添付資料 2. 日本側投入

2.1 専門家派遣実績

1 年次

	担当業務	氏名	2011年 8	9	10	11	12	2012年 1	2	3	人・月 第一年次 現地	国内
			第一年次									
現地業務	総括/都市環境管理	志村 享	24 28 36				10 13 35		25 15 20		3.03M/M	
	副総括/中間処理/最終処分場管理	佐藤 尚文	4 30 88				10 21 43		15 15 30		5.37M/M	
	水環境管理	森下甲子弘	24 24 32					17 14 58			3.00M/M	
	廃棄物収集･運搬	森 郁夫				17 31 45		28 5 9			1.80M/M	
	参加型都市環境管理(1)/環境教育	小槻倫子	4 23 20			23 12 20		10 29 20			2.00M/M	
	参加型都市環境管理(2)/パイロットプロジェクト	-										
	都市環境管理ベースライン調査	川田晋也	24 7 45			7 16 40		10 8 30			3.83M/M	
	医療廃棄物調査計画	小田真之介						8 21 45			1.50M/M	
											現地業務小計 20.53M/M	
国内作業	総括/都市環境管理	志村 享	21 23 3									0.10M/M
	副総括/中間処理/最終処分場管理	佐藤 尚文	21 23 3									0.10M/M
											国内作業小計	0.20M/M
											合計 20.53M/M	0.20M/M
											20.73M/M	

2 年次

	担当業務	氏名	2012年 4	5	6	7	8	9	10	11	12	2013年 1	2	3	4	5	6	7	8	9	第二年次 現地	国内
			第二年次																			
現地業務	総括/都市環境管理	志村 享	13 26 14	27 1 5				29 21 23			1 16 16		2 17 44			3 12 40		1 1 32			5.80M/M	
	副総括/中間処理/最終処分場管理	佐藤 尚文	10 27 49		16 9 56					5 6 32		4 11 26 39		24 27	7		9 64		(14 (3) 21		9.60M/M	
	廃棄物収集･運搬	森 郁夫		17 15 29																	0.97M/M	
	参加型都市環境管理(1)/環境教育	小槻倫子	10 29 20										4 23 20						22 10 20		2.00M/M	
	参加型都市環境管理(2)/パイロットプロジェクト	小田真之介			19 18 30				15 5 52			8 23 47		22 2 42		12 10) 60					7.70M/M	
	医療廃棄物調査計画/医療廃棄物管理計画	小槻倫子						7 26 20			3 22 20			10 29 20		29 17 20					2.67M/M	
																					現地業務小計 28.74M/M	
国内作業	本邦研修(1)	趙 烯庭												11 15 5		7-10.13 5						0.33M/M
	本邦研修(2)	佐藤 尚文												26 29 4								0.13M/M
	本邦研修(3)	小田真之介														15 24 10						0.33M/M
																					国内作業小計	0.80M/M
																					合計 28.74M/M	0.80M/M
																					29.54M/M	

凡例: 現地作業 / 国内作業

3 年次

1. 現地業務

担当業務	氏名	2013年 10	11	12	2014年 1	2	3	4	5	6	7	8	9	10	11	12	2015年 1	2	日数合計	人月合計
総括/都市環境管理	志村 享	10/30	26	11/24		2/10	3/15			6/13	49	8/13	10/4	33	11/5	12/30	1/24	26	181	6.03
						34						13								
副総括/最終処分場管理(1)	佐藤 尚文																1/9	2/5	28	0.93
																	23	5		
中間処理/最終処分場管理(2)	鈴木 保	10/30	26	11/24		2/2	3/7			6/9	7/18			10/19	11/22				135	4.50
						34				40					35					
参加型都市環境管理(1)／環境教育)	小槻 倫子					2/26	3/17				7/26	8/14					1/21	2/11	62	2.07
							20				6	14					##	##		
廃棄物収集・運搬／参加型都市環境管理(2)／パイロットプロジェクト	小田 真之介	10/20	49	12/7		1/20	3/15			5/19	6/29	8/4	9/2	10/25		12/10	1/2	2/7	260	8.67
							55			42		30			47		30	7		
																現地業務小計		実績	666	13.53

2. 国内業務

担当業務	氏名	2013年 10	11	12	2014年 1	2	3	4	5	6	7	8	9	10	11	12	2015年 1	2	日数合計	人月合計
総括/都市環境管理	志村 享												10/1	10/3					3	0.15
														3						
																国内業務小計		実績	3	0.15
																		合計	実績	13.68

4 年次

1. 現地業務

担当業務	氏名	2015年 3	4	5	6	7	8	9	10	日数合計	人月合計
総括/都市環境管理	志村 享	10 8	21		6 21	16	16		1	150	5.00
		30	47			26	16	30	1		
副総括/最終処分場管理(1)	佐藤 尚文	10 7						10	30	50	1.67
		29						21			
中間処理/最終処分場管理(2)	鈴木 保	8 4					1	30		89	2.97
		28					31	30			
参加型都市環境管理(1)／環境教育)	小槻 倫子			3	22		20 8			40	1.33
				20			12	8			
廃棄物収集・運搬／参加型都市環境管理(2)／パイロットプロジェクト	小田 真之介	21	8			12	6 27	25		105	3.50
			49			26	5	25			
										434	14.47

2. 国内業務

担当業務	氏名	2015年 3	4	5	6	7	8	9	10	日数合計	人月合計
総括/都市環境管理	志村 享				15 19	17	12 14		2	10	0.50
					5	1	3		1		
副総括/最終処分場管理(1)	佐藤 尚文				15 26					10	0.50
					10						
										20	1.00
											15.47

2.2 機材・施設

Office Supply	
Photocopy machine with paper feeder (Canon)	1
Laser printer (Canon)	1
Inkjet color printer (Canon)	1
Facsimile (Canon)	1
Video projector (Canon)	1
Digital camera (Canon)	1
Video camera (Canon)	1
Screen (Stand Ander 70”x70”)	1
Laptop personal computer (Toshiba)	2
Microsoft office	2
Windows 7 professional	2
Titanium internet security	2
Lao script	2

Inputs for Pilot Projects	VTE	LPB	XYB	Source*
Home composting				
Compost barrels (normal/worm)	58/22	10/43	247/102	
Leaflets of home composting (Normal)	100	50	350	LPPO
On-site compost promotion video		1		
Eco basket				
Eco baskets	3095	1482	2023	
Eco stay				
Compost plant				
Composting workshop (300m2)		1		
Warehouse (6mx4m=24m2)		1		
Electrical works (Wiring, outlet)		1		
Water supply works		1		
Electricity poles & wires (single-phase)		200m		
Open drainage and sewage pit		1		
Gravel pavement t=150mm		200m^2		
Pipe drain and gravel pavement		1		
Wood chipping machine		1		
Tools for operation (Wheelbarrow, Sieve, Shovel, Hoe, Writing board, scale)		1 set		
Food waste barrels		120		
Eco bags for tourists		800		
Eco bags for tourists		700		LPPO
Small signboards		50		
Leaflet (1)		2,000		
Leaflet (2)		3,000		
Leaflet (3)		5,450		LPPO
Off-site compost promotion video		1		
School recycling				
Environmental education hand books for waste separation	600 sheets			
School Recycling Storage Sheds		6	3	
Scales for School Recycling		2	2	
Collection improvement				
Wheeled waste containers		Large 80	Small 155	
Wheeled waste containers (120L)	80			LPPO

* Financial source was LPPE if not specified.

Collection expansion					
	Container manufacturing equipment (Welding machine, Iron cutting machine, Oxygen welding torch, Oxygen cutting torch, 30m Gas horse, Mask, 20m Welding horse 4 Clamp, Oxygen gauge, Acetylene gauge)		1 set	1 set	
	Container manufacturing material (Steel plates, Iron bars, paints, cut-disc, welding rod, hinge, gases)		For 10 containers	For 10 containers	
Disposal site improvement					
	Concrete plates (2m x 1m x 0.2m)	200	130	50	
	Barricade for truck control	1 set	1 set		
	Management of waste pickers				
	Jacket	155	32	12	
	ID Card	130	30	10	
	Boots	155	60	24	
	Cloth Mask	300	60	24	
	Gloves	300	60	24	
	Bulldozer (16-21ton)	1			JICA
	Spare parts for bulldozer	1			JICA
	Dump truck	2			JICA
	Spare tires for wheel loader at KM32	1			JICA
	Spare parts for crawler loader at KM32	1			JICA
	Hydraulic excavator (Bucket $1m^3$)		1		JICA
	Spare parts for hydraulic excavator		1		JICA
	Dump truck (8ton)		1	1	JICA
	Wheel backhoe loader (more than 7ton)			1	JICA
	Spare parts for backhoe loader			1	JICA
	Site clearing	1	1	1	JICA
	Access road	1200m, asphalt	800m	70 m	JICA
	Pipe drain (dai600mm L=10.0m)	2 places	3 places		JICA
	Buffer zone (3m interval of each planted tree)	200 m]			JICA
	Installation of new computer and new software for existing weight bridge	1			JICA
	Detailed design	1	1	1	JICA
	Earth drain		470 m		JICA
	Embankment		400 m		JICA
	Weight bridge (incl. platform and control house)		1		JICA
	Gate		1	1	JICA
	Leachate collection pipe		100 m		JICA
	Re-circulation pump and flexible pipe		150 m		JICA
	Administration Office			1	JICA
	Electricity installation (transformer) 50KVA for administration office			1	JICA
	Water well with pumping			1	JICA
	Observatory		1		

Sludge treatment facility improvement					
	Soil		34.6 m3	12 m3	JICA
	Crushed Stone		27.3 m3	8 m3	JICA
	Mixed Concrete		30.8 m3	8 m3	JICA
	Reinforcing bar		149 bar	74 bar	JICA
	Block		110 unit		JICA
	Wooden step		28 steps		JICA
	Zinc drain			19 m	JICA
	Others (wire, form, cement, sand, attachment)		1 set	1 set	JICA
	Wall protection (Concrete t= 150mm)	192 m^2	192 m^2		
	Open Drainage w= 30 cm	8m	26m		
	Receiving tank 3 x 4 m	2	2		
	Drain pit 0.6 x 0.6 x 0.7 m	2	1		
	Pipe Drain dia.= 300 mm, L=16 m	2	-		
	Pipe Drain dia.= 600 mm, L=8 m	1	-		
	Embankment W= 5.0m	10m	-		
	Gate w= 4.0m	1	1		
	Fence H= 1.8m (RC pole & Wire mesh)	136m	196m		
	Gravel pavement t= 150 mm	450m^2	250m^2		
	Access road (DBST) w= 5.0m	300m	25m		
	Pipe Drain dia.= 300 mm			32	
	Drainage pit 0.6 x 0.6 x 0.7m			1	
	Drainage pit 0.6 x 1.2 x 0.7m			1	
	Slope protection			2	
	Leveling and Gravel pavement (10x10m)			1	
	Repairing Receiving tank			1	
HCW Management					
	Waste incinerator for infectious waste	1 (20kg/h)	1 (10 kg/h)		JICA
	Containers for HCW collection		10	2	
	Flame for container		1 set	1 set	
	Spareparts for incinerators				
	Photoelectric eyes	1	1		
	Ignition electrode	1	1		
	Temperature sensor	1	1		
	Nozzle (dedicated to First Furnace, 10kg/hour burner)	1	1		
	Nozzle (dedicated to Second Furnace, 5kg/hour burner)	1	1		
	Solenoid valve	1			
	Making HCW separation promotion video		1		
	Pickup truck for HCW collection and transportation		1		JICA
	Healthcare waste incinerator house with water treatment tank、Fence, Earth work, Installation of Electricity pole, Installation of Sign board	1	1		
	Health Care Waste discharge pit /w wall and roof			1	JICA
	Gravel and Fuel for HCW pit		1		

Others					
	Polo shirts	250	250	250	
	Elephant Festival in XYB				
	Sign Board			1	LPPE
	Banner			5	LPPE
	Plastic garbage bin			40	LPPE
	Tong			40	LPPE
	Community-based sanitatiohn				
	Toilets, wastewater collection system, wastewater treatment system consisting of settler, anaerobic baffled reactor and anaerobic filter	1			JICA

2.3 カウンターパート研修

1. ベトナム・ハノイ市

(1) 研修目的

ベトナム国ハノイ市の廃棄物事業及び医療廃棄物処理事業を参考にして、対象 3 都市の医療廃棄物管理状況を改善するため。

（ハノイNam Son最終処分場）

（Thanh Hoa 71 Central Hospital医療廃棄物焼却施設）

（Cau Dienコンポストプラント）

（URENCOでの記念写真）

(2) 研修日程

No.	Date	Day	Schedule
1	10June	Sun	Leave from Laos to Hanoi by VN930: LPB (17:05) ->Hanoi (18:20) QV312: VTE (15:15) ->Hanoi (16:25)
2	11June	Mon	am: Meeting at JICA office and VEA/MONRE pm: Visit to Cau Dien Composting Plant
3	12June	Tue	Travel from Hanoi to Thanh Hoa Province (170 Km. from Hanoi) Visit Thanh Hoa 71 Central Hospital Meeting with DONRE and DOH
4	13June	Wed	Travel from Thanh Hoa Province back to Hanoi On the way visit Biogas Plant, Ninh Binh province
5	14June	Thu	Visit final disposal site at Nam Son Waste Management Enterprise – URENCO 6
6	15June	Fri	Leave from Hanoi to Laos by VN931: Hanoi (09:50) ->LPB (11:15) VN921: Hanoi (09:55) ->VTE (11:00)

(3) 研修参加者

National Level	
1. Mr.Phengkhamla PHONVISAI	Pollution Control Division, MONRE.
2.Mr.Phouthasenh ARKHAVONG	Deputy-Director of Ministry of Public Work and Transportation.
3.Mrs.Vilayvone MANGKHASEUM	Deputy-Director of Department of Hygiene and Prevention Disease, MOH.
4.Mrs.Palina KHOTPHOUTHONE	Technical staff of Department of Pollution Control, MONRE.
VTE	
5.Mr.Nousone MEUNVISETH	Deputy-Director of Vientiane Urban Development and Administration Authority
6.Mr.Hansana RATHAPHASAVANG	Head of Administration building and Environment Division Mahot Hospital
7.Mr.Bouakham PHAKASOUM	Deputy-Director of Solid waste Management KM 7 of VUDAA
8.Mr.Vilavong KENSOULINE	Technical staff of Department of Natural Resources and Environment in Vientiane capital.
LPB	
9.Mr.Chanthavong PHONNACHIT	Deputy-director of department of Natural Resources and Environment of Luang Prabang
10. Mr.Khamsone PHONGSAVATDY	Deputy –Director of Luang Prabang Provincial Hospital
11. Mrs.Kaysone KEOPASEUTH	Head of Solid waste Management in Luang Prabang UDAA
XYB	
12. Mr.Kitsamone PHOTHILACK	Technical staff of Department of Natural Resources and Environment in Xayabouri
13. Mr.Phathanong SONEPHAN	Technical staff of Urban Development and Administration Authority in Xayabouri
Others	
14. Mr. Xayamang NANTHANAVONE	SJET team (JICA)
15. Mr.Naofumi SATO	SJET team (JICA)

2. タイ・ピサヌルーク市

(1) 研修目的

タイ国ピサヌルーク市の廃棄物事業、民間リサイクル業者およびコミュニティーによる３R 活動から、本プロジェクト対象 3 都市における廃棄物管理改善に資する教訓を得るため。

(2) 研修日程

5 Aug. (Sun.) Counterparts from LPB and XYB travel to Vientiane by land transportation
6 Aug. (Mon.) 5:30 a.m. Meet at Patuxay
Take bus from Patuxay to Friendship Bridge
Passing Immigration of Lao and Thai sides at Friendship Bridge
Taking the bus from Friendship Bridge to Phitsanulok province (485 km.).
7 Aug. (Tue.) 9:30 a.m. Visit Phitsanulok Municipality
9:45 a.m. Orientation by Mayor of Phitsanulok Municipality
1:30 p.m. Study tour of waste management in Phitsanulok (collection, transportation and disposal)

8 Aug. (Wed.)　9:00 a.m. Study Tour of Wongpanit Waste Recycling Company
9 Aug. (Thu.)　9:00 a.m. Visit community's activities for waste management (waste bank, home compost, etc.)
12:00 a.m. Observe tourism waste management at Sukhothai Historical Park, Sukhothai Province (60 km.from Phitsanulok province)
10 Aug. (Fri.)　Travel from Phitsanulok to Nongkhai Passing Immigration of Thai and Lao sides at Friendship Bridge
Taking bus from Friendship Bridge to MONRE
11 Aug. (Sat.)　Counterparts from LPB and XYB travel to their cities by and transportation


リサイクリング会社の見学


廃棄物中継基地の見学


BMT最終処分場の見学


コミュニティーベース３Rs

(3) 研修参加者

National Level		
1	Mr.Phengkhamla Phonvisai	Chief of Pollution Control Division, Department of Pollution Control, MONRE
2	Mrs.Khamphone Sotapaseuth	DoPC, MONRE
	Mr.Vanhxay Phiomanyvone	Technician, Department of Pollution Control, MONRE
3	Mrs.Palina Khotphouthone	Technician, Department of Pollution Control, MONRE
4	Mr.Noudeng Vongdala	Technician, Department of Pollution Control, MONRE
5	Mr.Surasack Phonthachak	Chief of Planning and Budgeting Division, Department of Housing and Urban Planning, MPWT
Local Level		
1	Mr.VilasakVenpaseuth	Technician, Natural Resources and Environment Department, Vientiane Capital
2	Mr.Sonethavy Phimmasane	Deputy Chief of Housing and Urban Planning Section, VUDAA
3	Mr.Kaysone Chanthalath	Technician, Environmental Unit, VUDAA, Vientiane Capital
4	Mr.Kaisone Vivongsa	Technician, Waste Collection-Transport Division, VUDAA, Vientiane Capital
5	Mr.Thepsackda Boliboun	Technician, Waste Collection-Transport Division, VUDAA, Vientiane Capital
6	Mr.Thavisay Moasomphou	Deputy Chief of Saysettha District, Vientiane Capital
7	Mr.Alounxay Mingbopha	Head of Environment Unit, Saysettha District
8	Mr.Somedy Phonesavath	Deputy Chairman, Urban Development Administration Authority (UDAA), LuangPrabang Province
9	Mr.Sengphone Bounluexay	Deputy Chief of Waste Management Section, UDAA, LPB
10	Mr.Bounkhen Bounthongsy	Technician, Waste Management Division, UDAA, LPB

11	Mr.Sackdaphone Keoprachan	Technician, Natural Resources and Environment Department, LuangPrabang Province
12	Mrs.Khamphiou Phanthavong	Deputy Director, Natural Resources and Environment Division, Xayabouly Province
13	Mr.Bounkhong Phongsavanh	Chairman, Urban Development Administration Authority (UDAA), Xayabouly Province
14	Mr.Phonephiphat Thammavong	Head of Environmental Sanitation Unit, Xayabouly Province
15	Mrs.Saysamone Sonephanh	Head of Financial Unit, Xayabouly Province
Others		
1	Mr.Naofumi SATO	Deputy Team Leader, LPPE Project
2	Mr. Precha Chuntakorn	Assistant of the Project
3	Mr.Kongchai Vongtham	Chief of Waste Picker Multi-purpose Center KM. 32
4	Mr.Kongchai Vongtham	Chief of Waste Picker Multi-purpose Center KM. 32
5	Mr.Phonkham	Marketing and Waste Buying Section, Waste Picker Multi-purpose Center KM. 32
6	Mr.Sivilay Chanthavongs	Accounting and Waste Storage Section, Waste Picker Multi-purpose Center KM. 32
7	Mrs.Davone Sinthavong	Technician, Natural Resources and Environment Division, Vientiane Capital
8	Ms.Makiko INAMORI	JICA's Volunteer to Department of Natural Resources and Environment, Vientiane Capital

3. ASEAN事務局およびスラバヤ市

(1) 研修目的

まずインドネシア・ジャカルタ市において ASEAN 事務局を訪問し、LPPE に最新情報を提供する。次に、スラバヤ市へ移動し、スラバヤ市の廃棄物管理状況、とくに市民参加型の 3R 活動を視察し、本プロジェクト対象 3 都市の廃棄物管理改善に資する教訓を得る。

ASEAN事務局環境課
Senior Officerとの面談

当方より、ESC推進に向けたLPPEの最新の活動状況として、以下を報告した。

- ESCガイドライン（案）は英語がまとまり、ラオス語版を年内に作成する。
- 来年以降、MONREはガイドラインをすべてのProvincial Capitalにて適用していく計画である。
- パイロット３都市では、ガイドラインに沿って活動しており、PPの選定過程にある。

JICAインドネシア事務所
廃棄物関連案件動向について

JICAインドネシア事務所の廃棄物管理担当者より、インドネシアにおける廃棄物管理行政とそれを支援するJICA案件の今後の動きについて、説明を受けた。

スラバヤ市Benowo最終処分場

以下の点についてLPPEカウンターパートに参考となると考えられる。

- 処分エリアの区画管理と使用終了箇所の覆土処理。
- 投棄エリアへのアクセス確保
- 投棄後の敷均し、転圧

Bratang コンポスト化施設

以下の点についてLPPEカウンターパートに参考となると考えられる。

- LPBにおけるオフサイトコンポスト化施設PPについて、より具体的イメージを持った上での検討。
- コンポスト化プロセスや、原料および製品コンポストの特性に関する知見。

Batarajaya villageにおける
住民主導の廃棄物管理

以下の点についてLPPEカウンターパートに参考となると考えられる。

- 住民自らが居住環境の美化のために大きな力となること。
- そのためには、適切な情報提供と意識の向上を図るための、住民を巻き込んだ組織体制が重要であること。

スラバヤ市Assistant Mayorとの質疑

スラバヤ市Assistant Mayorとの協議において、スラバヤ市の環境施策について概要が示され、ほとんどを市の自主財源により施策を展開していること、各セクター間の調整のもとで市の施策をSub-districtレベルに落として実施していくこと、学校教育と連携し環境意識の向上を図っていることなどの説明を受けた。

(2) 研修日程

Date	Schedule	
9 Dec. (Sun.)	Counterpart from Luang Prabang and Xayabouri move to Vientiane by land transportation	
10 Dec. (Mon.)	TG 571 (VTE-BKK) 13:50 14:55 GA 869 (BKK-JKT) 17:10 20:35	Fly from Vientiane to Bangkok Fly from Bangkok to Jakarta Check-in hotel (Harris suits fX Hotel) Jl. Jend Sudirman, Pintu Satu Senayan,
11 Dec. (Tue.)	9:00	Ms. Susan Wong, Senior Officer, Environment Division, ASEAN Secretariat Jl. Sisingamangaraja 70A Jakarta
	11:00	JICA Jakarta Office Sentral Senayan II 14 th Floor, Jl. Asia Afrika No. 8 Jakarta
	GA0320 (CGK-SUB) 15:35 17:05	Fly from Jakarta to Surabaya Check-in hotel (favehotel MEX) Jl.Pregolan 1,3,5, Surabaya
12 Dec. (Wed.)	AM	Surabaya city office Visit Final Disposal Site Benowo
	PM	Visit Bratang composting house
13 Dec. (Thu.)	AM	Visit to villages to see home composting
	PM	Discussion
14 Dec. (Fri.)	AM	Free
		Check-out by 11:30
	GA0317 (SUB-CGK) 13:25 14:50	Fly from Surabaya to Jakarta
		Check-in hotel (Harris suits fX Hotel)
15 Dec. (Sat.)	GA 868 (JKT-BKK) 12:50 16:15 TG 574 (BKK-VTE) 19:50 21:00	Fly from Jakarta to Bangkok Fly from Bangkok to Vientiane
16 Dec. (Sun.)	Counterpart from Luang Prabang and Xayabouri go back to their cities by land transportation	

(3) 研修参加者

National Level		
1	Ms. Khamfong SOTAPASEUTH	Cabinet Office of MONRE
2	Mr. Vanhxay PHIOMANYVONE	DoPC, MONRE
3	Mr. Aphisayadeth INSISIENGMAY	Ministry of Public Work and Transport
Local Level		
4	Mr. Vilavong KENSOULINE	DoNRE of Vientiane
5	Mr. Sonethavy PHIMMASANE	VUDAA
6	Mr. Soulaphon PHILAKOUN	DoNRE in Louangprabang province
7	Ms. Kaysone KEOPASEUTH	UDAA of Louangprabang province
8	Mr. Kitsamone PHOTHILACK	DoNRE in Xayaboury province
9	Mr. Khamlar KONGSAP	UDAA of Xayaboury province
10	Mr. Thavisay MOASOMPHOU	Deputy Head of Saysettha district
Others		
11	Ms. Noriko OTSUKI	JICA Expert
12	Mr. Precha Chuntakorn	Assistant of the Project
13	Ms. Nurdianti Indah Pratiwi	Local Interpreter

4. 本邦研修第 1 回

(1) 研修目的

本研修コースは、「ラオス国 JICA-ASEAN 連携ラオスパイロットプロジェクト（環境コンポ

ーネント）」に携わるカウンターパートのうち特に政策決定者について、日本の環境政策、廃棄物管理技術とその運営方法を学習することで、ラオス国の地方自治体の廃棄物管理事業を支援できる能力を向上することを目的とする。

(2) 研修日程

月日	曜日	時刻	研修内容	研修場所	講師•参加者•同行者
2013年 3/24	日		来日（成田到着）		
3/25	月	9:30～ 12:00	規定ブリーフィング		
		13:30～ 16:30	プログラムオリエンテーション	TIC	佐藤尚文（国際航業）
3/26	火	9:30～ 11:00	日本の廃棄物事業の歴史と政策	国際航業	日本環境衛生センター 講師：速水章一
		13:00～ 14:00	廃棄物中継基地	新宿区環境清掃部 新宿清掃事務所 新宿中継所	同行者：佐藤尚文（国際航業）
		15:00～ 16:00	医療廃棄物処理施設	株式会社 シンシア	同行者：佐藤尚文（国際航業）
3/27	水	9:00～ 9:20	さいたま市長表敬訪問	さいたま市役所	さいたま市経済局観光政策部 国際課 課長補佐　塚越龍彦 同行者：佐藤尚文（国際航業）
		10:00～ 16:30	（１）さいたま市の環境政策、廃棄物政策 （２）東部ﾘｻｲｸﾙｾﾝﾀｰ （３）最終処分場 （４）焼却工場	さいたま市役所	さいたま市環境局資源循環推進部資源循環政策課 島村和久　課長補佐 同行者：佐藤尚文（国際航業）
3/28	木	9:30～ 11:00	東埼玉資源環境組合第一工場 ごみ処理施設 （１）ごみ発電 （２）せん定枝・刈り草たい肥	東埼玉資源環境組合	同行者：佐藤尚文（国際航業）
		13:00～ 15:00	久喜宮代衛生組合 （１）生ごみたい肥化処理施設	久喜宮代衛生組合 清掃センター	同行者：佐藤尚文（国際航業）
3/29	金	9:00～ 11:00	評価会準備		佐藤尚文（国際航業）
		11:30～ 13:00	評価会		
3/30	土		離日（成田発）		

(3) 研修参加者

No	Name	Title
Central Government		
1	Mr. Sisavath VITHAXAY シーサワット・ヴィターサイ	Vice Minister of Ministry of Natural Resource and Environment (天然資源環境省　副大臣)
2	Mrs. Keobang A Keola ケオバンアー・ケオラ	Director General of Department of Pollution Control of Ministry of Natural Resource and Environment (天然資源環境省　公害管理局　局長)
Vientiane Capital		
3	Mr. Khampian INTHALUXA カムピアン・インタルーサー	Vice-president of Vientiane Urban Development and Administration Authority of Vientiane capital (ビエンチャン市　都市開発行政機構　副局長)
4	Mrs. Dr. Bang On XAYARATH	Deputy Director of Natural Resources and Environment

	バンオーン・サイニャラート	Department of Vientiane capital (ビエンチャン市　天然資源環境局　副局長)
5	Mr. Somphone SENGSILLAVONG ソムポーン・センシラヴォン	Deputy Director of Foreign Affairs of Vientiane Capital (ビエンチャン市　外務部　副局長)
Luang Prabang		
6	H.E. Mr. Saysamone KHOMTHAVONG サイサモーン・コムタヴォン	Vice governor of Luang Prabang province (ルアンプラバン県　県副知事)
7	Mr. Bounlath LATTANAPHOUBAY ブンラット・ラッタナプーバイ	Director of Natural Resources and Environment Department of Luang Prabang Province (ルアンプラバン郡　天然資源環境局局長)
8	Mr. Phoumy OPHETSANE プーミー・オーペットセーン	Director of Urban Development and Administration Authority of Luang Prabang district(ルアンプラバン郡　都市開発行政機構局長)
Xayabouri		
9	H.E. Mr. Phongsavanh SHTTHAVONG ポーンサワン・シッタヴォン	Vice governor of Xayabouri province(サヤブリ県　県副知事)
10	Mr. Pien CHANTHIP ピアン・チャンティップ	Director of Natural Resources and Environment Department (サヤブリ郡　天然資源環境局　局長)
11	Mr. Bounkong PHONESAVANH ブンコーン・ポンサワン	Director of Urban Development and Administration Authority of Xayabouri district (サヤブリ郡　都市開発行政機構　局長)

5. 本邦研修第 2 回

(1) 研修目的

本研修コースは、LPPE に携わるカウンターパートのうち特に実務担当者について、日本の環境政策、廃棄物管理技術とその運営の実務的側面を学習することで、ラオス国の地方自治体の廃棄物管理事業を推進できる能力を向上することを目的とする。

(2) 研修日程

Date	AM	PM	Location
13th(Mon)	Travel from VTE to Bangkok		
14th(The)	Arrive at Narita		Tokyo
15th(Wed)	Briefing about S/T regulation	Program orientation	Tokyo
16th(Thu)	Lecture “SWM History and Policy”	Final disposal site (Site visit)	Tokyo
17th(Fri)	Public awareness raising; To visit the Environmental education museum	Public awareness raising; To see the environmental education for children	Tokyo
18th(Sat)			*Tokyo*
19th(Sun)			*Tokyo*
20th(Mon)	Healthcare waste treatment facility(Site visit)	Transfer station(Site visit)	Tokyo
21th(Tue)	Recycling Center, Itabashi district (Lecture and Site visit)	Waste treatment facility, Itabashi district (Lecture and Site visit)	Tokyo

22th(Wed)	Waste discharge manner and Waste collection (Site visit), Itabashi district office	Travel from Tokyo to Kagoshima city (Flight time 2hours)	Tokyo→ Kagoshima
23th(Thu)	・Travel to Shibushi city, Kagoshima province ・Greeting to Shibushi mayor	Orientation and Lecture of the Environmental policy of Shibusi city	Tokyo
24th(Fri)	・Collection of recyclable waste as a group (Site visit) ・Agricultural wastewater treatment facility(Site visit)		Shibushi
25th(Sat)			*Shibushi*
26th(Sun)			*Shibushi*
27th(Mon)	・Discharge manner and collection of recyclable waste (Site visit) ・Municipal solid waste management landfill(Site visit)	・'Shochu'(distillery) waste composting plant (Site visit) ・Orientation for practical work	Shibushi
28th(Tue)	Practical work (Collection and transportation for general, recyclable and organic waste)	Private company authorized as waste collection service provider (Site visit)	Shibushi
29th(Wed)	Practical work (Intermediate treatment and composting facility)		Shibushi
30th(Thu)	Travel from Shibushi to Kitakyusyu		
31th(Fri)	Meeting to evaluate	Meeting to evaluate	Kitakyusyu
1st (Sat)	*Travel from Fukuoka for VTE*		

(3) 参加者リスト

No	Name	Title
Central Government		
1	Mr.Phengkhamla PHONVISAI	Director of Legislation and Information Division, Chief of Responsible Team for LPPE Project
2	Mr.Vanhxay PHIOMANYVONE	Acting Director of Pollution Control Division, Department of Pollution Control, a coordinator for LPPE Project
3	Mr.Bounthong KEOHANAM	Director of Planning and Urban Development, Division, Ministry of Public Works and Transport
Vientiane Capital		
4	Mr.Thaweesay MOASOMPHOU	Vice Governor of Saysettha District, Vientiane Capital
5	Ms.Khamlar THAMMAWONG	Chief of Environment Section, Department of Natural Resources and Environment, Vientiane Capital
6	Mr.Sonethavy PHIMMASANE	Chief of Urban Planning Division, Vientiane Urban Development Administration Authority (VUDAA)
7	Ms.Bouavone LUANGKHOTE	Technician, Department of Public Works and Transport, Vientiane Capital
Luang Prabang		
8	Mr.Chanthavong PHONNACHIT	Deputy Director of Department of Natural Resources and Environment, Luang Phabang Province
9	Ms.Kaisone KAEWPASEUTH	Chief of Waste Management Section, Urban Development

		Administration Authority (UDAA) of Luang Phabang District
Xayabouri		
10	Ms.Khamphiew PHANTHAVONG	Deputy Director of Department of Natural Resources and Environment, Xayabouri Province
11	Mr.Thonglanh PHOURPHONE	Vice President of Urban Development Administration Authority, Xayabouri District

添付資料 3.　キャパシティアセスメント

1.　目的

プロジェクトの評価は、PDM に示された指標を用いて成果やプロジェクト目標の達成状況を検証するものである。成果やプロジェクト目標の達成は、C/P が個人としてあるいは組織として持つべきキャパシティを発揮した結果ではあるが、C/P のキャパシティの向上の様子をより把握するため、キャパシティアセスメントを行った。また最後のアセスメントは第 4 年次初頭に行うことで、課題を見出し、第 4 年次の活動で対応を図った。

2.　方法

2.1　アセスメントの対象とする能力

C/P のキャパシティの向上は、プロジェクトにおける活動を通じて行われる。このことから、成果達成のための個々の活動ごとに向上が期待される能力を特定し、これをアセスメントの対象とした。

また、LPPE が目標とする ESC の促進には、社会全体が総体として環境を意識した気運をもち、行政が ESC に向けて円滑に組織運営を行うといった、ESC 促進のために望まれるバックグラウンド、あるいはまさに「器」と呼ぶべきキャパシティが重要である。本 LPPE はその活動や投入の内容から、この ESC 促進のためのキャパシティを直接的に支援するものではないが、参考としてそのキャパシティの程度の把握も試みた。

したがってキャパシティアセスメントは、「各成果に付随したキャパシティ」と「ESC 促進に関するキャパシティ」の 2 つの観点で行った。

2.2　質問票の作成と配布・回収

「各成果に付随したキャパシティ」については、成果ごとに期待する能力が国レベルと地方レベルにおいて異なることから、3 つの成果それぞれについて中央（国レベルすなわち MONRE および MPWT）の C/P 用と地方レベル C/P 用（DONRE、UDAA、VUDAA、DPWT 等）として、合計 6 種の質問票を作成し、それぞれ活動に参画した C/P に回答してもらった。

「ESC 促進に関するキャパシティ」については、社会面や行政組織の状況を国レベルの C/P の視点でアセスメントしてもらうよう質問票を作成し、当該関係者に回答してもらった。

回答はいずれも 1 から 5 の 5 段階評価で行い、数の大きいほどキャパシティの高いことを示す。

また、実施時期と回数は、第 1 年次の 2011 年 12 月～2012 年 1 月に第 1 回キャパシティアセスメントをベースラインとして行い、その後およそ 1 年おきに 3 回、合計 4 回実施した。

なお、4 回の回答者は、人事の異動等の事情により入れ替えがある。このためアセスメント結果の時系列変化をそのままキャパシティの変化と見なすことはできない。しかし、ある種の能力を測るために設問を複数用意し複数人から回答を得て平均値をとることで、特定の人物の入れ替えによる影響はいくらか回避され、C/P の集合体としての能力の推移をある程度は読み取ることができると考える。

3.　結果

3.1　成果 1 に関するキャパシティ

3.1.1　成果 1 ：中央レベル

成果 1 の活動において中央レベルは、ESC ガイドラインの内容に精通し、ESC ガイドラインを用いて地方レベルに対し ESC 構築を指導していく立場にある。この考え方に沿って、各活動（PDM の活動 1.1～1.6）に呼応した個人の能力に関する設問をパート A にて尋ね、また、パート B では組織的なキャパシティを捉える目的で、ESC ガイドラインあるいはそのマニュアルの必要性と ESC 促進体制について尋ねた。結果を下に示す。

なお、活動 1.7（ESC ガイドラインのマニュアル策定）に関する質問は、活動 1.7 は最終年次に行う活動であり、活動をしていないうちにアセスメントするのは不適当であることから、尋ねていない。また、活動 1.8 や 1.9 は ESC ガイドラインの指導対象がパイロット 3 都市以外のラオスの都市、あるいは他国に拡大してはいるが、ESC ガイドラインの指導能力は活動 1.6 に関する質問で問うていることから、活動 1.8 と 1.9 に関する質問も入っていない。

表 1：成果 1 に関するキャパシティセスメント結果（中央レベル）

Group of Questions		The 1st CA		The 2nd CA		The 3rd CA		The 4th CA	
		Ave.	Stdev.	Ave.	Stdev.	Ave.	Stdev.	Ave.	Stdev.
A.	Individual Capacity	-	-	-	-	-	-	-	-
A11	Data collection and analysis	3.0	1.5	3.4	1.2	4.8	0.4	4.6	0.9
A12	Laws, strategies and action plans	3.8	1.0	3.4	1.3	5.0	0.0	5.0	0.0
A13	Best practices	3.0	1.2	3.3	1.0	4.3	0.6	5.0	0.0
A14	Environment and development vision	3.2	0.4	3.1	0.8	4.3	0.6	5.0	0.0
A15	Formulation of action plan	3.5	0.6	3.1	1.1	4.3	0.6	3.7	1.2
A16	ESC guidelines	3.0	1.0	3.5	1.4	5.0	0.0	5.0	0.0
B.	Organizational Aspects	-	-	-	-	-	-	-	-
B1	Needs of the ESC guidelines and the manual	4.1	0.8	4.2	1.0	4.0	0.0	4.7	0.6
B2	Organization for ESC promotion	3.6	1.2	4.0	0.8	4.5	0.6	4.0	1.2
	Total	**3.4**	**1.0**	**3.6**	**1.2**	**4.5**	**0.5**	**4.6**	**0.8**

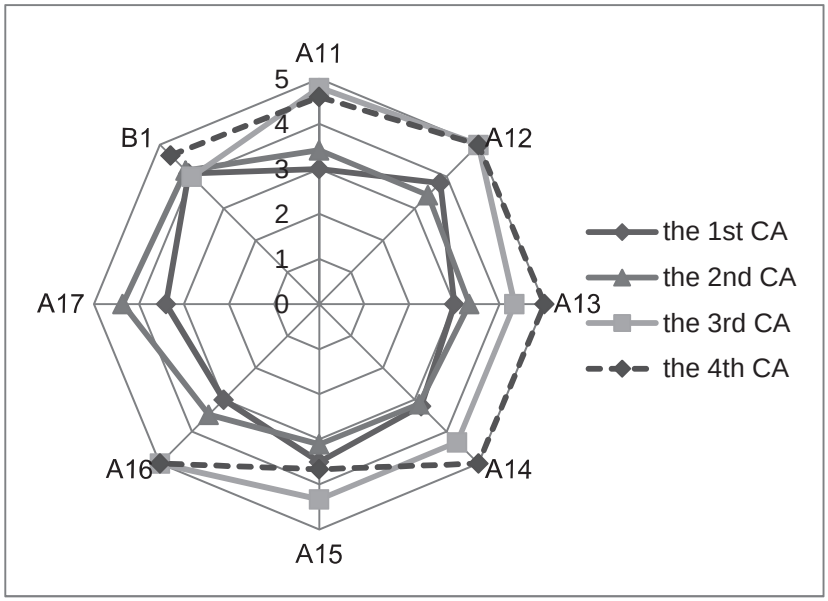


図 1：成果 1 に関するキャパシティセスメント結果（中央レベル）

アセスメント結果として、全体として向上傾向が見られる中で、特に A16（ESC ガイドラインの指導）に高い結果が得られ、A15（アクションプラン作成）に関し能力低下が見られた点が特筆される。

A16 で第 3 回、第 4 回とも高い回答を得られたのは、ESC ガイドラインの普及活動を第 2 年次中盤からパイロット都市以外に広げ、ESC ハイレベルセミナーでの発表、カンボジア国での普及活動など、ESC ガイドラインを説明･紹介する機会が多くあったことが功を奏したものと考えられる。

A15 での低下に関しては、第 2 年次から 3 年次にかけてパイロットプロジェクトを実施した結果を踏まえて改定したアクションプランを、第 4 年次に各都市に説明し、LPPE 実施後の活動について助言を行ってアクションプランに関する理解向上を図った。また、第 4 年次に ESC ガイドラインのマニュアルを作成し、この中でアクションプランの作成についても説明している。

3.1.2　成果 1 ：地方レベル

成果 1 の活動において地方レベル（パイロット 3 都市）は ESC 推進主体として、ESC ガイドラインを利用しつつ、都市環境の状況把握やアクションプランの策定等を実施していく能力が求められる。これに関するキャパシティアセスメント結果を以下に示す。

表 2：成果 1 に関するキャパシティセスメント結果（地方レベル）

Group of Questions		The 1st CA		The 2nd CA		The 3rd CA		The 4th CA	
		Ave	Stdev.	Ave	Stdev.	Ave	Stdev.	Ave	Stdev.
A.	Individual Capacity	-	-	-	-	-	-	-	-
A11	Data collection and analysis	3.6	0.9	3.4	0.8	4.3	0.6	4.8	0.4
A12	Laws, strategies and action plans	3.8	0.7	3.5	0.8	4.3	0.7	4.6	0.5
A13	Best practices	3.5	1.1	3.5	0.8	3.8	0.8	4.5	0.5
A14	Environment and development vision	3.8	0.6	3.2	0.8	4.5	0.5	5.0	0.0
A15	Formulation of action plan	3.2	0.9	3.4	0.9	4.3	0.7	4.6	0.5
A16	ESC guidelines	3.4	1.1	3.5	0.9	4.3	0.5	5.0	0.0
B.	Organizational Aspects	-	-	-	-	-	-	-	-
B1	Needs of the ESC guidelines and the manual	3.9	1.3	3.7	0.9	4.4	0.5	4.8	0.4
B2	Organization for ESC promotion	3.7	1.0	3.5	0.8	4.1	0.7	4.9	0.3
	Total	**3.5**	**1.0**	**3.5**	**0.8**	**4.2**	**0.6**	**4.5**	**1.2**

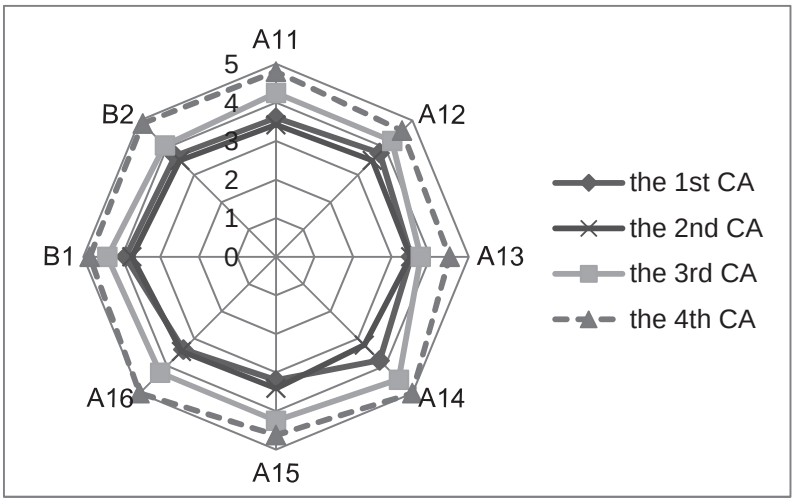


図 2：成果 1 に関するキャパシティセスメント結果（地方レベル）

ここに示したように、いずれの項目に関してもキャパシティの上昇傾向が見られ、第 4 回における

結果はほとんど 5.0 に近いものとなっている。パイロット 3 都市の C/P は、活動 1.8 や 1.9 において、MORNE による ESC ガイドラインの説明を繰り返し見聞きし、また自らも ESC ガイドラインの適用状況を事例として紹介する機会があった。これが、上に示した高い能力向上結果につながったものと考えられる。

3.2 成果２に関するキャパシティ

3.2.1 成果２：中央レベル

成果２は、廃棄物管理分野に関して行政能力を向上することを目的としている。この成果２に関連する活動としては、活動 2.1～2.4 に加えて、成果１でおこなった都市環境管理関連の活動 1.1、1.3、1.4、1.5 に関しても廃棄物管理の観点から取り上げ、パート A として質問した。またパート B としては、廃棄物管理を推進する組織の状況を尋ねた。回答者は中央レベルであり、廃棄物管理を行う地方レベルに対する指導やサポートを行うとの役割を勘案した質問とした。

表 3：成果２に関するキャパシティセスメント結果（中央レベル）

Group of Questions		The 1st CA		The 2nd CA		The 3rd CA		The 4th CA	
		Ave	Stdev.	Ave	Stdev.	Ave	Stdev	Ave	Stdev.
A	Individual Capacity	-	-	-	-	-	-	-	-
A11	Data collection and analysis	3.6	0.9	3.3	1.2	3.9	0.7	4.5	0.8
A13	Best practices	3.0	1.1	3.5	0.9	3.9	0.7	4.1	0.9
A14	Environment and development vision	2.9	0.6	3.3	1.3	3.8	0.9	4.2	0.9
A15	Formulation of action plan	3.0	0.5	3.2	1.2	3.9	0.9	4.1	1.0
A21	Selection of pilot projects	3.6	0.7	3.8	1.0	4.3	0.7	4.4	0.7
A22	Planning of pilot projects	3.2	0.6	3.6	1.2	3.8	0.9	4.0	1.0
A23	Implementation of pilot projects	3.1	1.1	3.6	1.2	3.9	0.9	4.3	0.9
A24	Reporting of results of pilot projects	3.1	0.9	4.3	1.0	4.5	0.5	4.5	0.5
B	Organization Aspects	-	-	-	-	-	-	-	-
B1	Organization for improving SWM	3.5	1.4	4.2	1.0	4.1	0.7	3.9	1.2
	Total	**3.2**	**0.9**	**3.6**	**1.2**	**4.0**	**0.8**	**4.2**	**0.9**

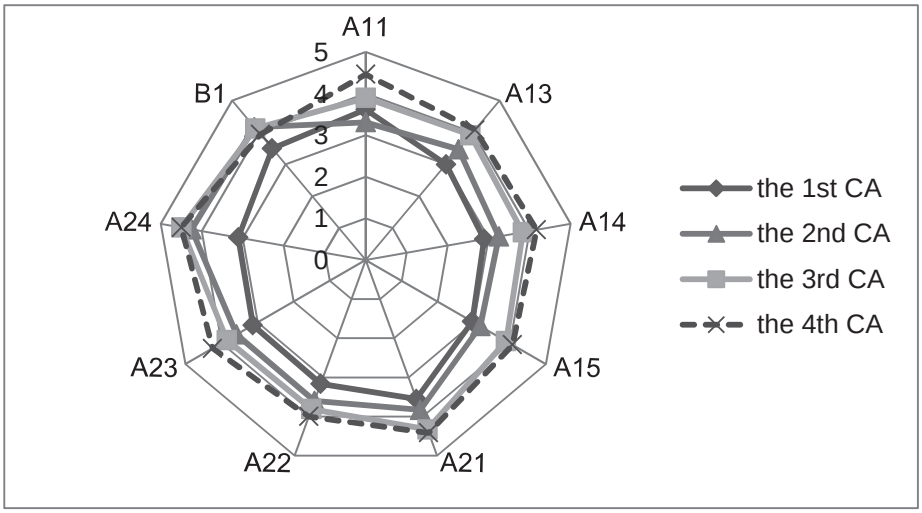


図 3：成果２に関するキャパシティセスメント結果（国レベル）

ここでもある程度の経年的向上傾向が見られるが、A22 および B1 に多少課題が見受けられる。A22 は活動 2.2 のパイロットプロジェクトの計画策定能力を、B1 は廃棄物管理を担う組織内の責任の所在や組織間の連携を問うものである。これらへの対応として、第 4 年次にはアクションプランの見直しを行ってパイロットプロジェクトの継続・拡大計画や各組織の役割について C/P と検討し、計画策定への理解や各組織の役割の認識の向上を図った。

3.2.2　成果２：地方レベル

国レベルでの質問と同様に、活動 1.1、1.3、1.4、1.5 および成果 2 の全活動に関する能力向上と組織力に関するアセスメントを行った。対象者は地方レベルの C/P であるため、廃棄物管理の現場での実施責任や実行能力を問うものとした。

表 4：成果２に関するキャパシティセスメント結果（地方レベル）

Group of Questions		The 1st CA		The 2nd CA		The 3rd CA		The 4th CA	
		Ave	Stdev.	Ave	Stdev.	Ave	Stdev.	Ave	Stdev.
A	Individual Capacity	-	-	-	-	-	-	-	-
A11	Data collection and analysis	3.2	1.1	3.2	0.9	3.9	0.9	4.0	0.7
A13	Best practices	2.7	1.0	3.4	1.2	3.9	0.9	4.1	0.8
A14	Environment and development vision	2.9	1.0	3.5	0.8	4.0	0.6	4.1	0.6
A15	Formulation of action plan	3.0	0.9	3.3	0.8	3.7	0.8	4.0	0.8
A21	Selection of pilot projects	2.8	1.1	3.6	1.2	3.8	0.8	3.9	0.8
A22	Planning of pilot projects	2.6	0.8	3.1	1.1	3.8	0.6	4.0	0.7
A23	Implementation of pilot projects	2.6	1.1	2.8	0.9	3.5	0.8	3.9	0.8
A24	Reporting of results of pilot projects	2.9	0.9	3.3	1.0	3.8	0.7	3.9	0.8
B	Organization Aspects	-	-	-	-	-	-	-	-
B1	Organization for improving SWM	3.5	1.2	3.6	1.0	4.2	0.8	4.1	0.9
	Total	**2.9**	**1.1**	**3.3**	**1.0**	**3.8**	**0.8**	**4.0**	**0.8**

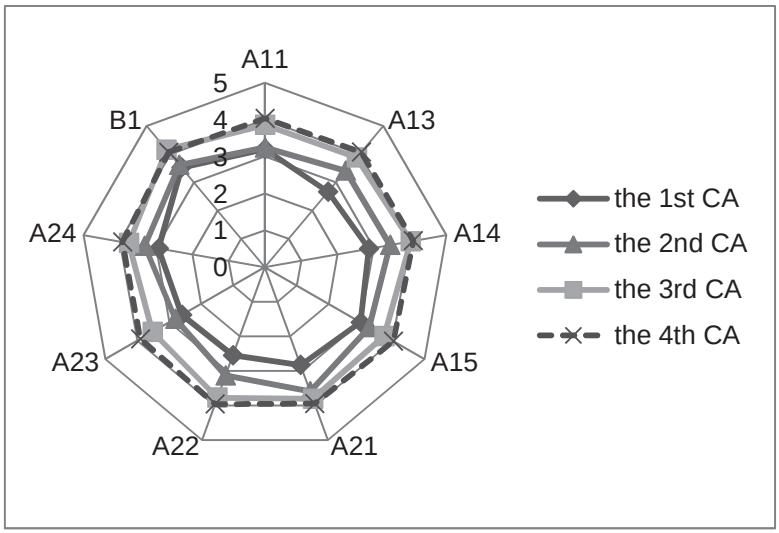


図 4：成果２に関するキャパシティセスメント結果（地方レベル）

経年変化としては上昇しているが第 3 回から第 4 回に掛けての上昇幅は小さく、第 4 回のアセスメント結果は 3.9～4.1 にとどまった。第 2 年次から廃棄物管理のパイロットプロジェクトが行われ、第 3 年次ごろからは C/P が主導的責任を担っていることから、廃棄物管理を改善する知見や能力はある程度蓄積されているものと考える。しかし、実際に活動をしていく中でモニタリングの継続的な実施や他の地域への拡大展開など、新たな課題が見出されることから、アセスメントの視点も厳しくなっていることが推察される。

これを踏まえ第 4 年次には、パイロットプロジェクトのワークショップにて 3 都市間において、そして C/P と SJET 間とにおいて課題を共有し対応を協議したほか、これを踏まえたアクションプランを改定した。また最終処分場や汚泥処理施設、オフサイトコンポストプラント、焼却処理などの施設運営に関しては、運営維持管理計画を策定しその技術指導を行った。

3.3　成果３に関するキャパシティ

3.3.1　成果３：中央レベル

成果３は、コミュニティの廃棄物管理への理解や参加を促進することを目的とし、地方行政機関は直接的にコミュニティに働きかけ、中央レベルにおいてはそのような地方行政機関を後方支援することが求められる。意識啓発の分野であることから、中央レベルにおいては質問対象者は MONRE とし、MPWT は含んでいない。まず中央レベルでの結果を以下に示す。

全般的に、第 4 回のアセスメントで高いレベルの回答が見られた。MONRE はパイロットプロジェクトのモニタリングを第 3 年次から始めており、この活動を通じて市民からの反応に直に触れ、マニュアルの改訂等を行っている。こうした活動が廃棄物管理への市民参加への理解につながっているものと考えられる。

一方、全体の中では、パート B で質問した廃棄物管理に関する意識啓発の組織的対応についてやや低い回答となった。現在のラオスでは廃棄物管理に関する法体系が未整備で、市民の役割や責務が不明確であり、結果として行政機関としても市民参加を求めていく体制を整えがたい状況があるものと察せられる。

表 5：成果３に関するキャパシティセスメント結果（中央レベル）

Group of Questions		The 1st CA		The 2nd CA		The 3rd CA		The 4th CA	
		Ave	Stdev	Ave	Stdev	Ave	Stdev	Ave	Stdev
A	Individual Capacity	-	-	-	-	-	-	-	-
A31	Community-based UEM in Laos	2.7	1.2	3.3	0.9	4.3	0.6	4.7	0.6
A32	Community-based UEM in ASEAN	2.8	0.8	3.4	0.8	4.0	0.9	4.2	0.8
A33	Formulation of EEA program	3.1	1.2	3.1	1.1	3.4	0.7	4.0	0.9
A34	Planning of EEA program	2.9	1.1	3.3	1.1	3.3	0.9	4.0	0.9
A35	Development of EEA tools	2.9	0.9	3.1	1.0	3.2	0.7	4.0	0.9
A36	Implementation of EEA pilot projects	3.3	0.5	3.2	1.1	3.0	0.9	4.0	0.9
A38	Reporting of results of pilot projects	3.0	0.9	3.8	0.9	3.4	0.7	4.1	0.8
B	Organizational Aspects	-	-	-	-	-	-	-	-
B1	Organization for EEA for SWM	3.1	1.5	3.6	0.8	3.0	0.9	3.9	1.7
	Total	**3.0**	**1.0**	**3.3**	**1.0**	**3.3**	**0.8**	**4.0**	**1.0**

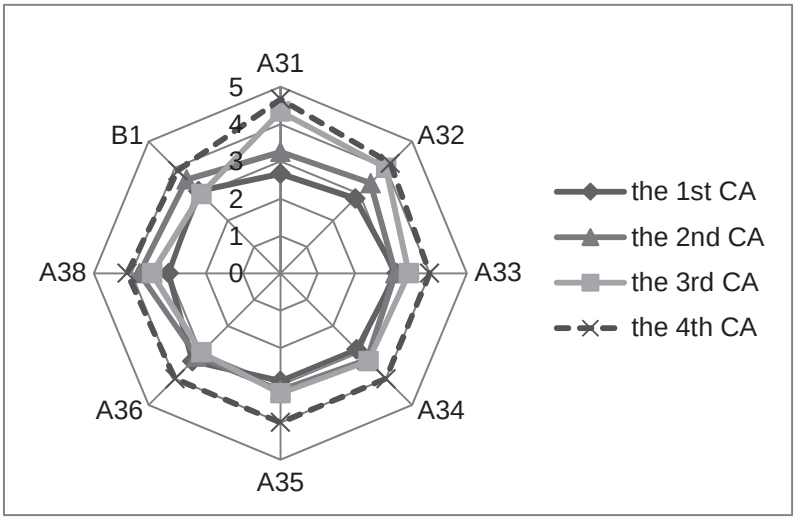


図 5：成果３に関するキャパシティセスメント結果（中央レベル）

3.3.2　成果３：地方レベル

地方レベルの行政組織は、収集改善においては市民のごみ排出ルールの適用、3R 推進においては家庭コンポストの実施やエコバスケットの利用などごみの排出の抑制などのため、住民の意識啓発を担っている。アセスメントの結果は、以下のとおりである。

結果は、成果２の地方レベルでのアセスメント結果と類似性がある。すなわち、上昇の程度が鈍化し、最終アセスメントの結果が 4 前後となっている点である。住民への意識啓発は、息の長い継続的な活動が求められ、活動の成果が端的に市民の行動の変化に現れるとは限らないことから、成果２よりもさらに活動の難しさを認識した状況が想像される。一方で、第３年次には学校リサイクル活動が始まり C/P の活動に教育的要素が加わっており、EEA（環境教育啓発）プログラムが多角化したことはプラスの効果を生んでいるものと考えられる。

第 4 年次には、継続的な啓発活動が LPPE 終了後にも計られるよう、パイロットプロジェクトワークショップで意見交換を行い、また今後の活動への提言を C/P へ示した。

表 6：成果３に関するキャパシティセスメント結果（地方レベル）

Group of Questions		The 1st CA		The 2nd CA		The 3rd CA		The 4th CA	
		Ave	Stdev	Ave	Stdev	Ave	Stdev	Ave	Stdev
A	Individual Capacity	-	-	-	-	-	-	-	-
A31	Community-based UEM in Laos	3.4	1.0	3.7	0.8	4.1	0.6	3.9	1.0
A32	Community-based UEM in ASEAN	2.8	1.0	3.4	0.8	3.6	0.8	4.0	0.8
A33	Formulation of EEA program	3.3	0.8	3.8	0.6	4.1	0.6	4.3	0.7
A34	Planning of EEA program	3.4	0.8	3.5	0.9	4.0	0.8	4.2	0.9
A35	Development of EEA tools	2.8	0.9	3.6	0.8	3.7	0.5	3.9	1.0
A36	Implementation of EEA pilot projects	3.1	1.0	3.6	0.9	3.8	0.8	4.1	1.0
A38	Reporting of results of pilot projects	3.2	0.6	2.6	0.8	3.7	0.6	3.9	0.9
B	Organizational Aspects	-	-	-	-	-	-	-	-
B1	Organization for EEA for SWM	3.0	0.8	3.7	1.0	3.9	0.6	4.2	1.0
	Total	3.1	0.9	3.5	0.9	3.8	0.7	4.1	0.9

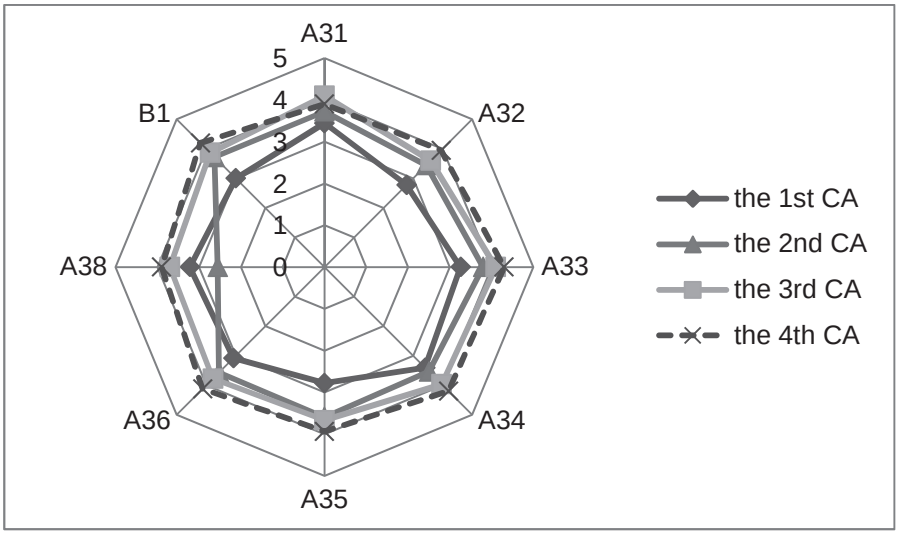


図 6：成果３に関するキャパシティセスメント結果（地方レベル）

3.4 ESC 促進に関するキャパシティ

ESC 促進に関するキャパシティは、社会面として一般市民の意識と事業者意識、環境管理に関する制度面、組織（MONRE および MPWT）面に関しては運営・コミュニケーション・人材・仕事環境・業務執行・知的資産に関して、および個人の ESC 促進に向けた意識に関し、計 65 の質問の回答を得た。結果は以下のとおりである。

表 7：ESC 促進に関するキャパシティアセスメント結果

		The 1st CA		The 2nd CA		The 3rd CA		The 4th CA	
		Ave.	Stdev.	Ave.	Stdev.	Ave.	Stdev.	Ave.	Stdev.
A	Social aspects								
A1	General public in urban area	2.9	0.84	3.82	1.35	3.4	0.99	3.6	0.83
A2	Business sectors	2.9	0.29	3.83	1.59	3.3	0.89	3.5	0.69
B	Institutional aspects	2.7	0.72	3.53	1.10	3.9	0.90	3.8	0.68
C	Organizational aspects								
C1	Management	3.3	0.86	4.31	0.87	3.6	1.26	3.9	0.93
C2	Communication	3.2	0.88	4.15	1.04	3.9	0.85	4.2	0.67
C3	Human resources	3.3	0.95	3.81	1.17	3.8	0.98	3.8	0.75
C4	Work environment	2.6	0.76	3.94	0.72	3.3	0.92	3.6	0.80
C5	Work execution	2.5	0.52	4.00	0.95	3.7	1.37	3.7	1.15
C6	Intellectual asset	2.8	0.45	4.00	1.08	3.7	0.67	3.8	0.87
D	Individual aspects	3.6	0.68	4.55	0.60	4.3	0.72	4.4	0.59
	Overall	2.98	0.80	3.88	1.12	3.7	0.98	3.8	0.80

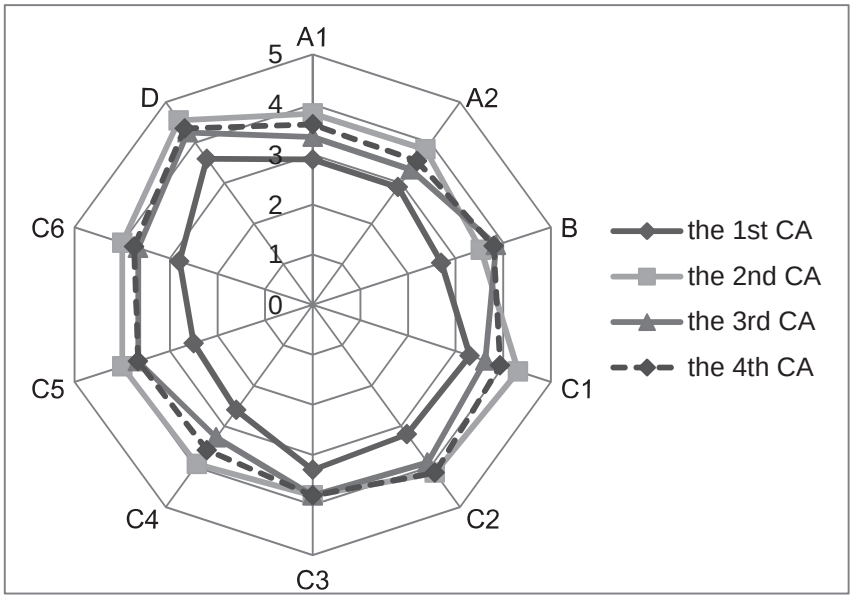
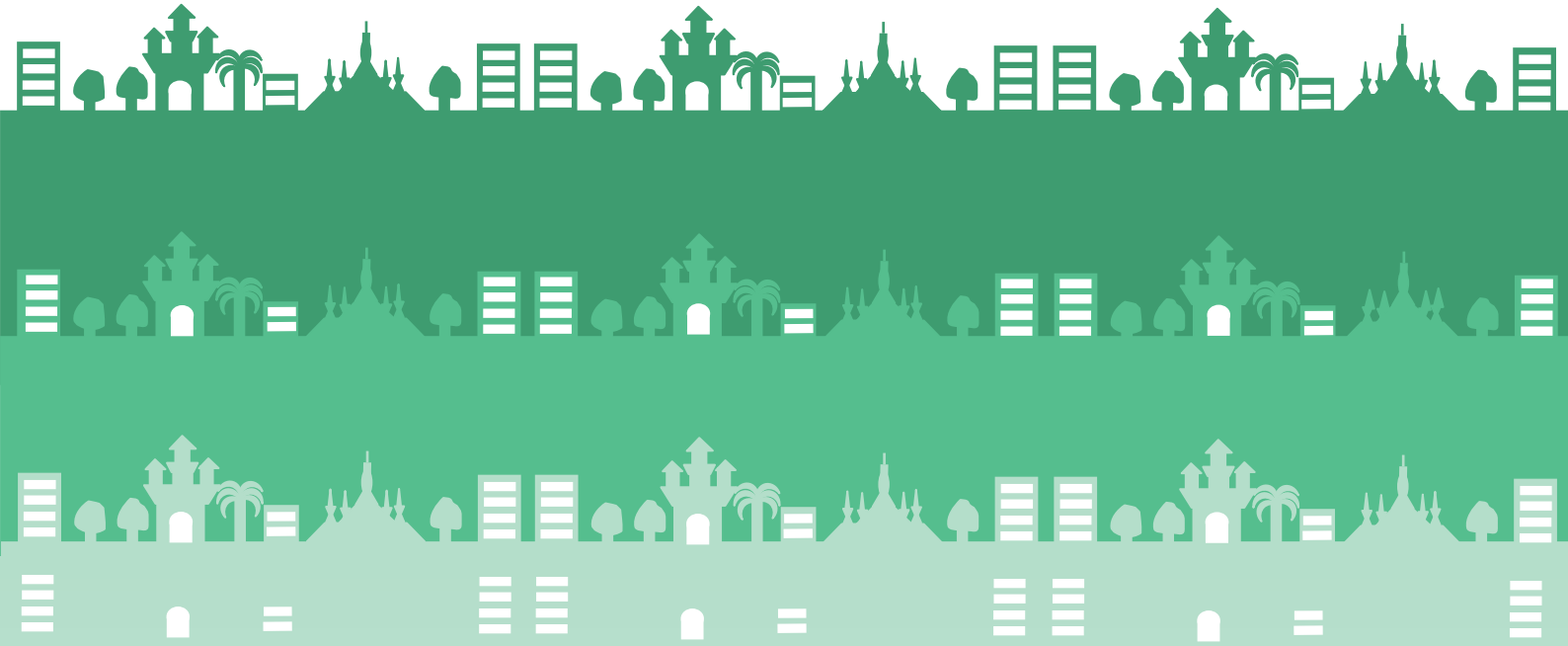


図 7：ESC 促進に関するキャパシティアセスメント結果

全体的な傾向として、第 1 回から第 2 回に総じてキャパシティの向上が見られるが、その後の第 2 回から第 4 回にかけては特段向上の様子が見られない。このアセスメントでは、社会の意識や組織の体制など変化に時間を要するものをそもそも対象としており、また回答はその主観的な評価であることから、この結果から時系列的傾向を見出すのは困難である。ただ、回答者が LPPE に参画したことで、社会における環境意識のありように敏感になったり組織連携に配慮するようになったりしたことが、回答に影響を与えていることは考えられる。

Guidelines for Environmentally Sustainable Cities of Lao PDR



Clean, Green, Beautiful Laos for Future Generations

Ministry of Natural Resources and Environment, Pollution Control Department
September 2015

Guidelines for Environmentally Sustainable Cities of Lao PDR

Issued by: Ministry of Natural Resources and Environment,

Pollution Control Department

Supported by: Japan International Cooperation Agency

September 2015

INTRODUCTION

Socio - Economic Development is the fundamental solution of poverty alleviation. Socio-Economic Development, however, could give an impact on the environment and people's life as it uses natural resources. Actually, how to maintain and protect the environment and how to use natural resources with minimum impact is a global environmental concern. Lao PDR executes socio economic development in parallel with environmental protection in order to make Lao PDR to be **Green**, **Clean** and **Beautiful**. One of its attempts was the tripartite project between Lao PDR, ASEAN secretariat and JICA to narrow the development gap for ASEAN integration. The project especially focused on the improvement of solid waste management, which is one of the actions to reduce pollution and impacts on the environment and climate change.

At the moment, in Lao PDR, the garbage amount is increasing quickly as the population increases. It relates with the mass consumption of the society.

Ministry of Natural Resources and Environment (MONRE) has a clear policy to carry on natural resource management adequately and sustainable in order to mitigate emission and garbage generation.

Therefore, the appropriate policies, suitable implementation and all people's participation are required to handle the current situation in Lao PDR.

The Objective of this guideline is to formulated organize for urban environment management, identifies urban environment issue by using three cities model.

I hope the Guidelines for Environmental Sustainable City (ESC_GL) of Lao PDR has lesson learn from three pilot cities would be a good reference to use for the sustainable implementation of urban environmental management particularly for waste and wastewater management that appropriate to other city.

I would like to express my great thanks to the government of Japan through JICA representative to Lao PDR for technical and financial support to the implementation of this project and to technical team of Pollution Control Department, MONRE, as well as to all local sectoral organizations concerned for facilitating and co-implementing the project successfully.

Director General of

Pollution Control Department

Kham Phanh NANTHAVONG

Contents

Abbreviation

DOES:	Department of Education and Sport
DONRE:	Department of Natural Resources and Environment
MICT:	Ministry of Information, Culture and Tourism
MOAF:	Ministry of Agriculture and Forestry
MOES:	Ministry of Education and Sport
MOEM:	Ministry of Energy and Mine
MOH:	Ministry of Health
MOHA:	Ministry of Home Affairs
MOIC:	Ministry of Industry and Commerce
MONRE:	Ministry of Natural Resources and Environment
MOPS:	Ministry of Public Security.
MPWT:	Ministry of Public Work and Transport
MPI:	Ministry of Planning and Investment
NPPN:	NamPaPa Nakhonluang (Water Treatment Plant)
NREO:	Natural Resource and Environmental Office
PWTO:	Public Work and Transport Office
PWTI:	Public Work and Transport Institute.
UDAA:	Urban Development and Administration Authority
VUDAA:	Vientiane Urban Development and Administration Authority

1 Introduction

1.1. Objectives of the Guidelines

This document presents the guidelines for environmentally sustainable cities (ESC). The objective of MONRE to publicize the guidelines is:

> To encourage the cities in Laos to be **clean, green and beautiful** so that they become environmentally sustainable without compromising the quality of living of the next generation.

In this context, **"clean"** means clean air, clean water and clean land without any harm to the human health and eco-system, **"green"** means rich fauna and flora that provide joy of living, and **"beautiful"** means "clean and green" that bring happiness and comfort to the urban lives.

The cities, or urbanized area at any levels of local administration, have been threatened by the adverse effects caused by their nature as cities. Ensuring environmental sustainability is a challenge to urbanization, which is an ever-steadily visible worldwide trend. However, it is also believed to be a challenge that has to be started regardless of when, by whom or how. The guidelines aim to facilitate a solid, however small, step forward to this challenge.

What the guidelines show is the only fundamental framework that is regarded as a widely applicable standard. Their application, however, can be flexible and lax according to the local physical, institutional and economic circumstances. The main concern lies in starting with something, keeping going and expanding it. The guidelines will serve as a momentum to make this happen.

1.2. How It Was Produced

The Guidelines (draft) were produced as an outcome of the first year activities of "Laos Pilot Program for Narrowing the Development Gap – Environmental Management Component (LPPE)", which was implemented by MONRE in association with MPWT and with assistance by the Japan International Cooperation Agency (JICA) from 2011 to 2015.

The overarching goal of LPP is ***"Clean, Green, Beautiful Laos"***. Under this, the LPPE aims to promote ESC in three model cities including Vientiane Capital, Luang Prabang District and Xayabouri District and a range of practical activities are to be implemented from April 2012. The drafted Guidelines were reviewed when necessary and finalized in October 2015 by modifying the ESC promotion procedure applied in LPPE so as to be applicable to all the local authorities in the country and by incorporating important and useful tips and lessons leant in the LPPE.

1.3. Background: Why We Need the ESC Guidelines?

The importance of ESC can be highlighted in the two ways as shown in the figure below in a national context and an ASEAN context.

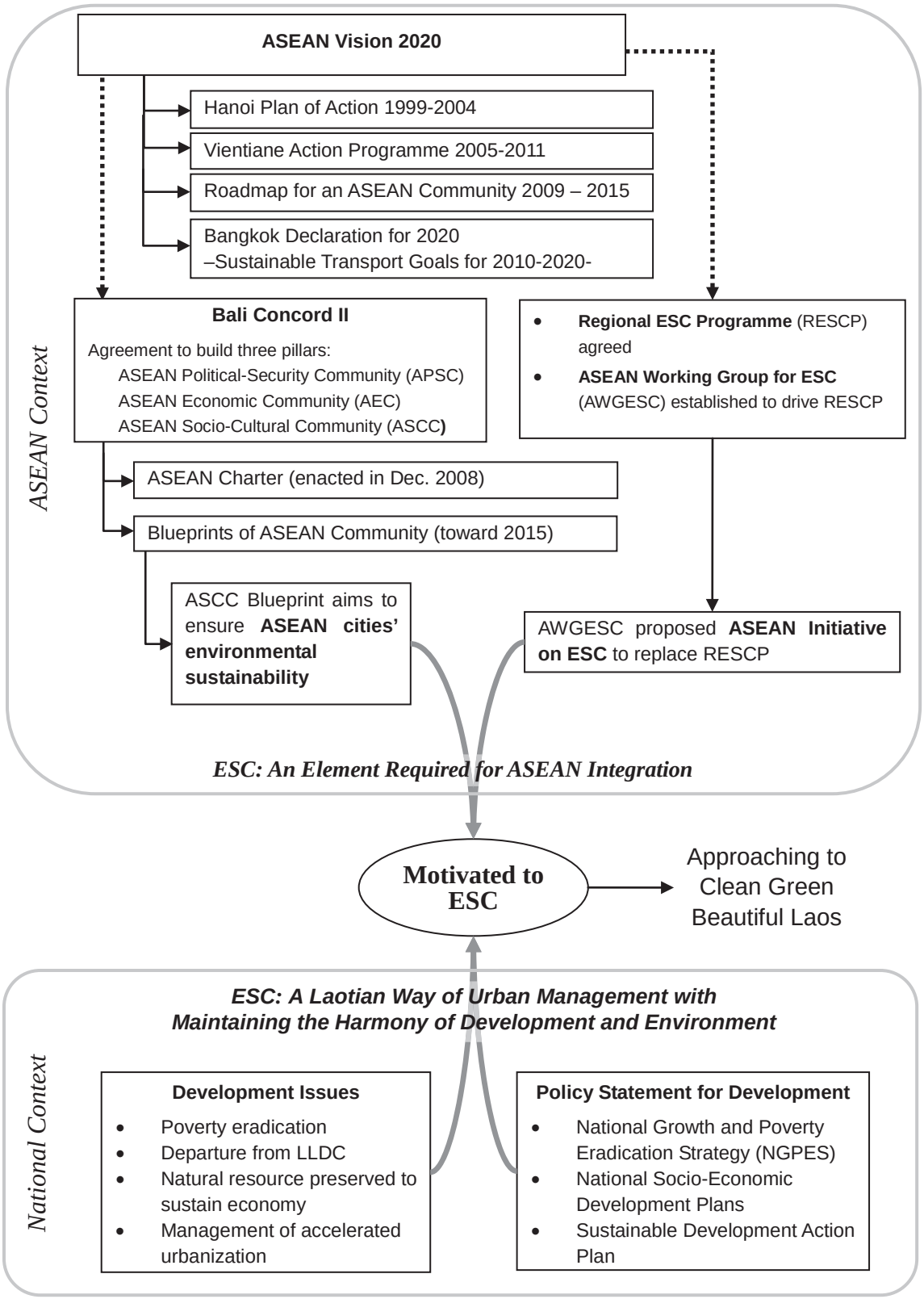


Figure 1: Significance of ESC in Laos

1.3.1. ESC in National Context

Historically, the Lao economy has been heavily relied on the natural resources. The symbiotic relation with the nature is a backbone of its economy and the relatively high economic growth observed in recent years in the country has been achieved while preserving a balance between development and the environment. Such a balanced correlation, however, should be considered as a simple consequence of the fact that the asset of water and land resources of Laos was abundant while population, as well as human-borne adverse impact on the environment, has been fairly dispersed over the country.

The urbanization in Laos, which has been gentle enough to contribute to the environmental sustainability, however, is gradually presenting an important change. Accelerated urbanization along with economic growth starts to demonstrate a risk to the balance with the environment.

It is particularly to be noted that the shift of population from rural to urban has a significant implication, that the poverty eradiation is becoming not just an issue in rural areas but also one of the major urban problems. The poor are those who unwillingly contribute to the degradation of urban environment due to low affordability to prepare appropriate sanitation facility or to use well-maintained, non-exhausting motorbikes. They are, at the same time, those who are most vulnerable to the degraded urban environment as they are easily exposed to such risks as unsafe water and uncollected solid waste.

Meanwhile, the Government of Laos has set a national goal of the departure from LLDC by 2020, and it is commonly in a heart of all the policy papers such as the National Growth and Poverty Eradication Strategy and the 5-Year National Socio-Economic Development Plans. The commitment of the Government of Laos to lead the country to a new status is also seen its formulation of Sustainable Development Action Plan.

The necessity for the country to manage the newly appeared changes due to urbanization and in parallel to step ahead of the LLDC status inevitably urges the country to seek for an innovative approach of city management that is not a simple replication of other proceeding countries. Here is the rational for ESC promotion.

It is highly required to acknowledge the unique and fundamental character of Laos that has been constructing environmentally harmonized socio-economy in its history, and to aim at Lao-oriented urbanization, or Lao-oriented environmental sustainability in cities.

1.3.2. ESC in ASEAN Context

ASEAN’s commitment to sustainable development was expressed as early as 1997 in the ASEAN Vision 2020, which advocates a pursuit of “a clean and green ASEAN with fully established mechanisms for sustainable development to ensure the protection of the region’s environment, the sustainability of natural resources and the high quality of life of its peoples”.

After the adoption of Bali Concord II in 2003, the pace for ASEAN integration was accelerated to realize ASEAN Community by 2015, leading to the creation of blueprints from 2009 to 2015 for three pillars of the Community; the ASEAN Political-Security Community, the ASEAN Economic Community and the ASEAN Socio-Cultural Community (ASCC).

In the ASCC blueprint, Section D is entitled as "Ensuring Environmental Sustainability", stipulating that "ASEAN shall work towards achieving sustainable development as well as promoting clean and green environment". Further, Section D.5 "Promoting quality living standards in ASEAN cities/urban areas" has set an objective as "Ensure cities/urban areas in ASEAN are environmentally sustainable, while meeting the social and economic needs of the people".

Such development of a political framework has endorsed by institutionalization of ASEAN Senior Officials on the Environment (ASOEN, 1989) and six working groups under the ASOEN. One of them is ASEAN Working Group for Environmentally Sustainable Cities (AWGESC), which is to develop strategies and action plans to drive the ASEAN Initiative for ESC under the framework of ASCC Blueprint.

Consequently, the ESC promotion is considered to be one of the elements that require every effort to all the ASEAN countries in a view of ASEAN integration.

1.4. Operation of the ESC Guidelines

1.4.1. ESC Guidelines in the Environmental Policy of Laos

The Lao government first promulgated Environmental Protection Law in 1999. It has been serving a fundamental framework for all the environmental policies in the country and other relevant environmental laws and regulations have been emerged from the Law.

At the country level, there are National Environmental Strategy and National Environmental Action Plan. The current publication of the former is targeting the year of 2020, while the latter uses the same time frame with National Socio-Economic Development Plan, which is currently in the stage of 2011-2015. Each arm of the local authorities, both local departments under the line ministries and offices of local administrations, in turn develop their Action Plans in their jurisdiction.

The ESC Guidelines will be used to integrate all the policies in the Action Plans relevant to the urban environment and put them in order of sub-sectors. For example, an issue of solid waste management (SWM) may appear in both the Action Plans of Environmental Management and of Public Works and Transport. The application of the ESC Guidelines will refurbish those Action Plans from a distinct view point of SWM and to create an independent SWM plan. Furthermore, the ESC Guidelines will facilitate the appointment of responsibilities, consensus building, and practical implementation of even a small step forward.

1.4.2. Responsible Agencies to Put the Guidelines into Force

MONRE is the primary agency that is responsible to put the guidelines into force. Pollution Control Department (PCD) is the focal point.

PCD will build an effective network at the national level involving relevant agencies, among which Department of Housing and Urban Planning, Ministry of Public Works and Transport will be the most relevant.

1.4.3. How the Guidelines are Used

PCD of MONRE applies the guidelines as a policy tool for Clean Green Beautiful Laos, in directing local authorities to take step-by-step actions. PCD gives an initial momentum to the local authorities, assists their attempts to be on a right track, and elaborates the guidelines to be more applicable and usable.

The local authorities can be referred to various organizations related to city environment and development. The guidelines, however, assume that the following agencies are to play roles to lead other agencies in a concerted manner by using the guidelines.

- Department of Natural Resources and Environment (DONRE) and Natural Resources and Environment Office (NREO)
- Department of Public Works and Transport (DPWT) and Public Works and Transport Office (PWTO)
- Urban Development Administration Authority (UDAA and VUDAA)

1.4.4. Implementation Structure of the Guidelines

The Guidelines has been put into force in the following approach.

- PCD of MONRE bore the primary responsibility of dissemination and amendment of the Guidelines (draft).
- PCD intended to apply the Guidelines (draft) to promote the implementation of the process flow shown in
- Figure 2 from A to C, up to “the Formulation of Vision for ESC”, in all the provinces over the country by 2015, and to promote the implementation of the rest part of the process flow by 2020.
- PCD reviewed the performance of three pilot cities of LPPE and other local authorities to which the Guidelines (draft) were applied as mentioned above and assessed the practicability of the Guidelines (draft).
- PCD amended the Guidelines (draft) and finalized it by the target year 2015.

- MONRE intends to endorse the finalized Guidelines by issuing an official regulatory document so that the Guidelines are utilized most effectively.

1.4.5. Basic Concept of ESC

Chapter 2 presents the step-by-step procedure of ESC promotion. In going through the procedure, the following basic concept should be taken into consideration.

❖ Proactive Approach

Environmental negative loads must be reduced and diverted at closest to their sources as possible and every effort should be made to prevent their generation in the first place. End-of-pipe approaches are more costly than preventive approaches.

Most of the developed countries and newly developing countries, which experienced heavy burden in tackling environmental issues, have been making a dramatic shift to the environmental-load-less society. Taking account of the difference between the social, economic and cultural conditions of those countries and those of this country, Laos should be in a position to pursue a totally proactive approach, which can preserve and nourish the value of our environment on the course of economic growth.

❖ Ecological Harmony

Population and economic activities are less concentrated in cities in Laos than cities in many other countries. The rural areas and urbanized areas are adjacent, or even intermingled, and that enriches the urban lives in Laos. This further implies that urbanization with greenery in Lao cities has enjoyed the benefit of ecological services, such as purification, dilution, decomposition, generation and renewal. Ecological harmony in cities is the strength of Laos and should be a great potential for environmentally sustainable development.

❖ Coordination

The attempts to ESC will be enhanced by the economic and social activities which are coordinated in a common direction to the environmental sustainability. Such coordination should be the result of mutual understanding by stakeholders, transparent decision making and equity of participation opportunities. It should be also associated with objective examination of cost and benefit, which is only possible when all the stakeholders seriously take the real condition of the environment.

2 Process Flow of ESC

The process flow for ESC that the guidelines show is largely divided into two stages and six steps.

Stage 1: : Formulation of Vision for ESC

A) Preparatory Stage: Establishment of Organizational System for ESC Promotion
B) Study of the Current Status of Urban Environmental Management (UEM)
C) Formulation of Vision for ESC

Stage 2: Implementation of ESC Vision

D) Formulation of Action Plan
E) Implementation of PDCA (Plan-Do-Check-Action) Cycle
F) Application of Experiences and Lessons to Other Activities and Other Sub-Sectors

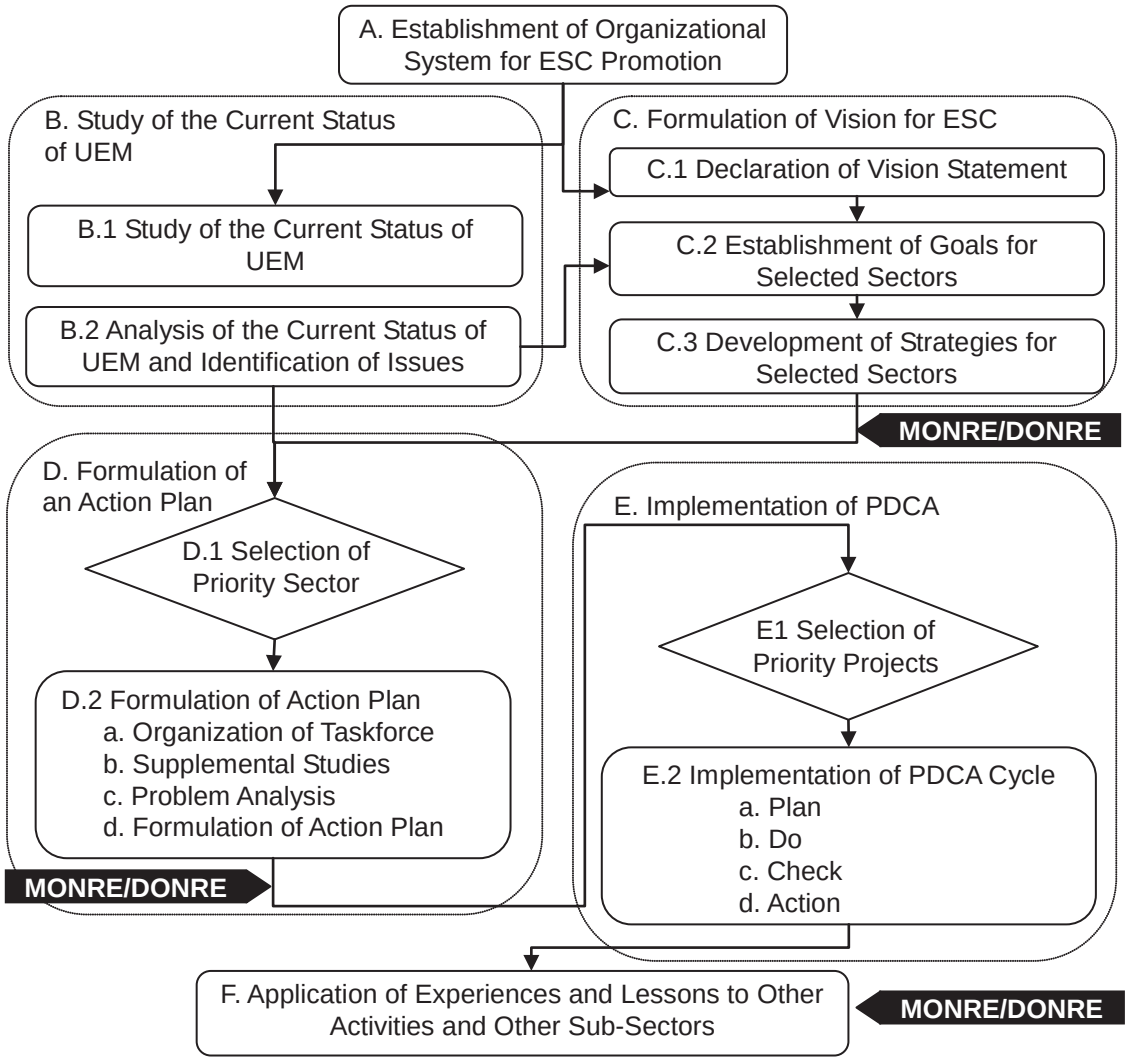
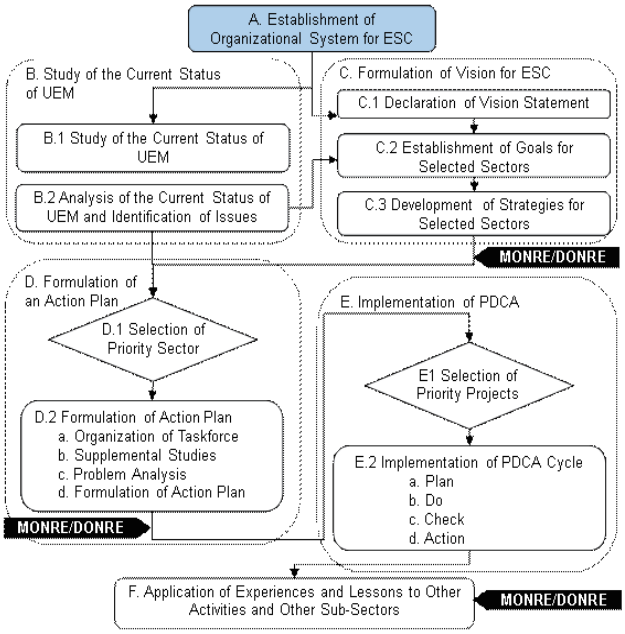


Figure 2: Process Flow for ESC

A. Establishment of Organizational System for ESC Promotion



ESC promotion necessitates the establishment of an organizational system for urban environmental management (UEM) of a city. UEM covers a wide range of environmental sub-sectors including natural resources preservation, pollution control and the management of socio-cultural activities, hence various governmental agencies and other stakeholders are concerned. ESC can not be promoted until a cooperative relationship is established among those concerned agencies and stakeholders.

In order to arrange such an organizational system for ESC promotion, it is advised to set up an ESC Unit under the DONRE of the city as a focal driver for ESC promotion at the provincial level. The ESC Unit of the DONRE will then develop a cooperative relationship between the concerned agencies and stakeholders and proceed the ESC promotion with their cooperation. There can be an ESC Unit in NREO (Natural Resources and Environment Office) as well in order to respond site specific issues at the district level. The figure below shows an expected organizational system for ESC promotion with the ESC Unit in the center.

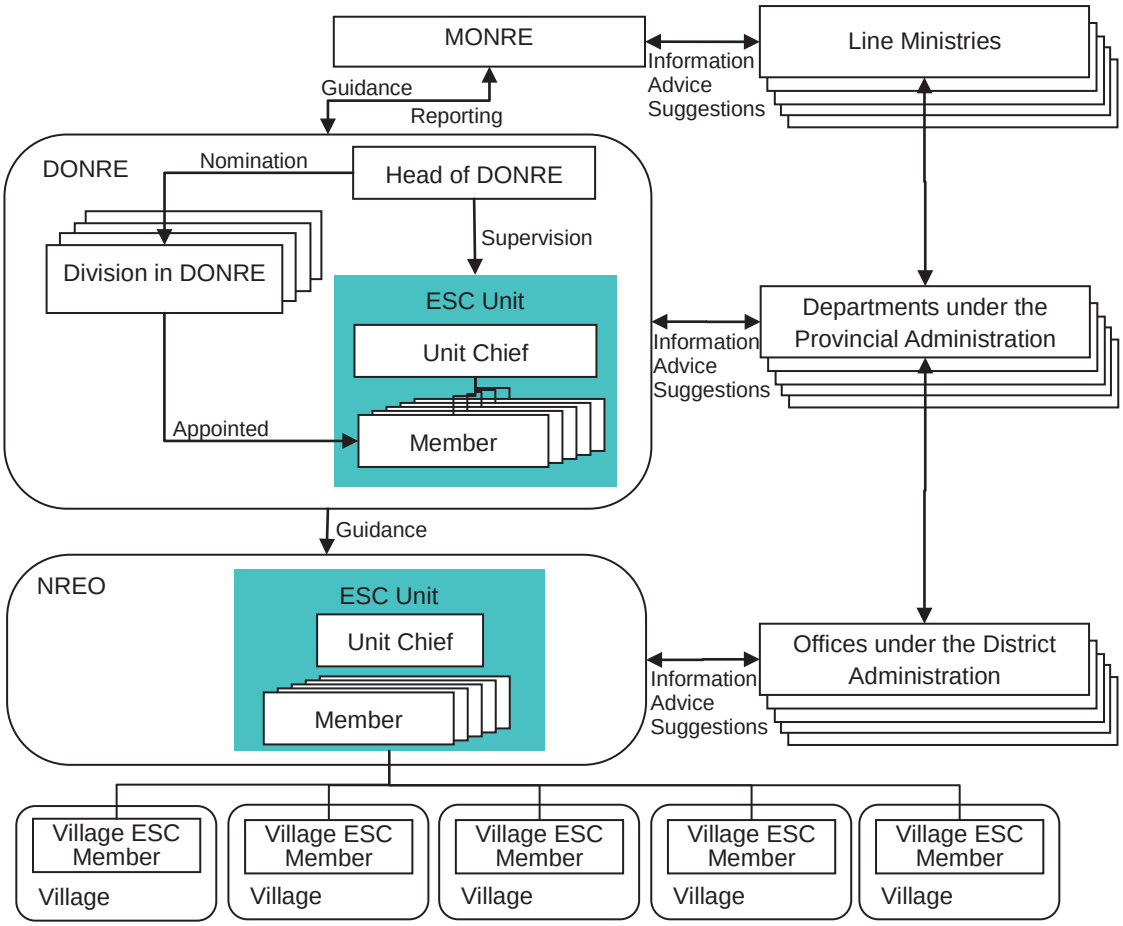
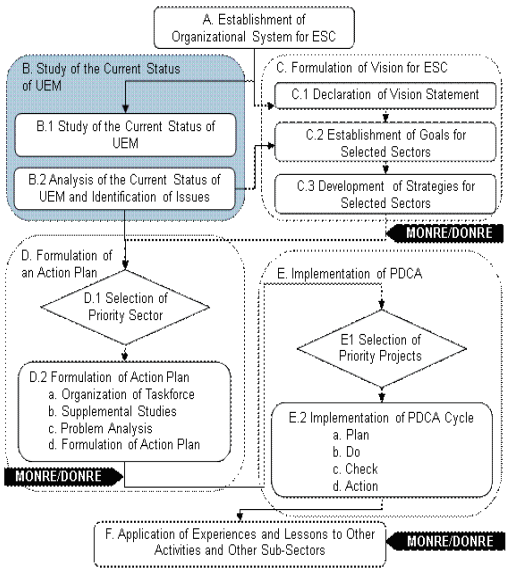


Figure 3: Organizational System for ESC Promotion

B. Study of the Current Status

B.1. Study of the Current Status of Urban Environmental Management (UEM)



Following the establishment of the organizational system, the current status of UEM will be studied.

Environmental sub-sectors to be studied are proposed as shown in the left column of Table 2-1. These sub-sectors are the integration of those used in the National Environmental Strategies of Laos and those that are used by JICA to

understand environmental conditions in an area of a certain development project prior to the environmental impact assessment. The UEM are divided into three areas namely social environment, natural environment and socio-living environment, and these are further divided into 12, 7 and 10 sub-sectors respectively, or 29 sub-sectors in total. Any environmental sub-sectors can be defined according to the local circumstances, but they should be wide enough at this early stage to get an appropriate and overall picture of the city.

The middle column of Table 2-1 shows types of information and data that are considered necessary in this study. Newly acquiring all these information and data can require heavy work force and high cost. Instead, the existing information and data possessed by different organizations should be collected and compiles as much as possible. The right column of Table 2-1 lists organizations that can be asked for information.

Table 2-1: Types of Information of UEM and Organizations to be asked for Information

Sub-sectors		Types of Information/Data	Organization
Social environment			
1	Local economy	1. Financial and economic index (GRDP (Gross regional domestic product), Budgets of local authorities) 2. Population (including migration) 3. Unemployment rate	MPI/ MICT
2	Land use	1. Current land use 2. Land use plan 3. Change of land use	MONRE/ DONRE
3	Traffic and road condition	1. Road network map 2. Road pavement rate 3. Traffic jam data 4. Route map of bus transportation	MPWT/MOPS
4	UEM policy implementation	1. 5-year environmental management action plan 2. Environmental management annual report 3. Implementation status of EIA	MONRE/ MPWT/ UDAA
5	Poverty	1. Poverty eradication strategy 2. Population /Household /Village in poverty	MPI
6	Ethnic people	1. Population/Rate of ethnic people by Village /District	MPI/MOES
7	Landscape	1. Landscape protection system 2. Landscape protection legislation	MOHA/MONRE/MPWT
8	Gender	1. Gender on education/job	Women's Union
9	Children's right	1. School enrollment ratio	MOES
10	Cultural heritage	1. Site, location and characteristics	MICT
11	Health	1. Location and types of medical institutions 2. Health indexes (under-five mortality rate, etc.)	MOH
12	Environmental awareness	1. Public opinion survey report	MONRE/MOES/MPWT

Natural environment			
1	Storm-water management	1. Records and reports of disasters caused by heavy rainfalls such as landslides, floods, etc.	MONRE/MPWT
2	Biodiversity	1. Flora, fauna (mammal, fish, bird, reptile, amphibian)	MONRE/ MOAF
3	Forest Resources	1. Conservation Forest/ Protection Forest/ Production Forest	MONRE/MOAF
4	Urban Green Area	1. Location, Area, Attraction	MONRE/MPWT/UDAA
5	Nature reserve	1. Value of protected area	MONRE/ MOAF/ MPWT
6	Global warming	1. Activities related to climate change	MONRE
7	Mineral resources development	1. Mining development records	MONRE/MOEM
Socio-living environment			
1	Air quality	1. Qualitative or quantitative monitoring data 2. Monitoring point 3. Public complaints 4. Results of vehicle emission inspection	MONRE/MOIC/ MPWT
2	Water quality	1. Qualitative or quantitative monitoring data 2. Monitoring point 3. Public complaints 4. Odor from water bodies 5. Stagnation in waterways	MONRE/MOIC/ MPWT
3	Safe drinking water	1. Service cover rate/area 2. Water purification facility	MOH/MPWT/NPPN
4	Sanitation	1. Percentage of population with adequate sanitation facility	MOH
5	Soil contamination	1. Measured result of chemical/ fertilizer	MOAF /MONRE
6	Solid waste management	1. Collection system 2. Collection service cover rate 3. Recycling system and activities 4. Treatment system (if exist) 5. Final disposal system 6. Hazardous waste management	UDAA/ MONRE
7	Noise/Vibration	1. Complaints from villagers 2. Result of measurement	MONRE/ MPWT/MOIC
8	Land subsidence	1. Groundwater utilization	MONRE/MPWT
9	Odor	1. Complaints from citizens	MONRE/MOIC
10	Accident	1. Number of cases/seriousness	MOPS/MPWT

B.2 Analysis of the Current Status of UEM and Identification of Issues

Using the basic information and data collected, the current status of UEM is analyzed and issues

are identified. A checklist shown below will be a useful reference in finding issues.

Table 2-2: Checklist for Finding Issues

Sub-sectors		Checklist	Reference
Social environment			
1	Local economy	1. Is the financial/ economic situation of the district or province (GRDP per capita, deficit of the budget, etc.) worse than the others? 2. Is the unemployment rate of the district or province worse than the others? 3. Is the population concentration in the urban area serious? 4. Is the population increasing?	1. Target GDP per capita in 2015: 1,700 US$ at 2011 price in 7th NSEDP[1] 2. Less than 2 % in Laos in 7th NSEDP
2	Land use	1. Is there a land use plan? 2. Is the land use regulated? 3. Is there illegally constructed building? 4. Are the green area and wetland decreasing?	
3	Traffic and road condition	1. Is the traffic seriously congested? 2. To what extent are the roads paved? 3. Do the main roads have safe sidewalks? 4. Is public transportation service adequately provided?	
4	UEM policy implementation	1. Is the implementation of the 5-year environmental management action plan properly monitored? 2. Is the achievement of environmental policy annually reported to the organizations at the higher level or governor? 3. Is the information on environmental conditions and environmental policy implementation available to the public? 4. Is the environmental impact assessment system adequately functioning?	
5	Poverty	1. What is the poverty indicator (road access, health care, education, income, or else)? 2. How many villages, households and people under the poverty line are there? 3. How is the prospect of solution? 4. Is the gap between the rich and the poor serious?	2. MDG[2] of Proportion of people under the poverty line in Laos: 24 % in 2015
6	Ethnic people	1. What is the ethnic composition? 2. Is there a race problem? 3. Are there any educational issues related to the race problem?	

[1] The Seventh National Socio-Economic Development Plan 2011-2015, Lao People's Democratic Republic, 2011

[2] 2015 target of the "Accelerating Progress Towards the MDGs, 15 September 2010" (MDGs)

		4. How is the prospect of solution?	
7	Landscape	1. Is the system (legislation, administrative system, etc.) to preserve the landscape established? 2. Is there consciousness among the people on landscape preservation? 3. Is the preservation of landscape addressed in strategies/action plans of the local authority? 4. Is an impact on landscape taken account of in development/construction projects? 5. Is there any built structure that affects landscape?	
8	Gender	1. Is there any gender discrimination concerned with literacy and education? 2. Are the activities of Women's Union effective? 3. What is the portion of women among the government staff?	1. MDG of number of girls per 100 boys enrolled in all the levels of education: 100 in 2015
9	Children's right	1. Can children go to school even in a remote area? 2. What is the percentage of children who cannot attend school?	2. MDG of net primary enrolment rate: 98% in 2015
10	Cultural heritage	1. Has the cultural heritage been conserved properly? 2. Is there an opportunity for a developer to consult with authorities about the conditions for development projects? 3. Is the communication between MPWT and MICT well developed?	
11	Health	1. What is the percentage of local population who has good access to primary health care? 2. Is the under-five mortality rate (per 1,000 live births) high? 3. How much is the measles immunization coverage among one-year-olds? 4. Is there a local action plan to improve the situation?	2. MDG of under-five mortality rate: 55 in 2015 3. MDG of proportion of one-year-old children immunized against measles: 90% in 2015
12	Environmental awareness	1. Is the environment preservation consciousness spread in people? 2. Are the communities paying attention to the maintenance of neighboring canals/waterways? 3. Are the open space/roadsides/other public places often subject to littering?	
Natural Environment			
1	Storm water management	1. Is there an area of slope failure or landslide? 2. What is the problem with rainwater drainage? 3. How often does flooding or submergence occur?	
2	Biodiversity	1. Are there any areas to be protected for the conservation of biodiversity? 2. Are there any areas to be paid attention prior to development?	

		3. How are important flora and fauna distributed and protected?	
3	Forest resources	1. Where are the Conservation Forest, Protection Forest and Production Forest designated at the national, provincial and district levels located? 2. Are they managed and monitored properly?	
4	Urban green area	1. Where are the areas of urban greenery? 2. How large are they? 3. Is the area large enough for the population?	Park area in Vientiane: 0.26m^2 per person[3]
5	Nature reserve	1. Where are the nature reserves? 2. How large are they? 3. How are they valued? 4. Are they managed and monitored properly?	
6	Global warming	1. Are there any impacts given by climate change such as abnormal draught and flood? 2. Is the significance of the climate change issue properly recognized? 3. Is the influence to climate change given by activities such as open waste dumping and forestry deterioration well understood? 4. Is a local action plan prepared and implemented?	
7	Mineral resources development	1. Are the mineral resources development projects properly registered? 2. Is the implementation of the environmental conservation activities such as acid wastewater treatment and mining residual disposal by the project proponents adequately monitored?	
Socio-living environment			
1	Air quality	1. Is air pollution serious? 2. Is air quality legally regulated? 3. Is air quality monitoring conducted in accordance with environmental standards? 4. Is the responsibility of air quality management clearly allocated? 5. Is there a plan for air quality improvement? 6. Is vehicle emission inspected? How is the result? 7. Are there many public complaints about air quality?	Agreement on national environmental standards No.2734 /PMO.WREA, 7 Dec 2009.
2	Water quality	1. Is water pollution serious? 2. Is water quality legally regulated? 3. Is water quality monitoring conducted in accordance with environmental standards? 4. Is the responsibility of water quality management clearly allocated? 5. Is there a plan for water quality improvement?	Agreement on national environmental standards No.2734 /PMO.WREA, 7 Dec 2009

[3] The Final Report of "the project for urban development master plan study in Vientiane Capital", JICA, 2011

		6. Are there many public complaints about water quality? 7. Is water stagnated in some part of canals?	
3	Safe drinking water	1. What is the percentage of population covered by water supply system? 2. How is the quality of tap water? 3. How is the quality of drinking water in remote areas? 4. What is the percentage of population without access to safe drinking water?	4. Proportion of population using an improved drinking water source in 2010[4]: Urban: 77% Rural: 62%
4	Sanitation	1. What is the percentage of population with adequate sanitation facility? 2. Is the installation of septic tanks or other domestic wastewater treatment facilities regulated in urban areas? 3. Are the physical structures of those facilities regulated? 4. Do people remove septage regularly from their septic tanks?	1. Proportion of population using an improved sanitation facility in 2010: Urban: 89% Rural: 50%
5	Soil contamination	1. Is the import of pesticide and chemical fertilizer properly controlled? 2. Is the proper use of pesticide instructed by the local authority? 3. Are the residual pesticides analyzed? 4. Are there any cases of influences to public health reported?	
6	Solid waste management	1. What is the percentage of population covered by waste collection service? 2. How much is the waste recycled? 3. Is the boundary of final disposal site designated? 4. Is waste covered by earth after disposed of? 5. How is the infectious health care waste treated? 6. How is the septage treated?	1. Waste collection coverage rate in area with collection service (population basis)[5]: VTE: 38% LPB: 92% XYB: 39%
7	Noise/vibration	1. Is noise/vibration causing a serious problem? 2. Is noise/vibration legally regulated? 3. Is noise/vibration monitoring conducted in accordance with environmental standards? 4. Is the responsibility of noise/vibration control clearly allocated?	Agreement on national environmental standards No.2734 /PMO.WREA, 7 Dec 2009
8	Land subsidence	1. Is the groundwater pumped at a large scale causing land subsidence? 2. Are there complains about land subsidence raised by the local people?	
9	Odor	1. Are there many public complaints about odor	

[4] "Progress on Drinking Water and Sanitation, 2012 Updates" by UNICEF and WHO
[5] Survey on waste collection service by LPPE in 2011

		problems? 2. Are there any factories emitting offensive odor?	
10	Accident	1. Is there statistics record of traffic accident? 2. Is traffic safety awareness campaign regularly carried out? 3. Are any countermeasures to reduce traffic accidents carried out? 4. Are there any other security problems than traffic accidents?	

Based on the table above, the issues of the UEM are identified and the important environmental sub-sectors that need to be improved are selected. An example of this operation is shown in Table 2-3.

Table 2-3: Identification of Issues and Selection of Important Environmental Sub-Sectors
(Example in the Case of Vientiane Capital)

Sub-sectors			Description of Issues to be Concerned
Social environment			
1	Local economy	✔	Increase of population should be controlled.
2	Land use	✔	Land use should be appropriately monitored and controlled according to instruction of DPWT, DONRE
3	Traffic and road condition	✔	Environmentally sustainable transport should be promoted.
4	UEM policy implementation	✔	The capacity development of staff concerned with UEM is necessary although local decision-making institution have been changed for better in accordance with the government policy.
5	Poverty	✔	Poverty eradication should be promoted according to National Growth and Poverty Eradication Strategy.
6	Ethnic people	−	In VTE Capital, ethnic group, Lao, dominates with about 93% of the total population and there is little problem specifically concerned with ethnic people.
7	Landscape	✔	Urban landscape should be maintained for citizens. Beautiful landscape like water fall should be conserved for urban environment.
8	Gender	−	Awareness activity for gender has been conducted nationwide by Women's Union
9	Children's right	−	Children's right is guaranteed by law and most of all children can go to primary school.
10	Cultural heritage	✔	Cultural heritage should be surveyed prior to alteration of the land preserved for cultural and

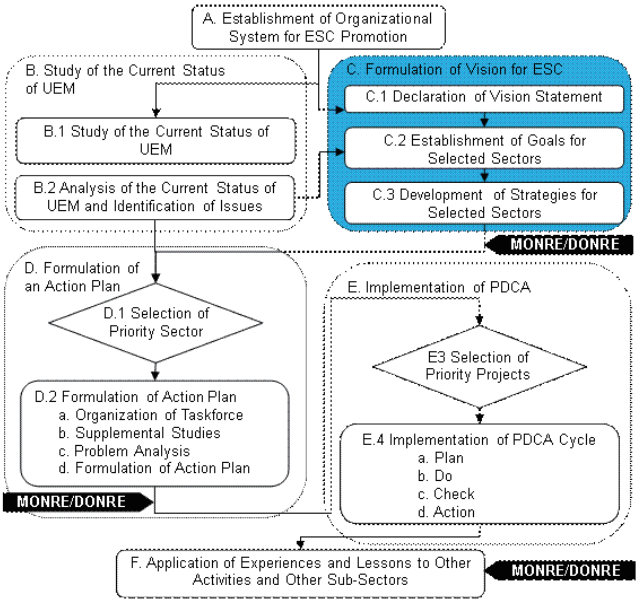
			historical resources.
11	Health	✔	Among nine districts, three districts from the western area, have a higher patient rate between 40% and 50% for the children who are under 5 years of age.
12	Environmental awareness	✔	Waste littering can be found in public areas. People do not have sufficient information and knowledge about the cause and effect of environmental problems.
Natural Environment			
1	Storm-water management	✔	The drainage condition shows improvement year by year, but there are still problems of water clogging and stagnation.
2	Biodiversity	✔	National, Provincial and District Biodiversity Conservation Area should be monitored regularly by relevant agency not to be developed haphazardly.
3	Forest resources	✔	Conservation forest and protection forest should be monitored so that illegal logging cannot be conducted.
4	Urban green area	✔	Urban green area like parks should be increased and conserved for citizens in VTE Capital.
5	Nature reserve	✔	That Luang Marsh is the largest wetland in VTE Capital. It is precious natural resources and also provides local people with economic benefits of aquatic resources, drainage system, flood protection and purification of wastewater. However, it is under increasing threat of loss and deterioration. Conservation should be considered.
6	Global warming	✔	Activity giving impact on global warming is required to be reduced.
7	Mineral resources development	✔	All mineral resources development should be well monitor properly in accordance with the policies and regulation such as National Environmental standard(NES)
Socio-Living Environment			
1	Air Quality	✔	Air pollution is not yet very serious, but negative effect given by mobile sources (vehicles) is emerging. Air quality monitoring and vehicle emission inspection are not insufficiently done.
2	Water Quality	✔	The water quality of canals which flow through the urban area is getting worse. Water quality monitoring is not sufficient in terms of both hardware (equipment and facility) and software (human resources and institutional system).

3	Safe Drinking Water	−	According to the national policy for water supply, service ratio will be 100% in urban area and 90% in rural area by 2015, and moreover the whole area of VTE Capital will be covered with water supply service by 2020.
4	Sanitation	✔	Wastewater is discharged to natural water body without adequate treatment.
5	Soil Contamination	✔	Chemical fertilizer and pesticide should be managed in accordance with the Regulation.
6	Solid Waste Management	✔	Sanitary landfill and 3R (Reduce, Reuse and Recycle) should be promoted.
7	Noise/Vibration	✔	Noise problem is not yet serious but problems due to vehicles are emerging in some limited area in the urban area. The noise monitoring system should be established.
8	Land Subsidence	✔	To monitor the mineral exploitation which's cause of land subsidence especially potassium mining project.
9	Odor	✔	To monitor all factories whose produce bad smell as affect surrounding communities such as slaughterhouse, animal farm, beer sludge treatment facility and so on.
10	Accident	✔	Traffic accidents have been increasing year by year according to increase of vehicles and motorcycles.

✔: Selected sub-sectors considered important for the improvement of urban environment

C. Formulation of Vision for ESC

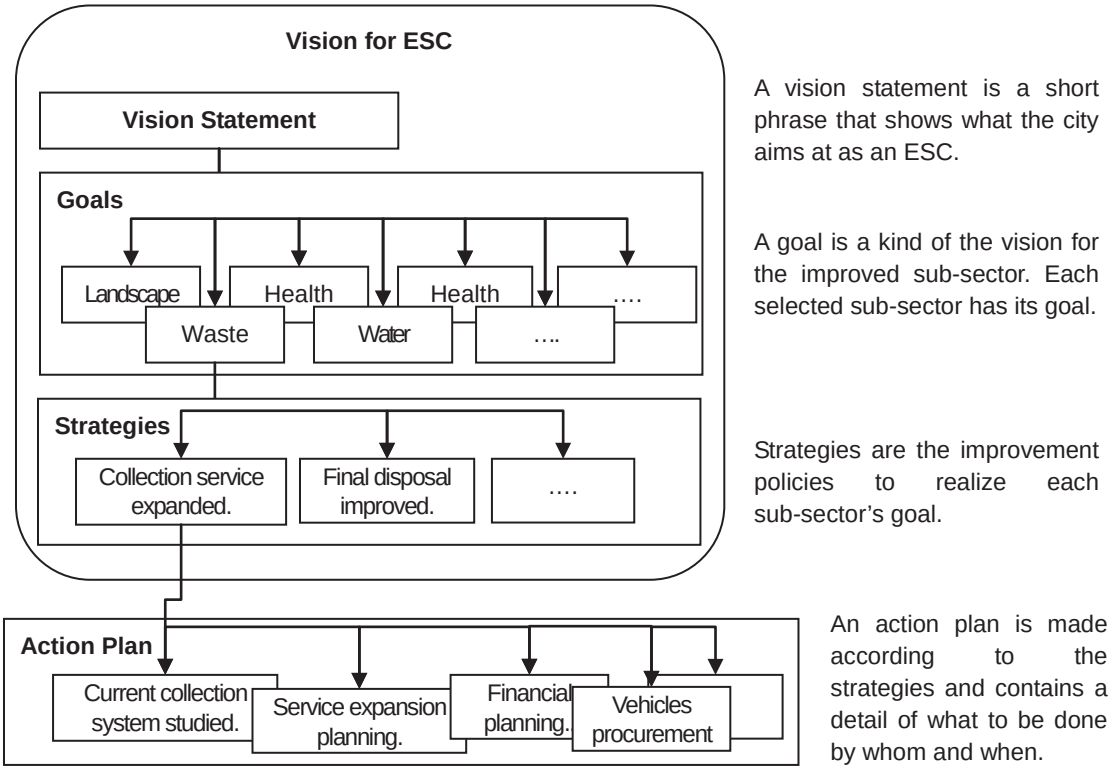
The process of vision formulation includes three steps: setting a vision statement, setting goals towards the vision statement, or expected future status, for each of the important environmental sub-sectors and further setting strategies to achieve the goals for the sub-sectors.



The relationship between the vision statement, goals, and strategies is illustrated in the figure below. The figure

also shows the relationship between the strategies and action plans, which are to

be described in Section D.



A vision statement is a short phrase that shows what the city aims at as an ESC.

A goal is a kind of the vision for the improved sub-sector. Each selected sub-sector has its goal.

Strategies are the improvement policies to realize each sub-sector's goal.

An action plan is made according to the strategies and contains a detail of what to be done by whom and when.

Figure 4: Relationship between Vision for ESC and Action Plan

C.1 Declaration of Vision Statement

A vision is a simple and clear message to express an ultimate goal as an ESC. It must fully reflect the fundamental characteristics, advantages and disadvantages of the city and must be understood and agreed by as many stakeholders as possible.

Accordingly, this process of vision setting should invite maximum stakeholders for building consensus. The vision for development and the environment of Luang Prabang is shown below as an example.

Example: The Vision for Environmentally Sustainable Luang Prabang

Develop Luang Prabang to be green, clean, and prosperous living harmony with environment preservation and world heritage sustainability forever.

C.2 Establishment of Goals for Selected Sectors

The city can approach to the vision by improving each of the environmental sub-sectors in such a way as to go along with the vision. It is therefore necessary to set a goal of improvement for each of the important environmental sub-sectors towards the vision. This process follows the steps below.

1. Using the result of the study on the current status of UEM, issues are found for all the environmental sub-sectors, and important sub-sectors to be improved are selected.

2. The target year of the improvement is defined. It will be 5-10 years ahead the present.

3. Based on the issues found, a goal of improvement by the target year is determined for each of the important sub-sectors. The goals of the sub-sectors should express the expected condition to be realized by the target year and support the vision that has been set.

The goal of the solid waste management sector of Luang Prabang is shown below as an example.

Example: The goal of the solid waste management sector of Luang Prabang toward the vision

A sound solid waste management system is established in harmony with the city environment.

C.3 Development of Strategies for Selected Sectors

The achievement of the goals of the sub-sectors cannot be straightforward as each sub-sector contains a number of components with different causes and symptoms. Therefore, it requires a set of several strategies according to the problem components. The strategies to be set at this stage will be rather simple and general since they are based on the findings of existing data and information obtained in the UEM study. But they should be set to cover all the basic requirements just enough to achieve the goal. It is recommended to clarify what the goal implies, to develop images of expected future conditions and to rephrase the goal using several practical terms.

The strategies for solid waste management improvement of Luang Prabang are shown below as an example.

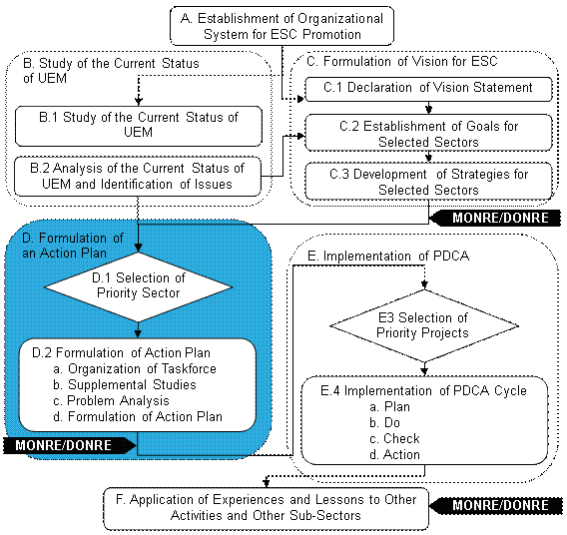
Example: The strategies for solid waste management improvement of Luang Prabang

- In order to lighten the load of solid waste collection and final disposal and to protect the environment, ”3Rs” are promoted at generation sources.
- Waste collection system is improved through the strengthening of collection service capacity and enhancement of public cooperation.
- Final disposal system is improved to mitigate adverse impacts on the surrounding areas.
- Healthcare waste management is improved.
- The governmental agencies, the private sector, the waste business operators and the local citizens evenly bear the responsibility.

When the Vision containing a vision statement, sectoral goals and strategies were concluded, the ESC unit should consult MONRE/DONRE. PCD makes sure that the Vision is in consistent with its policy direction to Clean, Green, Beautiful Laos.

D. Formulation of Action Plan

An action plan is formulated to practically describe the strategy set out in the previous section. It contains the following elements.



1. Approach: It shows the methodology to materialize the strategy which aims at the sub-sectorial goal. It is, therefore, said to be a detailed strategy.

2. Project: It shows what to be done to take the aforementioned approach. It contains specific projects necessary to actually implement the detailed strategy.

3. Activity: It shows what kinds of specific actions to be done to take the project. Each project contains specific activities.

4. Allocation of roles: For every activity, an organization responsible for implementation, another organization that assists implementation and other organizations to be collaborated in implementation are specified and their roles are defined.

5. Time schedule: A time schedule of each activity will be drawn.

6. Cost estimation: Cost required to implement each activity will be approximated and which financial sources are available and how to approach them will be shown.

D.1 Selection of Priority Sector

As the content of the action plan shows as above, action plan formulation requires technical knowledge and judgment of a certain level. This means that if a city does not have such experts but is to pursue the ESC, it is advised to recruit experts with sufficient qualification.

Also, action plan formulation will require in-depth understanding of the current situation in each of the sub-sectors concerned. This is because the goals and strategies set out up to this stage were based only on the UEM study and analysis conducted in Section B, which mostly relied on existing but limited data and information. The city, therefore, will need to prepare budget for necessary supplemental studies.

Accordingly, action plan formulation of each of the sub-sectors entails a certain amount of time and input. Due to the restriction of time and input available to the cities, the ESC Unit under the

DONRE is advised to prioritize the sub-sectors for which action plans are to be formulated taking the Vision for ESC of the city into consideration. The ESC Unit will then need to organize a selection committee that consists of representatives from organizations relevant to UEM and select priority sub-sector(s).

D.2 Formulation of Action Plan

D.2.1. Organization of Taskforce

The action plan of the priority sub-sector must clarify which organizations carry out which implementation activities from when and how. Such task must start with detailed understanding of current conditions and important issues of the sub-sector through supplemental studies. Therefore, prior to action plan formulation, the ESC Unit is recommended to organize a taskforce for action plan formulation, which consists of representatives of organizations relevant to the sub-sector and experts.

D.2.2. Implementation of Supplemental Studies

The first question for the taskforce is whether the supplemental studies are needed for action plan formulation. Then if the answer is yes, an implementation organization, methodology and time schedule must be determined. The taskforce further has to secure the necessary input (cost and manpower), and the studies are to be carried out. Examples of the types of supplemental studies are shown below.

Example: The types of supplemental studies required for sub-sectors.

Sub-sector	Types of Supplemental Studies
Landscape	Study of current land use, study of land use transition
Solid waste management	Waste amount and composition study, final disposal amount study
Water quality	Study of water quality, study of pollution loads

D.2.3. Problem Analysis

Result of the supplemental studies will be analyzed to identify the current problems and their structures. Proper understanding of the problems is significantly effective to construct an appropriate and feasible plan for improvement. Also, the strategies, which were set out based on the existing data and information available at the time of the UEM study, may need to be modified by using the results of the supplemental studies.

In the case of Luang Prabang, specific problems related to Strategy 1 were identified in the supplemental study. They are shown below.

Problems related to Strategy 1 for Luang Prabang, which were found in the results of waste amount and composition survey, and recycling system and collection coverage study:

- Small recycling rate: Only 4.4% of the total waste generation is recycled. The waste recycled at households is only 1.5%.
- Large portion of kitchen and garden waste: Kitchen waste and garden waste, both of which are organic and compostable, account for as much as 69% of waste generated at households.
- Insufficient coverage of waste collection service: As much as 29% of waste is disposed of by households (self-disposal). This indicates insufficient coverage of waste collection service. However, the areas with high self-disposal rate are mostly located in the remote suburban area with poor access. Therefore, the collection service for those areas will be more costly than other areas already receiving collection service.

In addition, similar problems in water environment of Vientiane Capital are summarized below.

Problems related to one of the Strategy for establishment of step-wise wastewater improvement plan in Vientiane Capital, which were found in the results of “the study on improvement of water environment in Vientiane city.”

- Combined open sewer systems: Existing system of conveying the wastewater is two major canal networks, namely Hong Xeng and Hong Ke. They are so-called combined open sewer systems, which convey mainly wastewater in the dry season, and convey rainwater and wastewater together in the wet season.
- Domestic wastewater as a dominant source of water pollution: In the canal system, pollution loads of domestic water use origin are dominant sources, which account for more than 50 % of total pollution loads.
- Surviving aquatic lives in the river system including canal network: In the rainy season, various fishes could be found even in the canal water.
- Issues of modern centralized sewerage network: If a modern centralized sewerage system is adopted for installation with pipe network, the existing canal will be dried up in the entire year only excluding the raining period in the wet due to no natural watersheds in most of the canal systems.

- How harmonize engineering intervention with surviving natural environment: Possibilities to restore the damaged water environment have been getting less and less as time passes. Water quality of surface water in the canal system has been getting worse so far as well as environment of canal system itself such as accumulation of sludge on the canal bad and offensive odor from the canal.

D.2.4. Formulation of Action Plan

It should be also noted that in action plan formulation, some kinds of improvement projects require further detailed studies, or often called "feasibility studies (F/S)" for planning. While the supplemental study covers sector-wide issues, the scope of the F/S is, in general, limited to the development of a specific facility and/or infrastructure. The following is an example of the F/S and its content.

Example: F/S for water environment improvement works in the canal systems of Vientiane Capital

The F/S will include:

- Formulation of water environment improvement plan in the existing drainage canal networks through selection of appropriate countermeasures in accordance with particular conditions of individual canal.
- Preparation of preliminary drawings of the proposed countermeasures and their cost estimation.
- Formulation of step-wise implementation plan of the proposed plan.
- The examination of economic viability of the proposed plan.
- Environmental impact assessment for the proposed plan.

Taking all the findings and analysis into consideration, an action plan is formulated for each of the strategies of the priority sub-sector.

Examples of the action plans for Strategy 1 for solid waste management (SWM) in Luang Prabang and Strategy 4 for water environment management (WEM) in Vientiane Capital are shown below.

Table 2-4: Action Plan (An Example in Case of Strategy 1 for SWM in Luang Prabang)

Items	Content			
Strategy	In order to lighten the load of solid waste collection and final disposal and to protect the environment, "3Rs" are promoted.			
Problems identified	• Only 4.4% of the total waste generation is recycled. The waste recycled at households is only 1.5%. • Kitchen waste and garden waste, both of which are organic and compostable, account for as much as 69% of waste generated at households. • As much as 29% of waste is disposed of by households (self-disposal), but providing collection services to the areas with high self-disposal rate is costly.			
Approach	1.1 "3Rs" are promoted at on-site to reduce waste generation amount.			1.2 Recycling is promoted at off-site by composting
Projects	1.1.1. Reduction of kitchen waste and garden waste at households	1.1.2. Recyclable waste separation at generation sources. (Note 1)	1.1.3 Avoidance of the use of excess packages such as plastic shopping bags. (Note 2)	1.2.1. Reduction of kitchen waste from hotels and restaurants
Activities	Act 1. Project Planning Act 2. Planning of Pilot Project (PP) Act 3. Implementation of PP Act 4. Dissemination of PP	Act 1. Project Planning Act 2. Planning of Pilot Project (PP) Act 3. Implementation of PP Act 4. Dissemination of PP	Act 1. Project Planning Act 2. Planning of Pilot Project (PP) Act 3. Implementation of PP Act 4. Dissemination of PP	Act 1. Project Planning Act 2. Planning of Pilot Project (PP) Act 3. Implementation of PP Act 4. Dissemination of PP
Allocation of roles	Act 1. DONRE, UDAA Act 2. DONRE, UDAA Act 3. DONRE, UDAA Act 4. DONRE, UDAA	Act 1. DONRE, UDAA Act 2. DONRE, UDAA Act 3. DONRE, UDAA Act 4. DONRE, UDAA	Act 1. DONRE, UDAA Act 2. DONRE, UDAA Act 3. DONRE, UDAA Act 4. DONRE, UDAA	Act 1. DONRE, UDAA Act 2. DONRE, UDAA Act 3. DONRE, UDAA Act 4. DONRE, UDAA
Time schedule	Act 1. By June 2012 Act 2. By June 2013 Act 3. By October 2015 Act 4. November 2015 to 2020	Act 1. By July 2014 Act 2. By September 2014 Act 3. By October 2015 Act 4. November 2015 to 2020	Act 1. By June 2012 Act 2. By June 2013 Act 3. By October 2015 Act 4. November 2015 to 2020	Act 1. By June 2012 Act 2. By October 2013 Act 3. By October 2015 Act 4. November 2015 to 2020
Cost	• Investment cost born by LPPE • Part of education & monitoring cost born by DONRE & UDAA	• Investment cost born by LPPE • Part of education & monitoring cost born by DONRE & UDAA	• Investment cost born by LPPE • Part of education & monitoring cost born by DONRE & UDAA	• Investment cost born by LPPE • Part of education & monitoring cost born by DONRE & UDAA • Operation cost born by UDAA

Note 1: "Recyclable waste separation at generation sources" PP is divided into two PPs, i.e. "Waste separation project" and "School recycling project". "Waste separation project" is integrated in the "Primary Collection System Project" of Strategy 2.

Note 2: "Avoidance of the use of excess packages such as plastic shopping bags." PP is divided into two PPs, i.e. "Eco-basket project" and "Eco-bag project". In this table as for the Activities and Allocation of Roles both PPs are the same. But for the Time Schedule only "Eco-basket project" is presented.

Table 2-5: Action Plan (An Example in Case of Strategy 4 for WEM in Vientiane Capital)

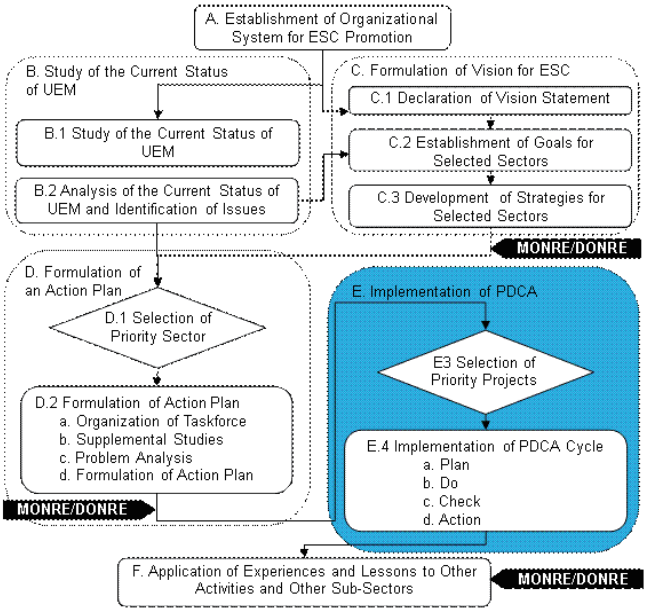
Items	**Content**		
Strategy	Step-wise wastewater improvement plan is established and implemented in accordance with characteristics of pollution sources.		
Problems identified	• Existing system of conveying the wastewater is two major canal networks, namely Hong Xeng and Hong Ke. They are so-called combined open sewer systems, which convey mainly wastewater in the dry season, and convey rainwater and wastewater together in the wet season. • In the canal system, pollution loads of domestic water use origin are dominant sources, which account for more than 50 % of total pollution loads. • In the rainy season, various fishes could be found even in the canal water. • If a modern centralized sewerage system is adopted for installation with pipe network, the existing canal will be dried up in the entire year only excluding the raining period in the wet due to no natural watersheds in most of the canal systems. • Possibilities to restore the damaged water environment have been getting less and less as time passes. Water quality of surface water in the canal system has been getting worse so far as well as environment of canal system itself such as accumulation of sludge on the canal bad and offensive odor from the canal.		
Approach	Water environmental improvement works is implemented in the existing drainage networks so as to provide resting places to the citizens by means of restoration of the environmentally-sound water front, preparation of habitats of aquatic lives, and construction of green corridors.		
Projects	1. Formulation of water environment improvement plan.	2. Detailed designing and construction of the facilities, and enhancement of people's awareness on water environment.	3. Evaluation of improvement effects of the facilities
Activities	• Study on present conditions of the existing canal network and selection of appropriate countermeasures against water quality deterioration. • Step-wise implementation plan following the above overall improvement plan	• Detailed design of the proposed facilities aiming at construction of the facilities. • Construction of the facilities for water environment improvement. • Conducting the participatory workshops and activities for water environment improvement.	• Sampling and testing water quality along the canal network. • Examination of the improvement effects of the facilities in water quality.

Allocation of roles	• Plan formulation: MPWT/ PTI/DPWT, MONRE/ DONRE	• Facility designing and construction works: MPWT/PTI/DPWT • Environmental education and awareness: PTI and DONRE	• Sampling and testing: MONRE • Evaluation: MPWT/ PTI/DPWT, MONRE/DONRE
Time frame with target indicator	• BOD of surface water in the canal network shall be below 10-12 mg/l even in the dry season by the year 2017.		
Cost	• Total cost: 18 million US$		

When the Action Plan was developed, the ESC unit should consult Pollution Control Department, MONRE. PCD makes sure that the Action Plan support the materializaion of the Vision in practical and realistic manner.

E. Implementation of PDCA Cycle

E.1 Selection of Priority Projects



As can be seen from the example above, the action plan tells that a wide range of activities should be carried out to achieve the goal of the sub-sector. Also, it shows that each of the activities necessitates appropriate role execution of different parties and allocation of required budget. Consequently, it can be very difficult to carry out all the activities in parallel.

The taskforce should therefore discuss to prioritize the activities in the action plan and select one or some of them to be "priority project(s)". The fundamental criteria to select priority projects will be whether the input (such as time, manpower, and budget) necessary for their implementation is secured.

E.2 Implementation of PDCA Cycle

E.2.1. Plan

A plan of the project implementation will include following components:

1. Target indicators (e.g. the rate of households who compost their organic waste at the target year) and timing of their monitoring.
2. Activities to be carried out and their sequential order
3. Allocation of roles: Name of appointed organization
4. Time schedule

The plan should be presented in such a format as to facilitate the implementation, monitoring and modification of the plan. The chart shown below is an example of the plan presentation in the case of a priority project of Strategy 1: 3Rs Promotion, Project of Reduction of kitchen waste and garden waste at households in Luang Prabang.

Planning Chart of the Priority Project

"Reduction of kitchen waste and garden waste at households"

Plan execution body: DONRE and UDAA

Target Indicators

The plan of the project is shown in the table below and the activities up to 2015 of LPPE are considered to be a pilot project (PP).

Area of PP: B. Vat Thaat, B. Pong Vane, B. Pakham (38 households, estimated 210 people)

Target of PP: The rate of the households that continue on-site compost to all the households that started on-site compost in all the pilot villages is 50%.

After the completion of the PP by LPPE, DONRE and UDAA shall disseminate the PP to other area of LPB based on the lessons learned from the PP.

Activities	Detailed Activities	Allocation of Roles	Time Schedule				
			2012	2013	2014	2015	2020
Project Planning	Set up project management system	DONRE, UDAA, SJET					
	Set up concept	DONRE, UDAA, SJET					
Planning of PP	Study and selection of pilot area	DONRE, UDAA, SJET					
	Study of composting method	SJET					
	Procurement of equipment	SJET					
	Preparation of education tools	DONRE, UDAA, SJET					
Implementation of PP	Delivery of equipment and instruction of method	DONRE, UDAA, SJET					
	Monitoring and awareness raising	DONRE, UDAA, SJET					
	Evaluation of the PP	DONRE, UDAA, SJET					
	Suggestion for dissemination	SJET					
Dissemination of PP	Planning of dissemination	DONRE, UDAA					
	Dissemination to other area	DONRE, UDAA					

Figure 5: Example of Planning Chart

E.2.2. Do

Referring to the planning chart, organizations appointed to each activities execute their works. The plan execution body should supervise and coordinate all the works and all the stakeholders involved according to the planning chart.

E.2.3. Check

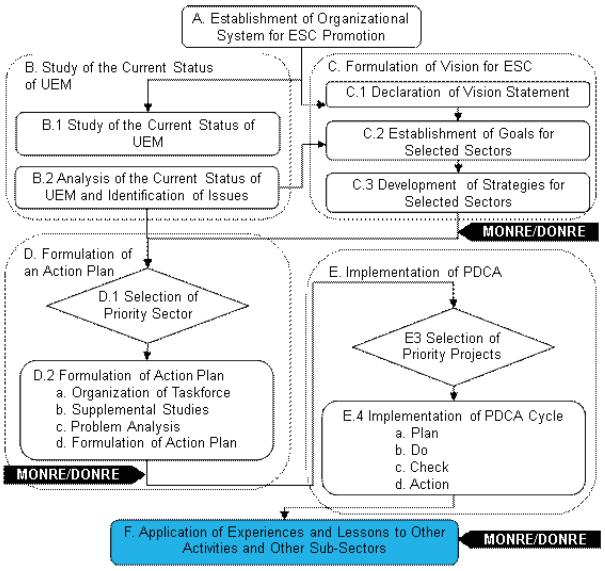
The plan execution body carries out the monitoring of target indicators at the time scheduled in the planning chart. It also needs to recognize the difficulties that are appearing as the project progresses. The causes of the obstacles or difficulties must be well understood in cooperation with relevant stakeholders to find out necessary measures to be taken.

E.2.4. Action

The taskforce, in collaboration with the plan execution body, examines the causes and countermeasures and modify the plan of the priority project. The modification may be required for the action plan if the priority project has to be drastically changed or even cancelled.

F. Application of Experiences and Lessons to Other Activities and Other Environmental Sub-sectors

The experience and lessons derived from the implementation of priority projects up to Process E should be applied to other new projects by (i) ESC Unit of DONRE and (ii) PCD. The application of experience and lessons by the ESC Unit of DONRE is to (i-1) other priority projects of the same sub-sector and (i-2) priority projects of other sub-sectors. The application of experience and lessons by PCD is practiced in (ii-1) the dissemination of ESC_GL and (ii-2) sharing good examples for the promotion of ESC in Lao PDR.



Contents of each application activity are as described below.

F.1. Application of Experiences and Lessons By ESC Unit of DONRE

The ESC Unit of DONRE applies the experiences and lessons obtained from the implementation of the priority project to the development of another priority project, which can be of the same sub-sector or other sub-sectors, by referring to the result of prioritization process carried out in D.1 and D.2.

F.1.1 Application to other priority projects of the same sub-sector

1. The priority projects implemented are evaluated.
2. From the results of the evaluation, the issues and problems of the sub-sector are

examined and proposals are made for the improvement of the issues and problems.
3. Based on the proposals, the A/P is revised and priority projects are selected.
4. Through Process E, the priority projects are selected, planned and implemented.

F.1.2 Application to other sub-sectors

1. Another priority sub-sector is selected.
2. From the results of the evaluation of the priority projects implemented, the applicable lessons to the newly selected sub-sector are examined and proposals are made for the improvement of the selected sub-sector.
3. Based on the proposals the A/P of the selected sub-sector is formulated.
4. Through Process E, priority projects are selected, planned and implemented.

F.2. Application of Experiences and Lessons By PCD

F.2.1 Dissemination of ESC_GL

The lessons learnt by the ESC Unit should be shared with PCD as the ESC Guidelines are alive, requiring feedbacks and reviews as follows.

1. During the application of the ESC_GL, the ESC Unit may find some issues such as unclear points and difficulties.
2. Those issues associated with ESC_GL application are reported to PCD.
3. PCD takes account of those issues in its activities of ESC_GL dissemination to promote the understanding by the local authorities.
4. If necessary, the ESC_GL is modified to be more useful and easy-to-understand.

F.2.2 Sharing good examples for promotion of ESC

Considering the current limitation of resources available for the local authorities, it is important for PCD to support them to promote ESC. One of the most important supporting works is to provide technical information useful for the promotion of ESC. The PCD acts as technical information hub, which collects and delivers technical information when it is required by the local authorities.

The technical information necessary for the local authorities to promote ESC is as follows:

1. Information on overall ESC promotion:
   This includes such information as the experiences of ESC unit formation and examples of visions for ESC. .It will be useful for the local authorities in the initiation stage.
2. Information on the improvement of sub-sectors:
   This includes, for example, procedures and methodologies of priority project selection of different sub-sectors and outputs produced through project implementation. It will be of help for the local authorities to conduct similar projects.

In case of LPPE, a lot of pilot projects have been implemented as priority projects of the SWM sector and produced the following important tools and examples as shown in the table below.

Table 2-6: Tools and Examples Collaborated by LPPE

Priority Projects	Tools and Examples
Strategy 1: 3Rs Promotion	
1.1 Reduction of kitchen waste and garden waste at households (On-site Composting)	• On-site composting leaflet • Worm composting dissemination video
1.2 Recyclable waste separation project at households	• Primary collection leaflet
1.3 School recycling project	• School recycling leaflet • School recycling dissemination video
1.4 Avoidance of the use of excess packages, Eco-basket project	• Eco-basket leaflet
1.5 Avoidance of the use of excess packages, Eco-bag project	• Eco-bag leaflet
1.6 Reduction of kitchen waste from hotels and restaurants	• Off-site composting education leaflet • Off-site composting dissemination video
Strategy 2: Collection System Improvement	
2.1 Improvement of exiting collection and discharge system, Primary collection system project	• Primary collection education leaflet
2.2 Waste collection service expansion	• Standard contract agreement of collection service
2.3 Waste collection service expansion by using 5m3 containers	• Contract agreement of collection service
Strategy 3: Final Disposal System Improvement	
3.1 Proper management of existing final disposal site	• Rules and penalty of KM32 disposal site users in VTE Capital • Rules of KM9 disposal site in XYB district
3.2 Proper management of waste pickers and improvement of their working conditions	• Rules of and penalty of KM32 disposal site waste pickers in VTE Capital • Rules of KM8 disposal site in LPB district • Rules of KM9 disposal site in XYB district
Strategy 4: HCWM Improvement	
4.1 HCW collection system establishment	• Contract agreement of separate collection service with MIs VUDAA in VTE Capital, UDAA in LPB district and in XYB district • Video for the proper HCW management
4.2 HCW treatment and disposal system establishment	

添付資料５．ESCガイドライン適用マニュアル（案）

Draft Manual for the Use of National Guidelines for Environmentally Sustainable Cities (ESC_GL) of Lao PDR

1. Introduction

This manual was prepared by PCD of MONRE in cooperation with JICA as an output of LPPE in order for PCD and DONRE to disseminate the ESC_GL and assist the local authorities (LAs) to step forward to ESC by using the ESC_GL. The user of the manual, in other words, the disseminator of the ESC_GL, is therefore mainly PCD and DONRE of each province.

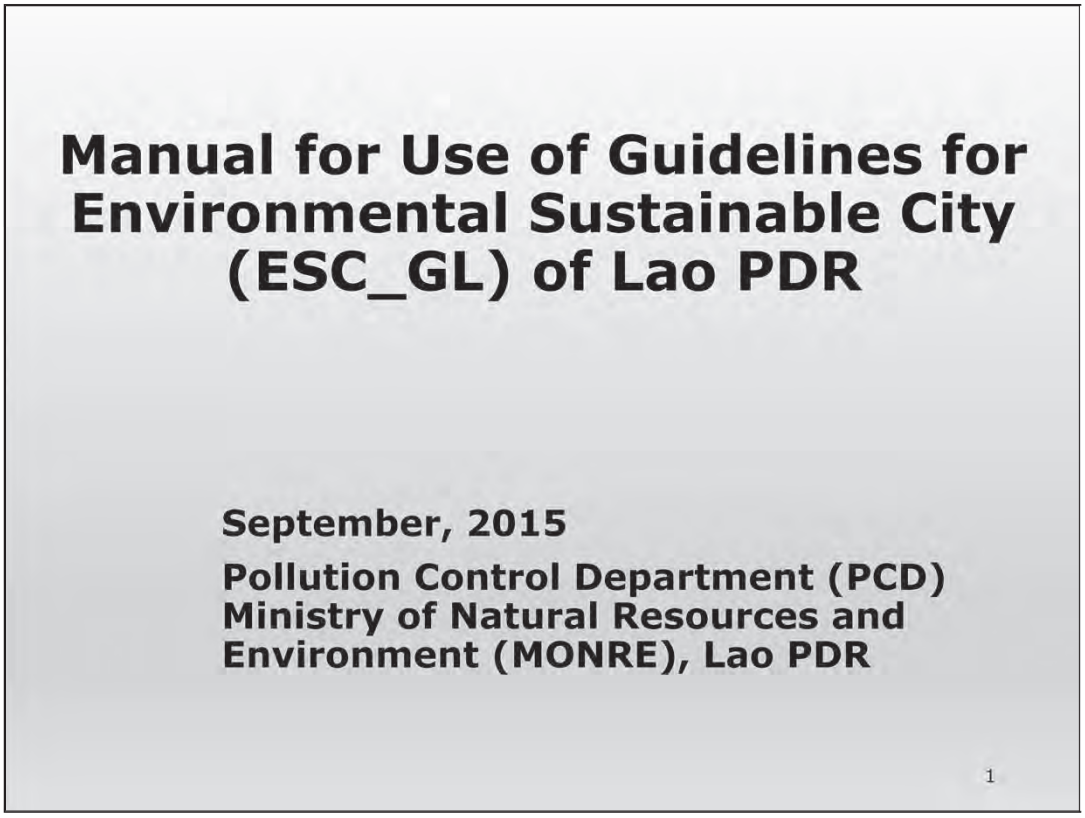
In order for PCD and DONRE to pursue the purpose, the manual is prepared in the form of Power Point Presentation (PPT). The PPT consists of the screens and notes. The user will show the screens to the LAs and explain them the contents of the guidelines by referring to the notes of the PPT.

Contents of the Manual

The contents of the manual are as follows:

Status of the Manual

The manual was first drafted in the beginning of August 2015. Since the ESC_GL was finalized on September 22 and the manual has to fully reflect the ESC_GL, 2015, it is not finalized yet as of the end of September. In addition PCD intends to carefully check the contents of the manual because the manual is very important tool for them to disseminate the ESC_GL to all the country. This manual is, therefore, still in the draft status.



This manual has been prepared by PCD of MONRE in cooperation with LPPE/JICA in order for local administrations to step forward to ESC by using the guidelines.

MONRE is the primary agency that is responsible to put the guidelines into force. Pollution Control Department (PCD) is the focal point.

Contents

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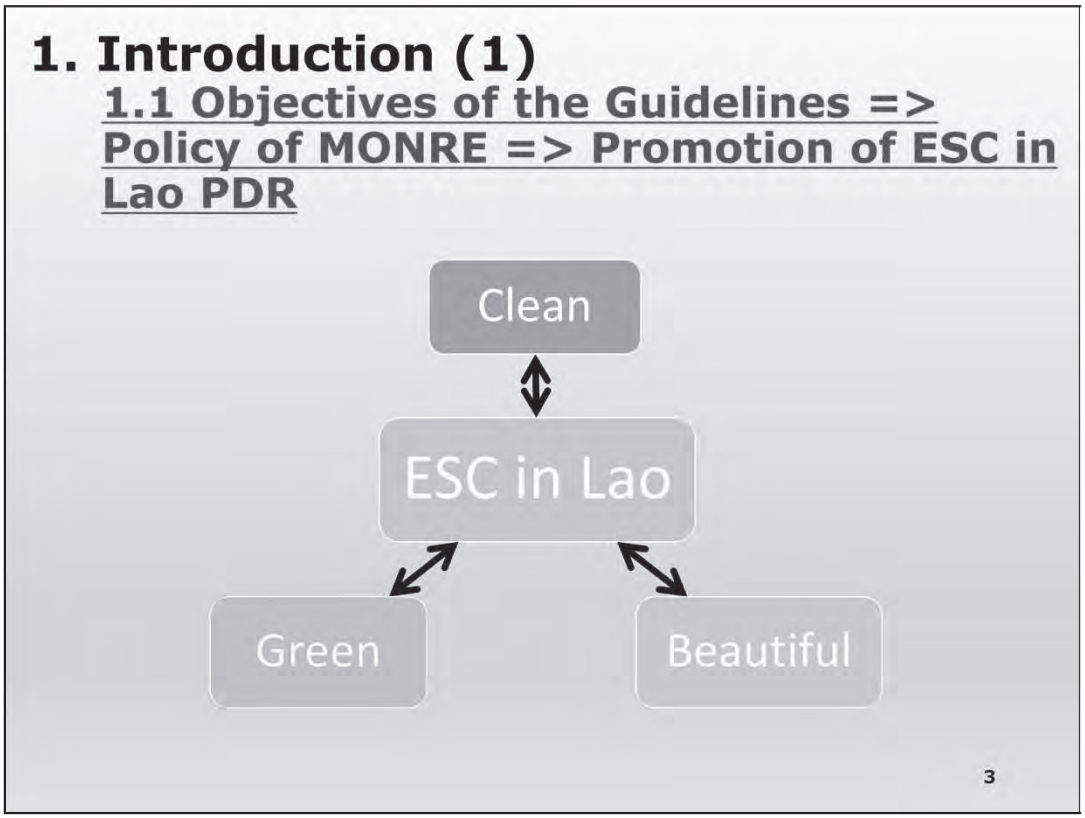
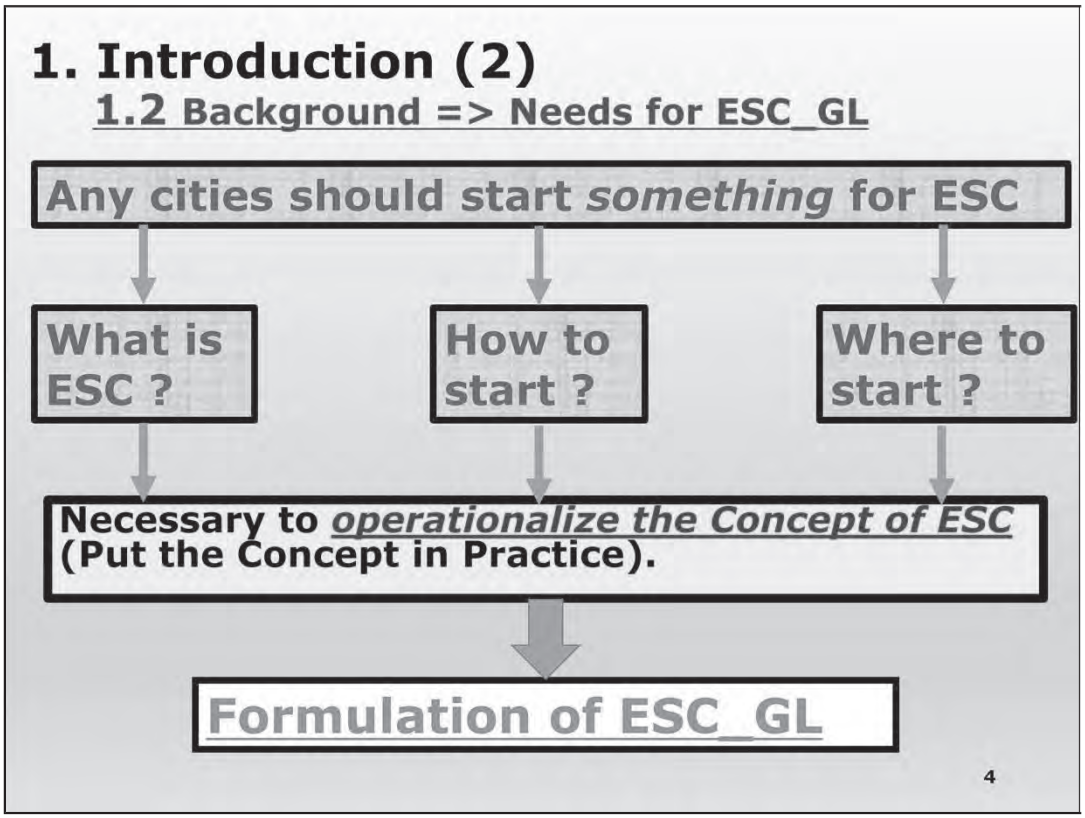


The objective of MONRE to publicize the guidelines is:

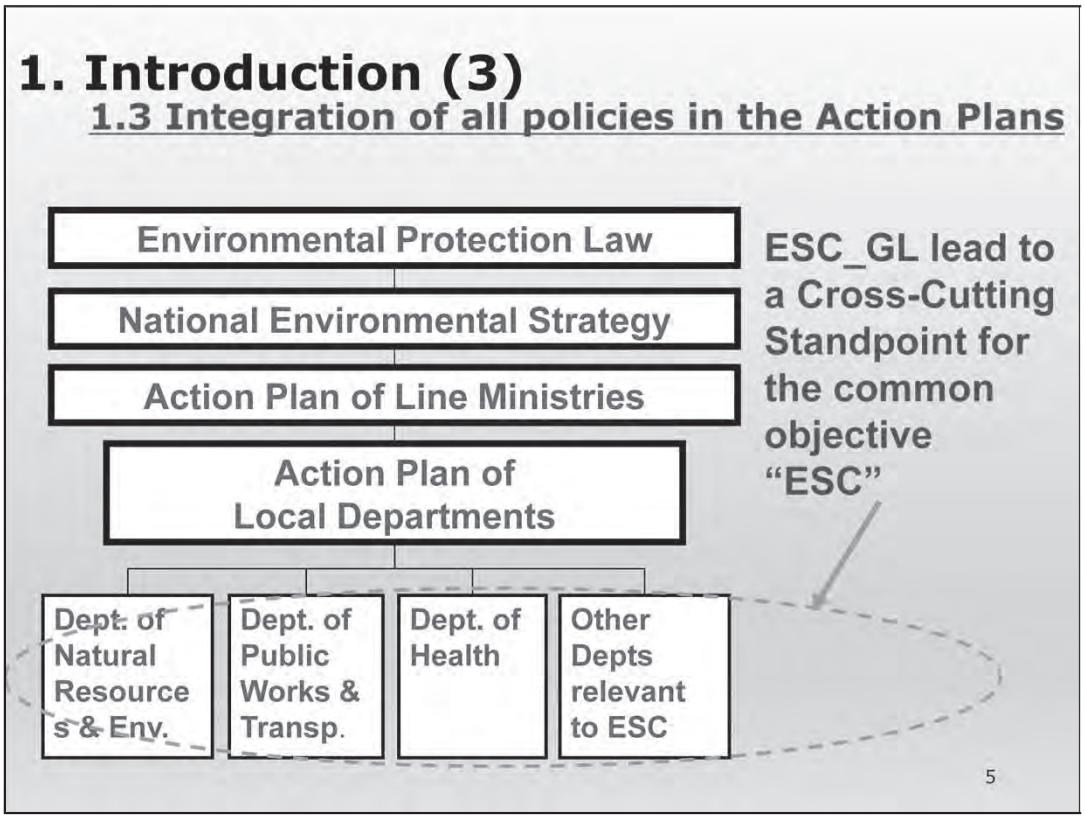
[To encourage the cities in Laos to be **clean, green and beautiful** so that they become environmentally sustainable without compromising the quality of living of the next generation.]

In this context, **"clean"** means clean air, clean water and clean land without any harm to the human health and eco-system, **"green"** means rich fauna and flora that provide joy of living, and **"beautiful"** means "clean and green" that bring happiness and comfort to the urban lives.



The cities, or urbanized area at any levels of local administration, have been threatened by the adverse effects caused by their nature as cities. Ensuring environmental sustainability is a challenge to urbanization, which is an ever-steadily visible worldwide trend. However, it is also believed to be a challenge that has to be started regardless of when, by whom or how. The guidelines aim to facilitate a solid, however small, step forward to this challenge.

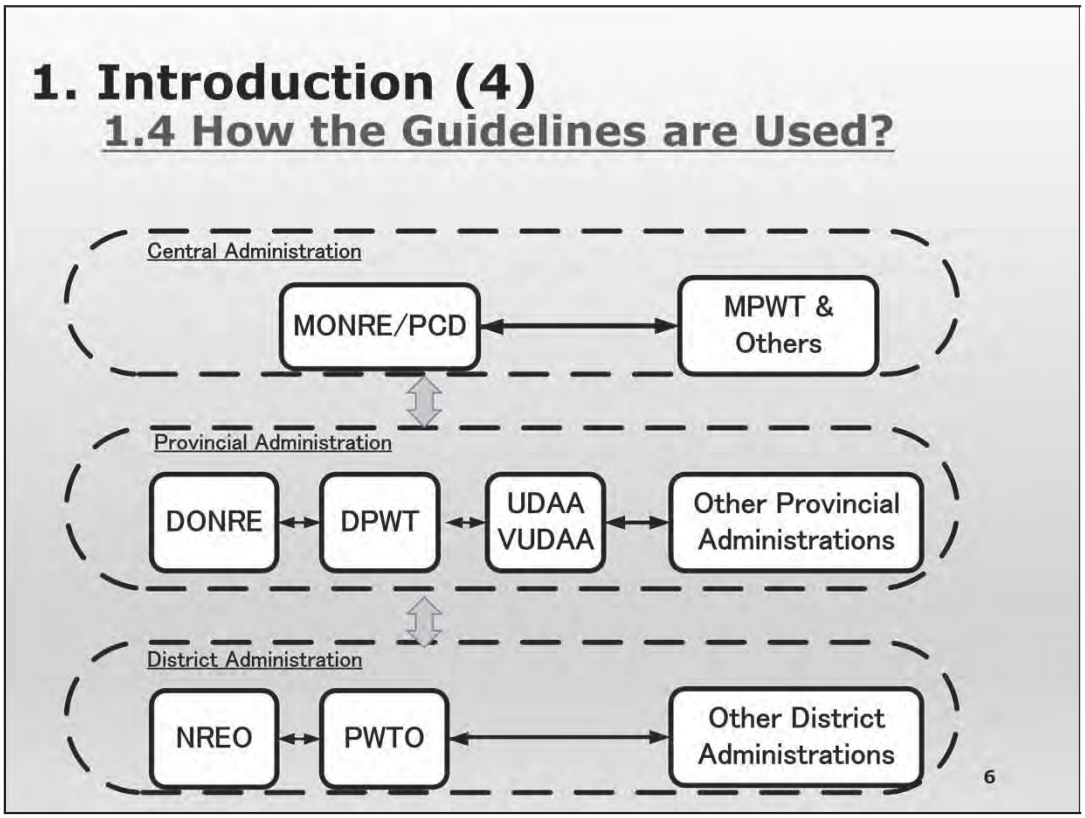
What the guidelines show is the only fundamental framework that is regarded as a widely applicable standard. Their application, however, can be flexible and lax according to the local physical, institutional and economic circumstances. The mainconcernliesinstartingwithsomething,keepinggoingand expandingit.The guidelineswillserveasamomentumtomakethishappen.



The Lao government first promulgated Environmental Protection Law in 1999. It has been serving a fundamental framework for all the environmental policies in the country and other relevant environmental laws and regulations have been emerged from the Law.

At the country level, there are National Environmental Strategy and National Environmental Action Plan. The current publication of the former is targeting the year of 2020, while the latter uses the same time frame with National Socio- Economic Development Plan, which is currently in the stage of 2011-2015. Each arm of the local authorities, both local departments under the line ministries and offices of local administrations, in turn develop their Action Plans in their jurisdiction.

The ESC Guidelines will be used to integrate all the policies in the Action Plans relevant to the urban environment and put them in order of sub-sectors. For example, an issue of solid waste management (SWM) may appear in both the Action Plans of Environmental Management and of Public Works and Transport. The application of the ESC Guidelines will refurbish those Action Plans from a distinct view point of SWM and to create an independent SWM plan.
Furthermore, the ESC Guidelines will facilitate the appointment of responsibilities, consensus building, and practical implementation of even a small step forward.



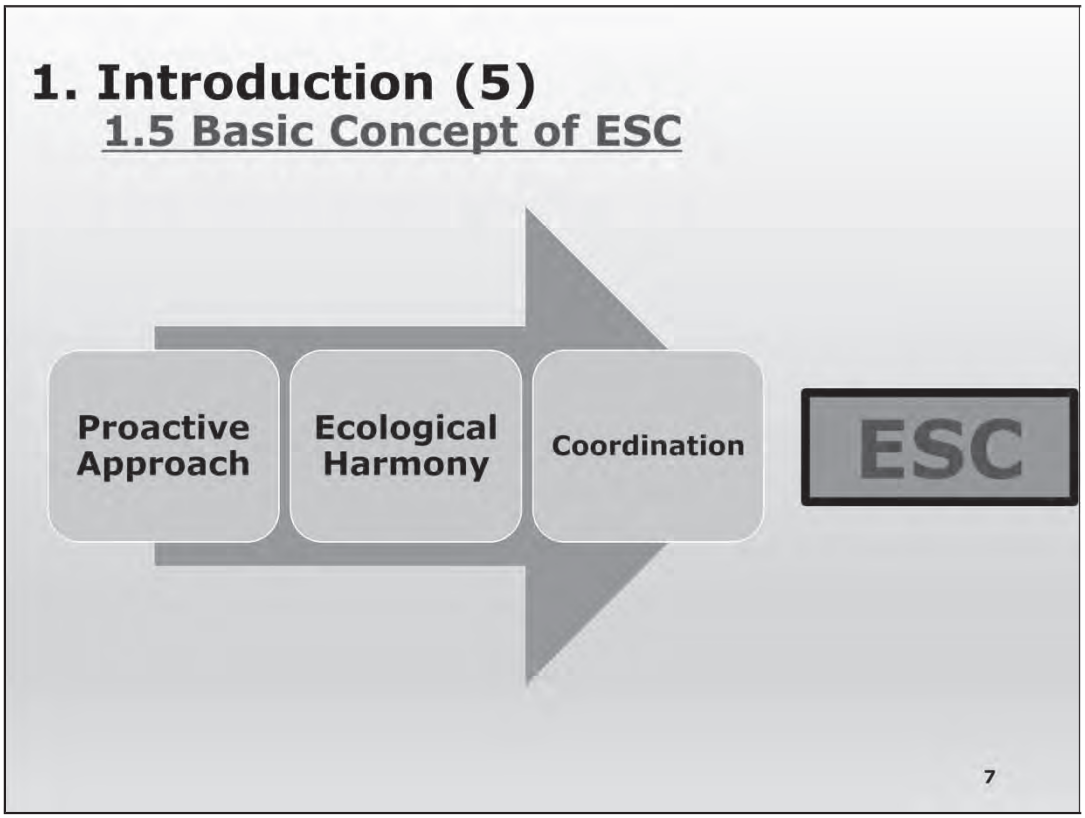
MONRE is the primary agency that is responsible to put the guidelines into force. Pollution Control Department (PCD) is the focal point.

PCD will build an effective network at the national level involving relevant agencies, among which Department of Housing and Urban Planning, Ministry of Public Works and Transport will be the most relevant.

PCD of MONRE applies the guidelines as a policy tool for Clean Green Beautiful Laos, in directinglocalauthoritiestotake step-by-stepactions. PCD gives an initial momentum to the local authorities, assists their attempts to be on a right track, and elaborates the guidelines to be more applicable and usable.

The local authorities can be referred to various organizations related to city environment and development. The guidelines, however, assume that the following agencies are to play roles to lead other agencies in a concerted manner by using the guidelines.

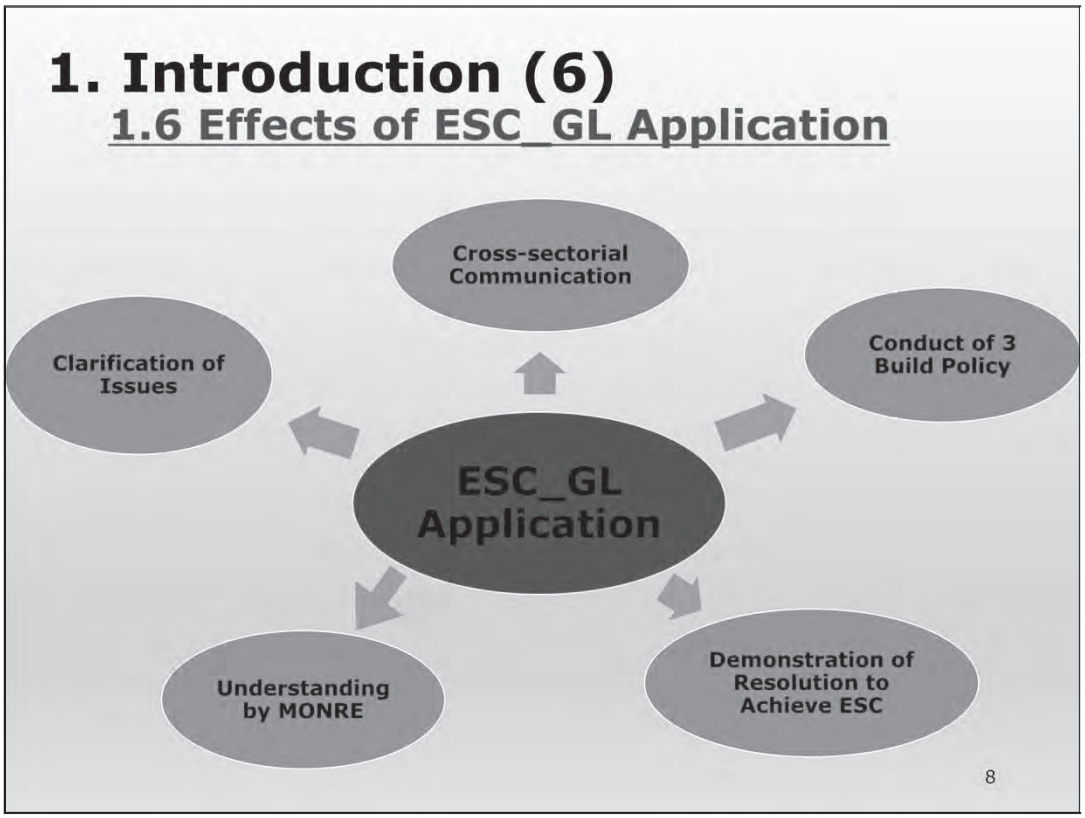
- Department of Natural Resources and Environment (DONRE) and Natural Resources and Environment Office (NREO)
- Department of Public Works and Transport (DPWT) and Public Works and Transport Office (PWTO)
- Urban Development Administration Authority (UDAA and VUDAA)



Proactive Approach
Environmental negative loads must be reduced and diverted at closest to their sources as possible and every effort should be made to prevent their generation in the first place. End-of-pipe approaches are more costly than preventive approaches. Most of the developed countries and newly developing countries, which experienced heavy burden in tackling environmental issues, have been making a dramatic shift to the environmental-load-less society. Laos should be in a position to pursue a totally proactive approach, which can preserve and nourish the value of our environment on the course of economic growth.

Ecological Harmony
Population and economic activities are less concentrated in cities in Laos than cities in many other countries. The rural areas and urbanized areas are adjacent, or even intermingled, and that enriches the urban lives in Laos. This further implies that urbanization with greenery in Lao cities has enjoyed the benefit of ecological services, such as purification, dilution, decomposition, generation and renewal. Ecological harmony in cities is the strength of Laos and should be a great potential for environmentally sustainable development.

Coordination
The attempts to ESC will be enhanced by the economic and social activities which are coordinated in a common direction to the environmental sustainability. Such coordination should be the result of mutual understanding by stakeholders, transparent decision making and equity of participation opportunities. It should be also associated with objective examination of cost and benefit, which is only possible when all the stakeholders seriously take the real condition of the environment.



MONRE/PCD found out ESC_GL application brought the following effects:

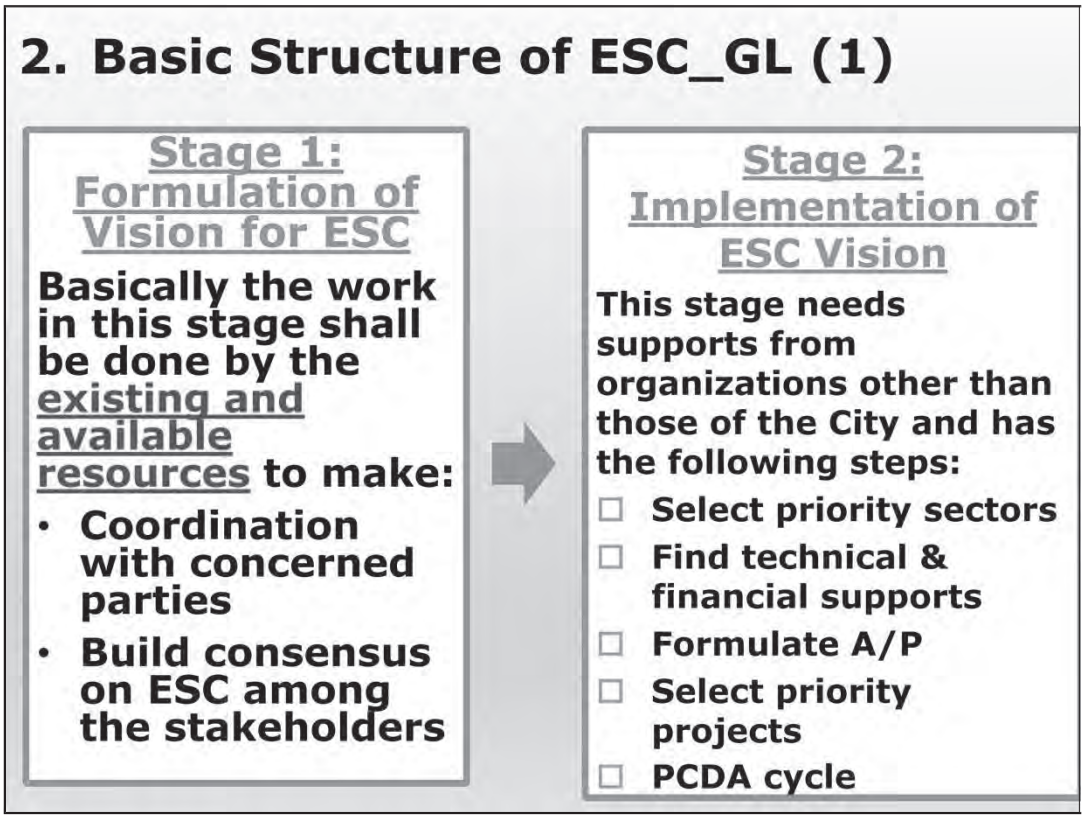
1. Good opportunity togatherallthe relevantpersonneltodiscussESC, which is a common, cross-sectorial agenda.

2. Clarificationofissues to be dealt with for promotion of ESC.

3. Encouragement to mobilize the available resources from the provincial, district and village levels (in line with "3BuildsPolicy"). => Facilitation of Decentralization

4. DemonstrationofresolutiontoachieveESC by local authorities to external agencies (including funding sources).

5. UnderstandingbyMONREabouttheoverallenvironmentalstatusalloverthe country.

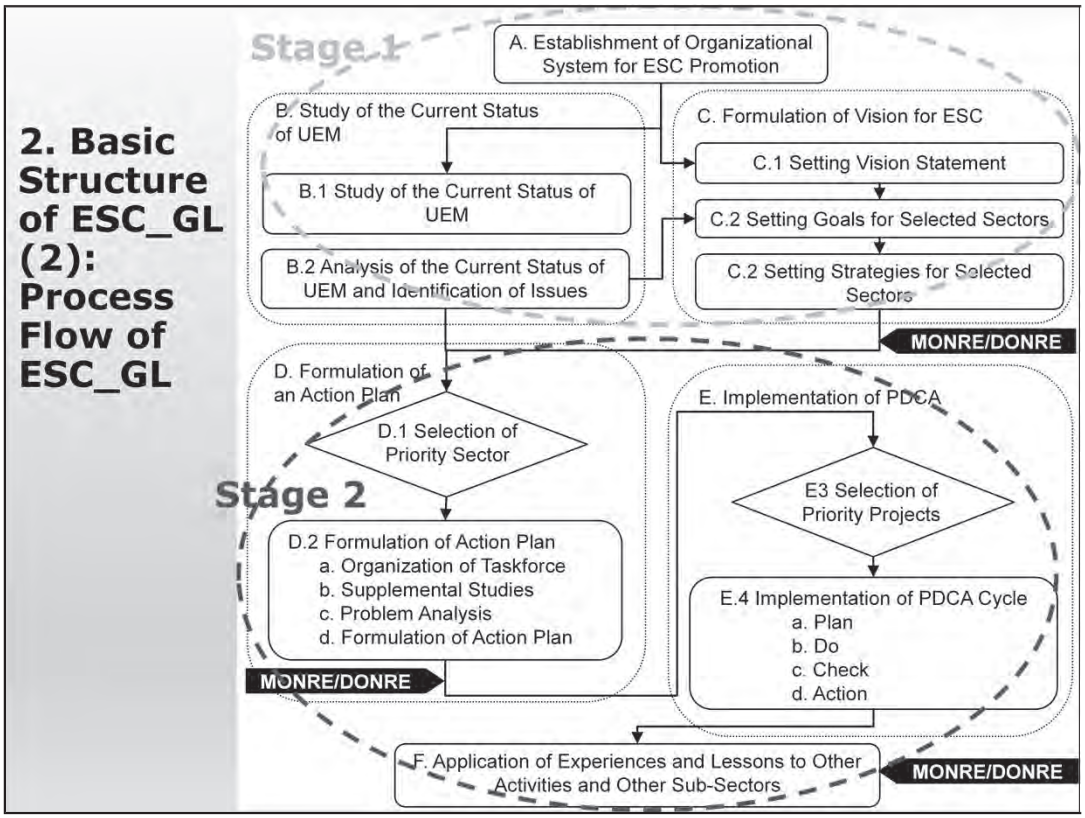


ESC_GL consists of the following two stages:

1. **Stage 1: Formulation of Vision for ESC**; and
2. **Stage 2: Implementation of ESC Vision**

Stage 1 shall be conducted by the existingandavailableresources of each city (Local Authority) by the coordination of concerned parties and building consensus on ESC among the stakeholders.

Stage 2: Implementation of ESC vision mayrequiretechnicalandfinancial supports from organizations other than those of the city, i.e. Central Government, International funding agencies, etc.



Both stages are further divided into three processes respectively.

Stage 1: : Formulation of Vision for ESC

A)　Preparatory Stage: Establishment of Organizational System for ESC Promotion

B)　Study of the Current Status of Urban Environmental Management (UEM)

C)　Formulation of Vision for ESC

Stage 2: Implementation of ESC Vision

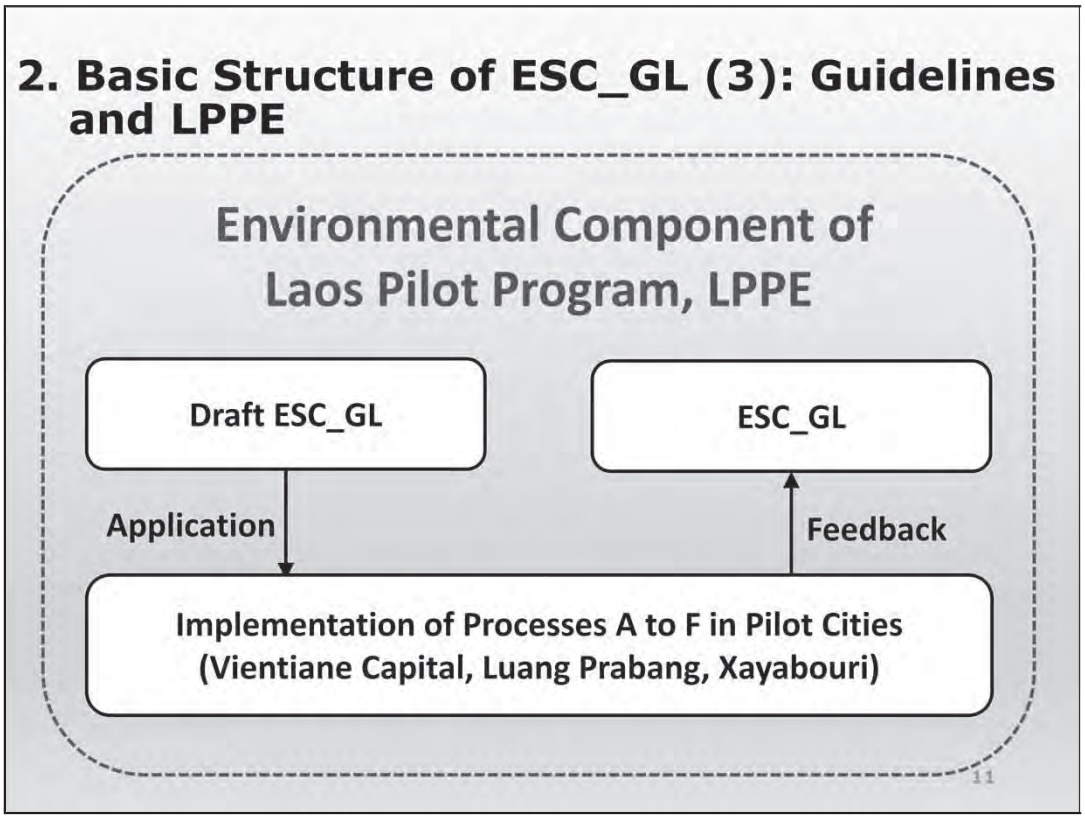
D)　Formulation of Action Plan

E)　Implementation of PDCA (Plan-Do-Check-Action) Cycle

F)　Application of Experiences and Lessons to Other Activities and Other Sub- Sectors

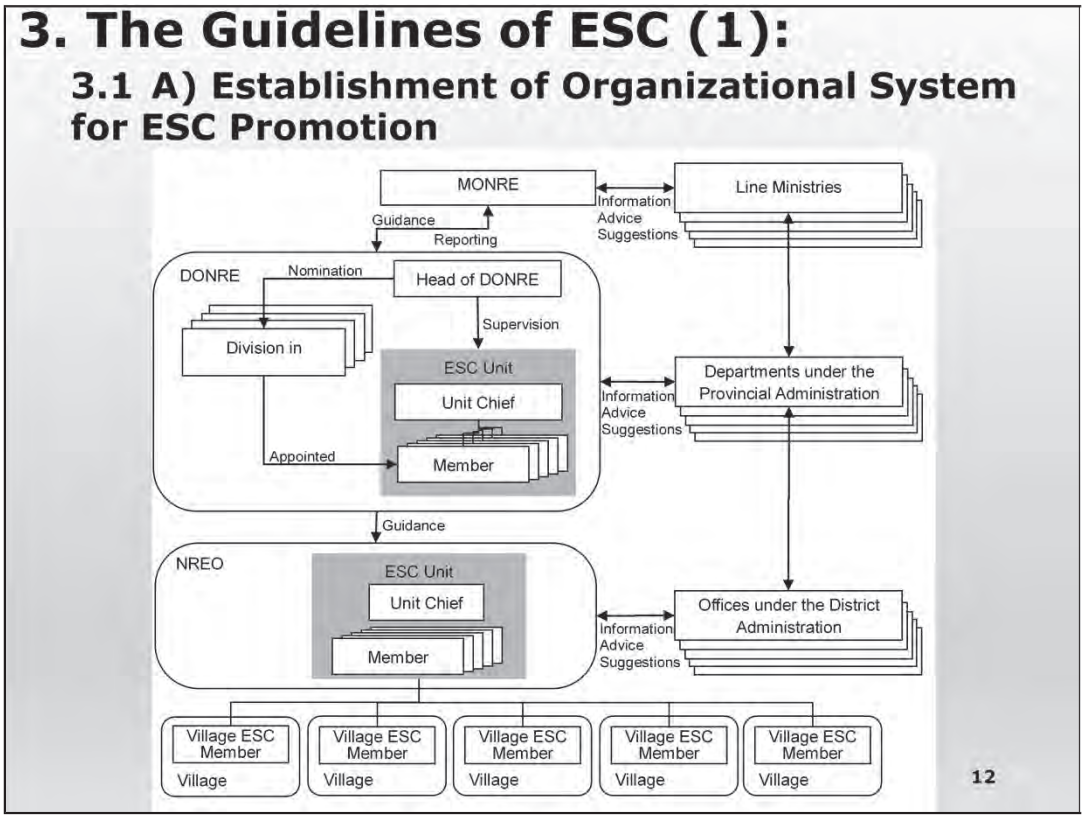
"Up to Stage 1, the urban environmental condition of the city is overviewed and a prospect for the improvement of most of the sub-sectors related to the city is developed.

On the contrary to Stage 1, Stage 2 considers selected specific sub-sectors in order to concentrate technical and financial input available to the local authority.



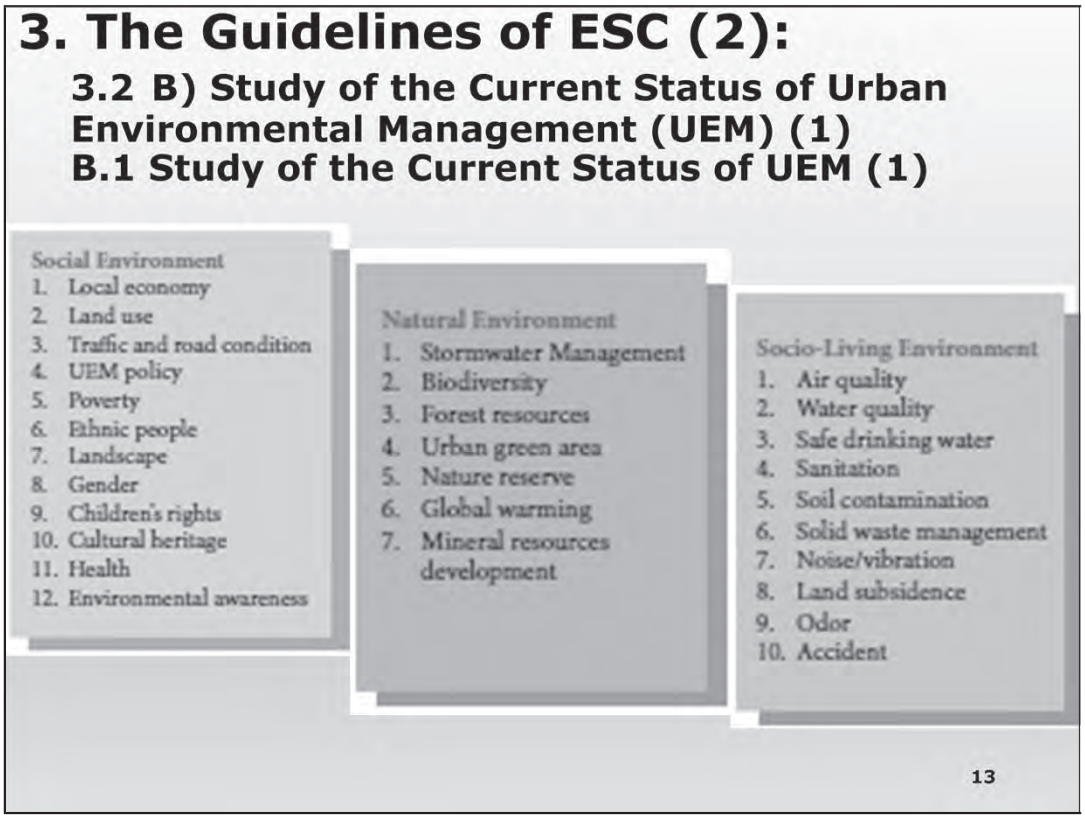
The Guidelines were drafted as an outcome of the first year activities of “Laos Pilot Program for Narrowing the Development Gap – Environmental Management Component (LPPE)”, which was implemented by MONRE in association with MPWT and with assistance by the Japan International Cooperation Agency (JICA) from 2011 to 2015.

In LPPE, the draft Guidelines were applied in the three pilot cities, Vientiane Capital, Luang Prabang, Xayabouri. Aforementioned processes from A to F were implemented and the applicability of the draft Guidelines was reviewed. The lessons learned in the pilot cities were fed back to the finalization of the Guidelines. This manual introduces various by-products of LPPE, so that the content of the Guidelines can be understood more easily.

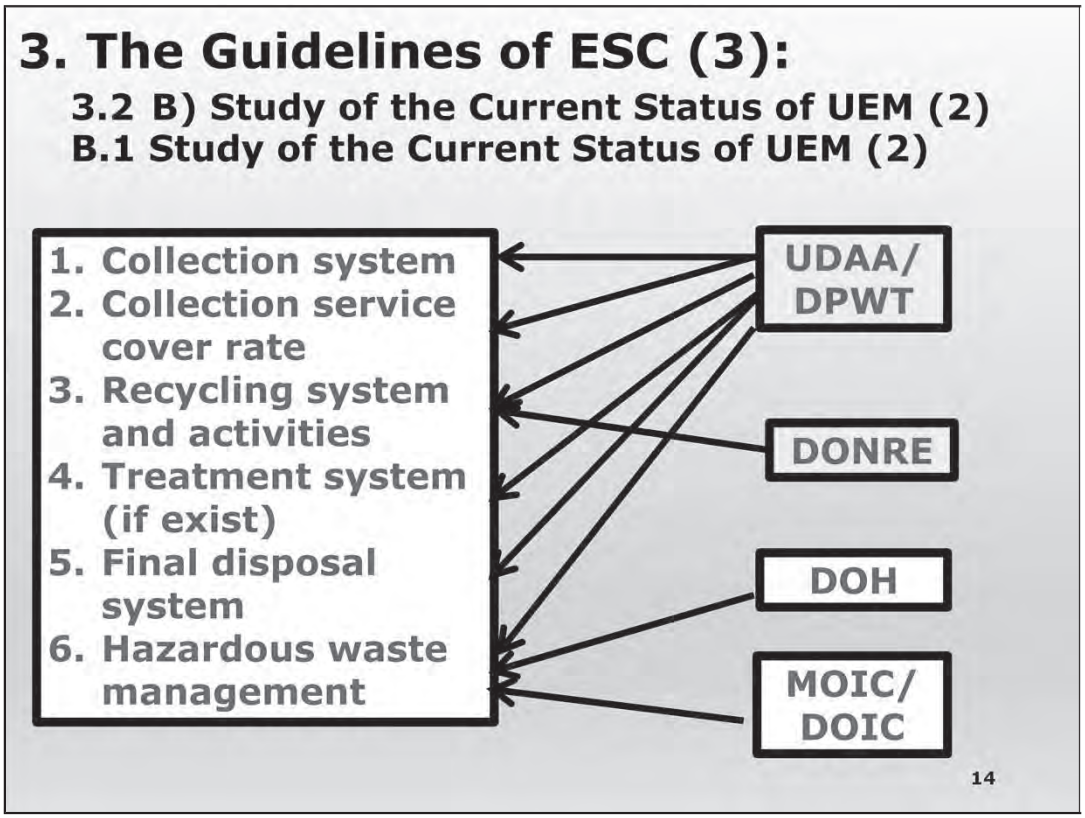


Stage 1 starts with Process A, which is the establishment of an organizational system for urban environmental management of the city. UEM covers a wide range of environmental sub-sectors, hence various governmental agencies and other stakeholders are concerned. ESC can not be promoted until a cooperative relationship is established among those concerned agencies and stakeholders.

In order to arrange such an organizational system for ESC promotion, it is advised to set up an **ESC Unit** under the DONRE of the city as a focal driver for ESC promotion at the provincial level. The ESC Unit of the DONRE will then develop a cooperative relationship between the concerned agencies and stakeholders and proceed the ESC promotion with their cooperation. There can be an ESC Unit in NREO (Natural Resources and Environment Office) as well in order to respond site specific issues at the district level. The figure on the screen shows an expected organizational system for ESC promotion with the ESC Unit in the center.



Following the establishment of the organizational system, we have Process B, where the current status of Urban Environmental Management (UEM) will be studied. The UEM are divided into three areas namely **Social Environment**, **Natural Environment** and **Socio-living Environment**, and these are further divided into **12 subsectors** (1. Localeconomy, 2. Landuse, 3. Traffic androadcondition, 4. UEMpolicyimplementation, 5. Poverty, 6. Ethnic people,
7. Landscape, 8. Gender, 9. Children'srights, 10. Culturalheritage, 11. Health and 12. Environmentalawareness), **7 sub-sectors** (1. Stormwater management,
2. Biodiversity, 3. Forestresources, 4. Urbangreenarea, 5. Naturereserve, 6. Globalwarming and 7. Mineralresourcesdevelopment) and **10 sub-sectors** (1. Airquality, 2. Waterquality, 3. Safedrinkingwater, 4. Sanitation, 5. Soil contamination, 6. Solidwastemanagement, 7. Noise/vibration, 8. Land subsidence, 9. Odour and 10. Accident) respectively, or 29 sub-sectors in total.



The first step of "the Study of the Current Status of UEM" is to collect existing and available information and data. Table 1 of the ESC_GL provides "TypesofInformationofUEMandOrganizationstobeAskedforInformation" for all 29 sub-sectors. This screen shows how to collect those information in the case of SWM sub-sector as follows:

- Most of information/ data necessary to understand current SWM are obtained from UDAA for Urban Area and DPWT for Rural Area;
- DONRE may have some information/ data on the recycling system and activities; and
- As for the Hazardous waste management especially for management at generation sources, DOH has information/data on healthcare waste management (HCWM) and MOIC/ DOIC may have those on Industrial Hazardous Waste Management.

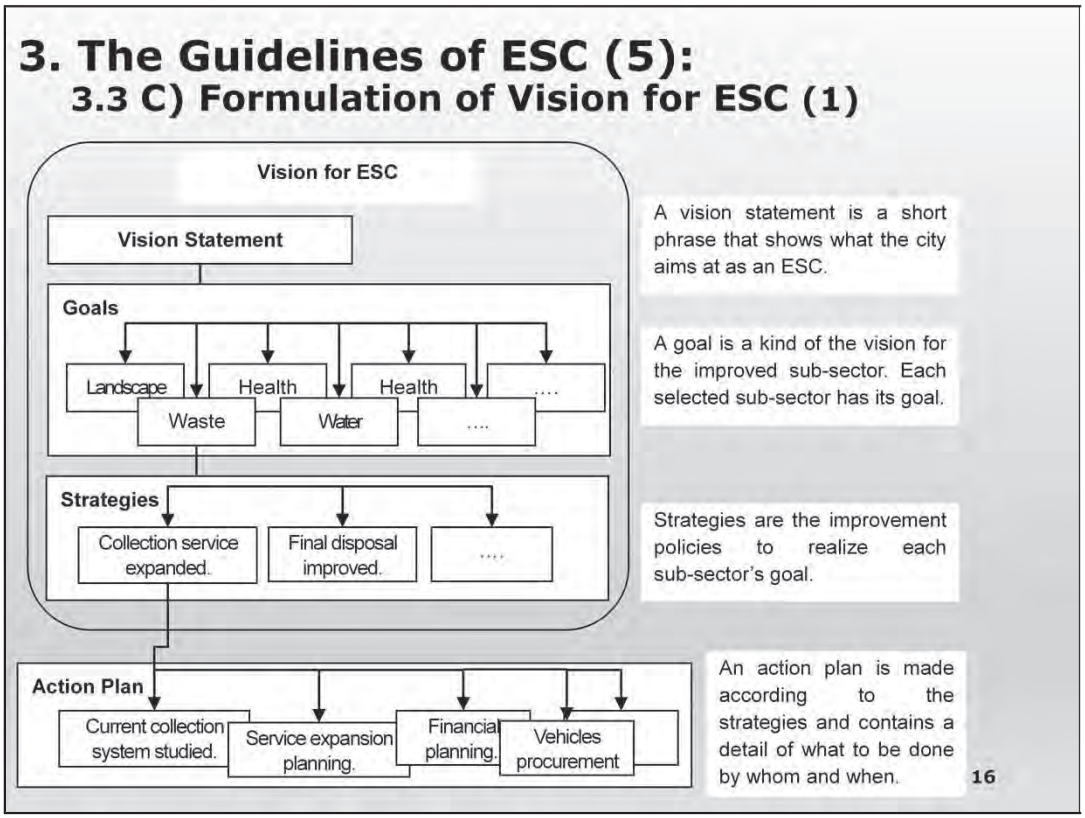
3. The Guidelines of ESC (4):
3.2 B) Study of the Current Status of UEM (3)
B.2 Analysis of the Current Status of UEM and Identification of Issues

Check List	Results	Issues
1. What is the percentage of population covered by waste collection service?	About 30%	Sanitary landfill and 3R (Reduce, Reuse and Recycle) should be promoted.
2. How much is the waste recycled?	Unknown	
3. Is the boundary of final disposal site designated?	Yes	
4. Is waste covered by earth after disposed of?	No	
5. How is the infectious health care waste (IHCW) treated?	Large portion of it collected & treated together with MSW	
6. How is the septage treated?	Disposed of at MSW dumpsite	

Using the basic information and data collected, the current status of UEM is analyzed and issues are identified. As for a useful reference in finding issues, Table 2 of the ESC_GL provides "ChecklistforFindingIssues" for all 29 sub-sectors. Based on this table, the issues of the UEM are identified and the important environmental sub-sectors that need to be improved are selected.

Table 3 of the ESC_GL provides "IdentificationofIssuesandSelectionof ImportantEnvironmentalSub-Sectors (Example in the Case of Vientiane Capital)".

This screen shows how to find issues by using those information in the case of SWM sub-sector in VTE.: Following to the procedure SWM sub-sector in VTE identified the issues of "**Sanitary landfill and 3R (Reduce, Reuse and Recycle) should be promoted**."



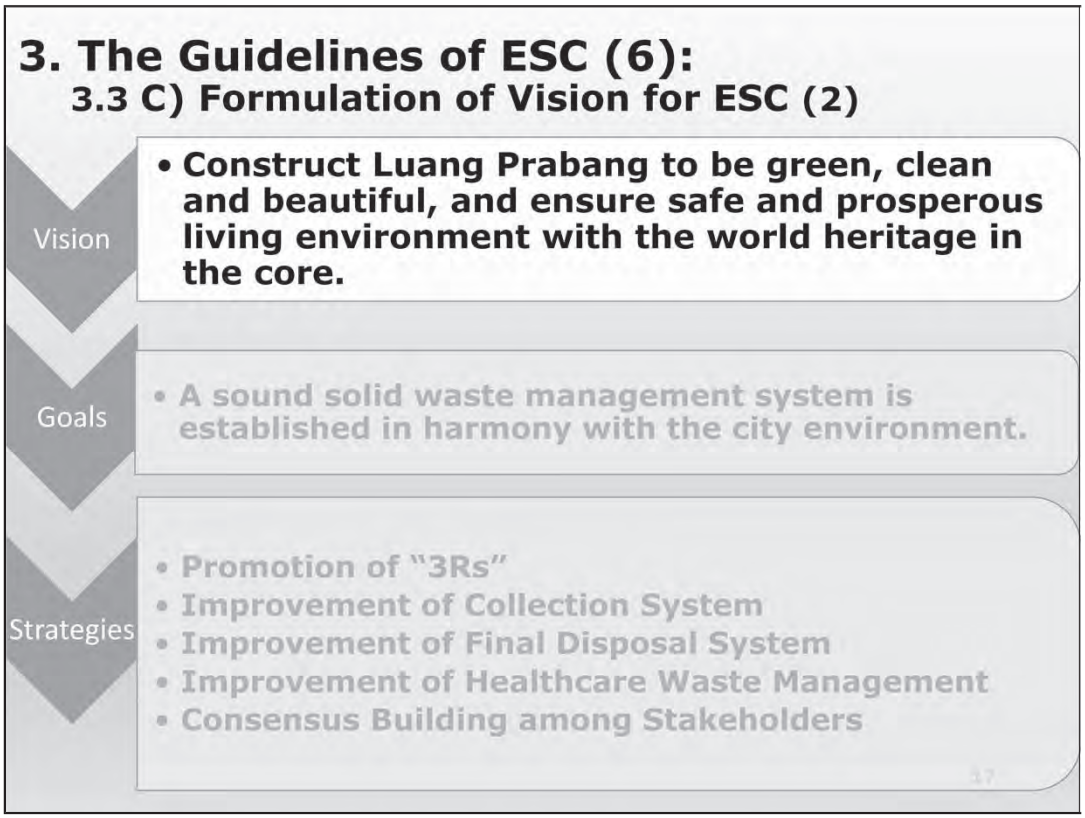
This is Process C, which is the last process of Stage 1. Process C is the process of vision formulation includes three steps:

1. setting a **Vision Statement**, => **A vision statement is a short phrase that shows what the city aims at as an ESC.**

2. setting **Goals towards the vision statement**, or expected future status, for each of the important environmental sub-sectors; => **A goal is a kind of the vision for the improved sub-sector. Each selected sub-sector has its goal.**

3. further setting **Strategies to achieve the goals** for the sub-sectors. => **Strategies are the improvement policies to realize each sub-sector's goal.**

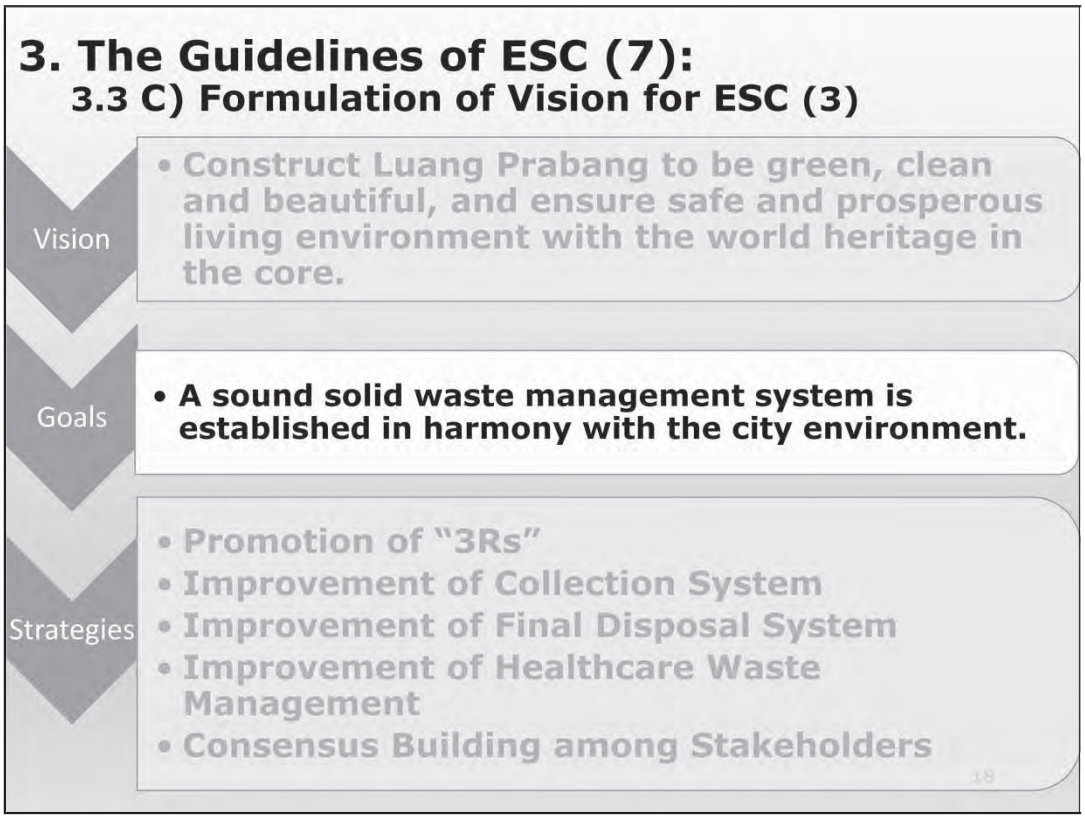
The relationship between the vision statement, goals, and strategies is illustrated in the figure of the screen. The figure also shows the relationship between the strategies and action plans, which are to be described in Section D.



C.1 Declaration of Vision Statement:

A vision is to express an ultimate goal as an ESC. It must fully reflect the fundamental characteristics, advantages and disadvantages of the city and must be understood and agreed by as many stakeholders as possible.

As an example the Vision for ESC of Luang Prabang is to "ConstructLuang Prabangtobegreen,cleanandbeautiful,andensuresafeandprosperousliving environmentwiththeworldheritageinthecore."



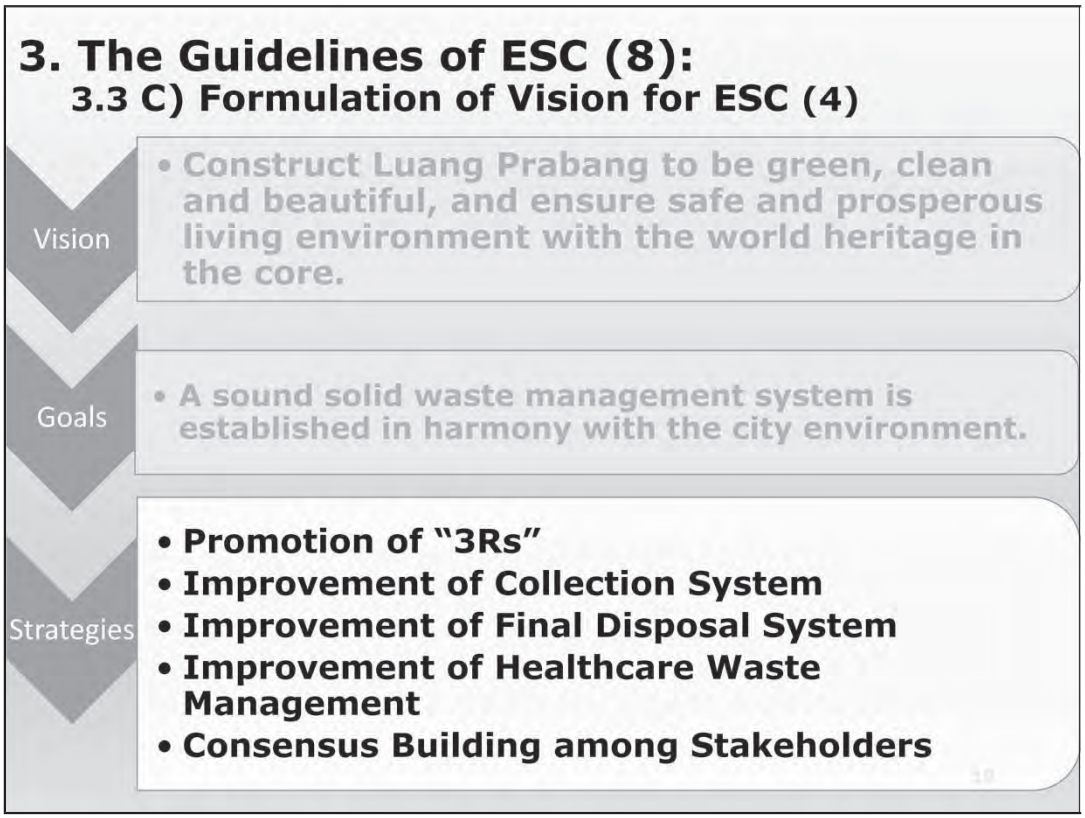
C.2 Establishment of Goals for Selected Sectors:

The process of Goals establishment follows the 3 steps:

Step1: Issues are found for all the environmental sub-sectors, and important sub- sectors to be improved are selected. **Step2:** The target year of the improvement
is defined. It will be 5-10 years ahead the present.

Step3: Based on the issues found, a goal of improvement by the target year is determined for each of the important sub-sectors. The goals of the sub-sectors should express the expected condition to be realized by the target year and support the vision that has been set.

As an example the Goal of the solid waste management sector of Luang Prabang toward the vision is "Asoundsolidwastemanagementsystemis establishedin harmonywiththecityenvironment. "



C.3 Development of Strategies for Selected Sectors:

Since each sub-sector contains a number of components, the achievement of the goals requires a set of several strategies according to the problem components. It is recommended to clarify what the goal implies, to develop images of expected future conditions and to rephrase the goal using several practical terms.

As for the example the strategies for solid waste management improvement of Luang Prabang are presented below:

1. In order to lighten the load of solid waste collection and final disposal and to protect the environment, ”3Rs” are promoted at generation sources.

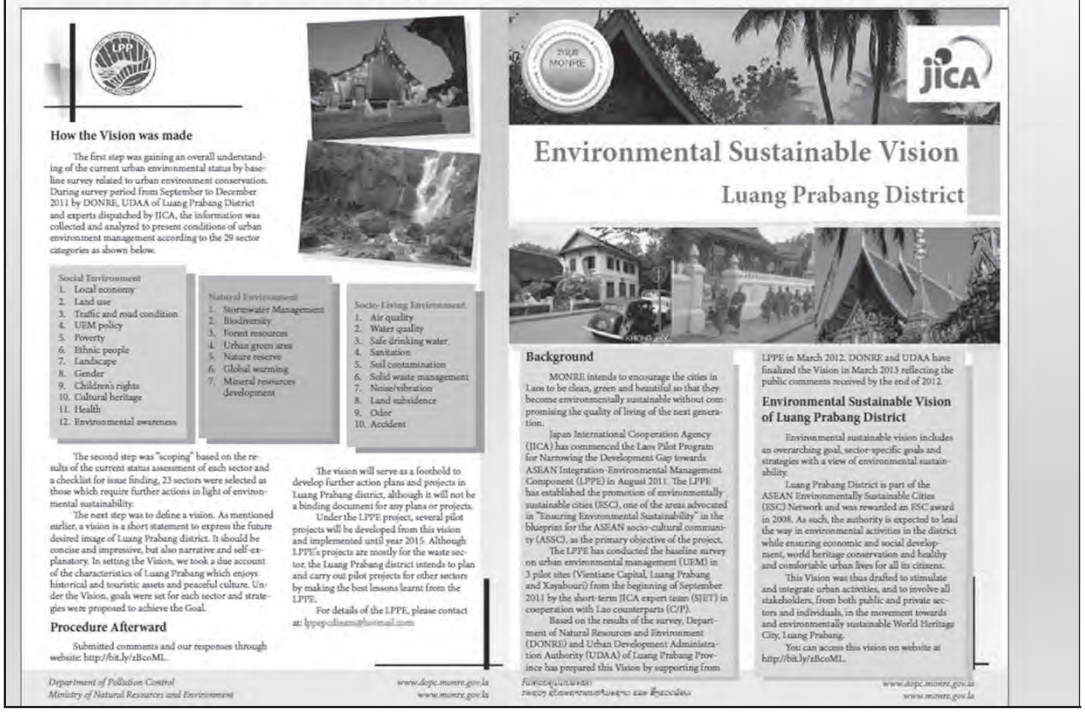
2. Waste collection system is improved through the strengthening of collection service capacity and enhancement of public cooperation.

3. Final disposal system is improved to mitigate adverse impacts on the surrounding areas.

4. Healthcare waste management is improved.

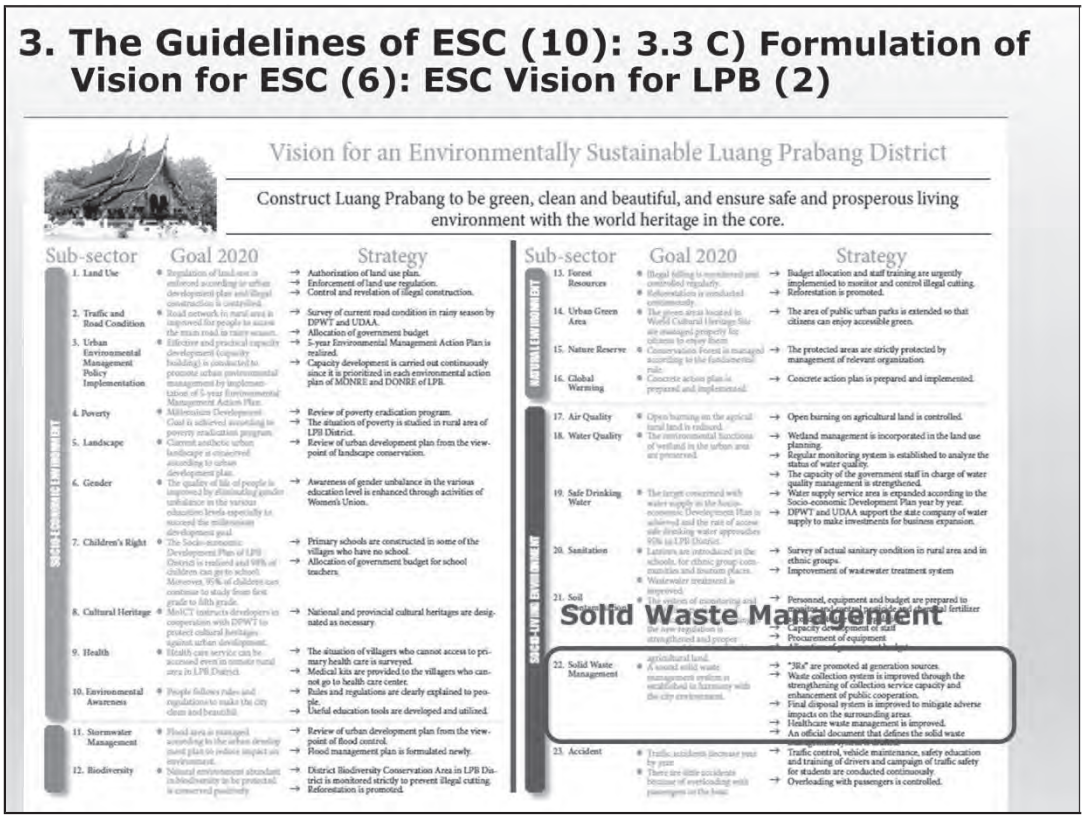
5. The governmental agencies, the private sector, the waste business operators and the local citizens evenly bear the cost under the transparent and fair rules.

3. The Guidelines of ESC (9): 3.3 C) Formulation of Vision for ESC (5): ESC Vision for LPB (1)



Since the Vision for ESC shall be understood and shared by as many stakeholders as possible, it should be published in a handy and simple manner so that its whole picture can be viewed easily. As for the example of Vision for ESC published, the screen shows front and back pages of the ESC Vision for LPB. The ESC Vision for LPB has been published in an A3 paper of both side as
shown in the screen. The A3 paper is folded to A4 and the screen shows the front and back side of the ESC Vision of LPB.

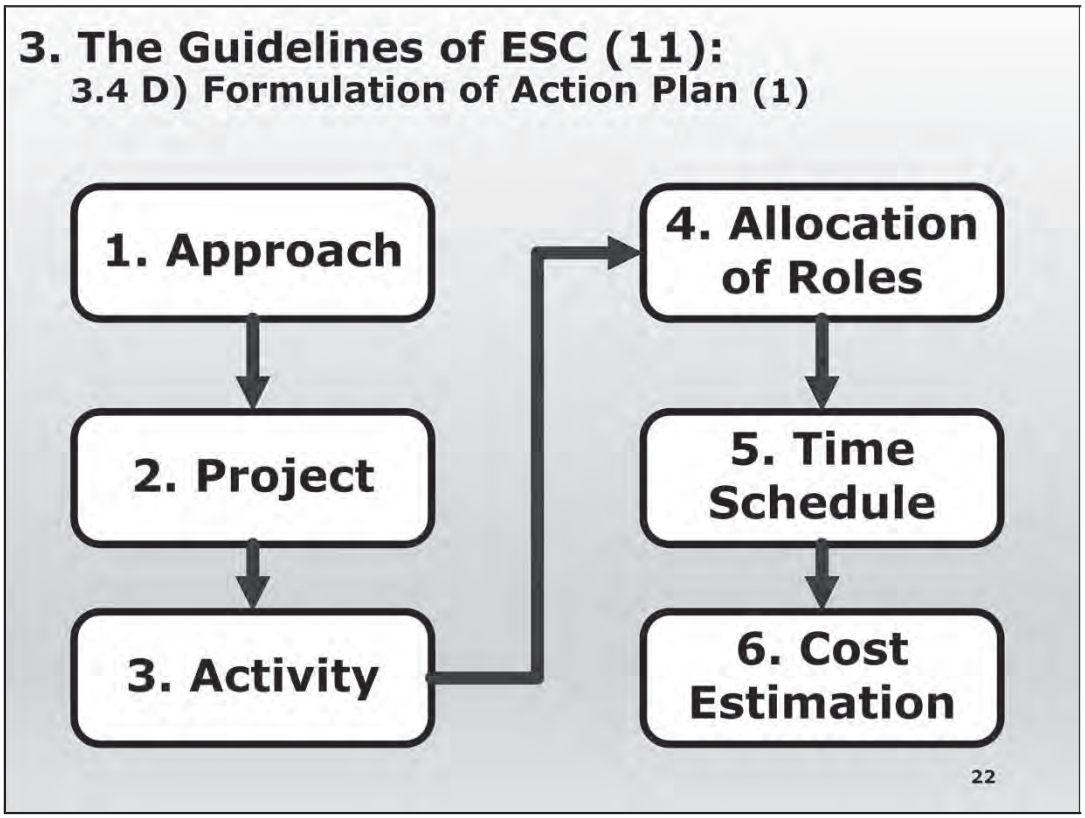
The front page gives information on Background and Introduction of the ESC Vision. The back page provides information of “How the Vision was made” and “Procedure Afterward”.



The screen shows the other side of the A3 paper, which presents the ESC Vision of LPB. As shown in the screen, based on the issues found for all the environmental sub-sectors the ESC Vision for LPB has selected 23 sub-sectors to be improved and set goals for 23 sub-sectors. Then in order to achieve the goals of the selected sub-sectors a set of several strategies according to the problem components were set as shown in the screen.

The sub-sector of solid waste management is found in the part surrounded by a red line. Its goal for the year 2020 is written in blue and five strategies are listed. By doing so for all the other sub-sectors, we can see a bird's- eye picture of city environment directed to ESC.

When the Vision containing a vision statement, sectoral goals and strategies were concluded, the ESC unit should consult MONRE/DONRE. PCD makes sure that the Vision is in consistent with its policy direction to Clean, Green, Beautiful Laos.



With this slide, Stage 2 "implementation of ESC Vision" starts. The first process of Stage
2 is Process D, "Formulation of Action Plan".

So far, goals and strategies are set for each of the sub-sectors. However, strategies do not tell practical directions and we need an Action Plan, which is a guiding document to carry the strategies into effect. It is formulated by clarifying the following elements.

1. **Approach**: It shows the methodology to materialize the strategy which aims at the sub-sectoral goal. It is, therefore, said to be a detailedstrategy.

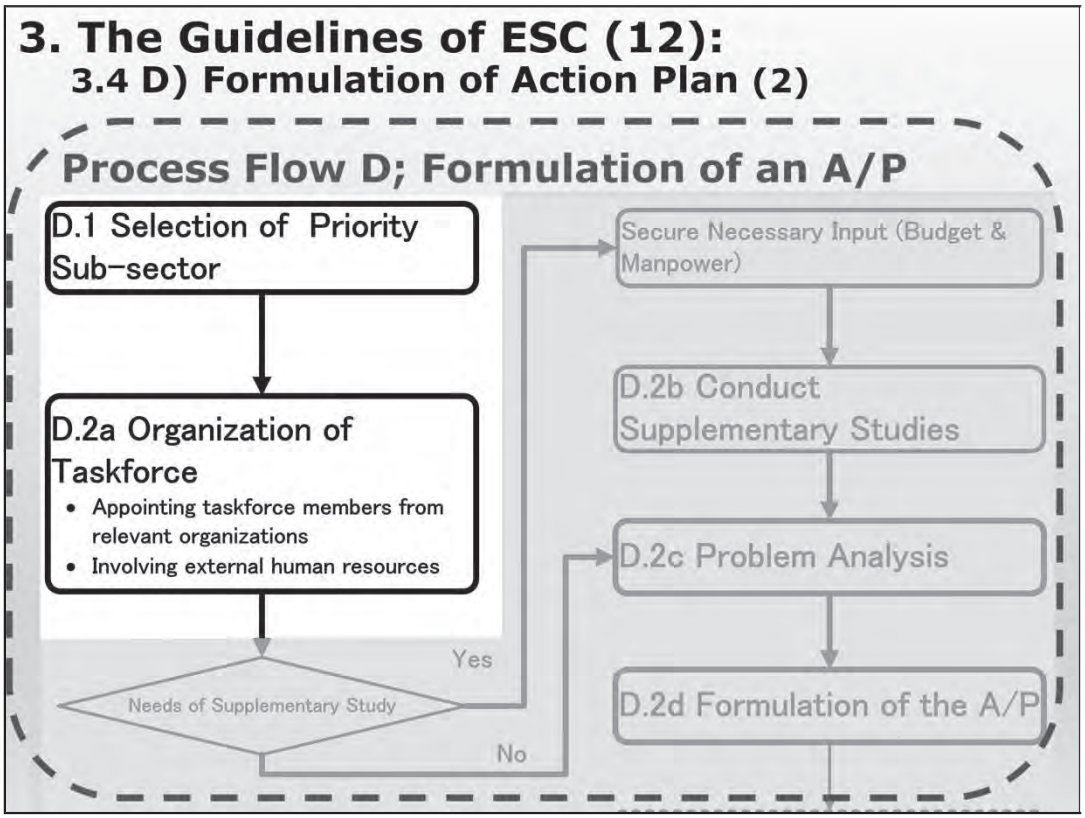
2. **Project**: It shows what to be done to take the aforementioned approach. It contains specificprojects necessary to actually implement the detailed strategy.

3. **Activity**: It shows what kinds of specificactions to be done to take the project. Each project contains specific activities.

4. **Allocation of roles**: For every activity, anorganizationresponsiblefor implementation,anotherorganizationthatassists implementation and other organizations to be collaborated in implementation are specified and their roles are defined.

5. **Time schedule**: A time schedule of each activity will be drawn.

6. **Cost estimation**: Cost required to implement each activity will be approximated and which financial sources are available and how to approach them will be shown.



D.1 Selection of Priority Sector

An action plan (A/P) formulation of each of the sub-sectors entails a certainamountof timeandinput due to the following reasons:

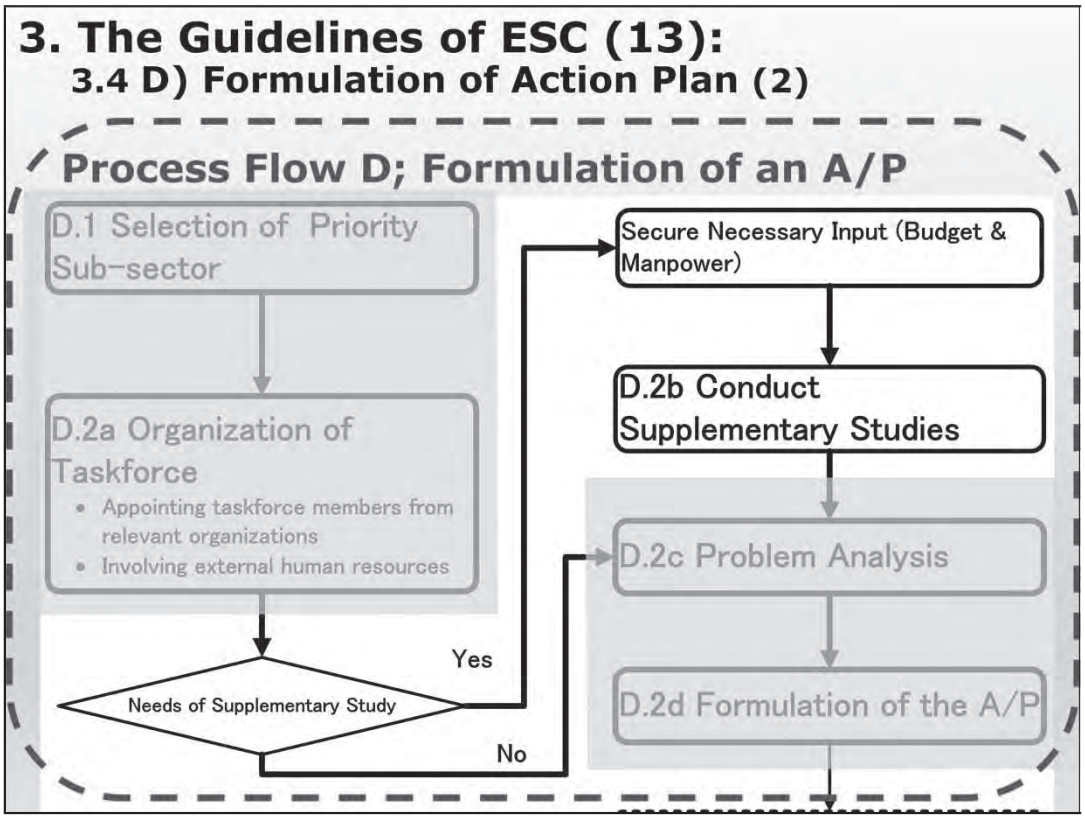
1. A/P formulation requires technicalknowledgeandjudgment of a certain level.

2. A/P formulation will require in-depthunderstandingofthecurrentsituation in each of the sub-sectors concerned. The city, therefore, may need to prepare budget for necessary supplemental studies.

Due to the restriction of time and input available to the cities, the ESC Unit under the DONRE is advised to prioritizethesub-sectors for which A/Ps are to be formulated. The ESC Unit will then need to organize a selection committee that consists of representatives from organizations relevant to UEM and select priority sub-sector(s).

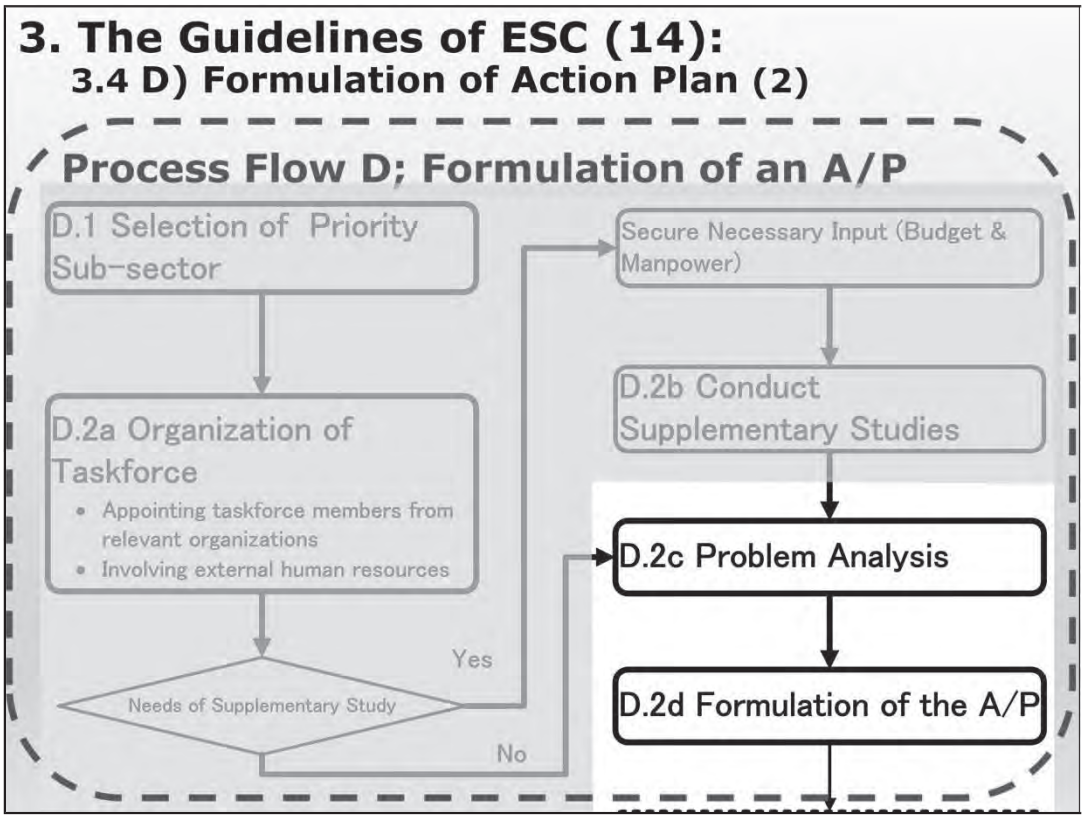
D.2 Formulation of Action Plan a. Organization of Taskforce

The A/P of the priority sub-sector must clarify which organizations carry out which implementation activities from when and how. Such task must start with detailed understanding of current conditions and important issues of the sub-sector through supplemental studies. Therefore, prior to A/P formulation, the ESC Unit is recommended to organize a taskforce for A/P formulation, which consists of representatives of organizations relevant to the sub-sector and experts.



b. Implementation of Supplemental Studies

The first question for the taskforce is whether the supplemental studies are needed for A/P formulation. Then the answer is yes, an implementation organization, methodology and time schedule must be determined. The taskforce further secure the necessary input (cost and manpower), and the studies are to be carried out. Examples of the supplemental studies for SWM sub-sector of Luang Prabang (LPB) are shown in the screen after next one.



c. Problem Analysis

Result of the supplemental studies will be analyzed to identify the current problems and their structures. Proper understanding of the problems is significantly effective to construct an appropriate and feasible plan for improvement. Also, the strategies, which were set out based on the existing data and information available at the time of the UEM study, may need to be modified by using the results of the supplemental studies.

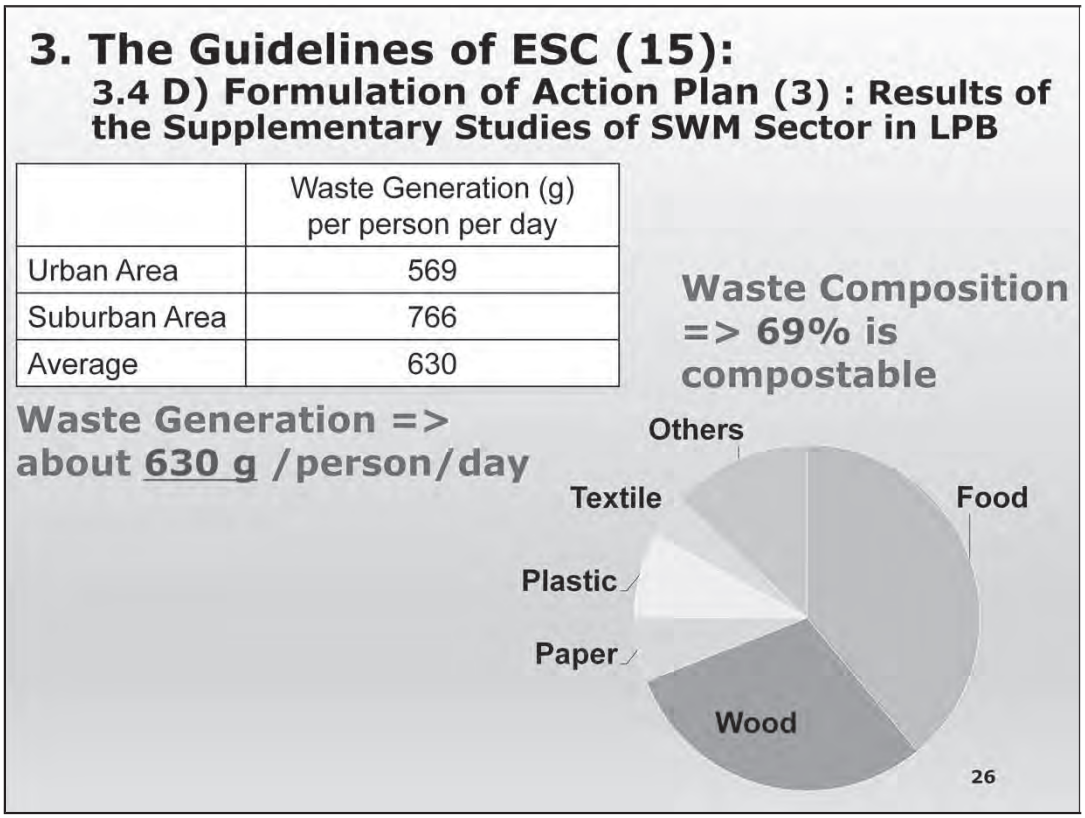
In the case of LPB, specific problems related to Strategy 1: **”3Rs are promoted.”** were identified in the supplemental study. They are shown in the screen after next one.

d. Formulation of Action Plan

Taking all the findings and analysis into consideration, an A/P is formulated for each of the strategies of the priority sub-sector.

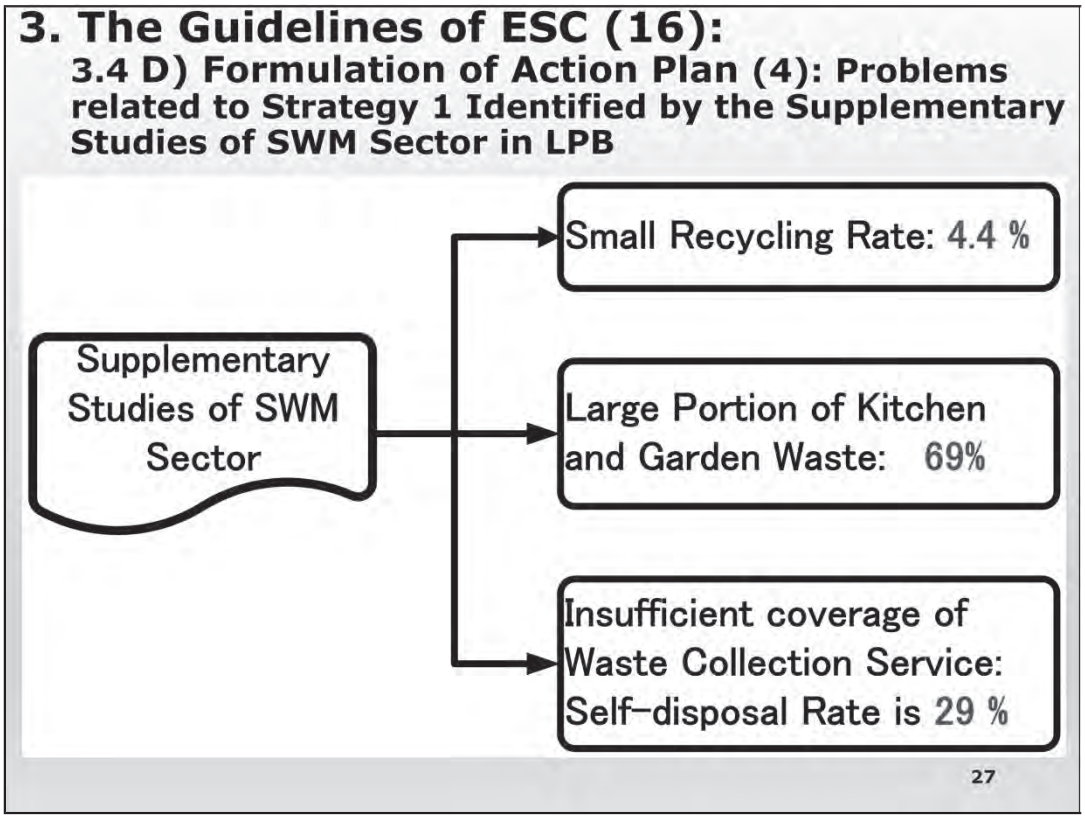
The A/P is the final output of Process D, and only priority projects in the A/P will proceed to Process E. Therefore, practically speaking, **the A/P as an output of Process D can be a simple framework leaving the detailed planning work to Process E**.

In order to understand Procedure of an A/P formulation, the A/P formulation process of Strategy 1: 3Rs Promotion of SWM sub-sector of LPB is presented from the next screen.



For the formulation of the A/P for SWM sub-sector of LPB, “Waste amount and composition study, final disposal amount study” was conducted as the supplementary studies. The screen shows the results of waste amount and composition survey.

For example, it was found that people in LPB generated about 630 g of waste per person every day. The study also showed that 69 % of waste was organic and compostable.

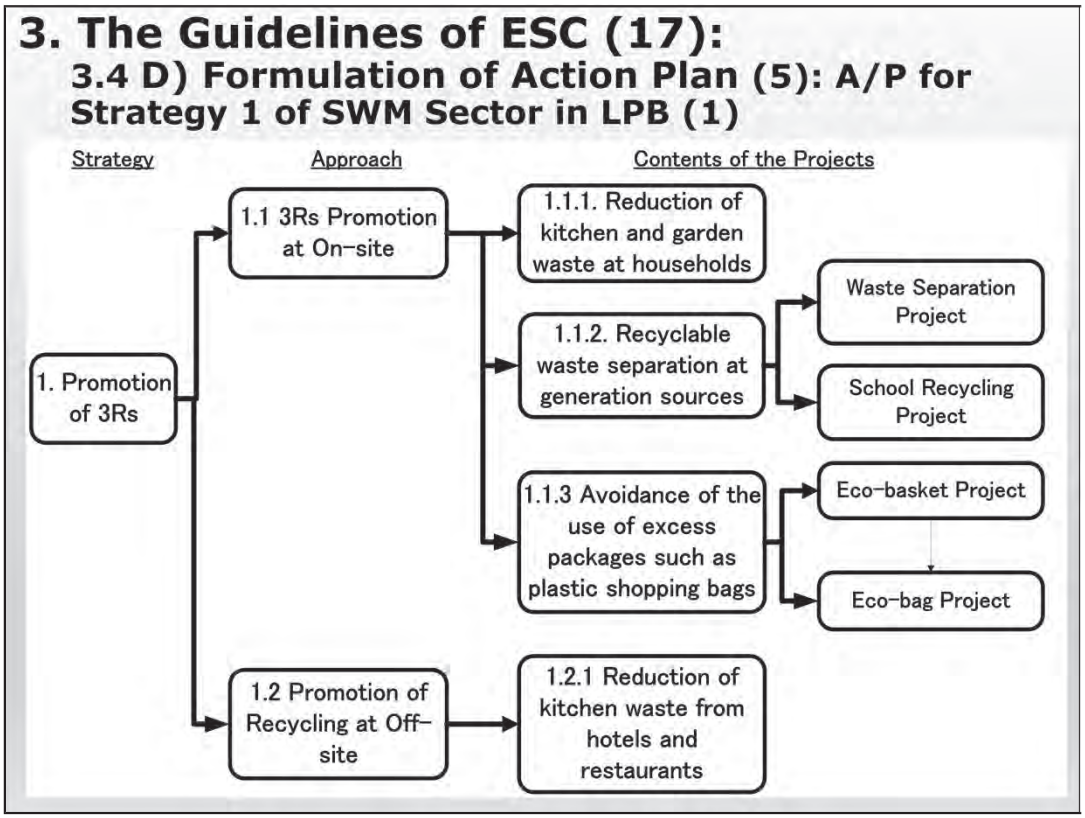


Problems related to Strategy 1 of SWM for Luang Prabang, which were found in the results of the supplementary studies as follows:

1. Smallrecyclingrate: Only 4.4% of the total waste generation is recycled. The waste recycled at households is only 1.5%.

2. Largeportionofkitchenandgardenwaste: Kitchen waste and garden waste, both of which are organic and compostable, account for as much as 69% of waste generated at households.

3. Insufficientcoverageofwastecollectionservice: As much as 29% of waste is disposed of by households (self-disposal). This indicates insufficient coverage of waste collection service. However, the areas with high self-disposal rate
are mostly located in the remote suburban area with poor access. Therefore, the collection service for those areas will be more costly than other areas already receiving collection service.



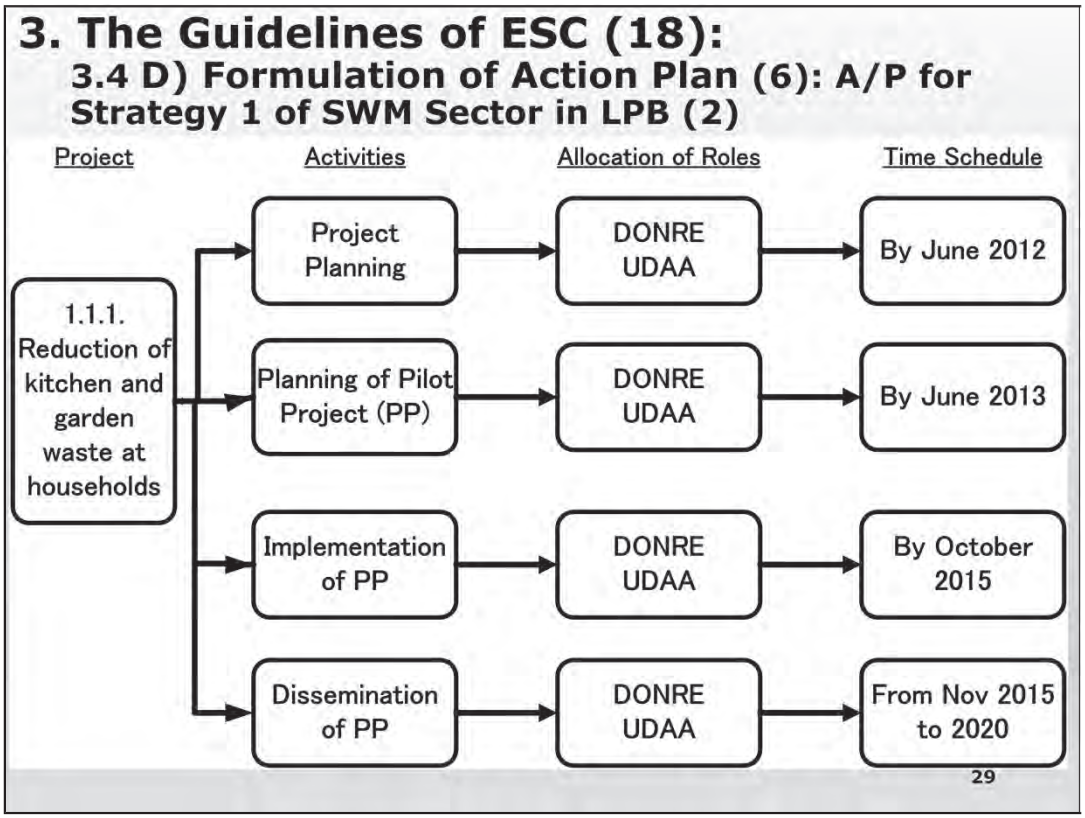
In order to solve the problems related to “Strategy 1: ”3Rs” are promoted.“ of SWM in Luang Prabang, an A/P was made as shown in Table4oftheESC_GL. The A/P the Strategy 1 is formulated according to the following procedures:

1. There are two approach: 1.1 “3Rs” are promoted at on-site to reduce waste generation amount. And 1.2 Recycling is promoted at off-site by composting.

2. There are 4 main projects: Approach 1.1 has three, “1.1.1. Reduction of kitchen waste and garden waste at households”, “1.1.2. Recyclable waste separation at generation sources” and “1.1.3 Avoidance of the use of excess packages such as plastic shopping bags”. Approach 1.2 has one, “1.2.1. Reduction of kitchen waste from hotels and restaurants”

3. “1.1.2. Recyclable waste separation at generation sources” is divided into two projects, “a. Waste separation project” and “b. School recycling project”.

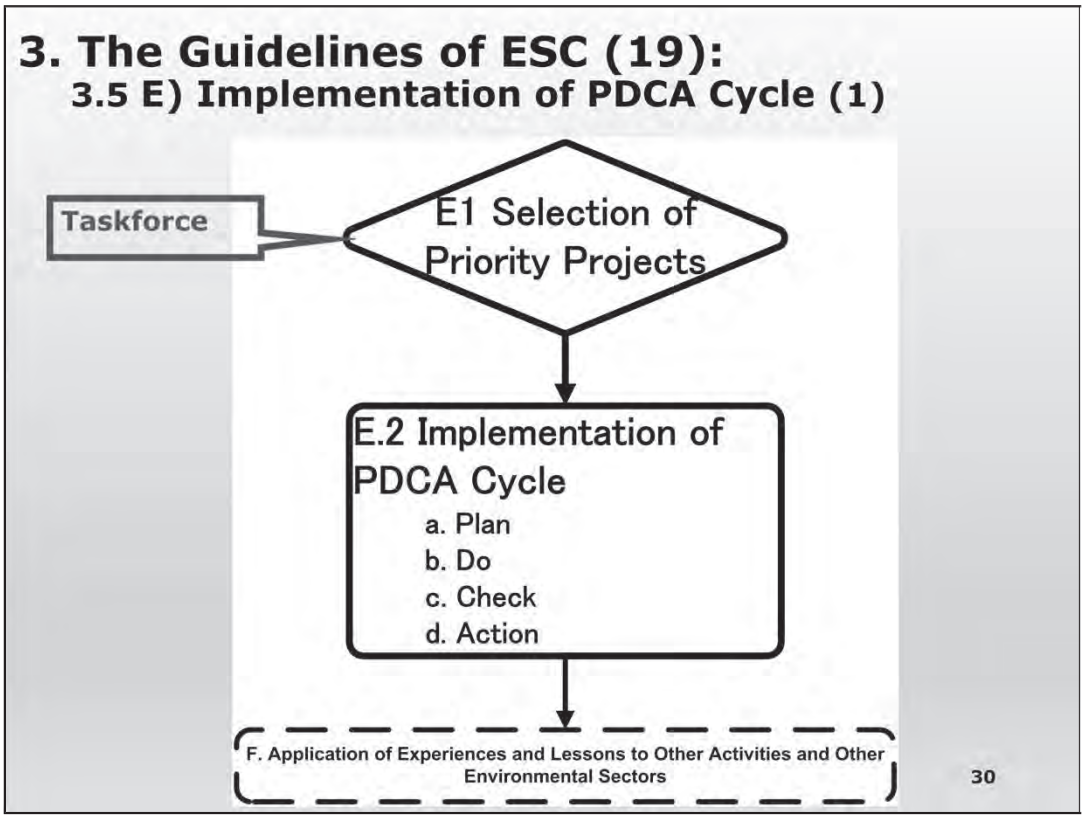
4. “1.1.3 Avoidance of the use of excess packages such as plastic shopping bags” is divided into two projects, “a. Eco-basket project” and “b. b. Eco-bag project”.



The screen shows the “Activities”, ”Allocation of Roles” and ”Time Schedule” of the Project, “1.1.1. Reduction of kitchen waste and garden waste at households” of Strategy 1, Approach “1.1 3Rs Promotion at On-site” of SWM in LPB.

The cost required to implement each activity was approximated. Then taskforce concluded most of the activities were able to start as pilot projects (PPs) of LPPE with cost sharing of “Investment cost born by LPPE” and “Part of education & monitoring cost born by DONRE & UDAA”.

So that PPs were considered to be the priority projects subject to the detailed planning work and implementation (PCDA) to Process E.



Action plan formulation is followed by Process E, which is the implementation of PDCA cycle.

E.1 Selection of Priority Projects.

The A/P tells that a wide range of activities should be carried out to achieve the goal of the sub-sector. Also, it shows that each of the activities necessitates appropriate role execution of different parties and allocation of required budget. Consequently, it can be very difficult to carry out all the activities in parallel.

The taskforce should, therefore, discuss to prioritize the activities in the action plan and select one or some of them to be “priority project(s)”. The fundamental criteria to select priority projects will be **whether the input (such as time, manpower, and budget) necessary for their implementation is secured.**

E.2 Implementation of PDCA Cycle a. Plan

A plan of the project implementation will include following components:

1. Target indicators (e.g. the rate of households who compost their organic waste at the target year) and timing of their monitoring.
2. Activities to be carried out and their sequential order
3. Allocation of roles: Name of appointed organization
4. Time schedule

The plan should be presented in such a format as to facilitate the following Do, Check and Action.

b. Do

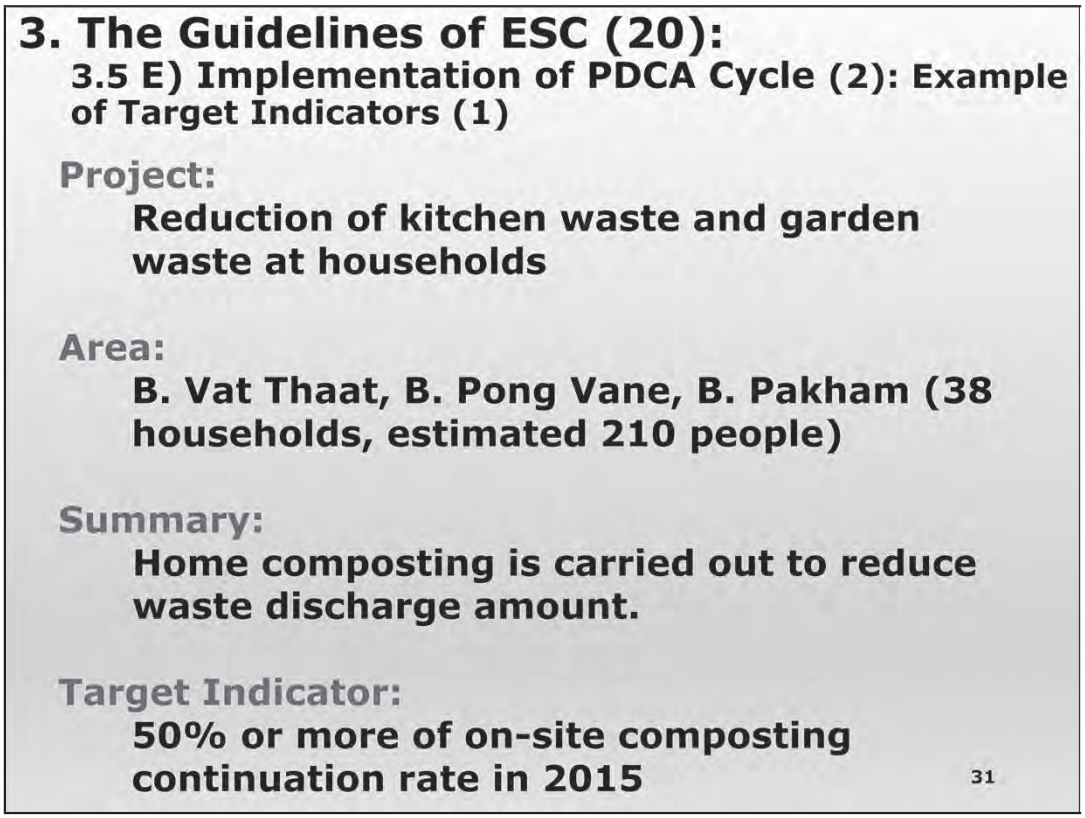
Referring to the planning chart, organizations appointed to each activities execute their works. The plan execution body should supervise and coordinate all the works and all the stakeholders involved according to the planning chart.

c. Check

The plan execution body carries out the monitoring of target indicators at the time scheduled in the planning chart. It also needs to recognize the difficulties that are appearing as the project progresses. The causes of the obstacles or difficulties must be well understood in cooperation with relevant stakeholders to find out necessary measures to be taken.

d. Action

The taskforce, in collaboration with the plan execution body, examines the causes and countermeasures and modify the plan of the priority project. The modification may be required for the action plan if the priority project has to be drastically changed or even cancelled.



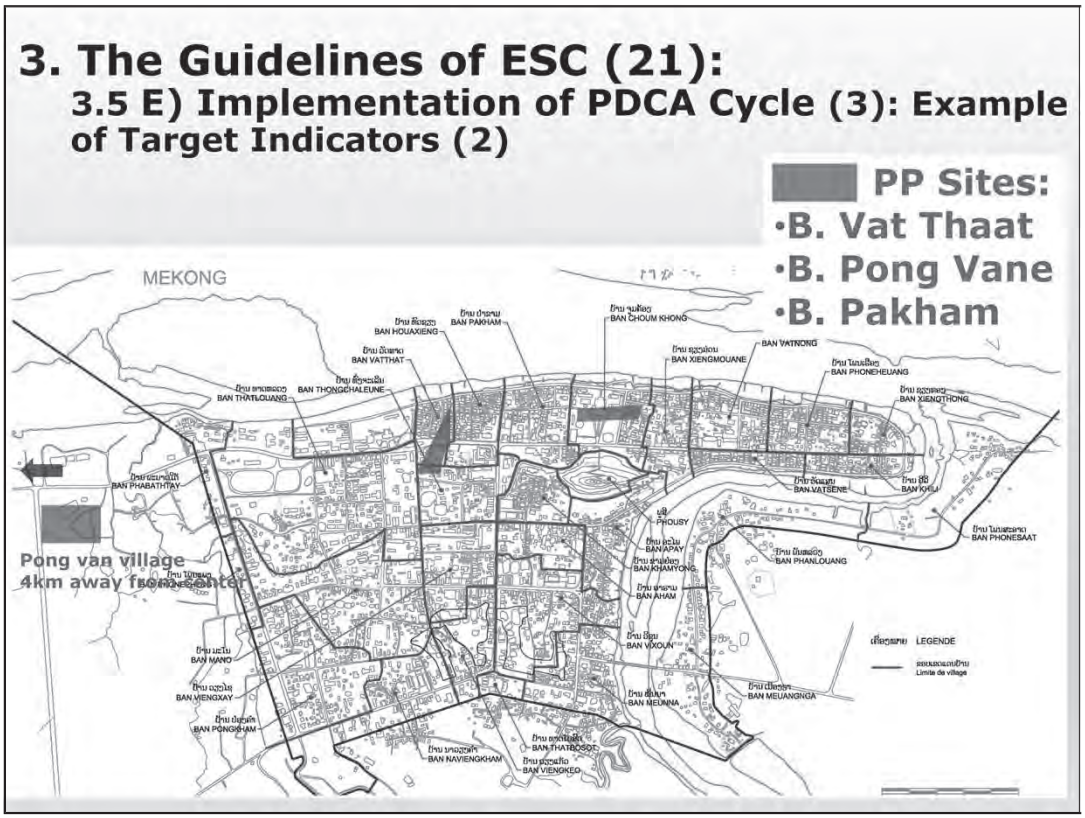
Actual activities in the PDCA cycle is presented in several slides from here taking one pilot project in Luang Prabang as an example.

The pilot project is the reduction of kitchen waste and garden waste at households. This was planned as part of Action Plan of Strategy 1.

The project area includes three villages as shown in the map on the next screen.

The project aimed at the reduction of waste discharge by carrying out home composting by village residents.

Composting continuation rate, in other words how many percentage of households continue composting, was considered as an indicator and the target was set at 50% in 2015, after three years of project initiation.



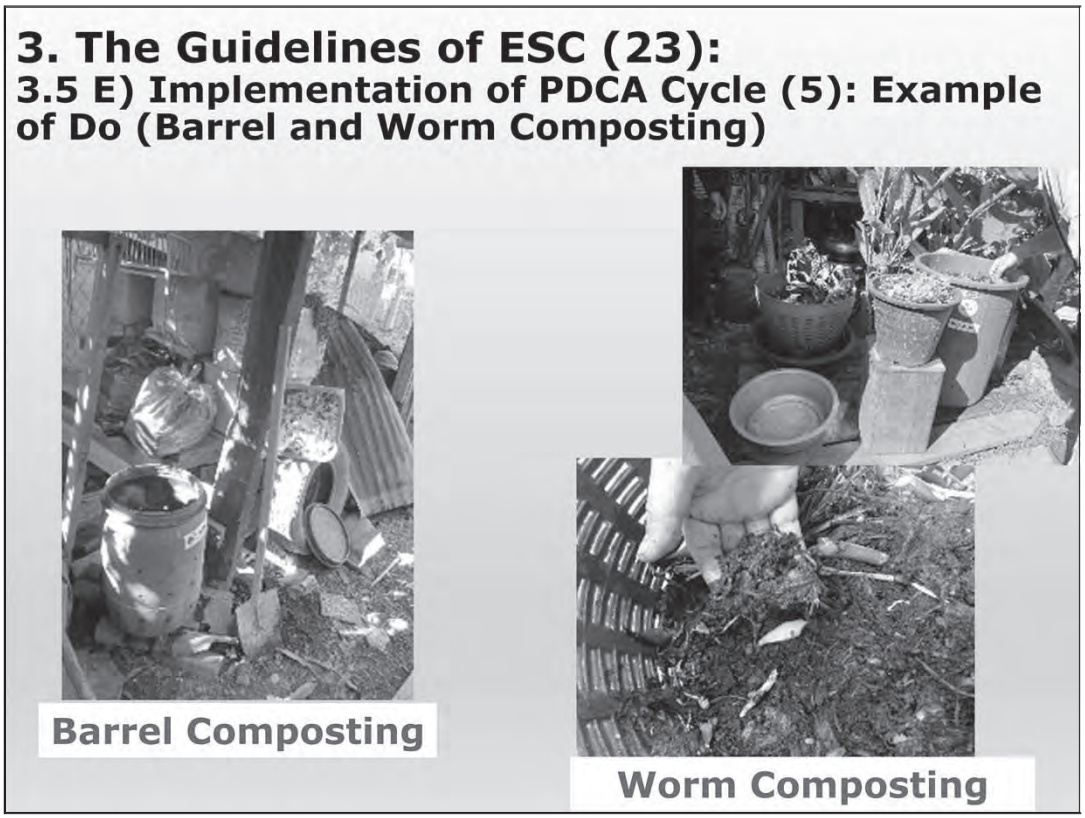
The PP site are located as shown in the screen. The taskforce made preliminary study of the project site and conducted PP planning.

3. The Guidelines of ESC (22):
3.5 E) Implementation of PDCA Cycle (4): Example of Plan (Planning Chart)

Activities	Detailed Activities	Allocation of Roles	Time Schedule				
			2012	2013	2014	2015	2020
Project Planning	Set up project management system	DONRE, UDAA, SJET					
	Set up concept	DONRE, UDAA, SJET					
Planning of PP	Study and selection of pilot area	DONRE, UDAA, SJET					
	Study of composting method	SJET					
	Procurement of equipment	SJET					
	Preparation of education tools	DONRE, UDAA, SJET					
Implementation of PP	Delivery of equipment and instruction of method	DONRE, UDAA, SJET					
	Monitoring and awareness raising	DONRE, UDAA, SJET					
	Evaluation of the PP	DONRE, UDAA, SJET					
	Suggestion for dissemination	SJET					
Dissemination of PP	Planning of dissemination	DONRE, UDAA					
	Dissemination to other area	DONRE, UDAA					

The screen shows the planning chart of the pilot project. The Planning chart shows:

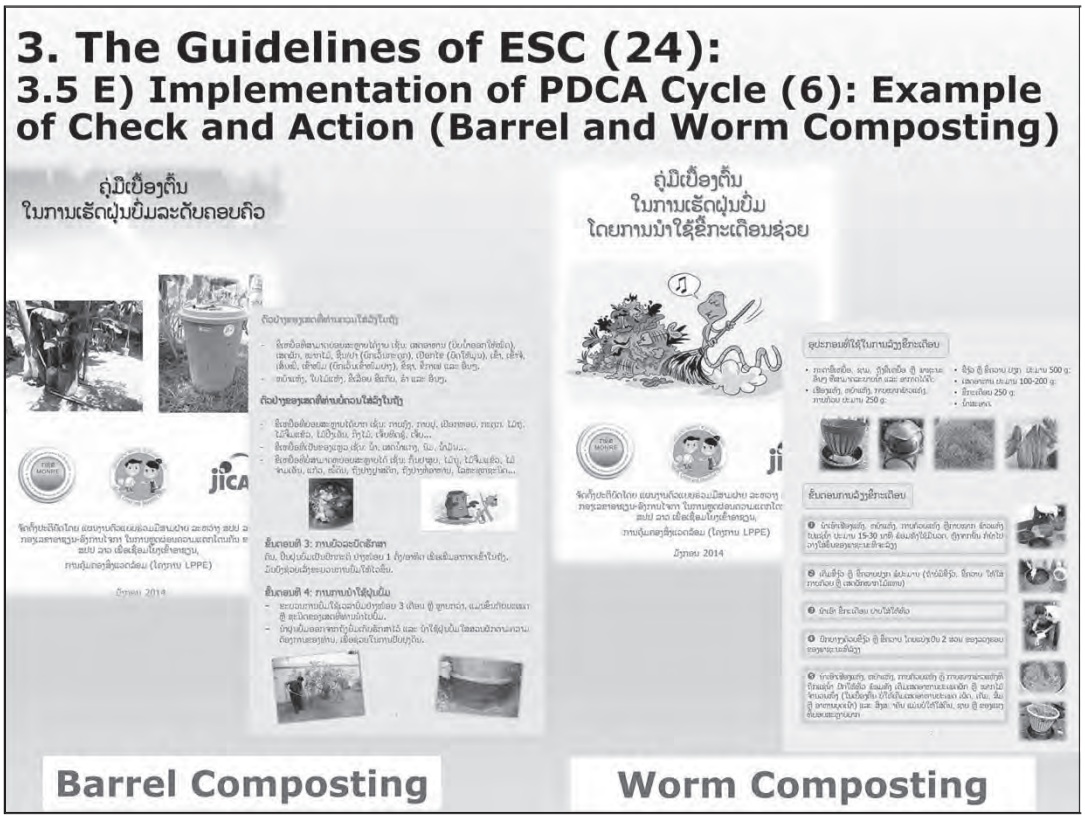
- Activities to be carried out
- Allocation of roles, i.e. Organization responsible for each activity
- Time schedule of each activity



The screen shows the Do (Implementation) of the Pilot Project (PP). The following two on-site composting PPs are conducted (Do):

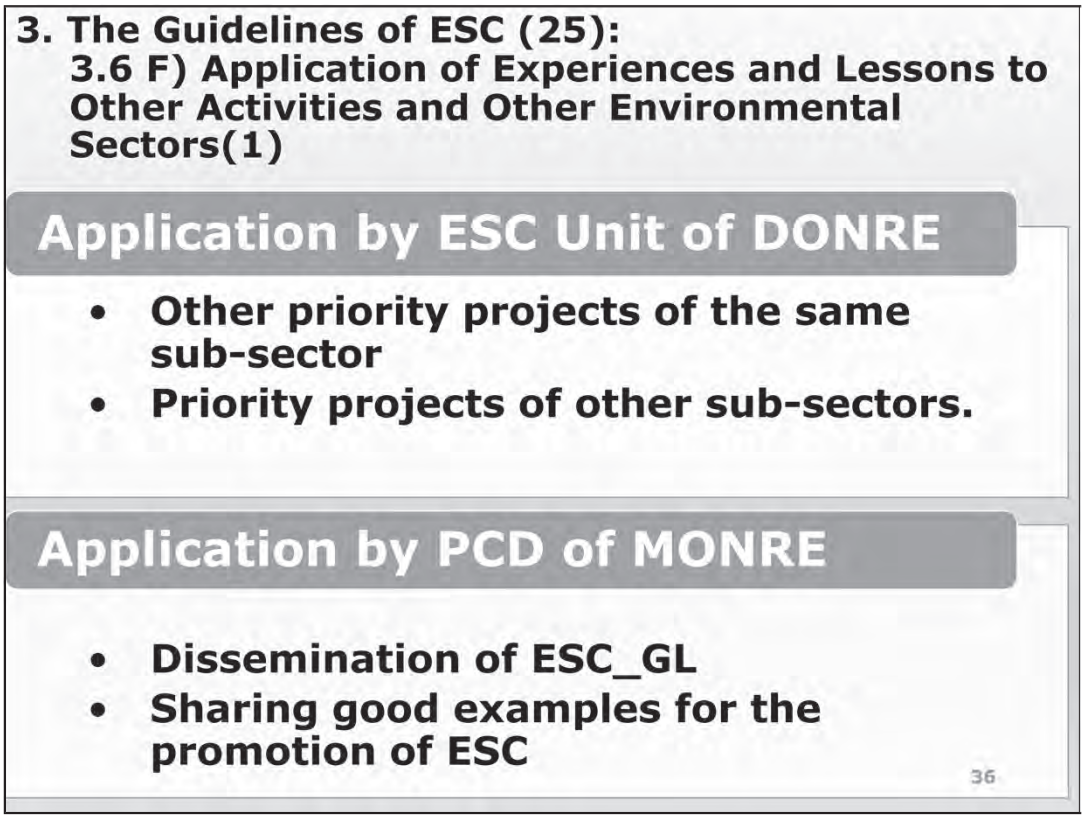
- Barrel composting
- Worm composting

Prior to the PPs instruction leaflets for both composting method were prepared. Then instruction and education of both composting were provided in the PP sites.



The screen shows the Check (Monitoring) and Action (Modification) of the Pilot Project. Based on the monitoring results the following actions were taken:

- Improvement of the Barrel and Worm composting methods;
- Modification and finalization of instruction leaflets for both composting
- Preparation of instruction video for worm composting

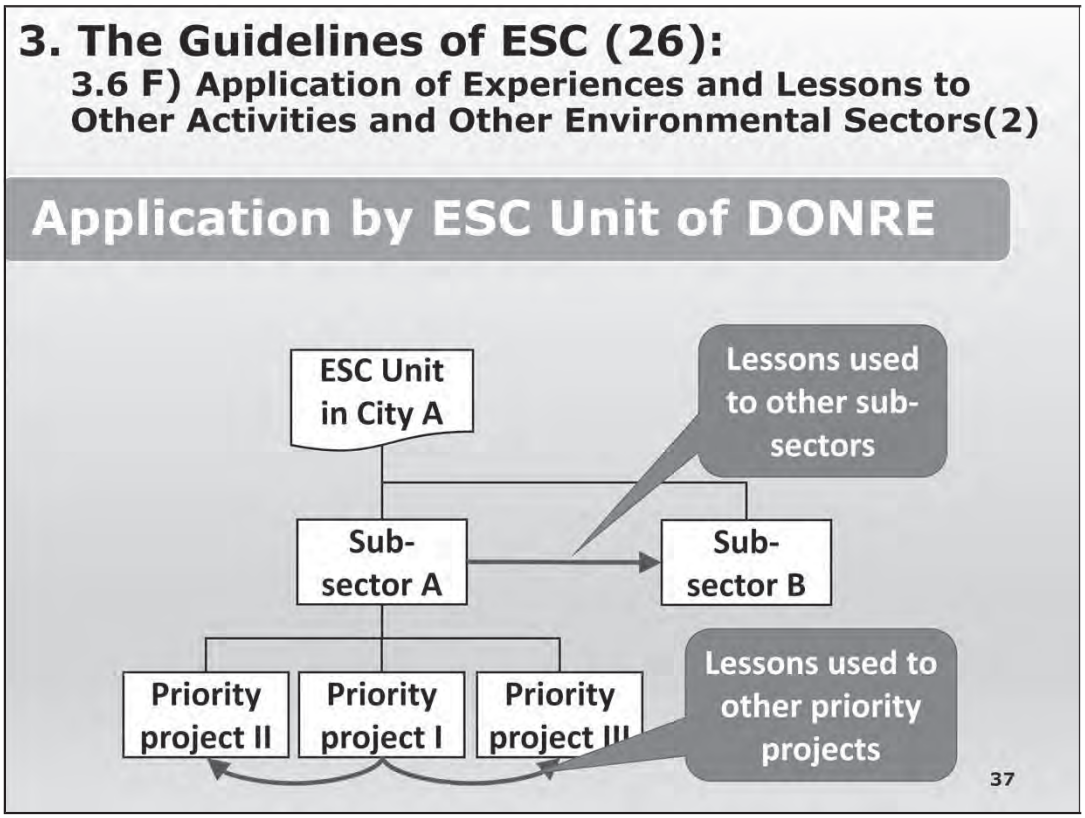


The experience and lessons derived from the implementation of priority projects up to Process E should be applied to other new projects by (i) ESC Unit of DONRE and (ii) PCD. The application of experience and lessons by the ESC Unit of DONRE is to:

1. Other priority projects of the same sub-sector
2. Priority projects of other sub-sectors.

The application of experiences and lessons by PCD is practiced in:

1. Dissemination of ESC_GL
2. Sharing good examples for the promotion of ESC in Lao PDR.



a. Application of Experiences and Lessons By ESC Unit of DONRE

The ESC Unit of DONRE applies the experiences and lessons obtained from the implementation of the priority project to the development of another priority project, which can be of the same sub-sector or other sub-sectors, by referring to the result of prioritization process carried out in Process D.1 and D.2 of ESC_GL.

a.1 Application to other priority projects of the same sub-sector

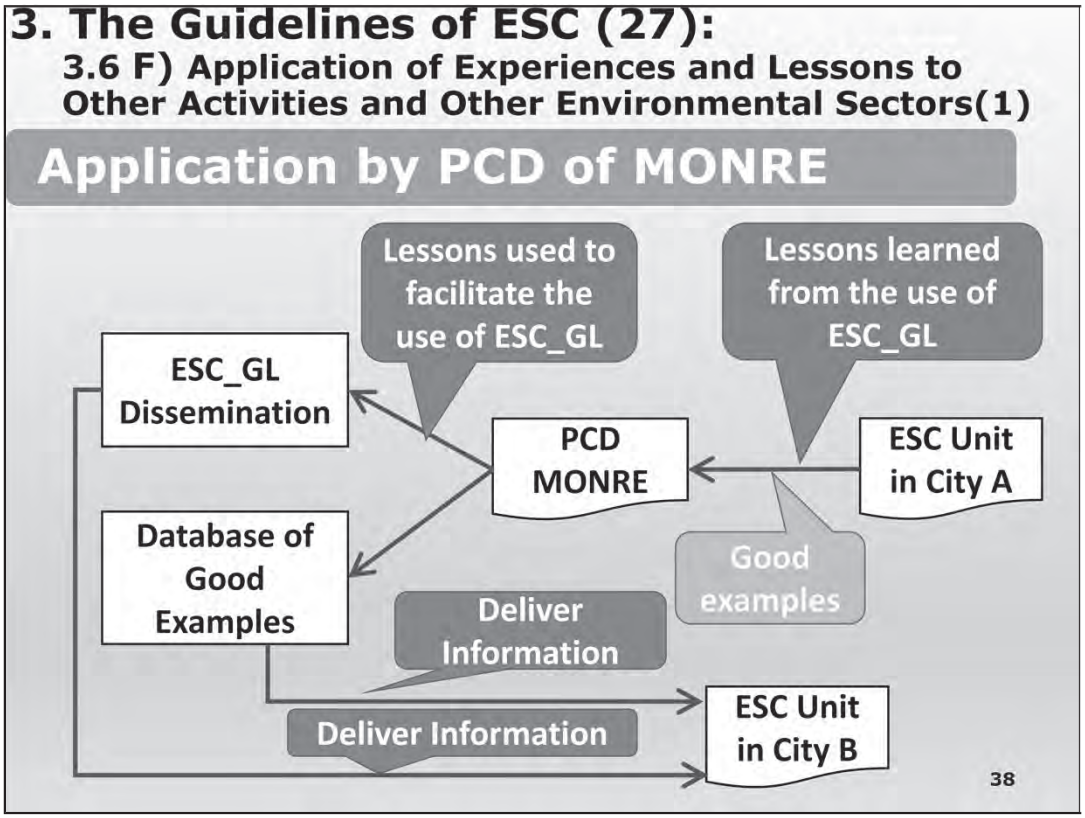
Application will be conducted as follows:

1. The priority projects implemented are evaluated.
2. From the results of the evaluation, the issues and problems of the sub-sector are examined and proposals are made for the improvement of the issues and problems.
3. Based on the proposals, the A/P is revised.
4. Through Process E, the priority projects are selected, planned and implemented.

a.2 Application to other sub-sectors

Application will be conducted as follows:

1. Another priority sub-sector is selected.
2. From the results of the evaluation of the priority projects implemented, the applicable lessons to the newly selected sub-sector are examined and proposals are made for the improvement of the selected sub-sector.
3. Based on the proposals the A/P of the selected sub-sector is formulated.
4. Through Process E priority projects are selected, planned and implemented.



b.1　　Dissemination of ESC_GL

The lessons learnt by the ESC Unit should be shared with PCD as the National ESC Guidelines are alive, requiring feedbacks and reviews as follows:

1. During the application of the ESC_GL, the ESC Unit may find out some issues such as unclear points and difficulties.
2. Those issues associated with ESC_GL application are reported to PCD.
3. PCD takes account of those issues in its activities of ESC_GL dissemination to promote the understanding by the local authorities.
4. If necessary, the ESC_GL is modified to be more useful and easy-to-understand.

b.2　　Sharing good examples for promotion of ESC

Considering the current limitation of resources available for the local authorities, it is important for PCD to support them to promote ESC. One of the most important supporting works is to provide technical information useful for the promotion of ESC. The PCD acts as technical information hub, which collects and delivers technical information when it is required by the local authorities. The technical information necessary for the local authorities to promote ESC is as follows:

1. Information on overall ESC promotion:
This includes such information as the experiences of ESC unit formation and examples of visions for ESC. It will be useful for the local authorities in the initiation stage.

2. Information on the improvement of sub-sectors:
This includes, for example, procedures and methodologies of priority projects selection of different sub-sectors and outputs produced through project implementation. It will be of help for the local authorities to conduct similar projects.

In case of LPPE, a lot of pilot projects have been implemented as priority projects of the SWM sector and produced a lot of important tools and examples. Those tools and examples are in the database of PCD and available to the local authorities.

Please contact with PCD of MONRE for further information.