

TABLES

Table VII-1 Integrated Urban Drainage (Functional Responsibilities)

Agencies	Drainage Policy / Programme						Research & Development		Drainage Facilities					Non-Structural Measures				Storm Water Quality Enforcement											
	Policy Formulation	Regulation / Rules	Guidelines	Technical Assistance	Drainage Master Planning	Integration of Land Use Urban Drainage	Financing / Funding	Research & Development	Capacity Building	River Channel Improvement	Trunk Drain	Infrastructure Drain	Road Side Drains	Flood Detention Pond	Other Storm Water Drainage Facilities	Water Quality Monitoring	Public Awareness	ERM	Maintenance	Land Use Violation	Utter / Solid Waste / Nuisance	Erosion of Hill Land	Damage of river banks, pollution of river	Sand Mining Operation (NLC)	Mining Operation	Discharge of Waste Water	Unlicensed blockage and diversion	Control of Earthwork	
Federal																													
Cabinet	●																												
MHLG (Local Government Department)	●	●				●																							
EPU	●					●																							
DID (Drainage Division)	●	●	●	●	●	●		●	●	●							●								●				
DOE																													
NAHRIM																													
Federal Department of Town and Country Planning						●																							
NCLG	●	●																											
National River Council	●	●				●			●																				
Dept. of Sewerage																													
IWK																●													
State																													
Exco/State Authority	●	●																											
State Secretary / Division of Local Government						●																							
State Town and Country Planning Department						●																							
State Director of Lands and Mines																													
State EPU																													
State DID	●			●				●	●	●																			
State JKR												●																	
DOE																													
State Planning Committee	●																												
State Waters Management Authority	●	●							●	●																			
Local Level																													
Local Authority	●	●			●			●		●																	●		
District Land Administrator																										●			
District Office																													
District DID									●	●																			

Table VII-2 Functional Responsibility for Drainage Facility

Drainage and Basic Facility	Catchment Area	Planning	Design	Construction	Maintenance
Basin Wide Drainage Facility					
1) River Channel Improvement	> 4km ²	DID	DID	DID	DID
2) Flood Retardation Basin	> 4km ²	DID	DID	DID	DID
3) Weirs/Gates	> 4km ²	DID	DID	DID	DID
4) Trunk Drain (connected to flood mitigation)	< 4km ²	DID	DID	DID	DID
5) Community Retention Facilitie (incorporated with multipurpose use/recreation facilities)	-	DID	DID	DID	LA
Sub-basin Drainage Facility					
6) Infrastructure Drain / Secondary Drain	< 4km ²	D/LA	D/LA	D/LA	D/LA
7) Roadside drain (State/Federal Roads)	-	JKR	JKR	JKR	JKR
8) Roadside drain (Municipal roads)	-	D	D	D	LA
9) Perimeter / Tertiary Drain	< 2km ²	D	D	D	LA
10) Flood Detention Ponds	-	D	D	D	LA
11) Other on site detention facilities	-	D	D	D	LA
12) Rehabilitation of existing detention ponds	-	LA	LA	LA	LA
13) Construction of Storage facility in open space	-	LA	LA	LA	LA
14) Storage tanks in new development	-	D	D	D	LO
15) Storage tanks in existing built-up area	-	LO	LO	LO	LO

Notes: D : Developer
 LO : Landowner
 LA : Local Authority
 JKR : Public Work Department

Table VII-3 (1/2) Drainage Contribution – Existing Practices

No.	State / Local Authority	Rate	Collected by	Total Collected (RM) (yr)	Enabling Law
1.0	PERLIS	-	-	-	-
1.1	MP Kangar	TK	-	-	-
2.0	KEDAH	RM2,500/ha (residential) RM3,750/ha (residential/ commercial <4 storey) RM5,000/ha (non-residential development < 4 storeys) RM12,000/ha (Compleks > 4 storeys)	i. MP Kota Setar ii. MP Sg. Petani	1.918 million (1995) 1.18 million (1995)	NLC
2.1	MP Kota Setar	*		*	Act 133
2.2	MP Sg. Petani	*		*	Act 133
2.3	MD Pendang	TK		-	
2.4	MD Bandar Baru	TK		-	
3.0	PULAU PINANG	RM25,000/ha	I. MP P. Pinang ii. MP S. Perai	3.6 million (1995)	
3.1	MP Pulau Pinang	*	*		Act 133
3.2	MP Seberang Perai	*	*		Act 133
4.0	PERAK	-	-	-	-
4.1	MB Ipoh	RM4,000/ha		RM1.778 million	Act 133
4.2	MD Manjung	TK			
4.3	MD Kinta Barat	TK			
4.4	MD Kerian	i. RM1,000-2,000/ha (residential) ii. RM2,000-3,000/ha (non-residential)		RM78,948	Act 133
4.5	MD Tapah	TK			
4.6	MD Gerik	TK			
4.7	MD Selama	TK			
5.0	SELANGOR	RM7,500/ha	JPS Selangor	183.2 million (1994)	
5.1	MP Klang	RM3,000/ha		RM4.684 million	Act 133
5.2	MP Shah Alam	TK			
5.3	MP Selayang	TK			
5.4	MP Subang Jaya	According to catchment area		RM1.778 million	Act 133
5.5	MD Kuala Langat	TK			
5.6	MD Sabak Bernam	TK			
6.0	N. SEMBILAN	RM8,000/ha	PTG N. Sembilan	-	-
6.1	MP Seremban	Sharing among developer (no fixed rate)	-	-	Act 171
6.2	MD Kuala Pilah	TK	-	-	
6.3	MD Rembau	TK	-	-	
6.4	MD Jelebu	TK	-	-	
7.0	MELAKA	RM7,414/ha	PTD	-	-
7.1	MP Melaka	RM0.75/m ² Floor area		RM1,738,550.26	Act 171
7.2	MD Jasin	RM0.70/m ² Floor area		RM13,916.00	Act 133
7.3	MD Alor Gajah	RM7.50/100sqft floor area			

Table VII-3 (2/2) Drainage Contribution – Existing Practices

No.	State / Local Authority	Rate	Collected by	Total Collected (RM) (yr)	Enabling Law
8.0	JOHOR	RM5,000/ha	PTG Johor		
8.1	MB Johor Bahru	No information		2.5 million (1995)	
8.2	MD Muar Selatan	i. RM300-1,000/unit (residential) ii. RM1,000/1000 floor sqft (non residential)		RM100,000	Act 133
8.3	MD Batu Pahat Barat	TK			
8.4	MD Muar Utara	i. RM10-1,000/unit (residential) ii. RM500-1000/1000 floor sqft (other than residential) iii. RM5,000/ha (golf course & industry)		RM10,000	Act 171
8.5	MD Batu Pahat Timur	i. RM50-700/unit (residential) ii. 1% buildng cost (other than residential)			Act 171
8.6	MD Muar Selatan	i. RM50-1,000/unit (residential) ii. RM500-1000/1000 floor sqft			Act 133
8.7	MD Segamat Selatan	TK			
9.0	PAHANG	TK			
9.1	MP Termeloh	TK			
9.2	MD Lipis	TK			
9.3	MD Jerantut	TK			
10.0	TERENGGANU	-	-	-	-
10.1	MP Kuala Terengganu	RM40-150 / unit		RM71,162	Act 133
11.0	KELANTAN	-	-	-	-
11.1	MD Gua Musang	TK	-	-	-
11.2	MD Tanah Merah	TK	-	-	-
11.3	MD Jeli	TK	-	-	-

Source : Local Government Department, Ministry of Housing and Local Government

TK : Not applied

* : Collected by Local Authority and given to State

Table VII-4 Maintenance Schedule for Drainage Facilities

Drainage Type by Area		Minimum Frequency
Concrete Drains	1. Drains in market area	Everyday
	2. Drains in stalls	Every other day
	3. Drains in Commercial Area	Twice in a week
	4. Drains in residential area	Once a month
	5. Drains in Industrial Area	Once a month
	6. Roadside Drains in city area	Once every three weeks
	7. Roadside Drains (outside city area)	Once a month
	8. Monsoon Drains	Once in two months
Earth drains	1. Drains in villages within urban areas	Once every two months
	2. Monsoon Drains	Once every two months

Source: MHLG (Local Government Department)

Table VII-5 Functional Responsibility and Cost Recovery Measures of
Urban Drainage Facilities

Work Item	Implementing Agency	Maintenance Agency	Source of Funding	Cost Recovery Measures
<u>Drainage Policy and Programme</u>				
1. Drainage Master Plan	DID, LA	-	Federal/State Govt./Local Authority/International Grants	
2. Non-Structural / Measures / Public Education / Public awareness	DID, LA	-	Local Authority Fund/DID	
3. Research and Development	NAHRIM, DID, MHLG	-	Research Grants (MOSTE), International Grants	
4. ERM	LA	-	Local Authority Funds	
<u>Basin Wide Drainage Facility</u>				
1. River Channel Improvement	DID	DID	Federal/State Grant	Drainage Contribution (National Land Code)
2. Flood Retardation Basin	DID	DID	- do -	
3. Weirs / Gate	DID	DID	- do -	
4. Trunk Drains (> 4km ²)	DID	DID	- do -	
5. Community Detention Pond	DID	LA	- do -	
<u>Sub-Basin Drainage Facility</u>				
1. Infrastructure Drain / Secondary Drain	Developers/LA	LA	Developer/Local Authority Funding	Drainage Improvement Charge s51 SDBA
2. Perimeter / Tertiary Drain	Developer	LA	Developer	-
3. Flood Detention Ponds	Developer	LA	Developer	-
4. Roadside Drain (Fed/State Roads)	JKR	JKR	Road Development Fund	State Road Grant
5. Other Municipal road side drains	LA/Developer	LA	- do -	- do -
6. Other on site detention facilities	Developer	LA	Developer	Drainage Rate
7. Rehabilitation of Existing detention ponds	LA	LA	Local Authority Fund	- do -
8. Construction of storage facilities in open space	LA	LA	- do -	Drainage Rate
9. Storage tanks in new development	Developer	Land Owners	Developer	-
10. Storage tank in house	LO	LO	Land Owner	Subsidy

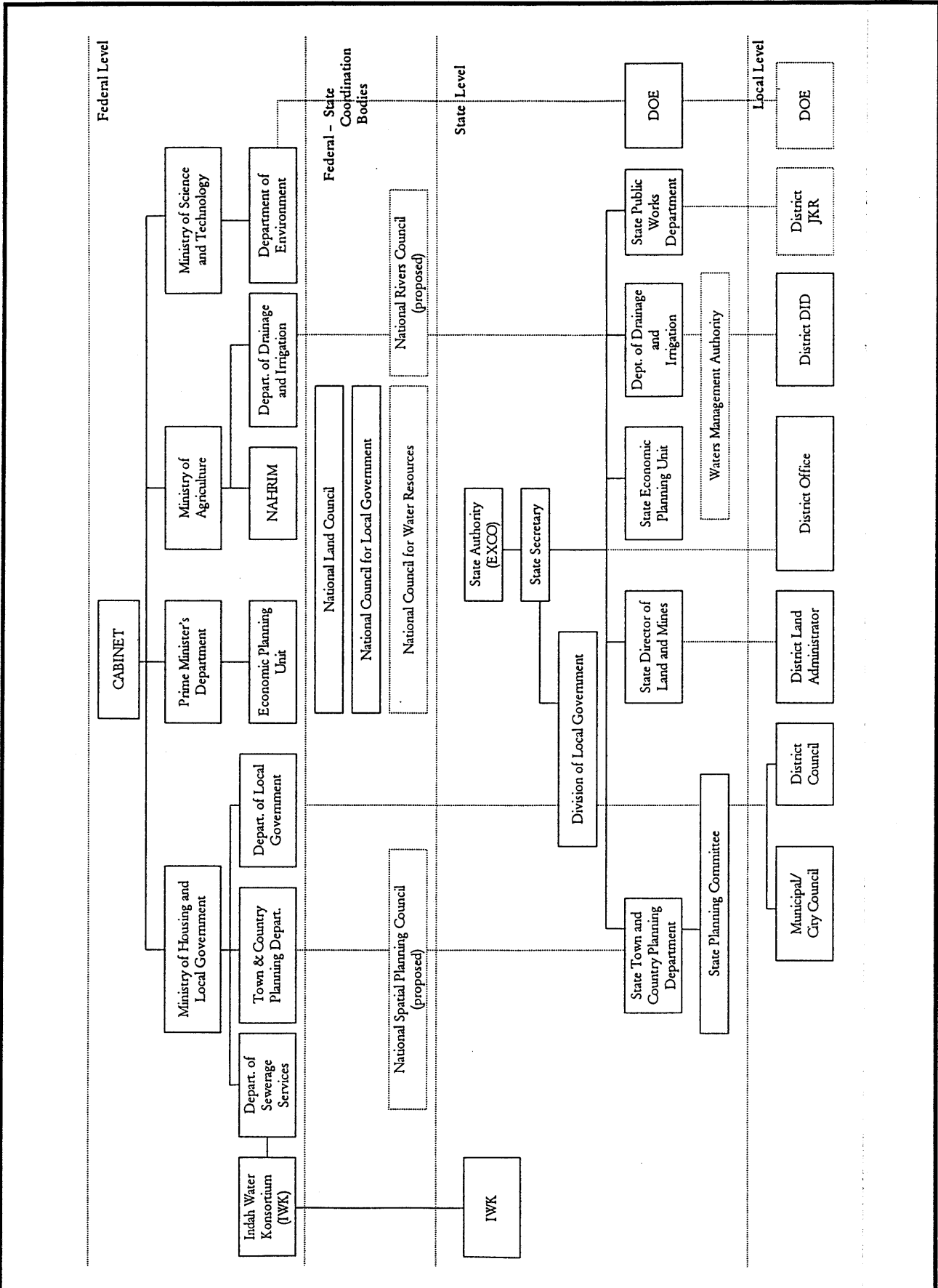
Table VII-6 Related Legislation and Implementation Agencies Pertaining Urban Drainage

Legislation	Implementing Agency / Authority
<p><u>Land Use and Land Conservation</u></p> <ol style="list-style-type: none"> 1. National Land Code 2. Town and Country Planning Act 1976 including Tree Preservation Order 3. Land Conservation Act 1960 	<p>State Authority/State Land Office State Planning Committee/Local Planning Authority State Land Office</p>
<p><u>Natural Resources</u></p> <ol style="list-style-type: none"> 1. National Forestry Act 1984 2. Water Supply Enactment No 3 of 1995 3. Waters Act 1920 (revised 1989) 4. Mining Enactment 1936 5. Selangor Waters Management Enactment 	<p>State Department of Forestry State Authority District Office State Director of Lands and Mines State Water Management Authority</p>
<p><u>Environmental Control Planning</u></p> <ol style="list-style-type: none"> 1. Environmental Quality Act 1974 2. Environmental Quality (Prescribe Activities) Environmental Impact Assessment, Order 1987 3. Environmental Quality Regulation 	<p>Department of Environment Department of Environment Department of Environment</p>
<p><u>Management of Urban Drainage</u></p> <ol style="list-style-type: none"> 1. Local Government Act 1976 2. Streets, Drainage, Building Act 1974 3. Drainage Works Ordinance 1954 4. Earthworks by Laws 	<p>Local Authority Local Authority State Authority/Drainage Board Local Authority</p>
<p><u>Guidelines</u></p> <ol style="list-style-type: none"> 1. Urban Drainage Design Standards and Procedures 2. Guidelines on River Front Development 3. Guidelines on the Prevention and Control of Silt Erosion 4. Use of Detention Pond as part of Open Space 5. Urban Storm Water Management Manual 	<p>DID DID DOE JPBD DID/LA</p>

Table VII-7 Enabling Law and Enforcement Agency for Illegal Activities on Urban Drainage

Violation/Offenses/Enforcement	Enabling Law	Enforcement Agency
Overall custodian role on all waterways	-	LA
Land use violation	NLC, TCPA	Land Administrator, Local Planning Authority
Litter and unauthorized garbage disposal	LGA	LA
Erosion of Hill Land	Land Conservation Act 1960	District Land Administrator
Control of Earthworks	Earthwork by laws, ESCP (Erosion and Sediment Control Plan)	LA DOE
Diversion and abstraction of water and damage to river banks	Water Act SWMAE	District Office, SWMA
Sand Mining operation	NLC, SWMAE	Director of Land and Mines (DLM), Inspector of Mines, SWMAE
Discharge of waster water	EQA, SWMAE	DOE, SWMA, LA
Unlicensed blockage and diversion	SDBA, WA, SWMAE	LA, SWMA District Office
Indiscriminate Development in Catchment Area	SWMAE, NFA	SWMA, Forestry Department
Enforcement of river and drain reserve	NLC, SWMAE	DID, SWMA, DLM
Enforcement of Detention Pond Facilities in Residential Development	TCPA	LA
Enforcement of Community Detention Pond Facilities	TCPA	LA

FIGURES



THE STUDY ON
 INTEGRATED URBAN DRAINAGE IMPROVEMENT
 FOR MELAKA AND SUNGAI PETANI IN MALAYSIA
 JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. VII-1
Institutional Organisation for
Integrated Urban Drainage

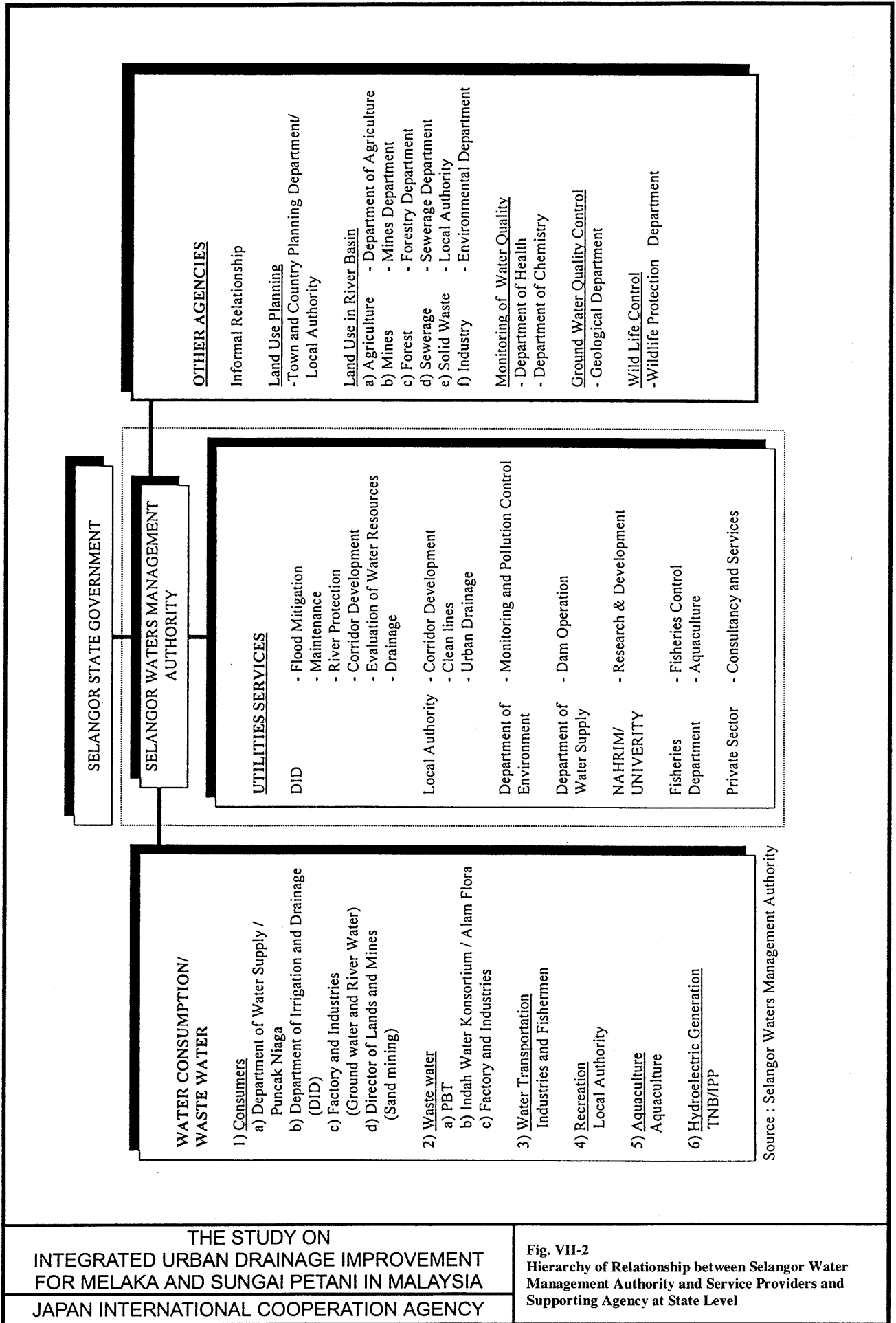
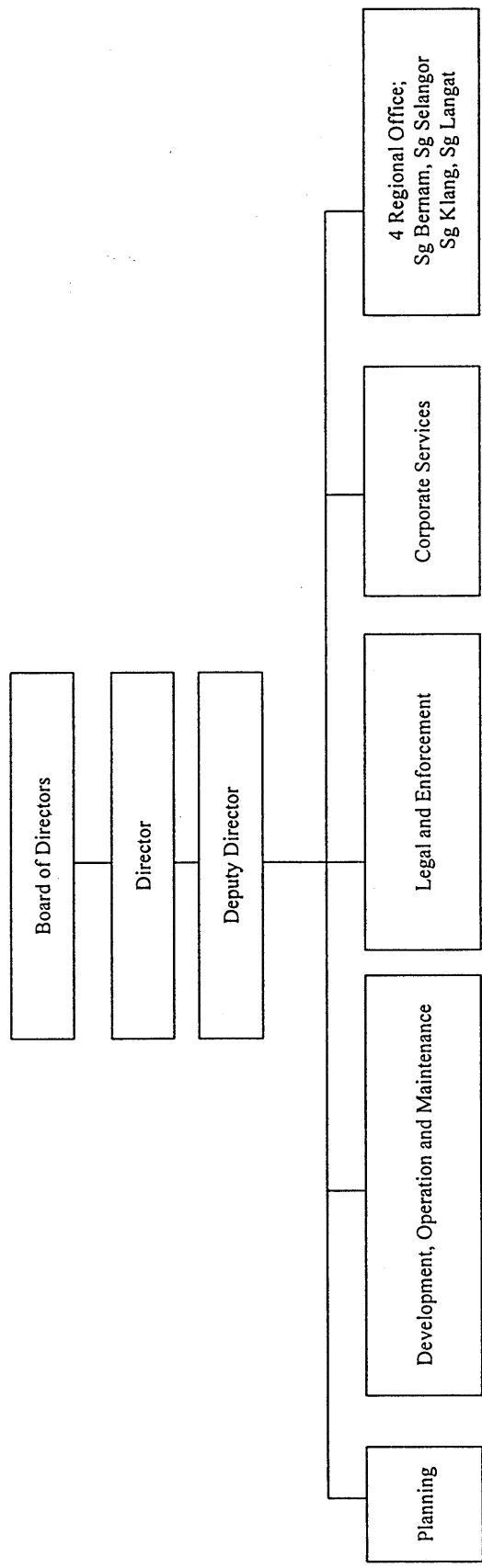


Fig. VII-2
Hierarchy of Relationship between Selangor Water Management Authority and Service Providers and Supporting Agency at State Level



Source: Selangor Waters Management Authority

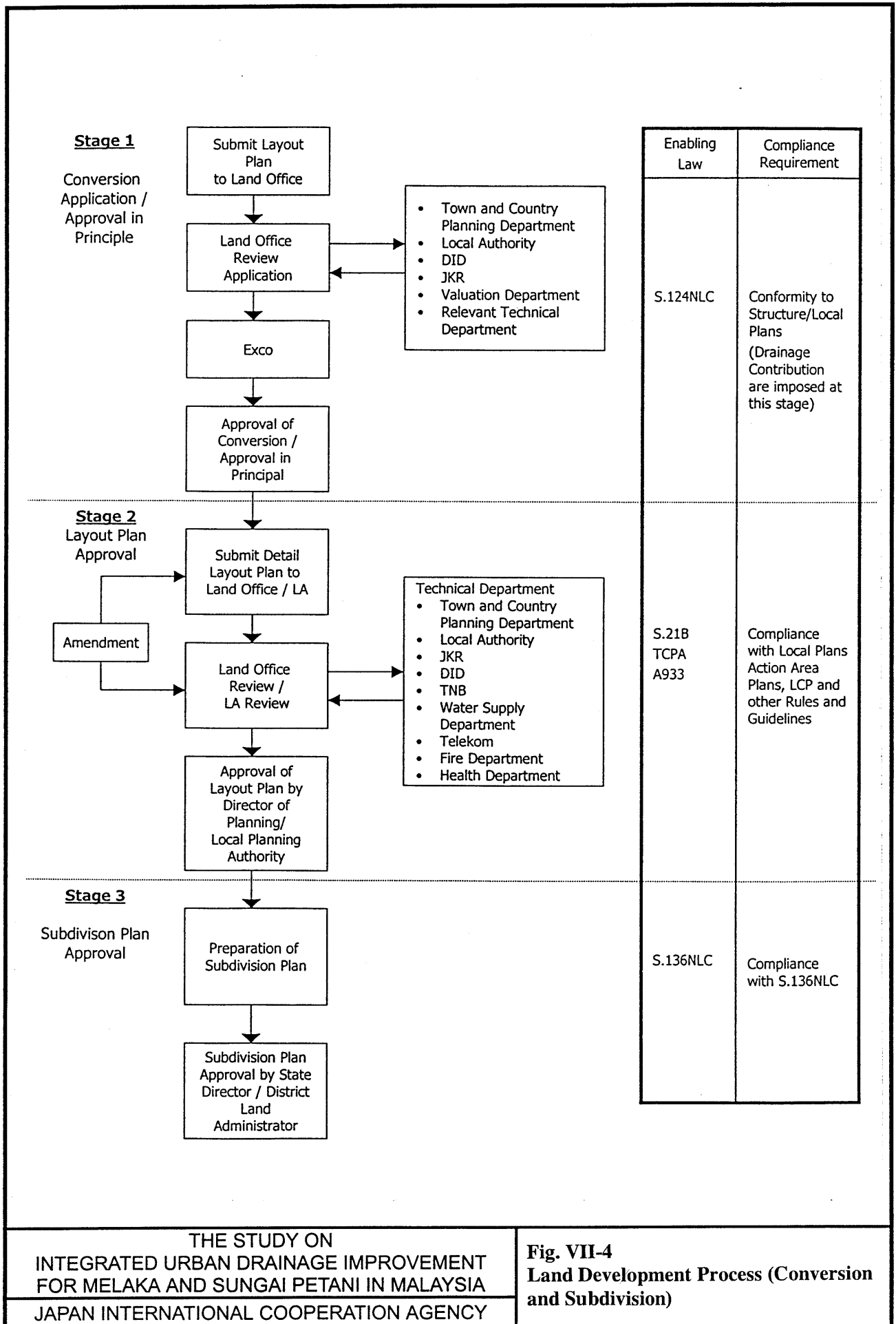


Fig. VII-4
Land Development Process (Conversion and Subdivision)

