 2007–2008 which affected the entire region. The economy is projected to grow over 7 % per annum over the decades until the year 2020. Meanwhile, a total population at 14.67 million in the year 2013 grows at an annual rate of 1.46 % outstripping other riparian countries of the Lower Mekong River. The urban population including Phnom Penh accounts for approximately 21.44% of the total population showing a significant rise from 18.32% in 1998 to 19.51% in 2008. The main factor for the rapid growth is believed to be influx of workforce from rural to urban areas seeking for employment opportunities. The figures also demonstrate the rapid economic growth and significant restructuring of the industry taking place in the country.

There is rapid deterioration of the urban environment as a result of the economic growth and urbanization in Cambodia. It is also observed that the pollution load is increasingly being discharged due to limited access to sewer services in Phnom Penh. Stream self-purification enhanced by natural wetlands functions had previously absorbed the pollutants; though, the incremental pollution loads have gone beyond the capacity of such natural ecosystem.

The manufacturing sector is flourishing with investment in the garment industry. Large scale real estate development has led to massive land degradation. Infrastructure investment and resource development have been triggered in recent years. In the past ten (10) years, private sector investment by Chinese and Korean capitals have risen. Investment by Japanese firms however, have also increased in special economic zones and in retail sectors.

In such context, appropriate assessment and management of environmental issues is becoming more important in order to realize sustainable economic growth. The Ministry of Environment of Cambodia is relatively a new entity in the country. It still requires improvement to enhance efficiency and effectiveness in its review process of environmental reports, implementation of environmental monitoring and necessary intervention to reduce degradation of the environment. Limited linkage between environmental approval by the Ministry of Environment and operating permits by pertinent authority have hindered the implementation of the precautious principle of Environmental Impact Assessment.

The laboratory of the Ministry has not focused much on fundamental parameters of Environment in its laboratory analysis. Due to limited man-power and laboratory infrastructure, the number of sampling locations and frequency of environmental monitoring is not satisfactory. The quality of the lobotomy service has not been appropriately assessed. In addition, analysis of trace toxic substance is also desirable but prioritization of issues is mandatory to address the challenges ahead. The challenges of capacity at the laboratory also cause inadequate supervision and monitoring of industrial operation and limited Improvement in cooperative arrangement with diverse stakeholders.

The Government of Cambodia requested the Government of Japan (GOJ)to implement a technical cooperation project for effective implementation of EIA and pollution control through development of capacity. In response, GOJ sent a preparatory study team in November 2016 to formulate a technical cooperation project, which led to an agreement on the general direction of the project signed on 15th December 2016 as the Minutes of Meetings on the Detailed Design Survey on the Technical Cooperation Project for Effective Implementation of EIA and Pollution Control through the Capacity Development of MOE. The implementation of the project then formally agreed on 6th March 2017 in the Record of Discussion. For the R/D and M/M, they are attached to this report as Annex 1.

The Project Design Matrix (PDM) of the Project attached to the R/D and M/M was subsequently revised according to the new findings and progressive elaboration during the project implementation. The original PDM is attached to this report together with the revised PDM as Annex 2.

1.2 PROJECT DESCRIPTION

The Project for Effective Implementation of EIA and Pollution Control Through the Capacity Development of MOE is referred to as "the Project" in this report unless the context otherwise requires.

The purpose of the Project is to strengthen GDEP capacity to prevent, reduce and mitigate environmental pollution focusing on EIA and water. The Project is designed to achieve the said purpose through generating three (3) outputs, as follows:

Output 1: Legal documents related to EIA and pollution control focusing on water are organized

Output 2: Technical issues and procedures related to EIA and pollution control focusing on water are clarified and shared with GDEP staff as well as other stakeholders.

Output 3: Capacity of GDEP and related departments under GDEP in the field of Environmental Management is enhanced.

The overall goal of the project is "MOE's institutional and technical capacity is developed to implement the mission of ensuring environmental protection effectively and efficiently." Performance indicators for the project purpose are: 1) GDEP's work on EIA and water pollution control received 20 percent increased confidence from government offices related to the above-mentioned fields compared to the level that of the starting point of the project, 2) Transparency of GDEP is increased through regular information disclosure and 3) EIA review and water pollution control related works are carried out in accordance with the development of technical guidelines and procedures.

CHAPTER 2. OVERVIEW OF THE PROJECT IMPLEMENTATION

2.1 DELIVERABLES OF PROJECT

The Table 2-1 presents and summarises the major deliverables of the project.

Table 2-1 Project Deliverables

Category	Subcategory	Title	Brief Description
EIA	Manuals	ESIA Report Review Manual (4th Edition)	An Environmental and Social Impact Assessment (ESIA) essentially provides information on the environmental and social consequences of given activities of a project in order to inform decision-making. Such information needs to be accessible to a wide range of users including decision-makers and stakeholders. Note in this manual ESIA refers to IEIA and EIA which are commonly used in Cambodia as well. This manual is expected to be used as an internal manual for reviewing activities in Department of EIA. Refer to Annex 3 attached to this report.
EIA	Guidelines	Guidelines on Environmental Impact Assessment for Road Sector Projects (Full EIA case)	This guideline provides a guidance on contents of EIA (Environmental Impact Assessment) study process and EIA reports by showing what is to be described in EIA report in road sector projects for the full-scaled EIA project. This guideline covers road projects including highways and bridges. In the EIA report, reference data/information source is to be provided. The guidelines would be further formalized by Department of EIA in the future. ・ Sub-decree on Environmental Impact Assessment Process (1999) and Prakas on General Guidelines for Initial and Full Environmental Impact Assessment Reports (2009) are referred during the development of this guidelines. Refer to Annex 4 attached to this report.
EIA	Guidelines	Guidelines on Environmental Impact Assessment for Road Sector Projects (IEIA case)	This guideline provides a guidance on contents of EIA (Environmental Impact Assessment) study process and EIA reports by showing what is to be described in EIA report in road sector projects for the IEIA project that may cause less impact comparing to full-EIA projects. This guideline covers road projects including highways and bridges. In the EIA report, reference data/information source is to be provided. The guidelines would be further formalized by Department of EIA in the future. ・ Sub-decree on Environmental Impact Assessment Process (1999) and Prakas on General Guidelines for Initial and Full Environmental Impact Assessment Reports (2009) are referred during the development of this guidelines. Refer to Annex 5 attached to this report.
EIA	Guidelines	Guidelines on Environmental Impact Assessment for Railway Sector Projects (Full EIA case)	This guideline is to provide a guidance on contents of EIA (Environmental Impact Assessment) study process and EIA reports by showing what is to be described in EIA report in railway sector projects for the full-scaled EIA project. In the EIA report, reference data/information source is provided. The guidelines may be further formalized by Department of EIA in the future. ・ Sub-decree on Environmental Impact Assessment Process (1999) and Prakas on General Guidelines for Initial and Full Environmental Impact Assessment Reports (2009) are referred during the development of this guidelines. Refer to Annex 6 attached to this report.
EIA	Guidelines	Guidelines on Environmental Impact Assessment for Railway Sector	This guideline is to provide a guidance on contents of EIA (Environmental Impact Assessment) study process and EIA reports by showing what is to be described in EIA report in railway sector projects for the IEIA project that may cause less impact comparing to full-EIA projects. In the EIA report, reference data/information source is to be provided. The guidelines

Category	Subcategory	Title	Brief Description
		Projects (IEIA case)	may be further formalized by Department of EIA in the future. ・ Sub-decree on Environmental Impact Assessment Process (1999) and Prakas on General Guidelines for Initial and Full Environmental Impact Assessment Reports (2009) are referred during the development of this guidelines. Refer to Annex 7 attached to this report.
EIA	Guidelines	Guidelines on Environmental Impact Assessment for Metal Industry Sector Projects (Full EIA case)	This guideline is to provide a guidance on contents of EIA (Environmental Impact Assessment) study process and EIA reports by showing what is to be described in EIA report in metal industry sector (factory) projects for the full-scaled EIA project. This guideline in particular focuses on factories for processing and refining of metals, which are needed special cares prior and during construction as well as operation phase. In the EIA report, reference data/information source is to be provided. The guidelines may be further formalized by Department of EIA in the future. ・ Sub-decree on Environmental Impact Assessment Process (1999) and Prakas on General Guidelines for Initial, Full Environmental Impact Assessment Reports (2009), and Terms of Reference on Infrastructure and Tourism Development Project (2018) are referred during the development of this guidelines. ・ Projects in this sector are automatically falling into full EIA category based on "Prakas No.021: On Classification of Environmental Impact Assessment for Development Project", so a guideline for IEIA in this sector was not developed. Refer to Annex 8 attached to this report.
EIA	Guidelines	Guidelines on Environmental Impact Assessment for SEZ and Industrial Zone Sector Projects (Full EIA case)	This guideline is to provide a guidance on contents of EIA (Environmental Impact Assessment) study process and EIA reports by showing what is to be described in EIA report in special economic zone (SEZ) and industrial zone sector for the full EIA project. This guideline covers SEZ and industrial zone, entailing infrastructure and expected locating premises development (Premises are subject to EIA Sub-decree). This guideline is not applicable to big SEZ or industrial zone development for heavy pollution potential industries, such as Petro-chemical industries. The guidelines may be further formalized by Department of EIA in the future. ・ Sub-decree on Environmental Impact Assessment Process (1999) and Prakas on General Guidelines for Initial and Full Environmental Impact Assessment Reports (2009) are referred during the development of this guidelines. ・ Projects in this sector are automatically falling into full EIA category based on "Prakas No.021: On Classification of Environmental Impact Assessment for Development Project", so a guidelines for IEIA in this sector was not developed. Refer to Annex 9 attached to this report.
Water Quality	Sub-decree	Revision of Sub-Decree No.27 on Water Pollution Control	The amendment was made on the following articles of the Sub-decree. Article 4, Article 9, Article 11, Article 12, Article 17 and Annex 2, Annex 3, Annex 4, and Annex 5 of Sub-Decree No. 27 issued on 06 April 1999 on Water Pollution Control. Refer to Annex 10 attached to this report.
Water Quality	Guidelines	Guideline on Wastewater Treatment Process and Facilities	The guideline provides for the procedures and techniques on the followings: ・ Water pollution management and control ・ Wastewater Treatment Process (physical, chemical and biological treatment process) ・ Sludge processing and disposal Refer to Annex 11 attached to this report.
Water Quality	Guidelines	Guideline on Factory Inspection	The guideline is designed to assist the General Directorate of Environmental Protection (GDEP), in general, and inspectors, in particular, to conduct industry or factory inspection in order to check for

Category	Subcategory	Title	Brief Description
			compliance with the Law on Environmental Protection and Natural Resource Management (*Preah Reach Kram / NS-RKM-1296/36 / 24 December 1996; Enacted on 18 November 1996*), in the most consistent, comprehensive, competent, and professional manner. The guideline focuses on providing standardized inspection procedures to the inspectors so that the GDEP can ensure that all inspection activities are treated with due importance and that all appropriate information for inspecting factory performance are collected by the inspectors. It is aimed to assess and to establish the veracity and accuracy of any information on (water) pollution sources, discharges, or transport of wastewater, or any suspected violation of the law. While an industry or factory inspection includes not only wastewater pollution but also other types and sources of pollution (such as air pollution, solid wastes, and hazardous substances), this guideline concentrates on wastewater pollution only. Refer to Annex 12 attached to this report.
Water Quality	Guidelines	Guideline on Beverage Factory Inspection	This guideline on the beverage industry sector is limited to carbonated or non-carbonated beverages and fruit juices. It excludes dairy products and alcoholic beverages due to their markedly different production processes. It is noted that the (non-alcoholic) beverage industry sector may be divided into two (2) sub-sectors which are often, but not always, separate factories or facilities with different owners. These two (2) sub-sectors are: ・ Syrup / Concentrate Production ・ Bottling or Canning Operations Refer to Annex 13 attached to this report.
Water Quality	Guidelines	Guideline on Textile Factory Inspection	The guideline is used for the following sub-group of the industry. ・ Dyeing, bleaching, and finishing (fabric or cloth and yarn) ・ Garment washing (regular washing, stone wash, acid wash) ・ Textile printing Refer to Annex 14 attached to this report.
Water Quality	Guidelines	Guideline on Snack Foods Factory Inspection	Snack foods are small servings of food consumed between main meals. Snack foods are often pre-cooked and packaged in convenient sizes for individual consumption. Street food such as traditional Cambodian delicacies that are consumed after main meals or between meals can be classified as snack foods. Since these street food native delicacies are often prepared in the street food stalls, they are generally small scale. This guideline is prepared for industrial size, snack foods production operations. At present, many of the processed and pre-packed snack foods available in supermarkets, grocery stores, and even street-side stores are produced outside Cambodia and are imported to meet the demand. It is expected the local facilities for the production of snack foods will increase as the market for processed and pre-packaged snack foods continues to expand. Refer to Annex 15 attached to this report.
Water Quality	Guidelines	Guideline on Slaughterhouse and Meat Packing Factory Inspection	The guideline is designed for inspection of the slaughterhouse and meat packing operations and to provides for the details on the followings. ・ Wastewater generation ・ Wastewater treatment process Refer to Annex 16 attached to this report.
Water Quality	Guidelines	Guideline on Poultry Dressing Industry	The guidelines for Poultry processing operation include the technical information on the following aspects: ・ Waste generation ・ Waste management ・ Wastewater generation ・ Wastewater treatment process Refer to Annex 17 attached to this report.
Water Quality	Guidelines	Guideline on Piggery Farm Inspection	The piggery industry sector may be sub-divided into swine breeding and swine growing and finishing; although, there are integrated piggeries which breed, grow, and finish pigs (hogs or swine), most of which are

Category	Subcategory	Title	Brief Description
			large facilities. Refer to Annex 18 attached to this report.
Water Quality	Guidelines	Guideline on Central Kitchen Commissary Inspection	The central kitchen or commissary industry sector may be sub-divided into baked goods and regular food items such as meat and vegetable dishes even as many central kitchens or commissaries combine both in their facilities. The main difference from the pollution control and wastewater treatment point of view is the quality of the raw wastewater which defines the treatment requirements. While the operations in a central kitchen or commissary are basically the same as in a home kitchen, the difference is in the scale, period or duration of operation, and the availability of services such as potable water production and supply and wastewater treatment. Refer to Annex 19 attached to this report.
Water Quality	Guidelines	Guideline on Groundwater Protection by Industrial Chemical	This Guideline is related to Article 8 of Water Pollution Control sub-decree (revised version), to provide management guidance for storage and handling of target chemicals which are used by the factory/industry. Organic solvent, specially chlorinated solvent, can cause serious contamination in soil and groundwater and affect environment and human health, if not properly handled and stored. Once contaminated, complete remediation of soil and groundwater would be very difficult and costly, if not impossible. The guideline provides technical conditions to protect the groundwater resources. Refer to Annex 20 attached to this report.

2.2 TIMELINE OF THE PROJECT

The project was commenced in July 2017 with a preliminary meeting with GDEP on the project scope, identification of major issues and the discussion on the Inception Report. It was originally designed for a duration of forty-two (42) months to complete in December 2020. However, it was unavoidably extended twice in October 2020 and July 2021 due to the COVID-19 pandemic and eventually until the end of the year 2021.

The general timeline of the project is provided in Figure 2-1. More details of the timeline are provided as the Plan of Operation in the Annex 21.

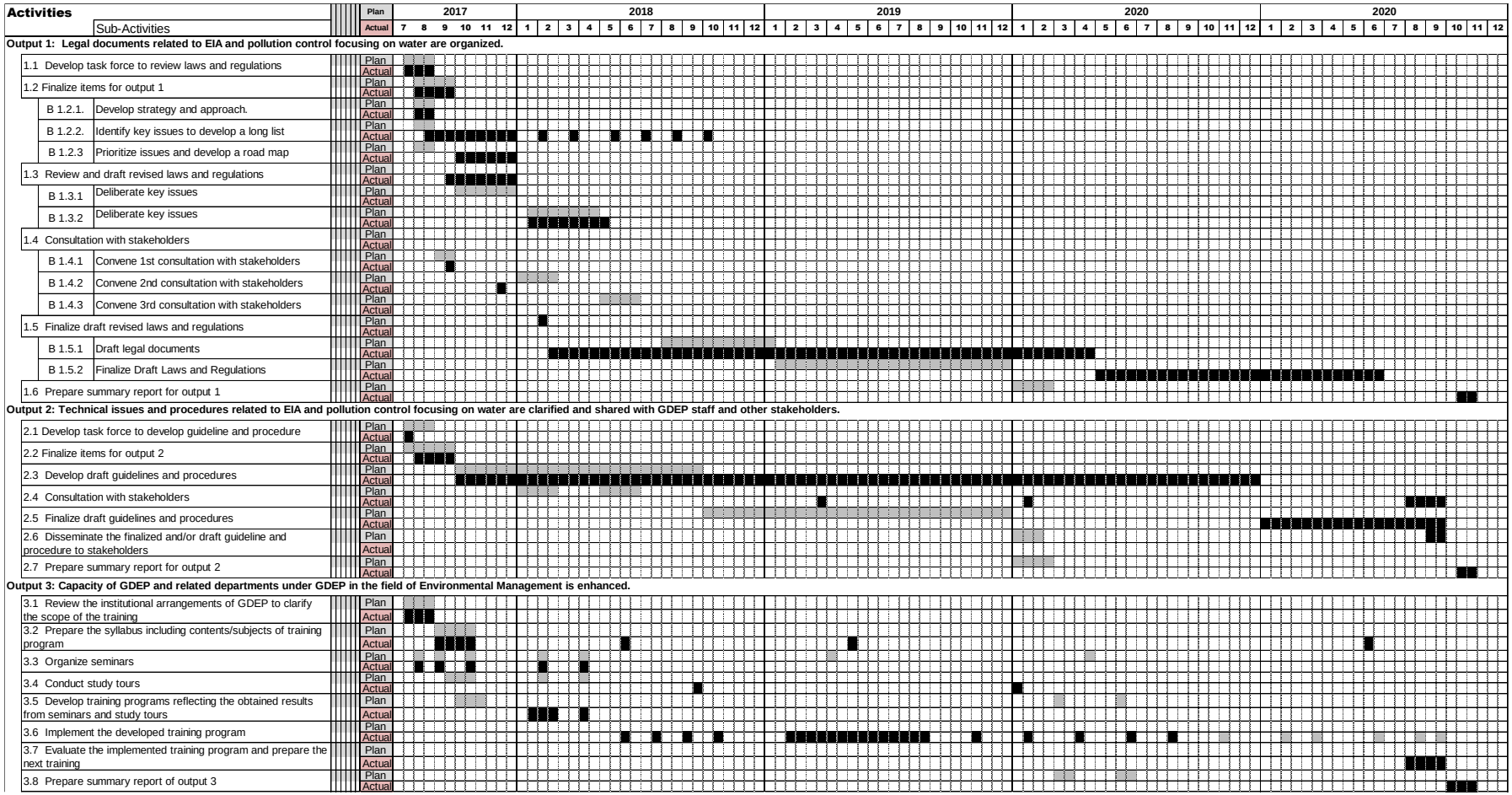

Figure 2-1 General Project Timeline

2.3 PROJECT INPUTS

2.3.1 Mobilization of JICA Experts

Mobilization of the JICA team members are summarised in Table 2-2. The readers of the report are reminded that some portions of assignment in Cambodia were reallocated to those in Japan after March 2020 to respond to the impacts resulted from the COVID-19 pandemic. Please note that some of the members were replaced during the project implementation. More details of the assignment record are provided in Annex 22.

Table 2-2 JICA Team Members and their Assignment

Positions		Names			Assignment Man-months	
					In Cambodia	In Japan
1	Team Leader/Environmental Management 1	1	Yasuhiko Muramatsu		4.17	1.18
2	Deputy Team Leader/Environmental Management 2	2	Akira Yamashita		4.97	2.03
3	EIA	3	Takayuki Hatano		4.53	1.37
4	Pollution Control and Regulations 1	4	Munehiro Fukuda		7.0	0.1
5	Pollution Control and Regulations 2	5	Taisuke Watanabe		3.47	0.53
6	Training Planner 1	6	Yusuke Nakayama	The member	3.63	0
		7	Masatoshi Chiba	was replaced.	1.73	1.48
	Water Environment/ Training Planner 2/Coordinator	8	Zenjiro Egawa	The member	6.7	0
		9	Takashi Onuma	was replaced.	1.43	4.17
8	Water Environment (Inspection)	10	Manuel I. Gloria, Jr.		5.67	0
9	PRTR Training Specialist	11	Munehiro Fukuda	The member	1.5	0
		12	Takashi Onuma	was replaced.	0.5	0
10	Pollution Control History in Japan	13	Taisuke Watanabe		0.47	0.53
11	Air Pollution and Noise Control	14	Tsuyoshi Osawa	The member	0.2	0.2
		15	Masatoshi Chiba	was replaced.	0.33	0.33
12	Solid Waste Management Training	16	Ikuo Mori		0.5	0.5
Man-months					46.80	12.1
					58.89	

2.3.2 Implementation of Overseas Training

The details of the overseas training are provided in Annex 23.

2.3.3 Equipment Provided

During the project implementation period, the following equipment (Table 2-3) was provided to GDEP.

Table 2-3 Equipment Provided

Name of Equipment	Specification/Model	No. of pcs	Date of Delivery	Location installed
Multifunction printer	Fuji Xerox A3 color Multifunction Device DocuCentre-VIC2271 CPS	1	30 August 2017	JICA Project office at MOE
Multi Parameter-Water Quality Meter	HORIBA Multi Parameter-Water Quality Meter U-52	3	24 April 2018	MOE
SPECTROPHOTOMETER	HACH DR1900 Portable Spectrophotometer	3	19 September 2018	MOE
Hot plate	Selecta-HOTPLATE Model 300718	2	19 September 2018	MOE
Water bath	Selecta-WATER BATH Model 6001197	2	19 September 2018	MOE
pH meter	HACH pH meter LPV2110T.97.002	2	5 October 2018 and 17 December 2018	MOE

Name of Equipment	Specification/Model	No. of pcs	Date of Delivery	Location installed
Mobile PM monitor	ENVIRO-EDM164Hand-held Environmental Dust Monitor, Model EDM 107	1	25 April 2018	MOE
Current meter	Handheld 1-D electro-magnetic current meter. AEM1-DA with standard accessories and software	1	13 September 2021	MOE
Water sampler	Alpha Water sampler, Vertical acrylic kit, 2.2L included carry case	1	13 October 2021	MOE

2.3.4 Mobilization of Cambodian Resources

During the project period, the pertinent officers of MOE participated in the formal meetings such as Task Force meetings, Consultation meetings and other types of stakeholder meetings on water and EIA. Between such meetings, the officers of GDEP/MOE engaged in the project activities for guiding the JICA Experts on technical and administrative matters related to the project, coordinating for project activities among the departments in MOE and with other government agencies, reviewing and providing inputs in the documents prepared under the project. Quantitative data of such inputs by the Cambodian side, however, is unavailable. Such "hidden human contribution" of the officers is accordingly not reported.

Further, during the project, local resources in private sector were also mobilized to facilitate data collection and analysis. The details of such records are provided in Annex 24.

2.4 CHANGES IN PROJECT DESIGN

The original PDM of the project was once agreed between MOE and JICA based on the results of the preparation survey in December 2016 and confirmed again at the occasion of the first Joint Coordination Committee (JCC) on 29th August 2017. Through progressive elaboration of the project, it has become evident that the PDM should be revised to integrate new findings and progress. MOE and JICA, recognised necessity of revisions and held several meetings to confirm key issues in the PDM. Through a series of consultation meetings, both sides developed a revised PDM, which was then discussed and agreed in the second Joint Coordination Committee (JCC) meeting on 10th January 2018. The justification of the changes is summarised in Table 2-4.

Table 2-4 Revision of PDM and its Justification

Items		Original Statement	Revised Statement	Changes and Justification
Project Goal	Means of verifiable indicators	・ Organizing a seminar to report the progress after the project and obtaining questionnaire answer from related stakeholders.	・ Organizing a seminar to report the progress after the project and obtaining questionnaire answer from related participated stakeholders.	・ The term “participated” was inserted to confine the respondents of the questionnaire survey to those who participated in the project. The change would make the evaluation more responsive to the overall project performance.
Project Purpose	Verifiable Indicators	・ GDEP’s work on EIA received more confidence from government offices related to EIA, compared to the level that of the starting point of the project. ・ Transparency of GDEP is increased through information disclosure.	・ GDEP’s work on EIA and water pollution control received 20 percent increased confidence from government offices related to the above mentioned fields compared to the level that of the starting point of the project ・ Transparency of GDEP is increased through regular information disclosure ・ EIA review and water pollution control related works are carried out in accordance with the development of technical guidelines and procedures	・ A phrase "water pollution control" is added because the indicator should cover two major subsectors. A numerical target was also added to make it more quantitative and accountable. ・ A phrase "regular" is added based on necessity and importance on transparent activates of EIA toward pubic. ・ The third indicator is newly inserted to ensure that regulatory decisions of MOE in the two sectors are performed in pursuance of the project goal.
	Means of Verification	・ Questionnaire answer from the related government offices ・ Website that contains information related to EIA and environmental pollution	・ Questionnaire answer from the related government offices ・ Information disclosure materials such as Annual report of MOE, Website that contains information related to EIA and environmental pollution ・ Result of the interview ・ Work record	・ "Annual report" is added as an example of means of information delivery to broaden options. ・ The third and fourth are added as examples of means to guide verification process.
Output 1	Output	・ Legal documents related to EIA and pollution control focusing on water are revised and processed for approval.	・ Legal documents related to EIA and pollution control focusing on water are organized	・ The term “organized” replaces “revised and processed for approval” affirming that the on-going activities are to resolve conflicts and settle ambiguity in the rules and regulations accordingly to align them in a consistent manner.
	Verifiable Indicators	・ Prakas/Joint Prakas : Documents submitted to Minister(s) for approval	・ Prakas/Joint Prakas: Documents are submitted to Minister(s) for approval	・ Grammatical errors are corrected. ・ Grammatical errors are corrected. Considering

Items		Original Statement	Revised Statement	Changes and Justification
		・ Sub-decrees : Document submitted to the Prime Minister's office for approval	・ Sub-decrees: Documents are submitted to the Council of Ministers for approval	that the sub-decrees are approved by the council of Ministers, it was rephrased.
	Means of Verification	・ Legal documents under approval process	・ Copy of legal documents approved or under approval process	・ The phrases "approved or " was added aiming at a higher level of achievement.
Output 2	Verifiable Indicators	・ Technical guidelines and procedures developed	・ Developed technical guidelines and procedures are understood by the stakeholders	・ Dissemination process for letting the people understood the developed guidelines and procedures are significant.
	Means of Verification	・ Printed Technical guidelines and procedures ・ Minutes of consultation meetings	・ Printed Technical guidelines and procedures ・ Minutes of consultation meetings ・ Questionnaire answer of the stakeholders	・ Questionnaire for the stakeholders (2-3) was added as an example to guide verification process.
Output 3	Output	・ Capacity of GDEP as a whole and related departments under GDEP is enhanced	・ Capacity of GDEP and related departments under GDEP in the field of Environmental Management is enhanced	・ The statement is elaborated by deleting the word "as a whole" to avoid vagueness of the target. Further it was specified to give a focus to Environmental Management considering the spirit of the project goal.
	Verifiable Indicators	Enhanced EIA review ・ Review and comment on EIA reports of 70 investment projects in 2017 and increase by 10% every year onward ・ - Collect data and related information of EIA/IEIA/EPA reports of 140 investment projects in 2017 and increase by 10% every year onward ・ - Monitor environmental EPA and EMP (written in IEIA/EIA reports) of 322 investment projects for 644 times in 2017 and increase by 10% every year onward Water quality monitoring ・ Pollution source mapping in PP area ・ Increased coverage of pollution source/waste water monitoring in PP area (100% coverage by 2020) ・ An increased number of sites for ambient water monitoring (50% increase from 2016)	・ Result of water quality monitoring is opened to the public by GDEP ・ Quality of the comments on EIA/IEIA reports made by staffs of EIA Department and other members of EIA review committee is improved compared to the level at the starting point of the Project.	・ Recognizing the following facts, the original indicators were replaced with those having more direct causal relationship with the project activities. ✓ the number of EPC and EIA/IEIA/EPA reviewed varies more than 20 % year by year, ✓ the impacts of the project on the changes in the numbers are inseparable from other attributes such as number of investment *per se*. ・ It is also recognized that the series of process of collecting, assembling, analysing, managing and disseminating information on water pollution may serve as an ultimate indicator of capacity development on the water pollution sub-sector under the project. Thus, the indicator is designed to verify the status of information accessibility on water quality status.

Items		Original Statement	Revised Statement	Changes and Justification
				The technical dimensions such as Pollution source mapping and the ambient water quality monitoring are transferred to the Means of Verification.
	Means of Verification	・ Internal reports ・ Water pollution mapping report ・ Monitoring data compiled	・ Water quality monitoring reports including Pollution source mapping in Phnom Penh area ・ Compiled water quality monitoring data ・ Compiled comments on EIA reports ・ Interview results from staffs of EIA Department and EIA review committee	・ As prerequisites of information disclosure, the project deliverables were identified to verify the status of project achievement for the water pollution sub-sector. For EIA, performance and quality of the review of EIA/IEIA reports will be evaluated through an analysis of the relevant reports and a series of interview of the pertinent officers.
Activities for output 1	1.1	・ Develop task force to review law and regulation	・ Develop task force to review laws and regulations	・ Grammatical errors are corrected for clarification.
	1.3	・ Review and draft revised law and regulation	・ Review and draft revised laws and regulations	・ Grammatical errors are corrected for clarification.
	1.5	・ Finalize draft revised law and regulation	・ Finalize draft revised laws and regulations	・ Grammatical errors are corrected for clarification.
Activities for output 2	2.3	・ Develop draft guideline and procedures ・	・ Develop draft guidelines and procedures	・ Grammatical errors are corrected for clarification.
	2.5	・ Finalize draft guideline and procedure	・ Finalize draft guidelines and procedures	・ Grammatical errors are corrected for clarification.
	2.6	・ N/A	・ Disseminate the finalized and/or draft guideline and procedure to stakeholders	・ The guidelines and other deliverables need to be fully understood and appropriately applied to daily business of EIA and water pollution control.
	2.7	・ Prepare summary report for output 2 ・ [Original activity 2.6]	・ Prepare summary report for output 2	・ The numbering was modified accordingly as a new activity is added before 2.6.
Activities for output 3	3.1	・ Finalize content/subject of training program	・ Review the institutional arrangements of GDEP to clarify the scope of the training	・ The activity was broken down to expound the process of developing the training programme to ensure accountability of the training components.
	3.2		・ Prepare the syllabus including contents/subjects of training program	
	3.3	・ Organize seminar ・ [Original activity 3.2]	・ Organize seminars	・ Grammatical errors are corrected for clarification.
	3.4	・ study tour ・ [Original activity 3.3]	・ Conduct study tours	・ A verb was added and grammatical error is corrected for clarification.
	3.5	・ Develop training program and implement	・ Develop training programs reflecting the	・ The activity was broken down to expound the

Items		Original Statement	Revised Statement	Changes and Justification
		・ [Original activity 3.4]	obtained results from seminars and study tours	process of developing the training programme to ensure accountability of the training components.
	3.6	N/A	・ Implement the developed training program	
	3.7	N/A	・ Evaluate the implemented training program and prepare the next training	・ The activity was added to integrate key issues and lessons learned in the design of the next training.
	3.8	・ Prepare summary report of output 3 ・ [Original activity 3.5]	・ Prepare summary report of output 3	・ The numbering was modified accordingly as a new activity is added.

2.5 JOINT COORDINATION COMMITTEE MEETING

Joint Coordination Committee (JCC) meetings of the Project were convened biannually since the commencement of the project in 2017. However, please note that the JCC meeting scheduled in the first quarter of the year 2019 was not convened because significant issues adversely affecting the project progress and performance were not identified in the precedent period. The following table (Table 2-5) presents the record of the meetings. The minutes of the meetings of the JCC are attached to this report as Annex 25.

Table 2-5 Joint Coordination Committee Meetings

JCC	Date/Venue	Major Issues
1	29th August 2017 at Cambodiana Hotel	Opening Remarks: H.E Eang Sophalleth, Under Secretary of State of MOE, Mr. Kotaro Tanaka, Deputy Chief Representative of JICA Cambodia, Chairperson: H.E Sao Sopheap, Advisor to MOE and Director of Cabinet.
		・ ToR for the Joint Coordination Committee ・ Presentation on the Inception Report
2	10th January 2018 at Himawari Hotel	Opening Remarks: H.E Eang Sophalleth, Under Secretary of State of MOE Mr. Kotaro Tanaka, Deputy Chief Representative of JICA Cambodia, , Chairperson Mr. Pak Sokharavuth, Deputy Director General of GDEP
		・ Presentation on the Progress Report ・ Presentation on the Project Design Matrix ・ Two taskforces were formally established separately for EIA and Water Pollution Control ・ Consultation meeting on water sector were convened for 1) academic and 2) the industry
3	13th June 2018 at Cambodiana Hotel	Opening Remarks: H.E Eang Sophalleth, Under Secretary of State of MOE, Mr. Kotaro Tanaka, Deputy Chief Representative of JICA Cambodia, Chairperson: H.E Sao Sopheap, Advisor to MOE and Director of Cabinet.
		・ It was reported that 1) the EIA Task Force members have developed a draft guideline on infrastructure sector (road). A Khmer version of the guidelines was also prepared and submitted to DEIA for their review and feedback; 2) The members of Water Quality Task Force developed a revised sub-decree for final review. ・ It was then presented that a key issue in finalizing the sub-decree lies in the threshold value of wastewater volume to exempt Small-Scale Enterprises from a uniform regulation. ・ It was informed that the first international training tour will be organized in September 2018 to send 16 officers to Thailand.
4	17th June 2019 at Himawari Hotel	Opening Remarks: H.E Eang Sophalleth, Secretary of State of MOE Mr. Yuichi Sugano, Chief Representative of JICA Cambodia, Chairperson: Mr. Chea Sina, then, Deputy Director General of GDEP
		・ The participants discussed 1) a desirable state of policy and legislative framework for water quality management to illustrate the current status and the way ahead; 2) the on-going activity for developing an inventory of pollution sources. ・ It was further presented that 1) a new website of GDEP was launched; and 2) collaboration among the Ministry of Industry and Handicraft (MISTI1), Phnom Penh Water Supply Authority

[1] The Ministry of Industry and Handicraft is now called as the Ministry of Industry, Science, Technology and Innovation (MISTI).

JCC	Date/Venue	Major Issues
		(PPWSA) and MOE was enhanced in developing a prototype of pollution source inventory.
5	08th January 2020 at Cambodiana Hotel	Opening Remarks: H.E Sao Sopheap, Secretary of State of MOE Mr. Yuichi Sugano, Chief Representative of JICA Cambodia and Chairperson: Mr. Pak Sokharavuth, Deputy Director General of GDEP
		・ Successful completion of the Pollution Source Inventory which would enable GDEP in: 1) identifying the location of major point pollution sources; and 2) quantifying pollution intensity if the database is integrated with information on the quality of discharge wastewater. ・ It was reported that some of the Verifiable Indicators in the PDM have been accomplished including those on pollution source mapping for the Output 3; and the Sub-decree for Output 1.
6	21st November 2021 Online	Opening Remarks: H.E Sao Sopheap, Secretary of State of MOE Ms.Haruko Kamei, Chief Representative of JICA Cambodia
		・ The meeting was convened online due to the COVID -19 pandemic. ・ Status of the project achievement on its outputs and purpose ・ Recommendations to achieve the overall goals ・ Actions by GDEP to achieve the overall goals

CHAPTER 3. ACTIVITIES AND OUTPUTS OF THE PROJECT

3.1 OVERVIEW

The review of legislation under Output 1 and the development of pertinent guidelines and manuals under Output 2 are a series of processes that are inseparable and should be implemented seamlessly by the same group of people who have common views and understanding on the issues and challenges. The formation of the Task Force on the EIA and Water sectors therefore became the point of departure for all the project activities which led to generation of the project outputs. The Task Force meetings at the initial stage of the project inevitably discussed a broad range of topics, which has however geared to focused sector-based dialogue on each issue through progressive elaboration to produce various deliverables and outputs to settle specific issues and challenges.

Hierarchy of Laws in Cambodia

Cambodian laws are aligned in the following hierarchy starting from the highest level to the lowest level of legal force:

- **The Constitution** of the Kingdom of Cambodia is the supreme law in Cambodia. All laws, legal documents and state body decisions must adhere to it.
- **A Royal Decree (Preah Reach Kret)** is an executive regulation issued by the King following a request from the Council of Ministers in order to organize the functioning of a public institution, create a new governmental body or appoint officials, ambassadors and judges.
- **A Sub-decree (Anu-Kret) i**s used to clarify provisions within existing laws. It is drafted within relevant ministries, approved by the Council of Ministers and endorsed by the Prime Minister.
- **Prakas or Ministerial Orders or Proclamations** are executive regulations made at the ministerial level to implement and clarify specific provisions within higher-level legislative documents and give instructions. Their scope is limited to the focus and subject matter of the ministry that enacted them.
- **Decisions (Sech Kdei Samrach)** are made by the Prime Minister or relevant ministers, and are used for a temporary purpose. They disappear once their goal is achieved.
- **A Circular (Sarachor)** is issued by the Prime Minister or a Minister, and provides instructions relating to certain legal or regulatory measures, but is not legally binding.
- **Local Regulations or Bylaws (Deika)** are approved by local Councils at sub-national level. They have force of law within the territorial authority of the local Councils, thereby cannot conflict with other regulations at the national level.

Source: CCHR Rule of Law Series Special Edition - Volume 8 – Hierarchy of Laws – January 2014

3.2 OUTPUT 1

The output 1 is intended to assist GDEP in organizing the pertinent legal documents for controlling pollution. The activity to produce the output was broken down into six (6) sub-activities as expounded in the subsequent sections of the report. The narrative summary of the output and its verifiable indicators are presented in Table 3-1.

Table 3-1 Narrative Summary of Output 1 and Its Verifiable Indicators

Narrative Summary	Verifiable Indicators
[Output] 1. Legal documents related to EIA and pollution control focusing on water are organized	1-1 Prakas/Joint Prakas : Documents are submitted to Minister(s) for approval 1-2 Sub-decrees:Documents are submitted to the Council of Ministers for approval

For the EIA subsector, through a series of discussion in the relevant Task Force meetings, the members agreed and decided to develop an EIA review manual and sector guidelines on road, railway, industry (metal) and Special Economic Zone (SEZ) to allow flexible internal mobilization of staff and provide a broader expertise required to respond to the expanding and fast-changing economy. It is therefore rational to report the pertinent activities on EIA under Output 2 because they would not undergo a formal authorization process as Prakas and/or Sub-decree at least during the project implementing period. More details on the activities on EIA are found in Section 3.3 on Output 2.

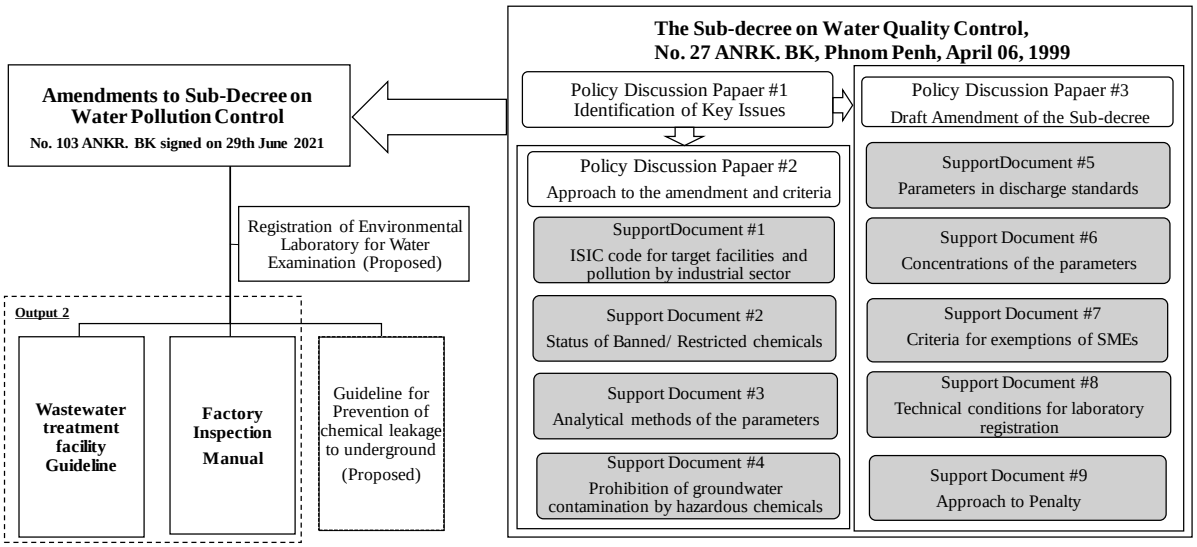

Figure 3-1 Legal Documents related Water Pollution Control Organized

For the Water Subsector, the members of the Task Team reviewed the previous Sub-decree on Water Quality Control issued in 1999. They discussed issues in the Sub-decree; and proposed amendment of the sub-decree which was then submitted to the Council of Ministers for approval in May 2020. It was eventually signed by Samdech Akka Moha Sena Padei Techo Hun Sen, Prime Minister of the Kingdom of Cambodia on 29th June 2021[2] as No. 103 ANKR. BK.

In pursuance of the activities to generate the Output, it was also found that effective enforcement of the Sub-decree on Water Pollution Control necessitates other guidelines and manuals as an integral part of the overall structure for controlling water pollution. They would include, among others, 1) Wastewater Treatment Facility Guideline, 2) Factory Inspection Manual, 3) Guidelines for prevention of chemical leakage to underground and 4) Registration system of Environmental Laboratory for Water Examination. An overview of such structure for water pollution control is illustrated in Figure 3-1. Development process of such guidelines and manuals are also inseparable from the activities for amending the Sub-decree, which therefore requires, for presentation purpose, to provides information in this section of the report.

3.2.1 Develop task force to review laws and regulations

The review of legislation under Output 1 and the development of pertinent guidelines and manuals under Output 2 are a series of processes that are inseparable and should be implemented seamlessly by the same group of people who have common views and understanding on the issues and challenges. Two task forces were thus organized on 1) Water Quality and 2) EIA in September 2017. The members of the task forces are presented in Table 3-2. The TOR of each Task Force and its membership are attached to this report as Annex 26. Additional members were then co-opted according to the issues to be discussed.

Table 3-2 Task Force Members

Sectors	Positions in MOE	Name
EIA	Deputy Director of EIA Department	Mr. Danh Serey, Director Department Mr. Duong Samkeat, Deputy Chair Mr. Chea Leng, Deputy Chair
	Chief of the Office of Research and Training in EIA department as the Deputy Chair and the Secretariat	Mr. Yim Sothan
	Chief of Office of Legislation,	Mr. Sok Ponlork

[2] Note that it is an amendment of the Sub-decree which had come into effect in 1999; and this amendment became effective upon the signature on 29th June 2021.

Sectors	Positions in MOE	Name
	Chief of Industrial and Health Project Review	Mr. Touch Rena
	Chief of Office of Mines and Energy Project Review,	Mr. Ou Sophorn
	Chief of Office of Agricultural and Water Resources Project Review,	Mr. Sor Kosal
	Chief of Office of Infrastructure and Tourism Projects Review and	Mr. Ngorn Mengly
	Chief of Office of Project Monitoring.	Mr. Chea Panharith
Water Quality	Director General of GDEP as the chairperson of the task force	Mr. Chea Sina, The chairperson of the taskforce
	Director of water quality management as the Deputy Chair (Secretariat)	Mr. Phin Rady
	Director of inspection and law enforcement as the Deputy Chair	Mr. Sarun Sambo
	Deputy Director of water quality management	Mr. Him Chandath, Deputy Director of Water Quality Management
	Deputy director of EIA and staff of the water quality management and inspection and law enforcement departments.	Mr. Chea Leng, Deputy Director of EIA Mr. Chap Yuthy, Deputy Director of Inspection and Law Enforcement Mr. Siv Kong, Deputy of Laboratory Mr. Kun Ty, Chief officer of Department of Water Quality Management Mr. Ngoun Kimtry, Chief officer of Laboratory

The major mandates of the Task Force members are as follows:

- Formulate new sub-decree or amendment to existing sub-decree in the area of industrial wastewater control.
- Formulate necessary guidelines and manuals related to industrial wastewater control.
- Study and collect the data necessary for the above.
- Develop consensus among the stakeholders for contents of the proposed new sub-decree or amendment, guidelines and manuals.
- Provide guidance for training program and provide coordination if necessary for the training program.

3.2.2 Finalize items for output 1

For the water subsector, it was decided to give a focus on the Sub-Decree on Water Pollution Control through a series of meetings of the Task Force on Water Pollution. It was agreed that the specific output of the activities included: 1) an amendment of the sub-decree on Water Pollution Control focusing on industrial wastewater control, 2) Registration system of Environmental Laboratory for Water Examination; 3) a Wastewater treatment facility Guideline; 4) a Factory Inspection Manual; and 5) a Guideline for prevention of underground leakage of chemicals.

For the EIA subsector, the relevant Task Force reviewed past (I) EIA reports to identify key issues to prepare a Review Manual; and develop three sector guidelines for 1) Infrastructure, 2) industry and 3) Special Economic Zone/Land Development. Further details on the activities related to EIA are provided in Section 3.3.2.

The subsequent sections of the report on Output 1 gives focuses on the activities on the Water Pollution Subsector. As reported in the introductory section on Output 1, Section 3-1, the guidelines and manuals relevant to water quality control are integral part of developing/amending the Sub-decree and thus the development process of them are also presented in this section.

3.2.3 Review and draft revised laws and regulations

The Task Force Meeting on Water Quality Control was convened six times over the project duration in the period from 2nd October 2017 until 4th March 2019. The records of the meetings are attached to this report as Annex 27. The summary of the Task Force meetings is provided in Table 3-3. The readers of the report are, however, reminded that the Task Force members discussed a broad range of issues to

include the amendment of the sub-decree and technical guidelines on inspection and wastewater treatment technology.

Table 3-3 Record of Task Force Meeting on Water Pollution Control

Task Force Meetings	Major issues Discussed
Task Force Meeting 1 on 2nd October 2017	1. Confirmation of Task Force ToR 2. Review of legal document on water quality control 3. Selection of target area in water field for JICA project work 4. Review of the preliminary work before official set up of task force 5. Work schedule of 2017-2018
Task Force Meeting 2 on 24th October 2017	1. Identification and confirmation of current decrees, sub-decrees, and procedures for Inspection and Sampling, including Enforcement 2. Clarification and confirmation of extent of authority and powers of MOE inspection groups 3. Observations on actual inspection 4. Initial Outline of Factory Inspection Manual for revision, and approval 5. Initial Outline of Wastewater Treatment Facility Guideline for discussion, revision, and approval 6. Procurement of equipment for GDEP 7. Confirmation of the schedule for 3rdTask force meeting
Task Force Meeting 3 on 29th November 2017	1. Review/confirmation of previous work on revision of Water Quality Control Sub-decree 2. Collaborate between MISTI/CDC/MOE for effective enforcement (1) Information sharing (2) Coordination penalty 3. Policy Discussion Paper#2 (1) General/Overall issues (2) Support Document#1-1 Revision of target facilities/business Annex 3 (3) Support Document#2 Removal of prohibited substances from standard (4) Support Document#3 Clarification of Method of analysis (5) Support Document#4 Addition of groundwater protection 4. The 2nd Consultation meeting with stakeholders (CCC, GMAC, and ITC)
Task Force Meeting 4 on 13th February 2018	1. Self-introduction of participants 2. Review of the previous activities of the Task Force 3. Explanation of proposed revision of WPC sub-decree (first draft) (1) Support Document #5 (2) Support Document #6 (3) Support Document #7 (4) Support Document #8 (5) Support Document #9 4. Current – Proposed revision of sub-decree 5. Schedule for development of final proposal for revision
Task Force Meeting 5 on 19th October 2018	1. Review of the draft wastewater treatment facility (WTF) guideline 2. Review of draft factory inspection manual 3. Training schedule of WTF guideline
Task Force Meeting 6 on 4th March 2019	1. Review the revision of Water Pollution Control Sub-Decree 2. Prakas on Official Methods of Water Quality Measurement 3. Prakas on Registration of the Laboratory for Water Quality Measurement 4. Guideline for Protection of Chemical Leakage to Underground 5. Proposed procedure for development and adoption of the factory inspection manual

The series of activity started from a thorough review of the previous Sub-decree on Water Quality Control issued in 1999, No. 27 ANRK. BK, Phnom Penh, April 06, 1999 “Water Pollution Control”, which was effective at the time of the project commencement. The key issues in the Sub-decree are summarised in Table 3-4.

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Table 3-4 Issues in previous Sub-decree on Water Quality Control issued in 1999

Chapter and Articles	Issues and needs for revision
Chapter 2 Article 4 Annex 2 (Effluent standard)	Some parameters are for chemical substance which already were banned /restricted for production and thus make no sense to include in effluent standard (also this is prohibited in ENR codes ver.8 Book 6 Waste and pollution management Book, Title 4 Management of Hazardous substances Article 9 Prohibition of Persistent Organic Pollutants)
	Some parameters do not correspond to the environmental quality standard
	CAS registry number shall be attached to clarify substance identification
	Method of measurement shall be attached
	Concentration level of effluent standard has no common basis in relation to water quality standard.
	Annex 2 has two columns, one is for protected area, another is for public water area/sewer. Effluent to sewage system shall be regulated by the authority who operates the sewage treatment facility.
	Concentration level of the effluent standard shall be compared with Standard in other countries Industry benchmark value with BAT(Best Available Technology) application
Chapter 2 Article 8 ANNEX 1	It need more clarification for Annex 1 in relation to effluent standard.
	It was suggested to include prohibition of chemical penetration to underground to protect groundwater
Chapter 3 Article 11 ANNEX 3 (Effluent discharge permit)	The industrial category shall be based on ISIC Ver.4 to avoid any confusion. Listing of industrial categories shall be based on pollution loading study of existing factory as well as those categories likely to be established in Cambodia.
	In order to cover the factory more effectively, data/information sharing with MISTI and CDC is essential. Administrative action such as granting QIP privilege by CDC as well as establishment permit and operating license by MISTI should be closely coordinated. Such coordination shall be amended.
	Current draft ENR codes specified the content of discharge permit. It should be revised to include them accordingly.
Chapter 3 Article 14	Condition to grant discharge permit is not clear. Technical guideline mentioned in article does not exist. Such guideline may include not only hardware requirement but also human (operator) aspect.
Chapter 4 Article 21	Qualification/approval/registration of laboratory shall be defined in Prakas or other document
Chapter 4 Article 23	There should be more clarification of self monitoring, in terms of parameter as well as type of data for record keeping, and the period of keeping
Chapter 5 Article 25 ANNEX 5	Some parameters has no correspondence to effluent standard,
	CAS registry number shall be attached to clarify substance identification
	Method of measurement also shall be attached.
	Concentration level of environmental standard shall be reviewed.
Chapter 6 Article 30	It shall be linked to the proposed Factory Inspection Manual. Owner's responsibility for taking and keeping record for inspection shall be further clarified.
Chapter 7 Article 34	Fine shall be adjusted to be more effective to industry.

The issues identified in the review process were then discussed for amendment of the sub-decree. For the purpose of building consensus among the participants of the Task Force, the summary of issues and key approaches were compiled as Policy Discussion Papers which were further supplemented by Support Documents. They are attached to this report as Annex 28 and the summaries of them are also presented in Table 3-5.

Table 3-5 Descriptions of Key Documents for Water Quality Control

Papers	Short Title	Brief Descriptions
Policy Discussion Paper #1	Identification of Key Issues	The paper presents the key issues identified in the previous Sub-decree on Water Quality Control[3] issued in 1999. The paper identified, among others: 1) inconsistency in Article 8 on disposal of hazardous substances and Annex 2 on arsenic, 2) ambiguity as exemplified by lack of information on analytical methods of parameters to be regulated, 3) a broad coverage of regulated industries causing ineffective intervention for pollution control from Small and Medium Scale Industries.

[3] No. 27 ANRK. BK, Phnom Penh, April 06, 1999 "Water Pollution Control"

Papers		Short Title	Brief Descriptions
Policy Discussion Paper #2		Approach to the amendment and criteria	The paper elaborated the issues in the previous Sub-decree to develop the major approach for amendment. The issues are presented in Table 3-4 The paper then proposed the approaches and method. For instance, the previous sub-decree contained some parameters which were banned or restricted for production. Therefore, it was proposed to remove these banned substance from regulation for consistency.
	Support Document #1	ISIC code for target facilities and pollution by industrial sector	This presented the revision of Pollution Sources to be focused in the regulation. It initially proposed to adopt ISIC Rev.4 for identification of substances, then identified and prioritized the categories of industries, discussed and proposed thresholds or minimum size of Industry to be regulated.
	Support Document #2	Status of Banned/ Restricted chemicals	The substances listed in ANNEX 2 as the parameters of effluent standards in the previous Sub-decree contained those banned or restricted for production under relevant international agreement. They are identified and proposed to be removed. Examples of such substances include 1) PCB was removed because it was banned under the Stockholm convention, 2) Carbon tetrachloride was also removed as its production was banned under the Montreal protocol, 3) Hexachloro Benzene was removed as it was banned under the Stockholm convention.
	Support Document #3	Analytical methods of the parameters	The paper proposed methods of analysis of the parameters to be regulated under the amended Sub-decree. Most of them adopted those in the Standard Methods for the Examination of Water and Wastewater in accordance with the methods used by the laboratory of the MOE's laboratory.
	Support Document #4	Prohibition of groundwater contamination by hazardous chemicals	The paper discussed Prohibition of Chemical Penetration to underground. It initially identified Volatile Organic Chemicals (VOCs) as the major contributor in groundwater contamination such as Trichloroethylene, Perchloroethylene and Dichloromethane; then presented the major causes of pollution and current situation in Cambodia. It then discussed the measures to prevent groundwater pollution.
Policy Discussion Paper #3		Draft Amendment of the Sub-decree	The paper is the first draft amendment of the Sub-decree on Water Quality Control. It initially reviews the discussions and issues in the pertinent Task Force meetings. All the issues in the previous meetings were integrated into the first draft. A set of proposed amendments for each of the articles were compared in a matrix format.
	Support Document #5	Parameters in discharge standards	The paper provides rationale and justification of Parameters to be included in the discharge standards by comparing the 1) WHO drinking water quality guidelines, 2) Japan's environmental standards, 3) the Japan's effluent standards, 4) the Cambodian Drinking water quality standards and 5) the environmental quality standards in the previous sub-decree on water quality control.
	Support Document #6	Concentrations of the parameters	It provides the numerical values of the effluent standards for each parameter. The values are proposed by comparing the relevant standard values and currently available technology for effluent treatment. For determination of the effluent standards, the relevant guidelines issued by the International Finance Corporation were referred.
	Support Document #7	Criteria for exemptions of SMEs	The paper discussed the rationale and justification of the thresholds for exemption of SMEs based on the volume of water supply to industries which was provided by the Phnom Penh Water Supply Authority with due consideration on its enforceability. The intention was to exempt SMEs from uniform application of the effluent standards.
	Support Document #8	Technical conditions for laboratory registration	It set forth the general conditions for registration of environmental laboratory especially for private laboratories to perform analysis of environmental pollution to ensure data reliability. It identified 1) Scope definition , 2) Instruments, 3) Human resources and 4) SOPs.
	Support Document #9	Approach to Penalty	The paper discussed penalties/ charging fine on violation against Sub-decree on water pollution control.

A Schematic Illustration of Review Process is presented in Figure 3-2.

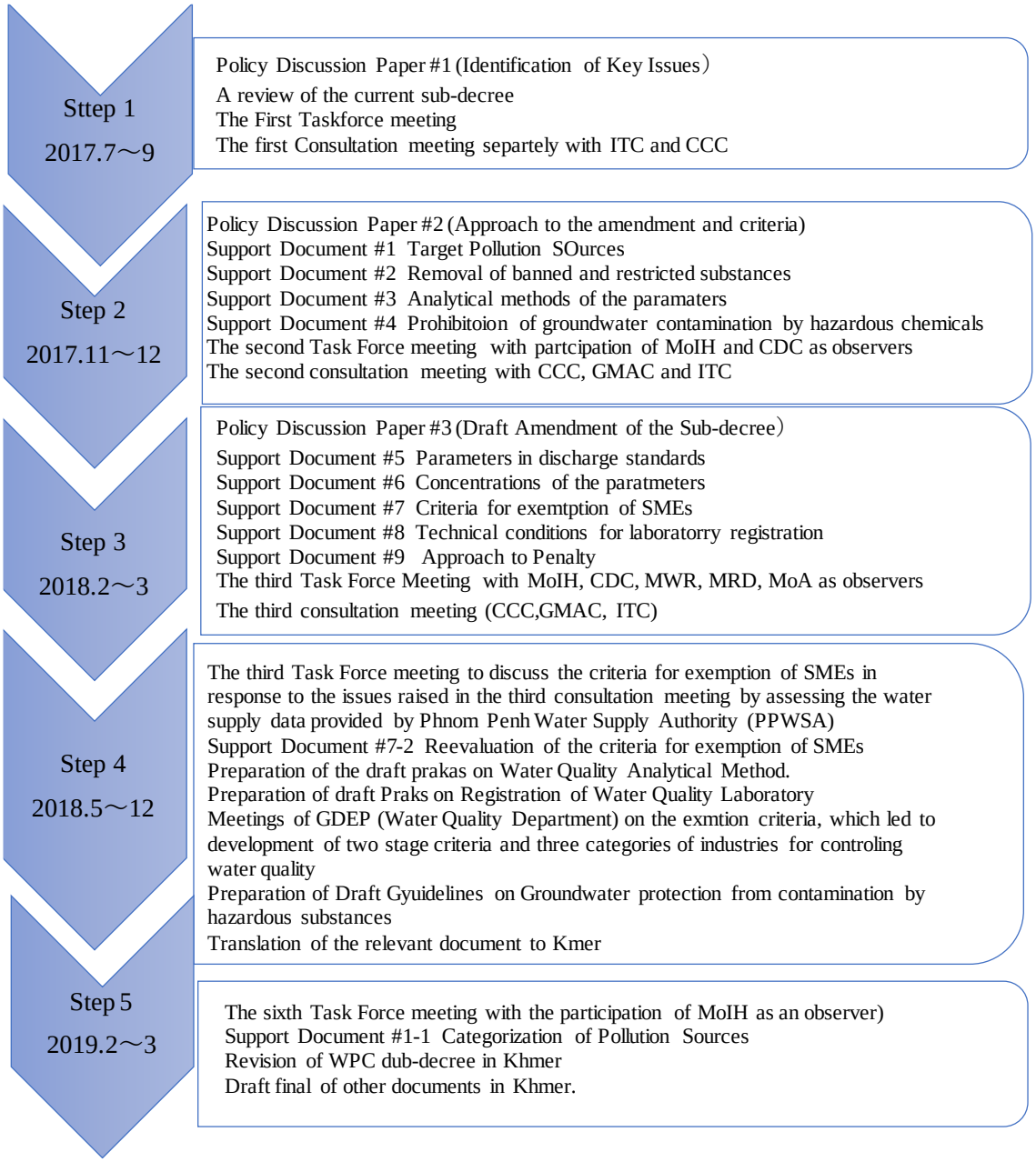

Figure 3-2 Schematic Illustration of Review Process

3.2.4 Consultation with stakeholders

Two consultation meetings on water sector were convened for 1) academe and 2) the industry. The consultation meeting with academe took place on 7th September 2017 with Institute of Technology of Cambodia to acquire views and feedback on the activities for modification of the relevant legislation on water quality control. With the private sector, the meeting took place on 28th September 2017 with the participation of Cambodian Chamber of Commerce (CCC).

Other informal consultation meetings with private sectors were also convened. The information is provided in a chronological order.

1) Nidec Corporation on 26th July 2017

2) JBAC, Consultation meeting on 26th July and 25th August 2017

3) Phnom Penh Specialized Economic Zone on 29th September 2017

4) Cambodia Suzuki Motor Co., Ltd. on 23rd November 2017.

The following meetings are not specific neither for water pollution nor EIA, but they are convened for overall project management and implementation to exert synergy effects.

1) The team of Environment & Social performance review of the World Bank on10th November

2) National Institute of Technology, Nagano College on 16th November 2017

3) Institute for Global Environmental Strategies on 14th November and 28th November.

The Key Consultation Meetings on Water Quality Control is summarised in Table 3-6.

Table 3-6 Key Consultation Meetings on Water Quality Control

Date	Target	Agenda
The 1st Consultation meeting with on 28th September 2017	- Cambodian Chamber of Commerce	Self-introduction of participants- Introduction of JICA project and purpose of the meeting Outline of revision on Water Quality Control Sub-Decree related to Industrial Wastewater Q&A
The 2nd Consultation Meeting on 1st December 2017	- Cambodian Chamber of Commerce (CCC) - Garment Manufacturing Association in Cambodia（GMAC） - Institute of Technology of Cambodia (ITC)	1. Review/confirmation of previous work on revision of Water Quality Control Sub-Decree 2. Policy Discussion Paper #2 (Approach and Criteria for Revision) (1) General/Overall issues (2) Support Document #1 Revision of Target Facilities/Business Annex 3 (3) Support Document #2 Removal of Prohibited Substances from Standard (4) Support Document #3 Clarification of Method of Analysis (5) Support Document #4 Addition of Groundwater Protection 3. Schedule/Next Step
The 3rd Consultation meeting on 20th February 2018	- Cambodian Chamber of Commerce (CCC) - Garment Manufacturing Association in Cambodia（GMAC） - Institute of Technology of Cambodia (ITC) - Happy Handicraft (Tissue Paper) - Lyly Food - Phnom Penh Autonomous Port - Sandek Pkay Handicraft - Yang Li Yi Tofu	1. Review of the previous activities 2. Explanation/discussion of proposed revision of WPC sub-decree (first draft) (1) Support Document #5 (2) Support Document #6 (3) Support Document #7 (4) Support Document #8 (5) Support Document #9 (6) Major points in proposed revision 3. Schedule for development of final proposal for revision

3.2.5 Finalize draft revised laws and regulations

Upon completion of the sixth (6th) Task Force Meeting on 4th March 2019, the proposed amendment of the sub-decree was put into Khmer language before formalization and authorization process. The process for authorization was the most challenging part of the activities as it contains the actions which are not under the control of the project team. It was also significantly affected by the Pandemic. The bar chart timeline for authorization of the sub-decree is presented in Figure 3-3.

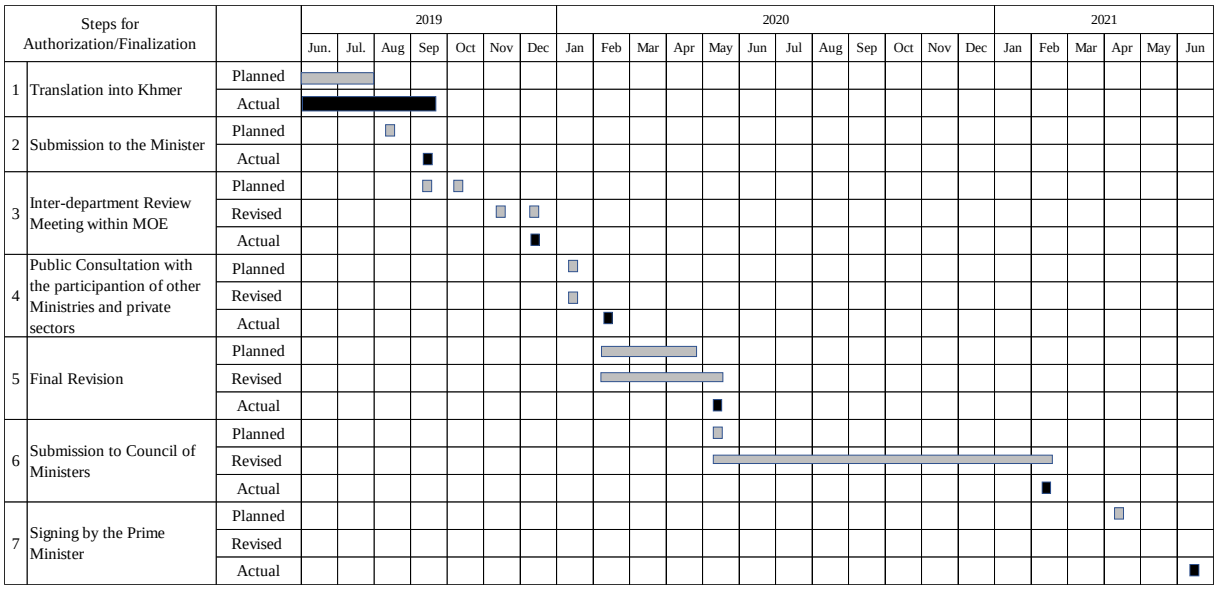

Figure 3-3 Bar Chart Timeline for Authorization of the Sub-decree

The Khmer version of the draft Sub-decree on Water Quality Control was submitted to the Minister of Environment for his initial review and approval in September 2019. The draft sub-decree was then brough to the Inter-department review meeting which was convened within MOE on 3rd December 2019. Among the articles in the sub-decree, Chapter 6 and 7 on Penalty was focused to be discussed on its validity and enforceability in the Inter-department review meeting. The GDEP brought the issue to the Ministry of Justice in 2020. A technical issue discussed in the meeting included the harmonization of the standards with other standards set forth by the Ministry of Industry and Handicraft, the Ministry of Water Resources and Meteorology, the Ministry of Public Work and Transport.

A public consultation meeting was further organized in February 2020. The details of the meeting is not available under the hand of the project team. The issues identified in the consultation meeting was reportedly integrated in the revised sub-decree before March 2020.

The revised draft Sub-decree was subsequently submitted to the Office of Council of Ministers which is now referred to as the Cabinet of Cambodia[4]. At this stage, the office suggested to retain the original articles on penalty to make it consistent with the Law on Environmental Protection Natural Resources Management which is in a higher hierarchy of the laws. The sub-decree was eventually signed by Samdech Akka Moha Sena Padei Techo Hun Sen, Prime Minister of the Kingdom of Cambodia on 29th June 2021[5] as No. 103 ANKR. BK

Other guidelines and Manuals related to the water pollution control were subject to the final review process in the period from August 2021 by two Cambodian experts to modify and customize them to the local settings.

3.2.6 Prepare summary report for output 1

The summary report for output 1 is attached to this report as Annex 29.

[4] It is the executive body of the Kingdom of Cambodia led by the Prime Minister, assisted by Deputy Prime Ministers, Senior Ministers, Ministers, and Secretaries of State. Members of the Cabinet are nominated by the Prime Minister and appointed by the Monarch.

[5] Note that it is an amendment of the Sub-decree which had come into effect in 1999; and this amendment became effective upon the signature on 29th June 2021.

3.3 OUTPUT 2

The output 2 is intended to assist GDEP in organizing the practical/technical guidelines for both EIA and pollution control. The narrative summary of the output and its verifiable indicators are presented in Table 3-7.

Table 3-7 Narrative Summary of Output 2 and Its Verifiable Indicators

Output	Verifiable Indicators
2. Technical issues and procedures related to EIA and pollution control focusing on water are clarified and shared with GDEP staff as well as other stakeholders.	2-1 Developed technical guidelines and procedures are understood by the stakeholders

As discussed in Section 3.2, it was agreed that the following are produced under Output 2: 1) The EIA review manual; 2) The sector guidelines on road, railway, industry (metal) and Special Economic Zone (SEZ) for the EIA subsector. For the guidelines and manuals relevant to water pollution control include: 1) Wastewater Treatment Facility Guideline, 2) Factory Inspection Manual, 3) Guidelines for prevention of chemical leakage to underground and 4) Registration system of Environmental Laboratory for Water Examination for the Water Pollution Subsector.

For the EIA sub-sector, the development of the guidelines and manuals adopted a thorough participatory process wherein the pertinent officers directly engaged in the preparation of the documents.

A series of public meetings were convened with the participation of the relevant ministries such as Ministry of Public Works and Transport to facilitate a good apprehension of the guidelines and the natures of the environmental impacts. This has enabled them to capture the overall framework and to familiarize them to the individual procedure in the guidelines and manuals. It was also observed that there were some circumstances where the officers refer to the guidelines and manuals especially some check items developed in the guidelines in their review of documents. These facts demonstrate that they have developed an understanding of the guidelines and manuals.

The observations in the Task Force meetings indicated that the officers are now more aware about the temporal and spatial nature of potential impacts differing among the sectors, approaches to designing and analysing monitoring studies to assess chronic, local environmental impacts. The experience in attending the meetings and the exhaustive discussion on the environmental impact assessment would bring changes in the quality of the comments. It is however noted that full assessment of such aspects is premature because they were finalized in second quarter of the year 2021.

For the water sub-sector, the officers were exposed to a series of discussion on desk-based review of the wastewater treatment process and underwent field observation of factories including those in Phnom Penh and Manhattan Special Economic Zone.

It was also noted that the topics in the guidelines contained a wide range of physical and chemical process such as sedimentation/filtration, coagulation and flocculation process. The guidelines and manuals carry exhaustive information about engineering aspects of wastewater treatment process to enable the officers to respond to future needs of pollution control.

The officers however encountered two problems in the documents, namely conciseness and readability, which rationalized further customization process to make them more workable and applicable. This indicates admittedly that the time allocation to cover such broad issues was, in retrospect, much less than really necessary especially when the background of the officers are considered who are not necessarily those having engineering background. The project therefore supported the officers to modify and customize the guidelines and manuals before the project completion.

For reporting purpose, as emphasized in the previous sections, it was judged proper to provide the information, as part of the amendment of the Sub-decree, on the development process of the guidelines

and manuals on water pollution control. Therefore, the following sections of the report give focuses on the activities relevant to EIA unless otherwise noted.

3.3.1 Develop task force to develop guideline and procedure

As reported in Section 3.2.1 on the Task Force formation, two Task Forces were established to discuss separately on Water Pollution and EIA. At this point, it is noted that members of the Task Force on EIA were nominated to represent the each of the sub-sections of EIA department. For the organogram of the EIA department, please refer to Figure 3-4.

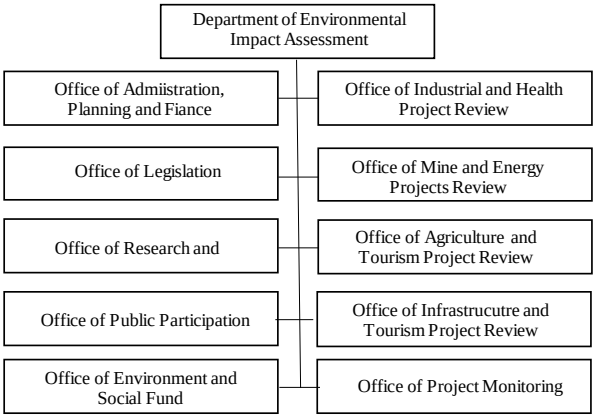

Figure 3-4 Organizational Structure of DEIA
(Source: Prakas No.445)

3.3.2 Finalize items for output 2

At the beginning of the project, GDEP and its Task Forces discussed what kind of documents shall be discussed through the project activities. Finally, Task Forces carefully determined effective fields for GDEP's capacity development based on urgent needs and their insufficiency of capacity.

(1) Environmental Impact Assessment

Department of EIA (DEIA) under GDEP is managing different sectors of development project including road, railway, dam, private development, and etc. Thus, necessary knowledge and experiences for their EIA reviewing also become wider and deeper. Based on discussion with DEIA / EIA-Task Force, several issues to be solved were confirmed as shown in Table 3-8.

Table 3-8 Issues to be Solved in DEIA at the Beginning of the Project

Issued	Reasons	Support through the Project
Officials in DEIA are required to have general knowledge for different infrastructure sectors. On the other hand, sector specified knowledge and experiences are limited.	It is not able to prospect what sector would come next and officials must treat all kinds of sector according to the actual projects brought from implementing agencies.	Sectoral guidelines (SGs) may assist insufficient knowledge and experiences, especially for unmatured officials. Process to develop such SGs can be a good opportunity to enhance their understandings.
DEIA always treats many project documents, therefore, young officials don't have enough educational opportunity for EIA reviewing.	Lack of good reference for EIA reviewing and educational opportunities were confirmed.	EIA Review Manual (RM) may assist insufficient knowledge and experiences, especially for unmatured officials. Process to develop the RM can be a good opportunity to enhance their understandings.
Officials in DEIA are not familiar with good practices in other countries and they should learn efficient and effective methodology from them.	Lack of opportunity to learn EIA systems in other countries.	Training courses in both foreign and domestic may assist insufficient knowledge and experiences, especially for unmatured officials.

With such background as mentioned above, DEIA itself once prepared sectoral EIA guidelines for energy sectors (Oil and Gas), although the guidelines have not been officially approved yet. Through the discussion for set concrete documents which would be produced through the project activities, all the Task Force finally decided to develop two kinds of documents, namely EIA Sectoral Guidelines (EIA-SGs) and EIA Review Manual (EIA-RM). The project utilized the process of developing these

documents to enhance DEIA's capacity, but did not impose its official approval during the project period.

For the EIA-SGs, it was agreed to develop three specific sectors, 1) Road and Railways, 2) Metal Industry, and 3) Special Economic Zone (SEZ). Major meetings on these activities are shown in Table 3-9. In addition to the meetings mentioned in the table, discussion on section of the field of EIA-SGs were continuously done in the following Task Force meetings. Meeting minutes are shown as Annex 30. To identify issues in the past EIA report, an analysis of the reports were performed and the results are shown in Annex 31.

Table 3-9 Major Meetings for Finalize Items on EIA under Output 2

Date	Contents	Major Participants
14th JUL 2017	Present Issues on EIA sectors	Dr. Muramatsu, Mr.Fukuda, Mr. Sambo, Mr. Leng
31st AUG 2017	EIA-Task Force Assignment Sector Guidelines' targets Training on EIA	Dr. Hatano, Mr. Leng, Mr. Sothan
04th SEP 2017	EIA-Task Force Assignment	Mr. Yamashita, Dr. Hatano, Mr. Srey
13th SEP 2017	Interview to Implementing Agency, Ministry of Public Works and Transport (MPWT): Regarding EIA procedures with Ministry of Environment.	Mr. Yamashita, Dr. Hatano, Mr. Novida, Mr. Vireak, Mr. Sovisal (Department of Planning, MPWT)
15 SEP 2017	Interview to DEIA's branch in CDC (Councils for Development of Cambodian): Regarding EIA procedures in private sectors under CDC's approval process.	Mr. Yamashita, Dr. Hatano, Mr. Novida, Mr. Vireak, Mr. Sovisal (Department of Planning, MPWT)

(2) Water Pollution Control

As discussed in the precedent sections of the report, the guidelines and manuals produced on the Water Pollution Subsector are as follows: 1) the Guideline for Prevention of chemical leakage to underground, 2) Registration of Environmental Laboratory for Water Examination, 3) Wastewater Treatment Facility guidelines and 2) Inspection Manual. For the Wastewater Treatment Facility Guideline, it was agreed to design it to assist the officers in making decisions for wastewater discharge permit. This would provide information on the volume of wastewater generation, design of facility etc. On the other hand, the Inspection Manual sets forth procedures, technical key issues in inspection with due consideration on the Cambodian context. This will be developed through undertaking joint inspection exercise organized by the inspection department.

3.3.3 Develop draft guidelines and procedures

(1) Environmental Impact Assessment

Determined documents as the products from Output 2 have been developed through the EIA-Task Force and relevant stakeholders. Methodology and records of activities are shown in the following descriptions. Firstly, the present general framework of EIA was discussed and the general procedure is summarised in Figure 3-5.

Based on the analysis at the beginning of the project, four (4) EIA sectoral guidelines (EIA-SGs) and one (1) EIA Review Manual (EIA-RM) has been developed through the project. Among the EIA-SGs, two kinds of guidelines, EIA-GLs and IEIA (Initial EIA)-GLs were prepared in Road and Railways sectors while the others, Industry (Metal) and SEZ, do not need IEIA level. That's because any project in latter two fields are to be considered as the project which requires EIA-level survey automatically based on the domestic legal frameworks.

In addition to the English versions, Khmer versions were prepared for all EIA-SGs and EIA-RM. The following table (Table 3-10) shows all documents which were developed as the products of Output 2 in the Project.

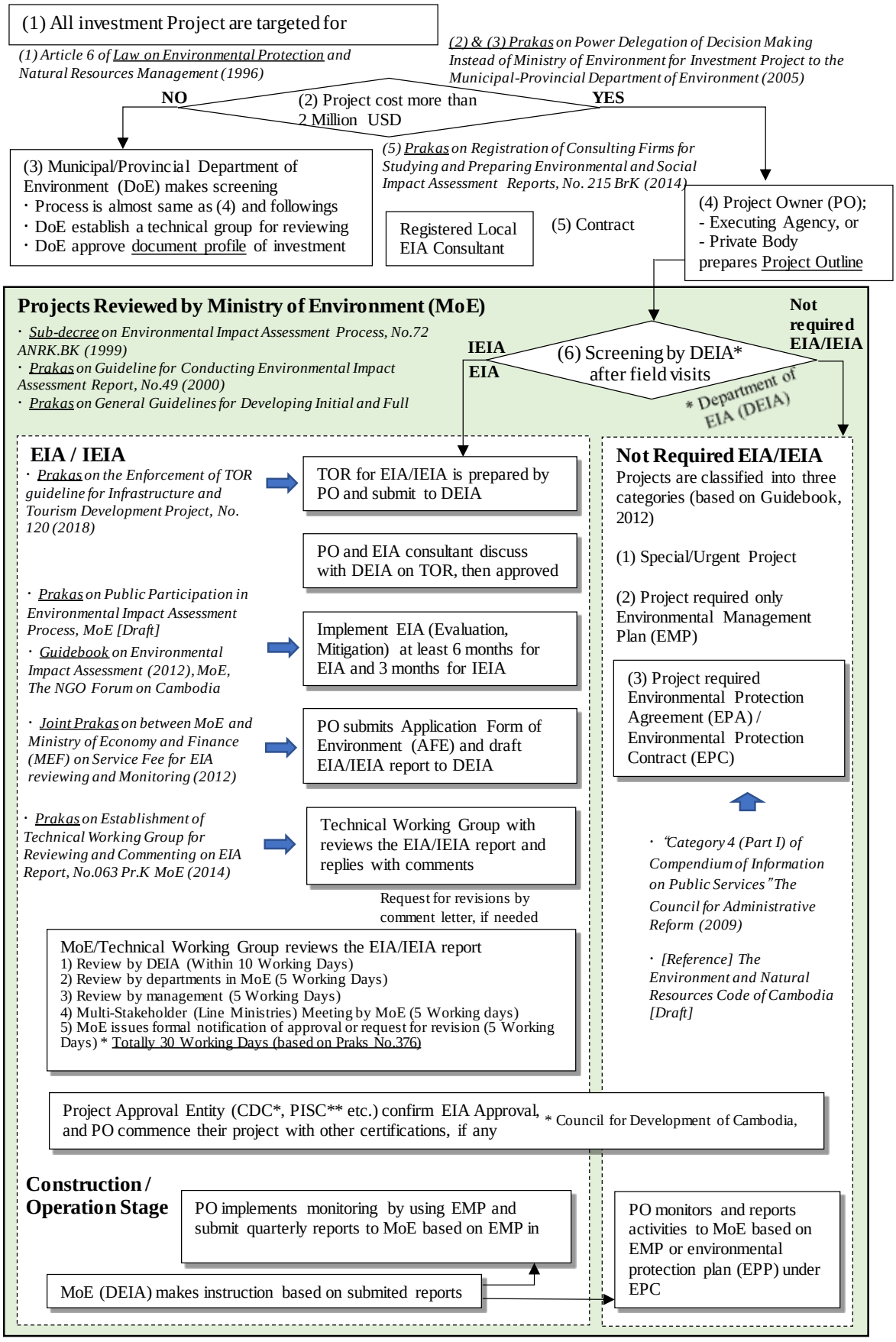

Figure 3-5 General Procedure of EIA Approval in Cambodia

Previously EIA-SGs were considered as the products under Output 1 which aims to develop legal documents. After the analysis and discussion on characteristics of EIA-SGs, however, these products are recognized as practical/technical document. Therefore, the Task Force decided that both EIA-SGs and EIA-RM are treated as the products under Output 2 finally.

Table 3-10 All Products on EIA as Output 2

Documents	Sector	Level	English	Khmer
EIA Sector Guidelines	Road	EIA	Prepared	Prepared
		IEIA	Prepared	Prepared
	Railway	EIA	Prepared	Prepared
		IEIA	Prepared	Prepared
	Industry	EIA	Prepared	Prepared
	SEZ	EIA	Prepared	Prepared
EIA Review Manual	-	-	Prepared	Prepared

a) Methodology

EIA-SGs and EIA-RM were mainly developed through discussions in the Task Force meetings of EIA. Each meeting focused on specific parts of the documents and participants made comment and provide alternative information to update the documents. Also, after the Task Force meetings, officers in DEIA continued to review the draft documents and update the documents. The following chart shows an image of methodology to develop documents through relevant bodies.

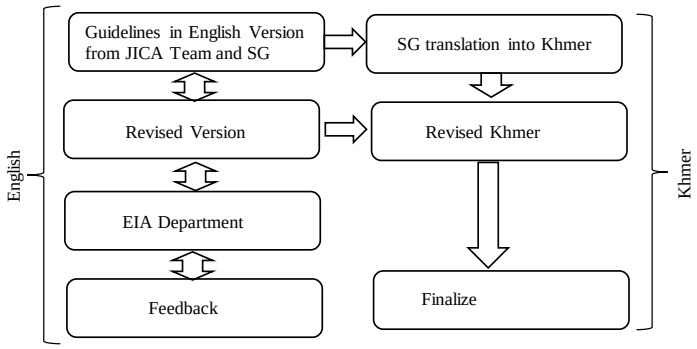

Figure 3-6 Flowchart for Developing Guidelines / Manual

Source: The JICA Team

In addition to the Task Force meeting, public consultation for the drafted EIA-SGs were implemented as a part of officialization and approval processes. Details on this activity is described in the following part.

b) Task Force Meetings and Relevant Meetings

Task Force meetings for EIA activates were organized many times to develop documents. Through this process, the Project achieved capacity development of participants, especially officials in DEIA. Besides these Task Force meetings, there were many opportunities to exchange opinions on developing such documents between JICA experts and DEIA, especially individual meetings with director of DEIA. The following table (Table 3-11) shows the records of major meetings relevant to Output 2.

Table 3-11 Major Meetings for Draft EIA Sectoral Guidelines and Review Manual

Date	Contents	Major Participants
29th SEP 2017 1st EIA-TF	・ Discussion on the priority sectors for EIA-SGs and methodology of development the documents. ・ Function and members of EIA-TFs. ・ EIA related training course	Dr. Hatano, Mr. Leng, Mr. Sivutha, and other 5 officials of DEIA
24th OCT 2017 2nd EIA-TF	・ It needs assessment on EIA activities including EIA-SGs development and EIA Review Manual. Priority sectors such as road and railways are confirmed with	Mr. Yamashita, Dr. Hatano, Mr. Nakayama, Mr. Leng, Mr. Samkeat, and other 4

Date	Contents	Major Participants
	their table of contents. - Infrastructure (Road, Railway) - Industry - SEZ	officials of DEIA
07th NOV 2017 3rd EIA-TF	Discussion on the structure/chapter of EIA-SGs. ・ Both EIA and IEIA Guidelines shall be prepared for each sector ・ Guidelines on Infrastructure (Road and Railway) sector	Mr. Watanabe, Mr. Leng, Mr. Samkeat, Mr. Yuthearith, and other 6 officials of DEIA
09th JAN 2018 4th EIA-TF	・ Updating the Table of Content for each Guidelines ・ Introducing local support staff for existing EIA review ・ Discussion on the Full EIA Guideline on Infrastructure * Infrastructure Guideline is separated into Road and Railway	Dr. Muramatsu, Mr. Watanabe, Mr. Leng and other 6 officials of DEIA
29th JAN 2018 5th EIA-TF	・ Verification of revised EIA-SGs (road and railways)	Mr. Yamashita, Dr. Hatano, Mr. Nakayama, Mr. Egawa, Mr. Serey, Mr. Leng, Mr. Samkeat, and other 11 officials of DEIA
12th MAR 2018	・ Schedule for approval of Guidelines to Prakas	Dr. Hatano, Mr. Chea Leng
27th MAR 2018 6th EIA-TF	・ Discussion on prepared draft EIA-SGs and EIA Review Manual	Dr. Hatano, Mr. Watanabe, Mr. Leng and other 4 officials of DEIA
03rd APR 2018	Interview with Oxfam Cambodia on EIA-ToR for ・ Sand exploitation ・ Stone exploitation ・ Agro-industry crop development ・ Factory and Handicraft establishment ・ Infrastructure and Tourism Projects	Dr. Hatano, Ms. Kim, Mr. Khim
11th JUN 2018 7th EIA-TF	・ Discussion on revised EIA-SGs for Road Sector and SGs shall be approved as Prakas in the future.	Mr. Watanabe and officials from DEIA
30th AUG 2018 8th EIA-TF	・ Discussion on revised EIA-SGs and follow up for the schedule of its finalization	Mr. Watanabe Officials from DEIA
28th NOV 2018 9th EIA-TF	・ Progress reporting on EIA-SGs and EIA-RM ・ Preparation for Public Hearing on EIA-SGs	Dr. Muramatsu, Mr. Yamashita, Mr. Leng, Mr. Yuthearith, and other 7 officials of DEIA
17th DEC 2018 10th EIA-TF	・ Discussion on revised EIA-SGs in Khmer and follow up for the schedule of its finalization.	Dr. Muramatsu, Mr. Watanabe, Mr. Leng, and other 2 officials of DEIA

c) Local Staff (Consultant)

Local staff were hired in order to support activities, especially for the processes of developing EIA-SGs and EIA-RM. Table 3-12 shows outlines of local staff / consultant on EIA activities during the project implementation. They worked closely with DEIA during the absence of JICA Experts.

Table 3-12 Local Staff Supporting EIA Activities

	1. SustinatGreen	2. Mr. Nhean Suy Bros
Contract Duration	December 2017 – May 2019	July 2019 – December 2021
Major Activities	・ Analysis on EIA sector guidelines ・ Preparation and implementation (facilitation) of the 1st Public Consultation for EIA-SGs ・ Khmer-English Translation / Interpretation	・ Preparation and implementation (facilitation) of the 2nd Public Consultation for EIA-SGs (Alternative opinion collection) ・ Khmer-English Translation / Interpretation ・ Finalization of EIA-SGs and EIA-RM in both English and Khmer

3.3.4 Consultation with stakeholders

(1) Environmental Impact Assessment

As a part of finalization process in MOE, several consultation meetings were implemented in order to update EIA-SGs based on their opinions and views. Image of officialization process including such consultation meetings is shown in Figure 3-7.

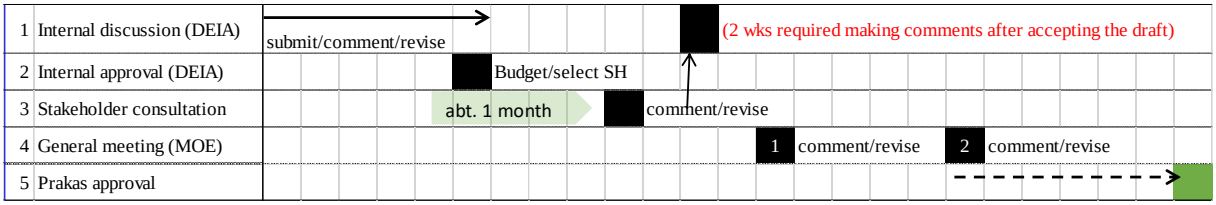

Figure 3-7 Finalization Process and Public Meetings

The first public consultation meeting was held on March 2019 to discuss draft EIS-SGs on road and railways. The meeting consisted of explanation on drafted documents followed by the other session of workshops to collect opinions from the participants. A total of 59 participants attended the morning session, with 31 of those representing ministries and 28 representing ESIA consulting companies and NGOs. During the afternoon session there was a total of 34 participants, with 15 representing ministries and 19 representing ESIA consulting companies and NGOs. 17 staff were also in attendance from Sustinat Green to support the facilitation of the event. In respect of the invitations distributed only the Ministry of Tourism and Environtech Co.,Ltd. were absent at the event. Report of the Public meeting is shown as Annex 32.

Comments from the meeting was reflected to draft documents. The revised documents were discussed again in the following another public meeting for the local consultant who registered as EIA survey firms under MOE on January 2020. Through this updating process, the draft documents of EIA-SGs were brushed up.

On the other hand, the 2nd Public Consultation and following meeting with local consultant for EIA-SGs on SEZ and Industry (Metal) was not able to organize as same as the 1st meeting because of restrictions of COVID-19. As an alternative way, the Project provided draft documents to relevant authorities and collect their comment through e-mail and/or other electrical measures to avoid face-to-face meeting.

Table 3-13 shows outline of the public meetings for EIA activities.

Table 3-13 Public Meetings for EIA Activities

Date	Contents	Major Participants
19th MAR 2019	The 1st Public Consultation for EIA-SGs on road and railways	Relevant implementing agencies including JCC members as well as local consulting firms who registered as EIA survey organizations
28th JAN 2020	DEIA organized a meeting with certified local consultant firms on EIA to share the prepared guidelines (road and railway sectors) and to collect their opinions.	Private sectors, especially registered consulting firms to EIA survey, are called.
August-September 2021	The 2nd Public Consultation for EIA-SGs on SEZ and Metal Industry ・ Due to COVID-19, Public Consultation was replaced to e-mail based opinion collection.	Relevant implementing agencies including JCC members as well as local consulting firms who registered as EIA survey organizations

3.3.5 Finalize draft guidelines and procedures

(1) Environmental Impact Assessment

EIA-SGs and EIA-RM have been discussed and revised many times based on opinion exchanges between JICA experts and officials in DEIA. In addition, the other opportunities such as public consultation meetings gave further views and improvements on the documents. Training courses

related to EIA during the Project also provided feedbacks on drafted documents from trainee who will use the guidelines and manual in the future.

After the final review of the contents in both English and Khmer versions, all products of Output 2 were prepared for final officialization process in MOE. DEIA will continuously proceed necessary internal steps to approve them as Prakas in the near future.

All prepared products (English versions / Khmer versions) shown as below are attached as Annex 3 throughout Annex 9.

- EIA (ESIA) Sectoral Guidelines on Road / IEIA (IESIA) Sectoral Guidelines on Road
- EIA (ESIA) Sectoral Guidelines on Railways / IEIA (IESIA) Sectoral Guidelines on Railways
- EIA (ESIA) Sectoral Guidelines on SEZ
- EIA (ESIA) Sectoral Guidelines on Industry (Metal)

3.3.6 Disseminate the finalized and/or draft guideline and procedure to stakeholders

(1) Environmental Impact Assessment

The draft EIA-SGs and the EIA-RM were provided to officials of MOE and other members of JCC as well as the participants of public meetings for discussing those EIA-SGs. Also, the summary and contents of these EIA-SGs and EIA-RM were shared among participants of training courses of the Project.

3.3.7 Prepare summary report for output 2

The summary report for output 2 is attached to this report as Annex 33.

3.4 OUTPUT 3

The activities of Output 3 aim to assist the capacity development of GDEP and related departments under GDEP in the field of Environmental Management by implementing a series of training courses designed to improve skills and knowledge relevant to the various aspects of environmental management. The narrative summary of the output and its verifiable indicators are presented in Table 3-14.

Table 3-14 Narrative Summary of Output 3 and Its Verifiable Indicators

Output	Verifiable Indicators
3. Capacity of GDEP and related departments under GDEP in the field of Environmental Management is enhanced	3-1 Result of water quality monitoring is opened to the public by GDEP 3-2 Quality of the comments made by staffs of EIA Department on EIA/IEIA reports is improved compared to the level at the starting point of the Project

The activity to generate Output 3 began with the review of the institutional settings of GDEP, which has led to the development of a training programme. Since the very early stage of the project, a series of lectures were provided; and various hand-on trainings such as water quality monitoring were also designed and delivered. In addition to such training courses, it is also noteworthy that GDEP developed fundamental but very important tools used for pollution controls.

For the verifiable indicators, the status is evaluated as follows:

- GDEP undertakes water quality monitoring at forty-seven sampling locations over the country for some selected parameters. The information of the water quality monitoring is presented in the annual report. But accessibility to the information seems to be in a limited extent. Meanwhile, it is also noted that the Environmental Information System to be developed with the fund of UNEP is expected to be used as an avenue for increasing information accessibility.
- For the second indicator, as reported in the section 3.3, the observations in the relevant Task Force meetings indicated that the officers are now more aware about the temporal and spatial

nature of potential impacts differing among the sectors, approaches to designing and analysing monitoring studies to assess chronic, local environmental impacts. The experience in attending the meetings and the exhaustive discussion on the environmental impact assessment had brought changes in the quality of the comments according to the observation from director/deputy directors of the Department of EIA. They evaluated the output 3 very high during a joint evaluation meeting and recognized that learning practical EIA review system in different countries including Japan could give young officers good opportunity to consider the quality of comments on their working EIA reports.

3.4.1 Review the institutional arrangements of GDEP

The institutional arrangements of GDEP were reviewed to clarify the scope of the training.

The General Department of Environmental Protection (GDEP) consists of seven departments and laboratory. Under GDEP, the responsible units to manage important environmental aspects or fields including air quality, water quality, waste, and environmental impact assessment were established as independent department to maintain nation-wide environmental quality from various forms of environmental degradation factors, such as pollutions and infrastructure development. The interviews with each department under GDEP were conducted to identify their status and needs in order to improve the capacity of environmental management and pollution control. The following issues were identified for capacity building of the staff.

- Review/Reinforcement of basic knowledge on environmental conservation and management in general
- Improvement of IT knowledge and skills for efficient management and processing of environmental information
- Improvement of IT knowledge and technology for efficient management and processing of environmental information
- Improvement of expertise in the field of environmental management under the jurisdiction of each department of GDEP
- Strengthen understanding of environmental management initiatives in neighboring countries in order to achieve international cooperation with Southeast Asian countries on transboundary environmental issues (air and water quality related).

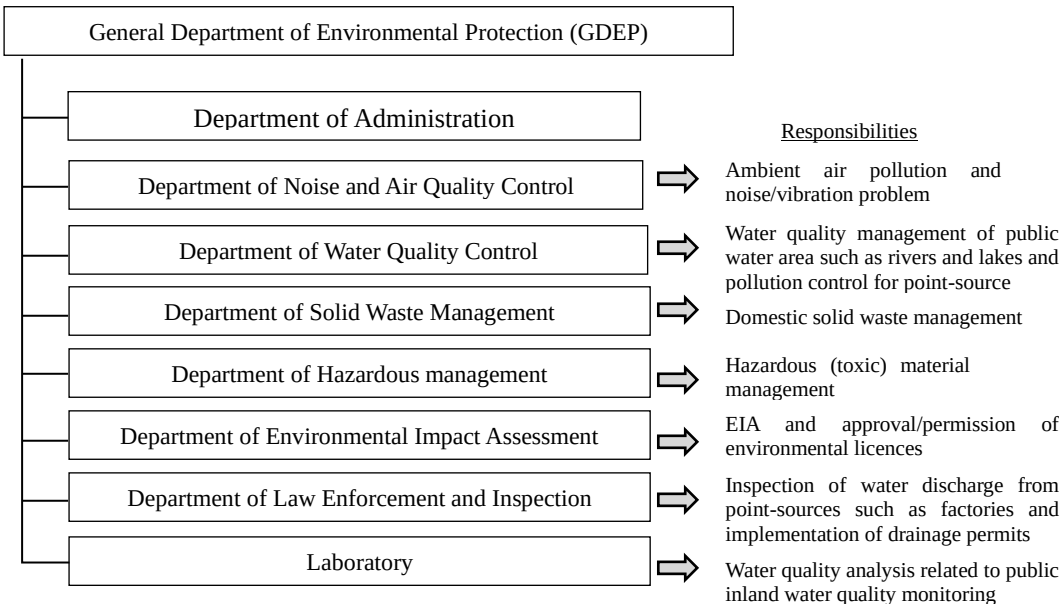

Figure 3-8 Institutional arrangement of GDEP

The scope of training aiming to overall capacity development of GDEP staff was defined by addressing the fields of the environmental management/pollution control that needed to be enhanced and the contents/aspects of the relevant fields that were desirable to be improved for promoting the

adequate knowledges and skills of GDEP staff. The proposed scope of training is presented in Table 3-15.

Table 3-15 Scope of Training

Aspect	Responsible Department	Scope of Training
General	All departments	・ Understand important environmental issues and approach of environmental management ・ Understand the methodologies of developing countermeasures to environmental problems/pollution ・ Understand the currently available information technologies such as GIS for efficient environmental information management
EIA	Department of Environmental Impacts Assessment	・ Understand efficient EIA system including overall procedure and step-by-step application such as scoping and screening ・ Understand necessity of sector-specific guideline and EIA manuals for better implementation of EIA ・ Understand challenges/issues of EIA implementation
Air Quality	Department of Noise and Air Quality Control	・ Understand the current status and challenges/issues of atmospheric environmental problems including air pollution, noise and vibration problem. ・ Understand the importance of legal framework by learning from the experience of other countries ・ Understand possible as well as effective countermeasure to cope atmospheric environmental problem
Water Quality	Department of Water Quality Control Department of Law, Enforcement, and Inspection Laboratory	・ Understand the current status and challenges/issues of atmospheric environmental problems regarding public water quality ・ Understand effective management strategies of water quality including inspection and regulation as well as data management ・ Understand effective regulatory monitoring of public water area
Waste Management	Department of Solid Waste management Department of Hazardous Management	・ Understand the effective management strategy of solid waste/Hazardous materials ・ Understand the basic issues and solutions of waste management.

3.4.2 Prepare the syllabus including contents/subjects of training program

The syllabus describing the composition of seminars for each field in the design structure of the training program, objectives/expected results of each seminar, target groups, the number of training sessions, and tentative schedule of the seminars was organized with careful consultation of relevant departments of GDEP. Total of 9 fields consisting of 32 training courses was proposed, aiming to the six departments and laboratory of GDEP.

The styles of each training courses are selected from a) lecture, b) seminar, and c) fieldwork/hand-on exercise so that the participants of each course can learn effectively through the training by choosing the suitable means of training based on the consideration of the nature and characteristic of each training courses. The Overall Design of Training Program is presented in Table 3-17.

3.4.3 Conduct study tours

The study tours were designed and conducted as the third country training program in Output 3. Originally, three sets of the study tours were planned for provide the target groups the experience of the foreign countries in the relevant fields of environmental management by visiting three countries that implement the good practice of environmental management and pollution control and having opportunities of discussion with respective agencies. The following countries were selected as destinations for the study tours: Thailand, Vietnam, and Japan. However, the study tour of Japan, which was originally planned in 2020 was cancelled due to the international travel restrictions at both Cambodia and Japan; and thus, the two study tours including one to Thailand and another to Vietnam were conducted as the activities of Output 3.

The first study tour was conducted in Thailand and introduced the relevant laws and regulations related to water environment administration in Thailand, as well as monitoring and other related

activities at each administrative level (national (Ministry of Environment) and provincial). The second study tour was executed in Vietnam and included lectures and site visits on the legal system and enforcement system related to environmental management and pollution source control. Table 3-16 summarises the study tours in the Project

Table 3-16 Conducted Study Tours in Output 3

Destination	Objectives	Date	Participants[6]	Locations
Thailand	This training is designed to expose the training participants to the approaches of pollution control that may be readily applicable to Cambodia. It mainly focuses on leaning the experiences in EIA and pollution control in Thailand.	10th September 2018 to 15th September 2018	Management Team: 18 officers from DoWQM, DoNAQM, DoSWM, DoHSM, DoLEI, DEIA, DoAPF, Labo	Bangkok and Rayong
		10th September 2018 to 18th September 2018	Technical Team: 9 officers from DoWQM, DoAQNM, DoSWM, DoHSM, DoLEI, DEIA, DoAPF, Labo	Bangkok, Rayong, Pathumthani and Sakeo
Vietnam	This training is designed to expose the training participants to the approaches of environmental management with particular focuses on leaning the experiences in Water quality management, pollution control, and waste management in Vietnam.	12th January 2020 to 18th January 2020	10 offices from DoLEI, DoSWM, DoAPF, DoAQNM, DEIA, DoWQM, DoHSM, Lab	Hanoi

3.4.4 Organize seminars

Among 39 training courses proposed in the training program, the 13 courses were designed as the seminar-style courses to promote further understanding of the relevant topics to the participants by incorporating discussion and hand-on exercises including fieldwork. Table 3-18 presents the summary of the seminars.

[6] DoWQM: Department of Water Quality Management, DoNAQM: Department of Air Quality and Noise Management, DoSWM: Department of Solid Waste Management, DoHSM: Department of Hazardous Substance Management, DoLEI: Department of Law Enforcement and Inspection, DEIA: Department of Environmental Impact Assessment (EIA), DoAPF: Department of Administration, Planning and Finance

Table 3-17 Overall Design of Training Program in Output 3

Field	Code	Course title	Objective/ Expected results	Course overview	Target Group
General training	A1	Seminar on environmental management	Understand the emerging issues in environment and non-regulatory approach of environmental management Formulate countermeasure plan for one of emerging issues as pilot work	・ Non-regulatory approach: Environmental management system &Monitoring system ・ PRTR (Thailand case) ・ Emerging issues in Environment (PM issue, Research collaboration with ITC ・ Research finding (PM issue) and Policy formulation	GDEP staff
	A2	Japan's experience in pollution control	Understand issues and solutions on pollution control through lessons from Japanese experience	・ Outline of laws and regulations, issues, control measures and stakeholders concerning Japanese experience	GDEP staff
Environmental information management	B1	Introduction to environmental information management	Understand the existing systems in the MOE in collecting and managing environmental information and to consider how to utilize various information management technologies in each department	・ Existing systems operation in environmental information management and issues in cooperation with other departments, ・ Utilization of websites, database construction and management method, ・ Basics of spatial data processing and GIS application	GDEP younger staff (especially new employee)
	B2	Environmental information management exercise 1 (GIS basic course)	Focusing on visual analysis in water environmental management, learn basic operation method of GIS so that geospatial information and GIS can be effectively utilized	・ Characteristics of GIS application and significance of utilization in environmental management, ・ Basics of spatial data creation using GPS, map and database processing using GIS application, and map making	DWQM and other GDEP staff in charge of related work
	B3	Environnemental information management exorcise 2 (GIS applied course)	Learn the knowledge and skills necessary to realize visualization of water quality related data	・ Practical exercises to realize water pollution source map based on the survey result of water pollution sources around Phnom Penh. ・ Consider methods of data update and website management in preparation for web publication of the map	DWQM and other GDEP staff in charge of related work
Air pollution, noise, vibration	C1	Air pollution	Acquire the expertise necessary for carrying out tasks related to the control of atmospheric pollutants	・ Outline of laws and regulations on air quality conservation, air pollution control, recent issues and measures based on case study	DANQM, DEIA and other GDEP staff in charge of related work
	C2	Noise and vibration	Acquire the expertise necessary for carrying out tasks related to the control of noise and vibration	・ Outline of laws and regulations on noise and vibration, recent issues and measures based on case study	DANQM, DEIA and other GDEP staff in charge of related work
	C3	Air pollution, noise control in other countries	Understand the air pollution, noise control and their measures in other counties including Japan	・ Outline of laws and regulations on air pollution prevention and noise control in other countries ・ The efforts to overcome	DANQM, DEIA and other GDEP staff in charge of related work

Field	Code	Course title	Objective/ Expected results	Course overview	Target Group
Solid waste management	D1	Basics on solid waste management	Acquire the expertise necessary for carrying out tasks related to the solid waste management	・ Provide outline of laws and regulations, issues and control measures including Japanese experience. - Overview of SWM - Typical issues and responses - Review of present policy	DSWM, DEIA and other GDEP staff in charge of related work
Hazardous substances management	E1	Hazardous waste management	Understand basic issues and solutions on the hazardous waste management	・ Provide outline of laws and regulations, issues and control measures including Japanese experience. - Issues on hazardous waste management - Policy setting on hazardous waste management - Review of present policy	DHSM, DEIA and other GDEP staff involved in related work
Water quality management	F1	Introduction to water quality management	Understand the basic knowledge and background for water quality control policy	・ Basic idea and knowledge required to revise the current water quality control sub-decree - Pollution control policy - Health risk of pollutants and determination of environmental standards - Quality of measurement value in Laboratory	DWQM, DILE and other GDEP staff in charge of related work
	F2	Water quality management in other countries	Understand the water quality management in other countries including Japan	・ Outline of laws and regulations on water quality management in other countries - Water pollution control in Japan - Groundwater pollution by industrial chemicals ~Japan's case~	DWQM and other GDEP staff in charge of related work
	F3	Introduction to wastewater treatment technology	Enable field inspectors to acquire knowledge and expertise on wastewater treatment processes to quickly and accurately assess the appropriateness and effectiveness of inspected wastewater treatment facilities to attain compliance with effluent standards	・ Attributes of a good wastewater treatment plant/ facility ・ Classification of wastewater treatment processes: Physical, Chemical, Biological and alternative treatment processes ・ Examples of wastewater treatment plants	DWQM, DILE and other GDEP staff involved in related work
	F4	Basic training on field water quality testing equipment	Learn how to use the field water quality testing equipment and to capture an overview of the status on water quality degradation in Phnom Penh	・ Provide basic knowledge and skill of water quality testing equipment. The training includes field work.	DWQM, DLabo and other GDEP staff in charge of related work
	F5	Water quality modelling	Understand the basic theory of water quality modelling To be able to run simple modelling software	・ Provide basic capacity for water quality modelling. The training includes introduction of various modelling methodology as well as some of the simple modelling software. Hand-on practice of some software will be included.	DWQM staff
	F6	Use of field water quality testing equipment for ambient water quality monitoring	Capture an overview of the status on water quality degradation on Phnom Penh	・ The training will be conducted in collaboration with regular survey conducted by DWQM/GDEP in order to capture the status on water quality degradation on Phnom Penh	DWQM, DLabo and other GDEP staff in charge of related work

Field	Code	Course title	Objective/ Expected results	Course overview	Target Group
	F7	Pollution Source study course	Capture an overview of geographical distribution pattern of pollution sources in Phnom Penh.	・ The training will be conducted in collaboration with regular survey conducted by inspection team/GEDP in order to capture status of geographical distribution pattern of pollution sources in Phnom Penh.	DWQM, DLabo, DILE and other GDEP staff in charge of related work
Inspection and Law Enforcement	G1	Inspection (introduction)	Acquire knowledge and expertise on inspection	・ Procedure of inspection and environmental pollution control - Factory inspection for pollution source - Overview about procedure of inspection - Fundamental techniques for inspection work - Technique for collecting and storing sample - Basic regulation for implementing the inspection activity	DILE and other GDEP staff involved in related work
	G2	Inspection field course	Enable participants (Inspectors) to acquire knowledge and expertise	・ Major issues in inspection will be identified. Guidance will be given to the participants to improve the quality of inspection	Officers in charge of inspection
Environmental Impact Assessment (EIA)	H1	EIA system outside Cambodia (Japan and others)	Enhance understanding of the EIA system by knowing the systems in other countries (supposing the participants understand Cambodian EIA system)	・ Legal system and authorization process for EIA in other countries including Japan (H1-1) ・ Evaluated railway (Sky Train) EIA case in Japan (H1-2)	DEIA staff
	H2	Sector specific Guidelines and its necessity	Learn what sector specific guidelines developed by taskforce are, and why they are necessary	・ Part of taskforce activities, JET encourages making outputs through discussions by providing necessary information	Taskforce member, DEIA staff
	H3	EIA review manual and its necessity	Learn what EIA review manual developed by taskforce is, and why it is necessary	・ Part of taskforce activities. JET encourages making outputs through discussions by providing necessary information	Taskforce member, DEIA staff
	H4	Major challenges/ issues in creating IEIA/EIA reports (sector specific)	Understand what a valuable comment is by extracting challenges/issues in the process before EIA reviewing (screening/scoping)	・ Dredge up challenges/issues from actual examples during screening/scoping from selected a couple of EIA cases (employing local consultant)	DEIA staff in charge of review, younger staff
	H5	Major challenges/ issues in reviewing IEIA/EIA reports (sector specific)	Understand what a valuable comment is by extracting challenges/ issues during EIA reviewing	・ Dredge up challenges/issues from actual examples during reviewing from selected a couple of EIA cases (employing local consultant)	DEIA staff in charge of review, younger staff
	H6	Practical training for IEIA/EIA screening/ scoping (sector specific)	Master how to conduct scoping/ screening based on check sheet etc. This is an applied training for sector specific guidelines	・ Practice using drafted guidelines based on recent EIA cases. ・ Field practice if necessary.	DEIA staff in charge of review, younger staff
	H7	Practical training for IEIA/EIA reviewing (sector specific)	Master how to review IEIA/EIA reports by using drafted review manual	・ Practice using drafted review manual based on recent EIA cases. ・ Field practice if necessary	DEIA staff in charge of review, younger staff

Field	Code	Course title	Objective/ Expected results	Course overview	Target Group
	H8	Review training using model EIA report	Master how to review IEIA/EIA reports by using drafted review manual and recognize the difference with EIA in Cambodia	・ Review EIA cases which are globally recognized as exemplary	DEIA staff in charge of review, younger staff
	H9	EIA course for provincial officers	Acquire the expertise necessary for carrying out tasks such as appraisal of EIA reports	・ Systems and methods related to EIA ・ Role required for provincial departments ・ Practical work for EIA process based on specific cases	Provincial Department staff in charge of EIA appraisal
	H10	EIA review practice for provincial officers	Understand the points to be considered in reviewing IEIA/ EIA reports so as to carry out the appraisal tasks smoothly in provincial department level	・ Lecture and practice by using drafted review manual, for appraisal method to be carried out by provincial department in the EIA process. ・ Field practice if necessary	Provincial Department staff in charge of EIA appraisal
Training abroad	I1	Training in Japan	To understand the historical background of Japan's EIA system and some major pollution cases	・ Japan's environmental management administration ・ Historical background, mechanism of the environmental management system ・ Interaction between the government and private sectors ・ Approaches in awareness raising to promote understanding of the importance of environmental management ・ Candidate for visit: Ministry of Environment, Kanagawa Prefectural Government, Kitakyusyu City Government	Person in charge of each institution (administrative officer, engineer, researcher)
	I2	Training in Thailand	To understand the issues and lessons learnt in controlling pollution	・ Outline of EIA and environmental management in Thailand ・ Incidence of the significant pollution taking place in the Map Ta Phut Industrial Estate ・ Candidate for visit: Ministry of Natural Resources and Environment, Ministry of Industry, Industrial Estate Authority, Environmental Research and Training Centre	Person in charge of each institution (administrative officer, engineer, researcher)
	I3	Training in Vietnam	To share issues based on the draft guidelines Be expected to exert synergy effects with the JICA supported Project for Strengthening Capacity of Water Environmental Management in River Basin in Vietnam	・ A workshop will be convened to discuss key issues and challenges in controlling pollution and EIA with the counterpart officers of the Project for Strengthening Capacity of Water Environmental Management in River Basin ・ Candidate for visit: Ministry of Natural Resources and Environment, Vietnam Environment Administration, Departments of Natural Resources and Environment of riparian provinces of Cau River	Person in charge of each institution (administrative officer, engineer, researcher)

Table 3-18 Organized Seminars in Output 3

Field	Code	Course title	Aims of Seminars	Remarks
General training	A1	Seminar on environmental management	Through this course, the participants shall identify emerging issue, study and evaluate them (in some case in collaboration with the stakeholders) and plan for various policy measure.	Fieldwork is also planned along with the seminar.
Environmental information management	B2	Environmental information management exercise 1 (GIS basic course)	The seminar is designed to provide basic idea and knowledge of GIS (Geographic Information System) including characteristics of GIS application and significance of utilization in environmental management, basics of spatial data creation using GPS, map and database processing using GIS application, and map making	Hand-on experience of GIS application, QGIS
	B3	Environmental information management exorcise 2 (GIS applied course)		
Water quality management	F4	Basic training on field water quality testing equipment	The seminar is designed to provide basic knowledge and skill of water quality testing equipment. The training includes field work as well as introduction of various equipment such as multi parameter water quality meter and spectrophotometer.	Fieldwork is also planned along with the seminar.
	F5	Water quality modelling	The seminar is designed to provide basic capacity for water quality modelling. It includes introduction of various modelling methodology as well as some of the simple modelling software. Hand-on practice of some software is also included.	N.A.
Environmental Impact Assessment (EIA)	H2	Sector specific Guidelines and its necessity	This seminar is designed as part of the EIA Taskforce activities and will be an opportunity to have a common view about the formulation of EIA sector-specific guidelines through the discussion.	N.A.
	H3	EIA review manual and its necessity	This seminar is designed as part of the EIA Taskforce activities and will be an opportunity to have a common view about the formulation of EIA review manual through the discussion.	N.A.
	H4	Major challenges/ issues in creating IEIA/EIA reports (sector specific)	This seminar is designed for the officers of MOE local offices as well as local consultant who undertakes the survey on review and analysis EIA reports for JICA Expert Team will assist the sessions.	N.A.
	H5	Major challenges/ issues in reviewing IEIA/EIA reports (sector specific)		N.A.
	H6	Practical training for IEIA/EIA screening/ scoping (sector specific)	This seminar is designed to provide hand-on experience of the main EIA procedures by conducting reviewing process of the IEIA/EIA reports by using drafted review manuals.	Fieldwork is also planned along with the seminar.
	H7	Practical training for IEIA/EIA reviewing (sector specific)		Fieldwork is also planned along with the seminar.
	H8	Review training using model EIA report	This seminar is designed to master how to review IEIA/EIA reports by exercising and outlining model EIA report.	N.A.
	H10	EIA review practice for provincial officers	This seminar is designed to acquire the basic knowledge of EIA procedure and the expertise necessary for carrying out tasks such as appraisal of EIA reports for provincial-level projects.	N.A.

N.A.: not applicable.

3.4.5 Develop training programs

The training program, structured based on the comprehensive review of the scope of training and syllabus, was approved and finalized by GDEP.

3.4.6 Implement the developed training program

The series of the seminars in accordance with the finalized training plan were conducted from 2017 to 2021. Due to the travel restriction resulting from COVID-19 pandemic, the training courses that held after March 2020 were mostly conducted via Internet by utilizing the online-meeting application such as Microsoft Teams. The timing of the training programme is recorded and provided in Table 3-19.

3.4.7 Evaluate the implemented training program and prepare the next training

(1) Overall Evaluation of Training Program

For verification of the effectiveness of the training courses implemented in Output 3, the self-evaluation methodology by participants of the training course was adopted. The participants evaluated the level of their understanding for the themes/contents of the training course at three levels, 1) very poor, 2) moderate, and 3) very well, at the timing before and after each training session. From the comparison of the participants' self-evaluations between before and after attending the trainings, it can be said that the participants understanding regarding respective themes of the training was improved. Details are provided in Annex 34.

(2) Promoting Motivation and Recognition of Further Efforts

a) Air Pollution Control

For the purpose of improving the pollution control capability of the Air Quality and Noise Management Department, the field observation to measure particulate matters (PM2.5 and PM10), a main concern in air pollution management in south-eastern Asia including Cambodia, in collaboration with Institute of Technology of Cambodia. The field observation was conducted at the 10 sampling locations within the proximity of Phnom Penh for two windy seasons: Nov 2019-Dec 2019 and Jan 2020-Feb 2020. In addition, a seminar hosted by the Air Quality and Noise Management Department was held to present, share and discuss the findings of the PM monitoring in Phnom Penh.

This attempt was significant in two points. First, by having experience of the field observation activity, the basic skills and understanding the status of PM in the Phnom Penh area has been improved among the relevant officials of GDEP. Secondly, this attempt promoted the motivation and recognition of the facts that environment cannot and, also, should not be managed by the Ministry of Environment alone in isolation from other stakeholders. An expectation is that the research collaboration between MOE and ITC should not terminate as research; it should be elevated as a policy formulation platform to facilitate collaboration between academe and policy makers. At this point of time, it is also noteworthy that the research collaboration was subsequently pursued with an additional fund provided by UNDP.

Since the current PM2.5 and PM10 concentration level is found to be relatively low, it is understood that the current status of particulate matters in the Phnom Penh area does not require the urgent measure. However, this activity was meaningful in a sense that it provided the experience of going through the basic procedure of air quality management, which should improve the capacity of air quality management in GDEP.

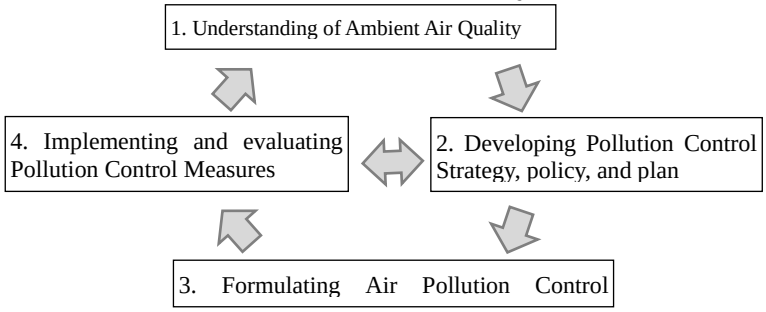

Figure 3-9 Process of Air Pollution Control

Table 3-19 Implemented Schedule of the Training Program

Field	Code	Training course	# of Sessions	2017						2018												2019												2020												2021											
				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
General Training	A1	Seminar on environmental management	4							2/12 ▲		4/25 ▲		5/2-4 ▲								PM Monitoring									▲10/18																											9/13 ▲		
	A2	Japan's experience in pollution control	3																															8/12,13,14,16 ▲																								
Environmental information management	B1	Introduction to environmental information management	1																																																								▲ 10/21		
	B2	Environmental information management exercise 1 (GIS basic course)	1																																																								May 26-27, June 2-3, June 9-10, June 17-19 and June23-24
	B3	Environmental information management exercise 2 (GIS applied course)	1																																																									
Air pollution, noise, vibration	C1	Air pollution	1									4/26 ▲																																																	
	C2	Noise and vibration	1																																																									
	C3	Air pollution, noise control in other countries	1																																																							▲ 10/22		
Solid waste management	D1	Basics on solid waste management	3									5/22-25 ▲												6/4-7 ▲																																	▲ 6/26		
Hazardous substances management	E1	Hazardous waste management	3									3/9 ▲	4/9 ▲	5/9 ▲																																																		
Water Quality management	F1	Introduction to water quality management	3	8/4,8/18,9/27 ▲▲▲																																																									
	F2	Water quality management in other countries	2		▲	▲																3/1,3/18 ▲▲																																								
	F3	Introduction to Wastewater Treatment Processes	3	8/11	9/8															12/4 ▲																																									
	F4	Basic training on field water quality testing equipment	2									4/24 ▲						9/19-20 ▲																																												
	F5	Water quality modeling	1																																																									1/30 ▲		
	F6	Use of field water quality testing equipment for ambient water quality monitoring	Several (Field work)															11/27-30 ▲		▲ 12/11-13																																												
	F7	Pollution Source study course	Several																																																									
Inspection and Law Enforcement	G1	Introduction to Inspection	3			10/10,11,12,17,26																3/11 ▲																																										
	G2	Inspection field course	3(Field work)			▲														12/5-6 ▲																																										
Environmental Impact Assessment	H1	EIA system outside Cambodia (Japan and others)	1		10/17 ▲					3/27 ▲						8/30 ▲																																															
	H2	Sector specific Guidelines and its necessity	1		10/24 ▲																																																								
	H3	EIA review manual and its necessity	1							3/6 ▲																																																				
	H4	Major challenges/ issues in creating IEIA/EIA reports (sector specific)	1															10/2 ▲																																										
	H5	Major challenges/ issues in reviewing IEIA/EIA reports (sector specific)	2																																																							6/3 ▲		
	H6	Practical training for IEIA/EIA screening/ scoping (sector specific)	1 Seminor 1 Field work																																																									
	H7	Practical training for IEIA/EIA reviewing (sector specific)	1 Seminor 1 Field work																																																							6/3 ▲		
	H8	Review training using model EIA report	1 or 2																																																									
	H9	EIA course for provincial officers	1																																																							9/23 ▲		
	H10	EIA review practice for provincial officers	1																																																									
Training abroad	I1	Training in Japan	1																																																									
	I2	Training in Thailand	1													9/10-18 ▲																																													
	I3	Training in Vietnam	1																																																								▲ 1/12-18		

I1:Training in Japan, originally planned in 2020, was cancelled due to the travel restriction resulting from COVID-19 pandemic in Japan.

b) Water Quality Monitoring at the Priority Area

As a part of hands-on training of water quality monitoring, a set of the field samplings was conducted at the water-discharge points of factories with highly concern for the water quality degradation. Three sampling locations called “hotspots” associating with three factories were selected for this practical training with the consideration of actual water pollution which became a serious concern for the neighbouring country, Vietnam.

Various tasks of water quality monitoring were undertaken in this training, which includes the development of the monitoring plan such as the site selection of possible pollution sources at the target drainage system and timing of sampling, actual fieldwork, analysis of sampling water, and evaluation of the pollution level. The experience in this hands-on training not only promoted further understanding of water quality monitoring by executing various tasks by themselves but also helped to initiate and motivate the responsible department to take proactive actions toward pollution control.

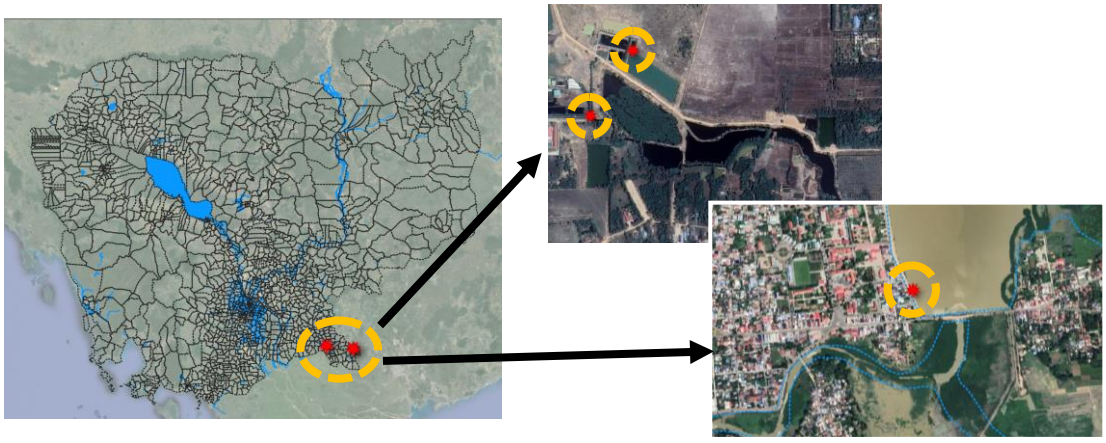

Figure 3-10 Hotspot Monitoring of Concerned Industrial Water Discharge

c) Pollution Inventory for Practical Operation of Pollution Control

As a part of trainings for the responsible department on water quality management, namely the Department of Water Quality Control, the Department of Law, Enforcement, the Inspection and the Laboratory, two additional activities were proposed and implemented in Output 3.

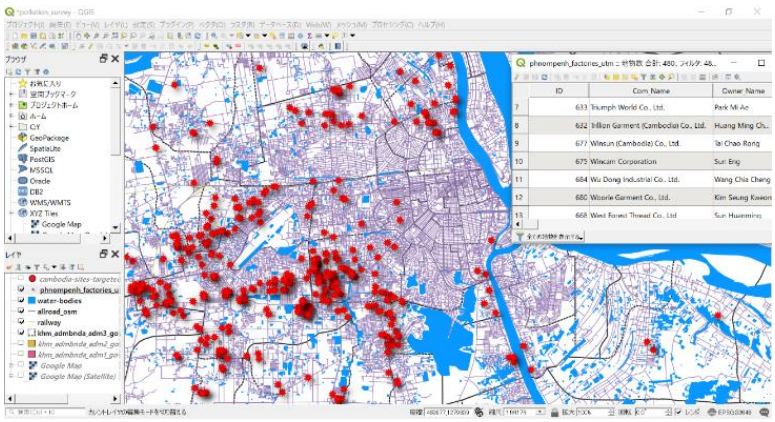

Figure 3-11 GIS based Pollution Inventory

The first additional activity was the Pollution Source Survey, or Pollution Inventory development. The purpose of this activity was to establish an appropriate management system for industrial effluent, which is one of the point sources of pollution in public water bodies, by a) developing information tools to enable and assist the better water quality management and b) providing training opportunity to utilize the information tool in the practice of daily operation of the departments responsible for water quality management.

The current situation of factory effluent in the area surrounding Phnom Penh was surveyed and organized it into a pollution source inventory (Microsoft Excel based database). In this work, a field survey involving interviews was conducted based on information provided by the relevant governmental agencies such as MISTI and PPWSA on various information (industry, size, location,

effluent license, effluent quality, etc.) on factories in the target area, and compiled the results into a database. The data in the inventory was transformed into shape file to enable analysis and assessment by using GIS.

In the training course "B: Environmental Information Management", the participants received a series of hand-on training of GIS software to learn how to utilize environment-related dataset including the developed GIS-based pollution inventory. By the skills obtained in the training course, spatial distribution as well as characteristics of pollution sources and their contribution can be easily identified; and thus, understanding the nature of pollution sources can directly be reflected into the operation of pollution control by the responsible section of GDEP.

3.4.8 Prepare summary report of output 3

The summary report for output 3 is attached to this report as Annex 35.

CHAPTER 4. ACHIEVEMENT OF PROJECT PURPOSE

4.1 PROJECT PURPOSE AND ITS VERIFIABLE INDICATORS

The project is designed to achieve the following purpose.

GDEP capacity to prevent, reduce and mitigate environmental pollution focusing on EIA and water is strengthened.

Further the Project Design Matrix set forth the following three Verifiable Indicators for assessment of the status.

1. GDEP's work on EIA and water pollution control received 20 percent increased confidence from government offices related to the above-mentioned fields compared to the level that of the starting point of the project
2. Transparency of GDEP is increased through regular information disclosure
3. EIA review and water pollution control related works are carried out in accordance with the development of technical guidelines and procedures

For the purpose of the evaluation, a questionnaire survey was administered to assess the perception on the status and changes of confidence level on GDEP'S service. There are admittedly technical challenges in the assessment methodology; though, the survey indicated an overall 20% improvement in confidence. Some important lessons and suggestions are also drawn from the survey. The suggestions provided by the interviews may be used as guidance for furtherance of improvement.

For the transparency, the thorough participatory process of the relevant guidelines and manuals is seen as a means to improve the transparency. There are some evidence to demonstrate the improvement in terms of the transparency in policy formulation process. However, there is a room for improvement especially in terms of information accessibility to the public and the private investors. Recommendations are drawn on this aspect in the subsequent chapter of the report.

For the third indicator, it is obviously premature at this point of time to apply the indicator for the assessment of the status because it is in the lead time to generate a discernible change as a result of the project. The counterparts and the JICA experts, however, recognized that the relevant officers of DEIA started to refer to contents of the documents developed by the Project in their daily works.

4.2 IMPROVEMENT OF CONFIDENCE OF GDEP'S SERVICE

A. Methodology for Status Evaluation

A questionnaire survey was administered to assess the perception on the status and changes of confidence level on GDEP'S service.

A closed-ended survey question was used to represent respondent feedback by adopting a five a rating scale: 1. Strongly Disagree, 2. Disagree, 3. Undecided, 4. Agree and 5. Strongly Agree., which was then followed by a free-writing feedback to acquire more information on their perception. The percentage change was enumerated by assigning 20 points for each level of response.

The questionnaire was initially sent to the members of the Joint Coordination Committee meeting because they were the people who were more aware about the changes and in a better position to provide the responses. Other important stakeholders of the project such as private companies were also inquired to acquire their perceptions. Before or after sending the questionnaire, the team had a follow-up by phone to the individual respondents to ensure that they are adequately interpret the context of the survey. The questionnaire was eventually sent to twelve (12) people who have participated in one or more activities of the project in the past four (4) years since July 2017.

In the questionnaire, the term "Confidence" was defined as "Faith or belief that GDEP will act in a proper and effective way in managing water quality or EIA procedures". Then it was compared with

an antonym to help them understand the term "Confidence" as follows: "Distrust of GDEP on its capacity in managing water quality which may be caused by wrong and/or ineffective way". Since the respondents are not closely monitored the status of the service offered by GDEP and would not have clear perception on the changes of the confidence, they were further provided the information on the changes of the status as presented in Table 4-1.

They were then inquired how much the confidence on GDEP's work on water pollution control / EIA increase as a result of the project.

Table 4-1 Comparison of the status

Before the project status	After the project status
The Sub-decree on Water Quality Control signed in 1999 contained inconsistencies among the articles. This had prevented smooth implementation of activities for water quality control.	The law on Water Quality Control was revised to remove inconsistencies among the articles to ensure smooth implementation of activities for water quality control. Therefore the water quality in Cambodia is more likely improved in an effective and efficient manner.
There was no technical guidelines and trainings on Factory Inspection. Therefore the inspectors may have abused discretion or arbitrary and capricious standards in factory inspection.	A technical guideline on Inspection was developed, then the officers were trained on use of the guideline. Therefore the inspectors are less likely to abuse discretion or arbitrary and capricious standards in factory inspection.
There was no technical guidelines and trainings on Wastewater Treatment Process. Thus the inspectors may have not assessed technical validity on the wastewater treatment process.	A set of technical guidelines were prepared for wastewater treatment process for the following sectors: 1) Central Kitchen Commissary, 2)Snack Foods Factory, 3) Textile Processing Industry, 4)Slaughterhouse and Meat Packing Industry, 5) Beverage Factory Inspection Industry and 6) Piggery Industry. The officers were then trained on use of the guidelines. Therefore The inspectors are more likely to assess technical validity on the wastewater treatment process.
There were no official EIA sectoral guidelines and review manuals on EIA appraisal. Thus, the officials of DEIA could not assesse technical validity on EIA reviewing in specific sectors.	A set of sector guidelines on EIA and an EIA review manual were prepared for EIA review process for the following sectors: 1) Road, 2) Railway, 3) Industry (Metal), 4) Special Economic Zone (SEZ) and the EIA Review Manual. The officers were then trained on use of the guidelines and manuals. Therefore, the officials in DEIA are more likely to assess technical validity on the EIA reviewing process.
Some business investors do not conduct the EIA report before starting their business (EIA system did not work for some kinds of private investment).	DEIA encourage the business investors to conduct EIA and develop EIA reports. Relevant documents have been prepared to implement EIA among private investment sectors correctly.

B. Results and Discussion

For the interview survey on water pollution, among the respondents, nine (9) people out of twelve (12) replied to the questionnaire. Two of the respondents were those in the private sector and the rest were in the public sector. On the other hand, nine (9) people out of twelve (12) replied to the questionnaire on EIA. One of them was in the private sector and the rest were in the public organizations. Please note that this does not include any officers of the Ministry of Environment.

The result of the survey on the water sub-sector presented in Table 4-2 protects respondent anonymity. The table provides the replies on 1) Overall Evaluation, 2) Perception before project, 3) Perception after project and 4) Expectation on JICA project.

Six (6) out of mine (9) respondents evaluated that the improvement was achieved from the level 4 to level 5; while the rest responded to have observed the changes from level 3 to 4. It was thus found that the overall evaluation of each respondent reached 20% improvement in the perception of the service quality by GDEP.

In addition to the numerical target achieved, following important observations and suggestions are obtained in the survey:

1. Some respondents recognized that the coordination mechanism among institutions were strengthened as a result of the project. However it was further encouraged to improve the institutional capacity including the private sector. (Respondent 1).

2. It was also suggested that the intervention by GDEP should be exercised with due recognition on cumulative impacts on environment (Respondent 8)
3. A respondent reserved his/her clear answer to the status of the achievement considering the fact that no discernible impacts have yet to be observed in the water quality (Respondent 6).
4. Most respondent expect further improvement in its management of water quality.
5. It was suggested that the intervention by GDEP should be designed to focus on priory areas(Respondent 1)
6. An emphasis is also given to provincial level to support monitoring process and actions for water pollution control (Respondent 3).
7. A continued support for institutional reform was also suggested (Respondent 4).
8. It was also suggested to help promote intervention by providing skills and knowledge on pollution control method (Respondent 9).
9. Provision on information on a regular basis was also encouraged. (Respondent 1)

Table 4-2 The results of the Questionnaire Survey on Project Purpose

Respondent	Dimensions	Results/Feedbacks by the respondents
1	Overall Evaluation	Improved from 4. Agree to 5. Strongly Agree
	Perception before project	1.Legal aspects or legal documents must be implemented. 2.GDEP fulfils its roles and responsibilities through the sub-decree on Water Pollution Control established by the Ministry of Environment, as well as the organization and function of GDEP. 3.GDEP has the role of facilitating and performing the duties of the relevant ministries and institutions 4.Contribute to strengthen the capacity of its officials, private sectors and officials of relevant institutions 5.Contribute to reduce pollution of private sector, factories, and enterprises, environmental protection will improve social and economic welfare. 6.Some business investors do not conduct the EIA report before starting their business.
	Perception after project	1. Strengthen the coordination mechanisms between institutions to be better 2. Amendment and revision of procedures for implementing, monitoring and inspection mechanisms, information and data sharing 3. Add more specific indicators, new guidelines, add more effective work system 4. Priority sectors have been identified and new standards have been set. 5. Strengthen the capacity of relevant officials 6. Obtain appropriate and new technology transfer 7. Department of EIA encourage the business investors to conduct EIA report.
	Expectation on JICA project	1. Strengthen the capacity of institutions, relevant officials and the private sectors 2. Obtain appropriate and new technology transfer 3. Participate in strengthening the institutional coordination 4. Regular and clear information and data sharing system 5. Change and reform old works 6. Develop standards and set pollution levels 7. Add and set priority areas 8. Develop coordination among stakeholders of private investment and MOE in order to secure systematic EIA implementation
2	Overall Evaluation	Improved from 4. Agree to 5. Strongly Agree
	Perception before project	- Not so clear about the implementation on water wastewater management activities of the Ministry of Environment
	Perception after project	- After the project finish, the sub-decree on water pollution control will be more effective
	Expectation on JICA project	- My expectation is getting more effective on water and wastewater management activities
3	Overall Evaluation	Improved from 3. Undecided to 4. Agree

Respondent	Dimensions	Results/Feedbacks by the respondents
	Perception before project	- Current water situation is under a concern due to the lack of proper and clear standards for wastewater treatment systems of businesses, as well as the lack of standards for efficient and transparent of water assessment and management.
	Perception after project	- Water pollution situation will be decreased, water quality has improved by correcting some inconsistencies and the development of new technical guidelines that make it easier to better manage water pollution.
	Expectation on JICA project	- The JICA project will improve the quality of water used in cities as well as in the provinces and make practitioners understand the methods of monitoring processes and strategies to manage water pollution more effectively.
4	Overall Evaluation	Improved from 3. Undecided to 4. Agree
	Perception before project	I have no idea
	Perception after project	- After the project has been implemented and established legal standards related to water quality and wastewater management in the Kingdom of Cambodia, which is an important document for reduction of water pollution, especially pollution discharged from people that provide serious affects the environment and human and animal life.
	Expectation on JICA project	- I hope that the JICA project will help the Ministry of Environment to prepare the necessary additional legal documents to ensure the efficiency of contaminated waste management, especially water pollution, which provide serious effect on people livelihoods. People and improve national economic development process as well.
5	Overall Evaluation	Improved from 4. Agree to 5. Strongly Agree
	Perception before project	- Before the JICA project implementation, legal regulation and some policies involved with pollution control were insufficient and some policies did not promote to implement. On the other hand, communication and coordination between the relevant institutions are not good.
	Perception after project	- Legal regulation and some policies involved with pollution control will be encouraged to implement and prepare Prakas on pesticide waste management. The implementation of green technology will be promoted such as Good Agricultural Practices-GAP, Organic Agriculture, Climate-Friendly/Smart agriculture, IPM and Integrated Soil Nutrient Management.
	Expectation on JICA project	- Promote to have good coordination and facilitation of implementation between involved institution
6	Overall Evaluation	Improved from 3. Undecided to 4. Agree
	Perception before project	- Not so clear about the implementation on water and wastewater management work of the Ministry of Environment
	Perception after project	1. After the project finish, the revision of sub-decree on water pollution control will be more effective 2. We need more time to implement this sub-decree to be more effective
	Expectation on JICA project	- My expectation is getting more effective on water quality and wastewater management activities.
7	Overall Evaluation	Improved from 4. Agree to 5. Strongly Agree
	Perception before project	- The water quality management is limited with the reason the same as JICA team has raised.
	Perception after project	- It is clear and the implementation will be more concise and effective
	Expectation on JICA project	- Provide high quality the revision of sub-decree on water pollution control
8	Overall Evaluation	Improved from 4. Agree to 5. Strongly Agree
	Perception before project	1. It is fine to check a quality of water pollution first before implementation the project. It is just use as a baseline to measure or compare with the result in the next during implementing the project. 2. In general, before the project implementation, the water pollution is rarely caused with an environment. However, it is costing also for the project owner to spend and it just use it as a base line only.
	Perception after project	The GDEP must be rights and duties as an environmental inspector on controlling the water pollution with all component polluted. The GDEP team must understand well about cumulative impact assessment on water pollution.
	Expectation on JICA project	- We hope that JICA's project is helpfully for any relevant stakeholders especially providing the project owner more enjoyable to invest in the Kingdom of Cambodia.

Respondent	Dimensions	Results/Feedbacks by the respondents
9	Overall Evaluation	Improved from 4.Agree to 5. Strongly Agree
	Perception before project	N/A
	Perception after project	- It will improve more better than now
	Expectation on JICA project	- Provide the pollution control methods for implementation

The result of the survey on the EIA sub-sector is presented in Table 4-3. The table provides the replies on 1) Overall Evaluation, 2) Perception before project, 3) Perception after project and 4) Expectation on JICA project.

Six (6) out of mine (9) respondents evaluated that the improvement was achieved from the level 4 to level 5; while the rest responded to have observed the changes from level 3 to 4 or 3 to 5. It was thus found that the overall evaluation of each respondent reached 20% improvement in the perception of the service quality by GDEP.

In addition to the numerical target achieved, following important observations and suggestions were obtained in the survey:

1. After the project, I hope that the procedure of EIA report is clearer and more effective. Project owner and EIA consultant company can follow the specific sectoral guideline that JICA team help to develop. (Respondent 1)
2. After the project implementation, EIA work at MOE will be easier and more effective than before because there are specific sectoral guidelines for EIA report. (Respondent 2, 3, 4, 5, 6, 7, 8, 9)
3. Some business investors do not conduct the EIA report before starting their business. (Respondent 9)
4. I think that the sectoral guideline and EIA review manual is important for project owners and EIA consultant company to make it clear, take short time and more effective. (Respondent 2, 6)
5. Please help to disseminate all sectoral guideline to business investors and encourage them to write the EIA report before implement the development project in Cambodia. (Respondent 3)
6. JICA continues to help the MOE for other sectoral guidelines. (Respondent 5)

Table 4-3 The results of the Questionnaire Survey on Project Purpose

Respondent	Dimensions	Results/Feedbacks by the respondents
1	Overall Evaluation	Improved from 4. Agree to 5. Strongly Agree
	Perception before project	1. The Ministry of Environment try to encourage the business investor to make EIA report before starting the project development. 2. MOE official pay attention to review the EIA report and consult with Inter-Ministries before approve the report.
	Perception after project	1. After the project, I hope that the procedure of EIA report is clearer and more effective. 2. Project owner and EIA consultant company can follow the specific sectoral guideline that JICA team help to develop.
	Expectation on JICA project	N/A
2	Overall Evaluation	Improved from 4. Agree to 5. Strongly Agree
	Perception before project	- Department of EIA play important role to encourage the development project of investor to conduct EIA report to protect environment.
	Perception after project	- EIA related work may be more effective and quicker.
	Expectation on JICA project	N/A
3	Overall Evaluation	Improved from 4. Agree to 5. Strongly Agree
	Perception before project	- Department of EIA tries to encourage the business investors to conduct EIA report. Some business investors do not conduct the EIA report before starting their business. It is difficult for EIA Department to work with them.
	Perception after project	- After the project implementation, EIA work at MOE will be easier and more effective than before because it has a specific sectoral guideline for EIA report.
	Expectation on JICA project	- All sectoral guidelines were developed by JICA expert have discussed with

Respondent	Dimensions	Results/Feedbacks by the respondents
		official in the department of EIA and also get comments from involved ministries and EIA consultant companies.
4	Overall Evaluation	Improved from 3. Undecided to 4. Agree
	Perception before project	- Department of EIA has many works to do related to EIA report review.
	Perception after project	- EIA report and review will be quick and more effective.
	Expectation on JICA project	- N/A
5	Overall Evaluation	Improved from 4. Agree to 5. Strongly Agree
	Perception before project	- Department of EIA encouraged the development project owner to make an EIA report and DEIA tries to review the report and have a ministerial meeting with involved ministries too.
	Perception after project	- EIA work at MOE will be more effective than before because it has a specific sectoral guideline for EIA report.
	Expectation on JICA project	- All sectoral guidelines were developed during the project have consulted with involved ministries and EIA consultant companies to make it more effective.
6	Overall Evaluation	Improved from 3. Undecided to 5. Strongly Agree
	Perception before project	- DEIA faces problems with development project owners because some of them do not know well about the regulation.
	Perception after project	- After the project implementation, development project owner will know more about regulation on EIA in Cambodia and EIA report will be more effective and quick.
	Expectation on JICA project	- N/A
7	Overall Evaluation	Improved from 4. Agree to 5. Strongly Agree
	Perception before project	- Development Project owner need to hire EIA consultant to make EIA report before implementation the project. It is the regulation in Cambodia. DEIA need to encourage the project owner to understand about regulation related to EIA.
	Perception after project	- Making EIA report will be quicker and more effective. Many development project owners will make EIA report follow to the EIA regulation in Cambodia.
	Expectation on JICA project	N/A
8	Overall Evaluation	Improved from 4. Agree to 5. Strongly Agree
	Perception before project	- Department of EIA encourage the business investors to conduct EIA report. Some business investors do not conduct the EIA report before starting their business. It takes time to write the report and consult with DEIA and involved ministries.
	Perception after project	- - After the project implementation, EIA work at MOE will be easier and more effective of EIA report.
	Expectation on JICA project	N/A
9	Overall Evaluation	Improved from 4. Agree to 5. Strongly Agree
	Perception before project	- Some business investors do not conduct the EIA report before starting their business. Department of EIA tries to encourage the business investors to conduct EIA report. Before implement the project, project owner needs to conduct EIA report. It is the regulation in Cambodia.
	Perception after project	EIA report will be quick and more effective than before because it has a specific sectoral guideline for EIA report.
	Expectation on JICA project	N/A

4.3 IMPROVEMENT OF TRANSPARENCY

Transparency and confidence are interrelated concepts in policy development process. The two terms in the Verifiable Indicator for the Project purpose are also related to accountability, participation, and inclusion. GDEP's intention to include the indicator was to reach out to stakeholders to inform them of their planned activities, offer assistance, and/ or explore possible collaborations.

Before the project, disclosure of information on its regulatory policy may have been in a limited scale. During the project, however, the development process of the policy documents adopted a thorough participatory process both for the water quality and EIA sectors as evidence by the following stakeholder/consultation meetings convened under the oversight of GDEP.

For the development of the Sub-decree on Water Pollution Control:

- The 1st Consultation meeting with on 28th September 2017 with the Cambodian Chamber of Commerce
- The 2nd Consultation Meeting on 1st December 2017 with the Cambodian Chamber of Commerce, Garment Manufacturing Association in Cambodia（GMAC）and Institute of Technology of Cambodia (ITC)
- The 3rd Consultation meeting on 20th February 2018 with Cambodian Chamber of Commerce (CCC), Garment Manufacturing Association in Cambodia（GMAC）and Institute of Technology of Cambodia (ITC) and other private companies such as Happy Handicraft (Tissue Paper), Lyly Food, Phnom Penh Autonomous Port, Sandek Pkay Handicraft and Yang Li Yi Tofu
- In the course of developing the Guideline on Wastewater Treatment Process and Facilities, GDEP convened a joint training program with the participation of CCC, GMAC, ITC in addition to the public sector including MISTI, MPWT, PPWSA. Through the training program, the fundamentals and essentials in the guidelines were disclosed and discussed to the private and public sectors.

For Development of the guidelines and manuals on EIA, more rigorous participatory process was pursued during the project. Several JCC members replied that the process of public meeting to develop guidelines were very transparent and effective with JICA experts' assistance. Some evaluators said the guidelines might be useful for not only relevant ministries but also for the private sectors who would play an important role to prepare EIA reports in the future.

- The 1st Public Consultation for EIA-SGs on road and railways on 19th March 2019 with the participation of the relevant implementing agencies including JCC members as well as local consulting firms who registered as EIA survey organizations
- A consultation meeting with certified local consultant firms on EIA on 28th January 2020 to share the prepared guidelines (road and railway sectors) and to collect their opinions.
- The 2nd Public Consultation online on EIA-SGs on SEZ and Metal Industry in the period from August-September 2021 with the participation of the relevant implementing agencies including JCC members as well as local consulting firms who registered as EIA survey organizations

JCC members appreciated such participatory approaches to discuss sectoral guidelines in their reply to the interview survey for project evaluation.

In addition to the project specific and ad-hoc information disclosure process, GDEP launched the first website of GDEP to disclose policies and regulations in the first quarter of 2019. GDEP initially attempted to develop the website by a formal procedure through the Ministry of Post and Telecommunications. GDEP subsequently decided to create a website as a subdomain of the Ministry's homepage, through which faster information disclose are expected. Although GDEP uploaded the information on the project status in March 2020, it became inaccessible in October 2021 due to an incident of computer hacking. It was informed that the website will become accessible again in a few weeks. GDEP now mainly use Telegram and Facebook which have become the main information channel with public. It was observed that: the information on air quality in Phom Penh is disclosed on a regular basis at the Facebook site; the authorization of the amendment of the Sub-decree on water pollution was also informed to the public through the Facebook site and further to the private sectors such as garment factory, textile, footwear and factories in SEZ by using Telegram.

It should be noted that GDEP is making a great effort to improve communication with the public. It is often a challenge to send technical information to the non-professionals, which occasionally mislead the public when technical jargon is used. For this purpose, GDEP developed and adopted some indexes such as Air Quality Index and Water Quality Index for delivering monitoring information through its Facebook site.

4.4 APPLICATION OF KNOWLEDGE AND EXPERTISE IN DAILY SERVICE

As of November 2021, GDEP is preparing for field application of the Sub-decree, guidelines and manuals for the daily business.

As for the Sub-decree, it took effect on 29th June 2021 upon its promulgation. It coincided with a surge in the number of people infected with the coronavirus in Cambodia, which has prevented the smooth and fast transition to the new system of water pollution control. Despite such constraints, GDEP made an effort to facilitate the transition through an announcement by using various SNS. The provincial departments over the country and major private companies have been informed on the enactment. Further penetration of the sub-decree and pertinent guidelines and manuals on water pollution control for full operation would take place in the coming months and years.

For the EIA review manual and the relevant guidelines, they were finalized in September 2021. Training courses used these documents as a textbook; and the officials of DEIA and the sub-national level such as Phnom Penh and Kandal learnt core contents of them.

Opinions from a joint online evaluation meeting with DEIA, director and deputy directors highly appreciated the opportunity of training course based on EIA review manual because it contributed to enhancement of their capacity. In addition, many participants of EIA training courses in the Project replied positively on application of knowledge and expertise in their daily services in the self-evaluation sheets. They suggested further cooperation with JICA in order to strengthen practical capacity of EIA reviewing of young officials. They indicated that the relevant training courses in Japan and/or opportunity of study in Japan would be effective. The lead time for full operationalization would require a couple of months due to the ongoing Pandemic.

CHAPTER 5. PROJECT EVALUATION

This section of the report provides information on the evaluation of the project. Six DAC Evaluation Criteria, namely Relevance, Coherence, Effectiveness, Efficiency, Impact and Sustainability, were used as the basis for evaluation. The report then discusses the key factors affecting implementation and outcomes and the evaluation on the results of the project risk management.

5.1 EVALUATION BY SIX DAC CRITERIA

5.1.1 Relevance

The relevance of the Project: high

1. The Government direction of pollution control and EIA management was consistent during the Project duration. The amendment of the sub-decree on water pollution control and preparation of relevant guidelines and manuals on EIA were the highly prioritized agendas of GDEP. Therefore, the Project's objective and approach was clearly in consistent with the policy of MOE/GDEP.
2. Degradation of water quality is a quite serious issue in Cambodia. With due consideration on the status of pollution of water, GDEP sought other funding opportunities for management of pollution. The collaboration with Institute for Global Environmental Strategies (IGES) for assessing pollution load in Tonle Sap area is one of such initiative to address the water quality issues in the region. GDEP would leverage the skills and knowledge gained by the Project especially through applying the Inspection Manual and the Wastewater Treatment Process Guidelines to assessment of pollution load discharged from factories spread over the region. Therefore, the Project's implementation approach and its scope are very much relevant to the local needs as well.
3. The government targets to attain upper middle-income status by 2030, which would require improved service delivery to private sector to prevent, reduce and mitigate environmental pollution especially by means of environmental assessment in the pre-investment stage. The improvement of EIA service remains a vital part of the MOE's policy instruments to ensure environmental integrity.
4. For the alternatives in the Project, potential destinations of the overseas training were considered at the planning stage. Initially three destinations in Japan were proposed and discussed but eventually rejected. Instead, two countries, namely Thailand and Vietnam, were selected as the destinations in addition to Japan. They were selected with due consideration on the commonalities in the national economic development stage which have significant implications on the key technologies adopted in environmental management. This arrangement further allowed the MOE's officers to comparatively assess applicability of the technology to Cambodia. Please note that the training in Japan was cancelled due to the Pandemic.
5. Two separate Task Forces were developed in the Project for pursuing all the project activities and supporting the decision-making process by GDEP on key technical matters. Formation of a single Task Force was also considered as an alternative to deliberate the two main issues but rejected considering the incremental complexities arising from such arrangement. The consideration of the alternatives at this stage of the Project facilitated the deliberation process to achieve the intended outputs of the Project.

5.1.2 Coherence

The coherence of the Project: high

The Project was implemented in coordination with the following projects funded by JICA:

1. The Project for Capacity Enhancement on Environmental Social Considerations in Implementing Agency in Road Sector in Cambodia

- It is first noted for ensuring the coherence that a member of the team of the Project participated as a member in this project. Having the common members in the two projects enabled to pursue the activities on the basis of common understanding and approaches. This has ensured technical consistency between the projects especially in preparing the Road Sector EIA Guideline and enhanced overall capacity of the Government in managing environmental aspects of road sector investment.

2. The Preparatory Survey on the project for Sewerage System Development in the Phnom Penh Capital City

   - Sewerage investment would have significant impacts on water quality by minimizing the pollution load to rivers in Phnom Penh. Therefore it is seen that the water quality management by MOE and sewerage investment planning by Ministry of Public Works and Transport are mutually dependent. Close liaison between the members were taken place to share information on the water quality, the technical challenges in regulations and thus to expedite the formulation process of the sewerage sector investment.

3. The project for Capacity Development for Sewerage Management of Phnom Penh Capital Administration and Ministry of Public Works and Transport (CDSMPP)

   - During the project duration, two major meetings were convened between the teams of the projects to discuss the challenges and measures in CDSMPP with a focus on the inconsistent values in effluent standards between the two Ministries. The information on the amendment of the Sub-decree was provided to ensure harmonization between the two projects.

4. Establishment of Environmental Conservation Platform of Tonle Sap Lake

   - The SATREPS for Tonle Sap was designed to promote science-based management to the government of Cambodia. The officers of MOE also participated in the project especially for the purpose of implementing the findings in the study to the real field of environmental management. Meetings were convened several times to exchange information on the water quality monitoring undertaken by MOE. The information was used for planning purpose of the SATREPS for Tonle Sap.

5. The Project for Establishment of Risk Management Platform for Air Pollution

   - This is also a project under the scheme of SATREPS and formally approved in May 2021. Any direct coordination did not take place during the Project duration. However, GDEP will utilize the skill and knowledge gained in the monitoring initiative of PM in Phnom Penh supported by the Project.

The followings are the relevant projects supported by organization other than JICA.

1. Environmental Governance Reform (UNDP)

   - Review and the revision of the Law on Environment and Natural Resource Management to develop a new law referred to as the Environment and Natural Resource Codes was supported as part of this project funded by UNDP. The Project produced the deliverables in consonance with the fundamental spirits of the ENR Codes.

2. Water Environment Partnership in Asia/WEPA Action Plan (IGES)

   - The study is to assist GDEP to implement a survey for analysis of major pollution sources and loads in Tonle Sap Lake in order to develop a methodology for inventory analysis of pollution sources and loads. The survey utilizes the outputs and the findings of the SATREPS for Tonle Sap. GDEP would leverage the skills and knowledge gained by the Project especially through applying the Inspection Manual and the Wastewater Treatment Process Guidelines to assessment.

3. Sustainable Urban Mobility for All Initiative (SUMAI) Project (UNDP)

- The monitoring activity of Particular Matter was launched as part of the activities for Output 3 of the Project, which led to a follow-up assessment under a title of "the Research of PM2.5 and PM 10 in Phenom Penh in the Windy Season 2019 -2020" as part of the as part of the Sustainable Urban Mobility for All Initiative (SUMAI) Project. This indicated that the Project provided information on the fundamental directions of SUMAI Project.

Harmonization with international agreements and commitments

1. SDG 6 to "ensure access to water and sanitation for all" is the target to which the Project would directly contributes. SDG 6.3 is more specific target pertinent to the Project.
   - " By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally"
2. GDEP revised the Sub-decree on Water Pollution Control, which would directly contribute to achieving SDG 6.3 if the Sub-decree is put into practice. As emphasized elsewhere in the report, relevant stakeholders in the public sector proposed and expected implementation of water quality management strategy at priority areas in collaboration with Provincial governments. The Project has provided the fundamental tools to enable such initiatives for water quality improvement.
3. Other relevant targets to which the Project can contribute include the following:
   - SDG 3.9 to substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination

5.1.3 Effectiveness

The effectiveness of the Project: high

1. The intended objective of the Project was to strengthen capacity of GDEP to prevent, reduce and mitigate environmental pollution focusing on EIA and water by means of 1) organizing legal documents related to EIA and pollution control, 2) clarify technical issues and procedures related to EIA and pollution control focusing on water and shared with GDEP staff as well as other stakeholders; 3) enhancing capacity of GDEP and related departments under GDEP in the field of Environmental Management. It is judged that the intended output has been well developed as intended.
   - The Sub-decree on Water Quality Control issued in 1999 contained vagueness and ambiguity in its articles, which had prevented effective intervention for pollution control. GDEP have identified the issues in the sub-decree; proposed amendment of the sub-decree; then submitted it to the Council of Ministers for approval in May 2020. It was eventually signed by the Prime Minister on 29th June 2021 as No. 103 ANKR. BK. The process of amendment adopted a thorough participatory approach wherein the officers of the Water Quality Management Department directly engaged in. The officers gained knowledge and understood the fundamentals in the Sub-decree. Their level of technical skill was also enhanced by preparing other guidelines such as Wastewater Treatment process and Inspection; and participating in the relevant training. GDEP has also developed a pollution source inventory which would enable them to identify priority areas and sectors for pollution control planning. The said changes as the result of the Project would enhance the capacity of GDEP in preventing, reducing and mitigating environmental pollution.
   - For EIA, the EIA department had to compromise on its performance due to limited readiness for flexible internal mobilization of staff and broader expertise required to respond to the expanding and fast-changing economy. The EIA department prepared the EIA review manual accompanied by Sector Specific Guidelines to facilitate flexible internal mobilization of staff and equip the staff with broader expertise on road, railway, Metal Industry and SEZ. The officers participated in the all the development process, made key decisions in preparing the relevant guidelines. The entire process of preparing the guideline and manuals on EIA

increased the capacity of the EIA department in undertaking environmental assessment of the said sectors.

2. Other important effects of the Project are identified as follows:

· With a recognition of the fact that the environmental pollution can not be solved by GDEP/MOE alone, GDEP made efforts to broaden the network with other stakeholders to pursue its mandates as demonstrated by the following facts. It has also improved the effectiveness.

- The Project has facilitated the inter-agency collaboration especially among the MOE, MISTI and PPWSA for the purpose of developing the Pollution Source Inventory. The information held by the individual organizations was put together to make it as a tool for pollution source analysis. The collaboration among Ministries and departments brings significant beneficial impacts on its performance.
- A Memorandum of Understanding signed between GDEP and ITC has enabled a collaborative monitoring of PM in Phnom Penh. The scope of PM monitoring was subsequently extended with the additional fund provided by UNDP.

5.1.4 Efficiency

The efficiency of the Project: high

1. The level of achievements on the outputs and the project purpose is judged to be satisfactory based on the following facts:

· The Project has developed a number of guidelines and related manuals necessary for the GDEP to duly implement water quality management and EIA related activities. To date, all the guidelines and manuals have been prepared.

· The GDEP staff has obtained sufficient knowledge and know-how about the whole procedures on water pollution control and EIA especially on the selected sectors: Road, Railway, Metal Industry and SEZ. through the development of guidelines and manuals.

· The Project successfully involved various organizations such as Cambodian Chamber of Commerce (CCC), Garment Manufacturing Association in Cambodia （GMAC） and Institute of Technology of Cambodia (ITC) and UNDP.

· The questionnaire survey and interview with the stakeholders confirmed that the level of achievements in the project purpose and outputs. The overall evaluation of each respondent reached 20% improvement in the perception of the service quality by GDEP. Some important suggestions were drawn from the questionnaire as follows.

- Some respondents recognized that the coordination mechanism among institutions were strengthened as a result of the project. However it was further encouraged to improve the institutional capacity including the private sector.
- It was also suggested that the intervention by GDEP should be exercised with due recognition on cumulative impacts on environment.
- A respondent reserved his/her clear answer to the status of the achievement considering the fact that no discernible impacts have yet to be observed in the water quality.
- Most respondent expect further improvement in its management of water quality.
- It was suggested that the intervention by GDEP should be designed to focus on priory areas.
- An emphasis is also given to provincial level to support monitoring process and actions for water pollution control.
- A continued support for institutional reform was also suggested.

- It was also suggested to help promote intervention by providing skills and knowledge on pollution control method.
- Provision on information on a regular basis was also encouraged.

2. The Project made progress as mostly scheduled except the period affected by COVID-19 pandemic. The approval process of the Sub-decree on Water Pollution Control was fully affected by the Pandemic. Nevertheless, it is noteworthy that the approval process reached up until the signature by the Prime Minister beyond the target set by PDM as defined "Sub-decrees: Documents are submitted to the Council of Ministers for approval". The contributing factors are identified as follows:

· Leadership of GDEP in pursuing the activities especially as observed during the approval process where all the issues are settled by the officers alone.

· Appointment of adequate and responsible officers as the members of the relevant Task Force facilitating the deliberation on technical issues.

3. The proposed amendment of the Sub-decree on Water Pollution Control was submitted to the Council of Ministers in May 2020, which was well before the end of the original contract period in January 2021. In this light, it is evaluated that the duration and the budget of the Project were judged mostly adequate to achieve the target specified in the Project Design Matrix.

· The above observation is more relevant to the water sub-sector. The assignment schedule of the JICA team for the water subsector was fully adequate with more resource allocation in the first two years; and with lesser resource allocation in the latter half of the period. This arrangement has minimized the impacts caused by the Pandemic as majority of the deliverables had been produced before the Pandemic.

· For the guidelines on Inspection and Wastewater Treatment Process, an additional activity for a review was proposed and implemented during the extended period by the Pandemic to maximize the Project benefit. Noting that the technical guidelines often requires periodical updates and amendment, it is evaluated that the process has contributed to the enhancement of quality of the products.

  - It incurred additional JY 256,957 for finalization of Guidelines on Inspection and Wastewater Treatment Process. However it is judged worthwhile when the significance of the pollution from industry is considered.

· As an alternative of the Study in Japan, GDEP proposed acquisition of a sampling device and a current meter with the total additional cost at JY 1,227,796, equivalent to 0.5% of the Project total budget. The acquisition of the devices for sampling and measurement of flow velocity would produce much value if they are frequently used for water quality monitoring to facilitate the shift from controlling pollutant concentration to controlling pollutant loading.

· For the EIA sub-sector, it was observed that the Pandemic has certainly caused declines in the operational efficiency as observed in the timing of producing the guidelines and manuals on EIA. When the Pandemic started to affect the Project implementation, the deliverables in the EIA sub-sector had reached a certain level of maturity. However it is seemed that the cumbersome procedure for translation and finalization process of the seven types of documents required a longer time than initially expected. The guidelines and the manual on EIA were eventually complete in the third quarter of the year 2021. The delay has caused a cascade effect on the overall project management to have a tight schedule for project closure.

· It is also noted that the remote operation of the Project caused minimal impacts on the overall Project budget. No additional budget was needed for mobilization of the JICA specialists for the extended period of the Project except for those on Project management. The extension of the Project duration caused by the Pandemic required incremental mobilization of the local coordinator as well as the team leader for remote management.

- The total incremental cost was equivalent to merely 1 % of the total project budget. They included: 1) the additional 11.83 MM, equivalent to JY 1,963,000, of local coordinator for project administration in Cambodia and 2) the additional 0.35 MM, equivalent to JY 1,103,872, of the team leader for remote operation and management of the Project.

4. It is also noted that direct causal linkages were observed between the activities and the project outputs. Identification of issues in EIA and water sub-sectors was necessary to produce the deliverables fitting to the needs of the officers. The consultation meetings with diverse stakeholders were also important process to respond to the needs of the society. Most of the activities are judged proper and thus necessary to produce the intended outputs of the Project.
5. Further there was no observed duplication of efforts in the Project activities. The members of the JICA team were fully capable of performing all the activities backed by years of experience especially those in developing countries comparable to Cambodia in the designated field of speciality.

5.1.5 Impact

The prospect of the Project's impact: Moderate (The prospect of impact will heavily rely with the implementation of policies in the field for pollution control intervention.

1. The impacts recognized at the time of final evaluation are as follows:

· The major challenges in the water pollution control in Cambodia had been the ambiguity and inconsistency in the relevant Sub-decree. GDEP addressed these issues through the implementation of the Project. This would bring about improvement of effectiveness and efficiency in its policy implementation. It is also deemed that the tools developed under the Project would reinforce existing institutions of GDEP. Meanwhile the guidelines and manuals on EIA would also assist DEIA in improving the effectiveness and efficiency in the review process of EIA by allowing flexible internal mobilization of staff with enhanced skills and knowledge on the selected sectors. Therefore it is very likely that the Overall Goal of the Project would be achieved in the coming years. The level or the extent of the improvement, however, would be contingent on the budget availability for implementation of policies in the field for pollution control intervention. This is because the major activities in the Project were desk-based discussion. Instead, application of the knowledge and skills in the field is a vital part to have noticeable level of changes.

- Overall Goal: MOE's institutional and technical capacity is developed to implement the mission of ensuring environmental protection effectively and efficiently.

· Progress made in WEPA Action Plan supported by IGES: GDEP engaged in the WEPA Action Program to identify major pollution sources and estimate pollution loads in Tonle Sap Lake (TSL) especially for the sub-national level. This is intended to estimate pollution load by leveraging the experience in the Project. This would be the first occasion where the Sub-decree are specifically referred and used for the purpose of the study. Since one of the focus is industrial pollution sources, the guidelines on inspection and wastewater treatment process would be useful source of information for analysis and assessment.

2. The National Strategic Development Plan 2019-2023 identified the followings as key areas in the period. The Project implemented the hands-on training along with the desk-based training on water quality monitoring and provided limited range of monitoring equipment. GDEP further discussed and introduced indexes to translate the technical information into plain Khmer on water quality management. In this regard, the Project outcome is likely to generate impacts on the Development Plan. However it is also noted that the inter-agency coordination should be pursued to generate pronounced impacts by maintaining the channel with PPWSA.

· Developing an effective water quality monitoring system to ensure that drinking water supply complies with national drinking water quality standards.

- Creating a competitive environment by introducing key water quality service quality indicators as a measure of the organization's capacity and transparent monitoring system under the subtitle of "Promoting the awareness on the benefits of clean water and participation"

3. The PDM identified two important assumptions in achieving the Overall Goal. Significant changes in the first assumption, "Present national policy and environment regulation in Cambodia is maintained and improved", are unlikely to occur as far as the current political climate is considered. Major changes in the second assumption, Manpower and budget to be provided by the government, are also unlikely to occur. In the past years, MOE has recruited more officers which is seen as a positive sign for exerting the project impact. Meanwhile it is also needed to allocate more resources to the provincial governments to have full impacts over the country.
4. The incidence of the pandemic would have caused increased public spending for emergency operation and may cause a decline of government revenue in the years to come. Shrinkage of national budget for environmental sector is a likely consequence under a scenario of prolonged pandemic status. This is seen as a factor which would potential prevent achieving the overall goal.
5. It is noted that the Project Purpose has direct logical linkage with the Overall Goal. However the statement of the overall goal is seen to underline the institutional capacity in addition to individual and organizational capacity. Field application of the skills and the knowledge is indeed necessary to further develop institutional capacity. It is therefore recommended that GDEP should cautiously monitor institutional challenges in implementation of any type of filed activities.
   - [Overall goal] MoE's institutional and technical capacity is developed to implement the mission of ensuring environmental protection effectively and efficiently.
   - [Project purpose] GDEP capacity to prevent, reduce and mitigate environmental pollution focusing on EIA and water is strengthened.
6. Although it is acknowledged that the followings are not direct consequence of the Project, the Project would contribute to the quality of living environment in the long-run by means of increasing the accessibility to clean water and thereby improve the well-being of the people in Cambodia. It is generally observed that the urban segment of the society would often enjoy the faster benefit delivery; while the poor in rural settings would need a longer time span to have the benefit. It is therefore imperative to have a balance between equity and efficiency in selecting the target areas of the GDEP's intervention.

5.1.6 Sustainability

The prospect of the Project's sustainability: Moderate

1. It is unlikely the current policy direction would be significantly changed. A present, the government policy and strategy support the implementing the interventions for EIA and water pollution control in line with the sub-decree and other guidelines. However, suspension of the finalization of the Environment and Natural Resource Codes (ENR Codes) is seen a challenge to exhibit a long-term sustainability of the Project because it provides a framework for the entire environmental management. This is because the water quality issues would become a mixture of challenges in solid waste management, noxious smell and natural resource management as well when GDEP steps in the pollution control at the field in selected areas. The same holds true for delegation of EIA review process. As for the linkage of the Project and the ENR Codes, please refer to the first item in Chapter 6.
2. The initiative to roll out the experience of the project will be supported by WEPA. But it is just at the very early stage of studies and assessment. Planning process for pollution control and implementation of specific intervention would require further steps realized through capacity development of the provincial government.

3. GDEP/MOE maintains adequate organizational structure to enable sector-wise approach to pollution control. This is seen as the strength of the GDEP/MOE. On the other hand, the strength would be challenged when the actions are brought into the field because the problems in the field often require cross-cutting approach. The inter-agency coordination supported by the Project should be leveraged to ensure sustainability of the Project.
4. In the development process of the relevant policy documents, thorough participatory approach was adopted where the JICA team acted as the facilitators and the GDEP officers made major decisions. The process has contributed to increasing the sense of ownership during the Project duration. It was also observed that the younger generation of the officers also participated in the major meetings to witness the development process.
5. Potential challenges to have impacts of the Project over the country would include limited capacity of the MOE's laboratory in providing reliable analytical results and limited capacity of the provincial government in putting the laws into the plans and actions within the respective administrative boundary. If these challenges are settled, the Project would have wider impacts over the country.
6. The financial implication of the Pandemic, as emphasized in the previous section, is seen a risk factor which may cause delays in generating the Project impacts. Flexible mobilization of the officers at the central level for planning and implementation at the sub-national level may be a coping strategy to address the risk. Joint planning for investment would have positive results in exerting the wider impacts, which would be realized by identifying common targets with other agencies and implementing activities in a joint manner.
7. It is difficult to assess the risks on the financial side caused by the Pandemic. But it is evident that Cambodia is in a better position with the prompt reaction of the Government for nation-wide vaccination. More than 80% of the population has undergone vaccination twice as of December 6, 2021 according to the website of Our World in Data[7] as compared to 77.5% in Japan. Therefore the recovery of the economy is expected to be faster than any other countries.

5.2 KEY FACTORS AFFECTING IMPLEMENTATION AND OUTCOMES

Key factors affected the effective and efficient implementation of the project include the followings, among others:

1. Facilitation of participatory and inclusive approach from the early stage of the project
    - At the early stage of the project, GDEP ensured engagement of private sectors such as GMAC, JBAC and CCC. Awareness of the issues and concerns of the industrial sector in formulating the policies contributed to integrating the key issues which has realized the exemption clause for SMEs.
2. Inter-agency coordination and collaboration
    - GDEP promoted coordination with other government agencies such as MISTI and PPWSA, which was further supplemented by including of academe as key player in the project. This arrangement contributed to increased accessibility to vital information necessary for effective pollution control.

5.3 EVALUATION ON THE RESULTS OF THE PROJECT RISK MANAGEMENT

The key project risks affected the project implementation was the incident of Pandemic which started disturbing the project from the second quarter of the year 2020. The Project team decided inevitably to shift to online operation. The Pandemic impacts lasted for a longer period than initially expected, which has caused extension of the project duration. The remote/online operation caused decline of efficiency of the activities. However the overall impacts on the project result was minimal because

[7] https://ourworldindata.org/covid-vaccinations?country=OWID_WRL (Accessed on 6th December 2021)

majority of the activity had reached a certain level of maturity. The local coordinator made an effective arrangement for such remote operation of the project with the support of IT such as SNS and some types of internet collaboration application.

CHAPTER 6. KEY ISSUES AND LESSONS LEARNED

1. MOE was revising the Law on Environment and Natural Resource Management[8] to develop a new law referred to as the Environment and Natural Resource Codes (ENR Codes) with the assistance provided by UNPD when the Project was commenced. At the early stage of the Project, all the activities were undertaken in parallel with the development process of the ENR Codes. However, it was informed that the finalization process of the ENR Codes has been suspended. The ENR Codes is an overarching law governing all the deliverables of the Project. Therefore it was needed that the Sub-Decree on Water Pollution Control and other guidelines should be designed and prepared in line with the ENR Codes. During the Project, closer interaction with the team for preparing the ENR Codes especially at the early stage of the project implementation ensured coordination and thus minimized the risks of potential deviation from the fundamental spirits of the ENR Codes.
2. In implementation of the project, it was found that a set of vital information necessary for policy formulation was retained and held by various government agencies. GDEP in this project has coordinated with various government bodies to acquire crucial information for pollution control. It is often argued that compartmentalized structure of the government as well as limited transparent procedures constrain the inherent capacity of the public sector in Cambodia. There are occasions wherein the observations agreed with the general view as seen in the accessibility to the information held by other departments or ministries. However, it was also observed that such barriers could be removed through a relatively straightforward approach if the leaders were involved and played a role.
    a. GDEP leveraged the network to acquire the information on factory registration held by MISTI which was then integrated with an archive of GDEP's factory information developed by filing application document, records of inspection and other available information. The information on water supply to factories also become available with the additional inclusion of PPWSA in the series of dialogue on pollution source inventory.
3. The experience in the project suggests that working in collaboration beyond the boundary of Ministries or departments can produce significant beneficial impacts as seen in the development process of the Pollution Source Inventory. Some of the respondents of the Questionnaire Survey on Project Purpose expressed their expectation for furtherance of inter-agency collaboration being aware of the value of collaboration. GDEP is thus encouraged to explore areas for collaboration with other Ministries and other public agencies to ensure effective management of environment in Cambodia including hazardous materials and solid waste in addition to water and EIA.
4. GDEP made its best efforts to coordinate and collaborate with the private sector by enhancing the participation of private sector representatives such as GMAC, JBAC and CCC at the early stage of the policy formulation process. The issue of collaboration with private sector, however, seems to remain an issue of GDEP despite the fact that delivering service to private sectors is an essential element for achieving the government target to attain upper middle-income status by 2030. An open, inclusive and constructive dialogue should be sought in a continuous manner to develop a common ground on how governments, industry, and civil society can work together in pollution control because it is not such a simple problem that it can be solved by a single project.
5. It is undeniable that the information accessibility remains a challenge especially from the public and private sectors. It is however noted that GDEP is making a great effort to deliver technical information to the public in a plain manner by using indexes such as Water Quality Index and Air Quality Index. It is crucial to broaden a channel of information, in addition to such efforts, to the public and the private sectors for delivering information on the policy formulation and status of environment.
6. The website development of GDEP provided an avenue to enhance accountability and information accessibility to all stakeholders. However, as reported in Section 4-5, it is not accessible at the time of writing this report. The private sector activity has been sluggish on a

[8] The Law on Environment and Natural Resource Management is equivalent to Japan's Environmental Basic Act.

temporary basis during the Covid-19 Pandemic. It is strongly recommended to reactivate the website before the full-fledged economic revival in the post-COVID-19 era.

7. In undertaking EIA in Cambodia, it is recognized that there are some documents referred to as "guidebook" and/or other form of documents applied in EIA administration and practice. These documents are those unauthorized yet as Prakas or any other instruments but provide general rules as same as official documents. The EIA Guidebook issued by NGO-Forum in Cambodia is an example of such documents. Use of such internal rules and procedural guidelines would limit the accountability; though, provides flexibility and practicability in the evaluation process especially in the fast-growing economy. It is likely, in contrast, that authorization of such documents would bring about inflexibility and unreadiness to changing industry structure. With due consideration on these two different aspects, it is recommended GDEP to consider authorization, at some point in time, of the EIA-SGs as Prakas or other appropriate instruments to ensure that the relevant guidelines are referred and used for investment planning and monitoring of other ministries and entities. Meanwhile the EIA-RM shall remain as an internal guidebook in DEIA without high-level approval process.

8. In designing the effluent standards, *ex ante* impact assessment was adopted, which has led to exemption of SMEs from uniform application of the effluent standards in the Sub-decree on Water Pollution Control. It is likely the first occasion in Cambodia to adopt *ex ante* impact assessment in pollution control. It is further desirable to adopt cost benefit analyses for policy formulation wherever data is available and applicable to assess the welfare impacts of regulation taking into account economic and social impacts over time.
9. *Ex post* impact analysis is also important to ensure that the articles and the standards in the amended sub-decree are effective and efficient. It is recommended that GDEP put in place a mechanism of periodic evaluation by which the public can also make recommendations to modify, as necessary, the sub-decree and other existing regulations.
10. GDEP intends to embark on formulating a strategy in selected areas for promoting pollution control intervention. The WEPA Action Plan supported by IGES intends to develop capacity of sub-national governments to facilitate delegation process of pollution reduction planning. It is highly probable that the outputs of the Project is therefore used for the process for decentralization and capacity development of the provincial government. This is actually unexpected consequence which was not anticipated when the project was commenced. The field application at provincial level would however require cautious learning-by-doing process because there may be a complex relationship at vertical and horizontal levels coupled with capacity challenges differing from the central level. The same holds true for ESIA/IESIA process of small-scale projects. Following national policy of decentralization, it is desirable to progressively devolve the mandate of the environmental assessment for the small-scale investment in the long run. The process of devolution, however, should be proceeded with a readiness assessment of manpower, institutional arrangement, and the financial resources. During the Project, it was found that some officers of Phnom Penh Municipality and Kandal Province who attended the training workshop had a prior exposure to the environmental assessment process, which is believed to constitute a core element of devolution process. It is strongly recommended that dissemination of the relevant guidelines on EIA should be expedited over the country.
11. The Pollution Source Inventory integrated with a GIS database developed as part of activity for generating Output 3 is seen a strong tool in controlling water pollution by allowing GDEP to identify and prioritize geographical areas and industrial sectors. Followings are recommendations to ensure that the database is used more effectively and efficiently for controlling water pollution.
    a. Develop a mechanism for data entry and updates, which would be realized through inter-agency coordination with MISTI and PPWSA;
    b. Improve the information system to allow faster data entry and effective analysis for intervention;
    c. Develop a set of rules for information update by identifying responsible officers; developing and agreeing on information security procedures; and determining the timing and the protocol for data entry and authorization;

d. Setting up a structure to allow analysis of the information and thus to enable GDEP to revise the regulations, penalties, and other policy instruments.

12. In this project, rigorous technical assistance was not provided to the environmental laboratory as it was seen premature when the project was commenced. However, it was recognized that limited capacity of the laboratory would become a significant bottleneck for improvement of water quality especially in increasing accountable management of ambient and effluent control.
13. It was found that a systematic training program had not been developed in GDEP when the Project was commenced. To assist GDEP in developing individual skill and knowledge, the Project assisted the GDEP in implementing a broad range of training workshops/seminars throughout the entire project period. In implementing the training program, it was observed that there was a strong will among the individual officers to acquire new expertise and skills. The GDEP officers are relatively young and needs improvement in the knowledge, skills, and experience required to perform their duties. It is therefore recommended that the materials of the workshops/seminars should be used for constant self-improvement of the officers. The officer who participated in the training under the Project are encouraged to provide lectures and seminars in a systematic manner to the younger generation who did not have a chance to attend the training workshop
14. It was also observed that the past opportunities of training/capacity development offered by other donors were not fully and continuously used. For example, UNEP developed a training project for the MOE's Department of Geo-information Service under the General Department of Environmental Information and Knowledge in collaboration with ITC, in which a series of hands-on training was conducted. However, it was found that the training curriculum developed for the said training was not utilized after the completion of the project. This report therefore emphasizes the value and benefit of continuous education and training for professional skill development; and shed light on the needs for additional budget allocation for capacity development by MOE.
15. Although the issues of air pollution control in Phom Penh was not the mainstream activity of the project, the joint study with ITC on PM in Phnom Penh, supported to generate Output 3 of the project, eventually led to a follow-up assessment with an additional fund by UNDP. It was undertaken under a title of “the Research of PM2.5 and PM 10 in Phenom Penh in the Windy Season 2019 -2020” as part of the Sustainable Urban Mobility for All Initiative (SUMAI) Project. The management of pollution in Cambodia has only just begun and the challenges ahead are enormous. Resource mobilisation and funding arrangements should be further accelerated to ensure sustainable development in the post-COVID-19 era.

CHAPTER 7. RECOMMENDATIONS

MOE is expected to attain the status as provided in the Overall Goal of PDM (Table 7-1) upon completion of the Project. The status is generally expected to be achieved in a few years timeframe upon the completion. It is also noted that there are two important assumptions for achieving the overall goal as follows:1) Present national policy and environment regulation in Cambodia is maintained and improved; and 2) Manpower and budget to be provided by the government as already identified in the PDM.

Table 7-1 Narrative Summary of Project Goal

Narrative Summary	Verifiable Indicators
[Overall goal] MOE's institutional and technical capacity is developed to implement the mission of ensuring environmental protection effectively and efficiently.	MOE's work on environmental protection received better evaluation from related stakeholders, compared to the level that of the starting point of the project.

7.1 RECOMMENDATIONS TO ACHIEVE THE OVERALL GOAL

Under the said assumptions, the section of the report laid down key recommendations drawn from the issues and lessons learned in the Project as identified in Chapter 5.

1. Apply the sub-decree, the guidelines and manuals on water pollution control and EIA developed under the Project in the daily business of GDEP.
2. Promote dissemination of the sub-decree, the guideline and manuals to the provincial departments together with the public.
3. Maintain and strengthen the links with other government agencies developed through the implementation of the project especially with MISTI and PPWSA for maintenance and update of the pollution source inventory.
4. Pursue a constructive relationship with private sector by providing the information on its policy both by an electric form and a physical manner to support their decision on environmental investment.
5. Formalize the EIA-SGs as necessary and appropriate to further increase accountability of the decision making on environmental clearance.
6. Encourage the officers to continue self-development process especially the younger officers. It is also recommended for those of DEIA that a periodical training should be organized on EIA-SGs and EIA-RM.
7. Support the provincial departments in implementing the activities on water pollution and assessment of environmental impact with due consideration on the lessons learned in Chapter 5.
8. Resume the activities to finalize or modify as necessary the ENR Codes to streamline all the activities related to the management of environment and natural resources thus to contribute to improving efficiency and efficacy.

7.2 PLAN OF OPERATION OF GDEP TO ACHIEVE THE OVERALL GOAL

In response to the recommendations, GDEP d identified actions toward achieving the Overall Goal as presented and discussed in the final JCC meeting on 22nd November 2021 as follows.

1. Finalize the Environmental Codes and other legislations related environmental protection

2. Strengthening cooperation with concerned institutions, civil societies and private sectors to identify barriers/gaps and solution regarding the pollution prevention related issues
3. Strengthening the cooperation with development partners/donors to ensure sustainable project implementation after the project completion,
4. Development and implementation of policy, and legal instrument to minimize/prevent pollution in the Kingdom of Cambodia, to sustainable development and investment,
5. Strengthening of EIA process and reviewing to make sure the approved projects are sustainable and not harm to environment
6. Young officials are invite/encourage to participate in the training program, seminar, workshop, meeting for their capacity improvement.
7. Dissemination policies, legislation, guideline and related legal instrument to concerned stakeholders, private sectors and local authorities enable them to understand clearly on the ways forward they need to be obligated and complied,
8. Public and private sectors can access to all data and information that GDEP have been conducted
9. Pollution sources with GIS database will be maintenance for UpToDate data information, which is the important tools for pollution control and inspection,
10. Conduct training to the official of GDEP, concerned stakeholders, private sectors and local authorities on pollution control and inspection to ensure their capacity are UpToDate for catching up the development situation in the countries and globally.