

***VOLUME 3 - SECTOR VIII***

***ECONOMIC EVALUATION***

**THE STUDY ON INTEGRATED URBAN DRAINAGE IMPROVEMENT  
FOR MELAKA AND SUNGAI PETANI  
IN MALAYSIA**

**FINAL REPORT**

**VOLUME 3: SUPPORTING REPORT ON DRAINAGE STRUCTURE PLAN**

**SECTOR VIII: ECONOMIC EVALUATION**

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## SECTOR VIII

### ECONOMIC EVALUATION

#### 1. BUDGET ALLOCATED TO URBAN DRAINAGE IMPROVEMENT

The urban drainage improvement project proposed in this study requires the budget for its construction as well as operation and maintenance works. In order to evaluate the financial viability of the proposed projects, clarified was the recent budget allocated to the urban drainage improvement in Malaysia. The budget allocation for urban drainage in Malaysia is made in the three (3) tiers of Federal, State and Local Government. Among them, the Federal and State Government own their federal fund and state fund which have been rather independently allocated to the different urban drainage works. A major part of the budget for Local Government is, however, dependent to the federal fund.

Among the government agencies in the tiers of Federal and State Government, the Department of Irrigation and Drainage (DID) is the principal implementing agency responsible to urban drainage improvement. The Federal DID has undertaken the “Master Drainage Plans” for 26 regional town centers in the country since the “Third Five Year Malaysian Plan” starting in 1976. The State DID has also implemented the urban drainage improvement for major towns located within its jurisdiction area. As for the tier of Local Government, the Local Authority has taken a responsibility for prevention of flash floods which may occur due to clogging of drains by rubbish and silt.

As stated above, the principal implementation agencies for urban drainage improvement are enumerated as Federal DID, State DID and the Local Authority. Their budgetary allocation for the urban drainage works are described as below:

##### (1) Budget for Federal DID

The federal budget allocated to the infrastructure development has increased much from RM 790 million in 1994 to RM 1,968 million in 1998, which could be attributed to the Government's intention for building up the better living conditions of the people. (refer to Table VIII-1). In conformity with this trend, the budget of Federal DID has also increased as below (refer to Table VIII-2):

- (a) The total budget increased from RM 217 million in 1994 to RM 311 million in 1998; and

- (b) The budget allocated to the flood mitigation and urban drainage has also a drastic increment from RM 87 million in 1994 to RM 166 million in 1998. (refer to Table VIII-2. Table VIII-3 shows a part of this budget allocation to the projects in State of Kedah and Melaka during the period of 1995-1999.

(2) Budget for State DID

The state budget of Kedah and Melaka for the recent five years of 1995-1999 is as shown Tables VIII-4 and VIII-5. Out of the state budget, the DID Kedah had secured the annual budget of RM 7.1 million, while the DID Melaka RM 3.7 million. Thus, the DID Melaka has the far smaller budgetary scale than the DID Kedah. In spite of such smaller budgetary scale, the DID Melaka allocated the annual budget to the urban drainage works larger than that of DID Kedah as shown in Table VIII-6. That is, the annual average budget for State Kedah is RM 0.7 million for the period of 1995 - 1999, while the budget for State Melaka is RM 2.3 million. It is however noted that the budget for the DID Kedah tends to increase and has reached to RM 1.1 million in 1999. On the other hand, the budget for the DID of Melaka is within a small range of fluctuation.

A part of the above total budget of State DID is shared to the district office of Sg. Petani and Melaka Tengah as below (refer to Table VIII-7). Both of these district offices are responsible to the drainage works in the study areas.

- (a) The DID district office of Sg. Petani shares RM0.23 million for drainage development. The amount corresponds to about 32% of the DID state total budget allocated to urban drainage works.
- (b) The DID district office of Melaka Tengah shares RM 0.82 million for drainage maintenance. The amount corresponds to about 36% of the DID state total allocated to urban drainage works.

(3) Budget for Local Authority

Table VIII-8 presents the budget of Local Authorities of Sg. Petani and Melaka allocated to drainage development and maintenance works. Both of the two Local Authorities are directly responsible to the urban drainage in the objective study areas. As shown in Table VIII-8, the Local Authority of Sg. Petani has secured rather regular and constant annual budget of RM 0.65 million through the period of 1995-1999,

which is divided into RM 0.30 million for drainage development and RM 0.35 million for drainage maintenance on the average. As contrast with the Local Authority of Sg. Petani, the Local Authority of Melaka could have secured more active and affordable budget for urban drainage works. That is, its average annual budget for the period of 1995-1999 was RM 6.5 million, out of which RM 4.3 million was for drainage development and RM 3.2 million for drainage maintenance (refer to Table VIII-8).

## 2. BUDGETARY AFFORDABILITY FOR URBAN DRAINAGE WORKS

The project cost of the optimum drainage improvement plan is classified into the following two (2) components: (a) construction cost and (b) operation and maintenance cost. These cost components have been compared with the budget allocated for urban drainage improvement mentioned above, and financial affordability is evaluated as described hereinafter.

### (1) Affordability of Construction Cost

The construction cost of the proposed optimum urban drainage improvement plan is estimated at about RM 416 million, as described in Subsection 5.1.3. The construction cost is further divided into the following four (4) items:

Item	Cost (RM million)
(a) Channel improvement cost	102.95
(b) Rehabilitation cost of existing flood detention ponds	6.02
(c) Construction cost of new flood detention ponds	288.03
(d) Construction cost of storage facilities in public open space	19.09
Total	416.08

Among the above items, Items (a) to (c) are oriented to basin-wide drainage improvement, and need to be shouldered in principle by the government budget. On the other hand, Item (d) is associated with new land development and a substantial part of the cost could be charged against the private land developers. Thus, the cost to be shared by the government budget is estimated at about RM 128 million, the sum of Items (a) to (c).

In comparison with the required construction cost to be shared by the government budget, the recent average budget allocated for flood control and urban drainage improvement is as summarized below.

Tier of Government		Annual Average Budget (RM million)	Remarks
Federal DID		127.00	The annual budget tended to increase and reached the maximum of RM 166 million in 1998.
State DID	Kedah	0.70	The annual budget tended to increase and reached the maximum of RM 1.1 million in 1999.
	Melaka	2.26	The annual budget is rather constant with a small fluctuation.
Local Authority	Sg. Petani	0.65	The annual budget is constant.
	Melaka Tengah	6.48	The annual budget has a rather large fluctuation ranging from RM 3.7 to RM 7.7 million.

Note: The budget for Federal DID is the average value for the period 1994–1998, while those for State DID and Local Authority is the average of 1995–1999.

As listed above, the budget for Federal DID is far larger than the others, and will be the major source to recover the construction cost.

The implementation of the optimum drainage improvement plan will continue for about 20 years until 2020, and the aforesaid construction cost of RM 128 million could be converted to the annual average disbursement cost of RM 6.4 million. This annual average disbursement cost corresponds to 5.0% of the average annual budget of Federal DID.

Federal DID had allocated about 33.0% of its total budget for flood control and urban drainage to the objective states of Kedah and Melaka in the 5th Malaysia Plan (1986-1991) and 22.2% in the 6th Malaysia Plan (1991-1995). The allocation was based on the ad-hoc level, and therefore, the percentages allocated to the states could fluctuate according to the necessity of flood control projects. Nevertheless, the percentages allocated to the flood control project for Kedah and Melaka is far larger than the above value of 5.0% estimated as the percentage of average disbursement cost for the proposed optimum drainage improvement plan to the annual average annual budget of Federal DID. Moreover, the percentage of 5.0% is likely to reduce since the annual budget for Federal DID tends to increase. Judging from this available budget of Federal DID, it is concluded that the construction cost for the proposed drainage improvement plan could be financially affordable.

## (2) Operation and Maintenance Cost

The major part of the necessary operation and maintenance cost is to be shouldered under the budget of the local authorities of Sg. Petani and Melaka. The required annual operation and maintenance cost for the optimum drainage improvement plan is estimated at RM 2.1 million for Sg. Petani and RM 2.9 million Melaka, respectively (refer to Subsection 5.1.3). On the other hand, the local authorities of Sg. Petani and

Melaka have allocated the budget for drainage maintenance of RM 0.35 million and RM 2.2 million on the average for the recent five years as described above. Thus, the necessary operation and maintenance cost exceed the previous average budget allocated for the operation and maintenance of drainage facilities. The Local Authority of Sg. Petani, in particular, will encounter a significant shortage in operation and maintenance cost. However, such less operation and maintenance cost for Sg. Petani is because Sg. Petani constructed no major drainage facility.

The current budget for the local authorities could not cover the operation and maintenance cost of proposed urban drainage improvement works, and the following actions will be required:

- (a) A major part of the budget for the Local Authority is dependent on the Federal Fund. In this connection, the Local Authority should coordinate with the Federal Government (i.e., the Ministry of Housing and Local Government) to secure the necessary operation and maintenance cost.
- (b) The Local Authority should also attempt to reinforce its power under the present acts related to urban drainage such as the “Street Drainage and Building Act” and the “Local Government Act”. It should look for incremental revenue for operation and maintenance cost through the “Drainage Improvement Charges” and “Drainage Rates” (refer to Sector III, Institutional Setup Plan, Vol. 3, Supporting Report on Drainage Structure Plan).

## ***TABLES***

Table VIII-1 Federal Government Revenue and Expenditure

Unit : RM million

	1994	1995	1996	1997	Ratio in 1997	Average annual increase rate(%) 1994- 1997	1,998
<b>Revenue</b>	49,446	50,954	58,280	65,736	1.00	10.0	56,710
(A) : Tax revenue	37,487	41,671	47,272	53,627	0.82	12.7	45,336
(1) Direct taxes	20,160	22,699	25,851	30,432	0.46	14.7	30,015
(2) Indirect taxes	17,327	18,972	21,421	23,195	0.35	10.2	15,321
(B) : Non-tax revenue	11,338	8,469	10,330	11,421	0.17	0.2	10,883
(C) : Non-revenue receipt	621	814	678	688	0.01	3.5	491
<b>Expenditure</b>	46,341	50,624	58,493	60,415		9.2	62,687
(A) : Current Expenditure	35,064	36,573	43,865	44,665	1.00	8.4	44,584
(1) Defense and Security	5,498	6,004	6,622	6,607	0.15	6.3	5,896
(2) Social Services	11,541	12,141	14,824	15,651	0.35	10.7	15,062
(3) Economic Services	3,660	2,869	4,285	4,125	0.09	4.1	4,065
(4) General Administration	3,862	5,216	5,187	5,927	0.13	15.3	5,806
(5) Transfer Payment	3,688	3,822	6,152	6,529	0.15	21.0	6,827
(6) Debt Service Changes	6,815	6,521	6,795	6,426	0.14	-1.9	6,928
(B) : Development Expenditure	11,277	14,051	14,628	15,750	1.00	11.8	18,103
(1) Defense and Security	2,360	2,888	2,438	2,314	0.15	-0.7	1,379
(2) Social Services	3,285	3,513	3,984	4,919	0.31	14.4	5,795
(3) Economic Services	5,289	6,440	7,693	7,501	0.48	12.4	9,231
(a) Agriculture & Rural Developmen	1,342	1,360	1,182	1,105	0.07	-6.3	960
(b) Public Utilities	790	654	733	1,496	0.09	23.7	1,968
(c) Commerce and Industry	961	1,218	1,212	1,285	0.08	10.2	3,227
(d) Transport	2,158	3,151	4,530	3,587	0.23	18.5	3,051
(e) Communication	5	14	2	4	0.00	-7.2	2
(f) Others	33	43	34	33	0.00	0.0	23
(4) General Administration	343	1,210	513	1,016		43.6	1,698
<b>Financial Balance*</b>	4,408	1,861	1,815	6,626		14.6	-5,002

Source: Monthly Statistical Bulletin, April, 1999, Bank Negara Malaysia.

Note : (1) Financial Balance is calculated by adding the amount of loan repayment from the State Government.

(2) Direct taxes composed of corporate income tax, petroleum tax, personal income tax, stamp duties and other, Indirect taxes of export duties, import duties, excise duties, sales tax, service tax and other, Non-tax revenue of licences and permit, petroleum royalty, interest and return on investment.

Table VIII-2 Financial Development Performance of DID (JPS Malaysia)

Unit : RM thousand.

	1994		1995		1996		1997		1998		Average	
	Allocation	Expenditure	Allocation	Expenditure	Allocation	Expenditure	Allocation	Expenditure	Allocation	Expenditure	Allocation	Expenditure
JPS Malaysia	217,959	181,672	239,162	196,178	285,480	210,423	268,235	208,950	311,550	271,693	264,477	213,783
JPS IADP	165,955	132,146	200,295	154,292	219,813	167,709	210,368	170,496	187,842	142,179	196,855	153,364
Total	383,914	313,818	439,457	350,470	505,293	378,133	478,604	379,446	498,842	413,873	461,222	367,148
JPS Malaysia are composed of :												
(1) Irrigation	25,345	19,660	21,217	17,291	23,735	17,123	18,420	12,284	35,892	32,824	24,922	19,836
(2) Agriculture Drainage	24,655	19,415	23,499	17,197	24,111	14,494	21,179	19,222	27,071	24,335	24,103	18,933
(3) Flood Mitigation	122,205	103,909	144,077	118,505	186,415	135,976	186,788	145,401	201,430	174,220	168,183	135,602
(a) Flood Mitigation inc. Urban Drainage	86,816	77,408	98,760	84,163	140,410	101,221	141,466	121,537	165,837	150,993	126,658	107,064
(b) others inc. flood forecasting	35,389	26,501	45,317	34,342	46,005	34,755	45,322	23,864	35,593	23,227	41,525	28,538
(4) Hydrological Water Resources Assessment	3,500	3,296	1,010	972	2,000	989	2,250	2,097	2,810	2,709	2,314	2,013
(5) Coastal Engineering	17,400	16,256	28,631	25,496	29,900	26,973	18,985	16,356	24,700	21,458	23,923	21,308
(6) Others	24,853	19,135	20,727	16,716	19,320	14,869	20,613	13,590	19,647	16,147	21,032	16,091
Total	217,959	181,672	239,162	196,178	285,480	210,423	268,235	208,940	311,550	271,693	264,477	213,781

Source : Annual Report of DID (JPS Malaysia)

Note : IADP presents 'Integrated Agriculture Development Plan'

Table VIII-3 Federal Budget Allocation for the Flood Mitigation Projects of State of Kedah and State of Melaka

		Unit : RM thousand				
Projects	1995	1996	1997	1998	1999	
<b>State of Kedah</b>						
(1) Urban Drainage						
Implementation of Alor Star Town						
Drainage Phase I & II	8,400	4,500	4,480	6,900	8,800	
Sg. Petani Master Plan Study	950	600	300	0	0	
Kulin Master Plan Study	500	180	200	0	0	
Sub-total	9,850	5,280	4,980	6,900	8,800	
(2) Flood Mitigation						
Flood Mitigation of Sg. Padang Kerbau	194	completed	completed	completed	completed	
Flood Mitigation of Sg. Kuala Muda	583	265	2,340	completed	completed	
Flood Mitigation of Sg. Anak Bukit	654	485	180	100	200	
Flood Mitigation of Sg. Jabi	-	-	50	100	2,800	
Flood Mitigation of Sg. Jarak	-	-	60	100	completed	
Flood Mitigation of Sg. Melaka (in Kedah)	-	-	100	200	150	
Sub-total	1,431	750	2,730	500	3,150	
<b>State of Melaka</b>						
(1) Urban Drainage						
	-	-	-	-	-	
(2) Flood Mitigation						
Flood Mitigation of Sg. Melaka	3,000	3,000				
Flood Mitigation of Sg. Air Hitam	-	-	100	130	720	
Flood Mitigation of Sg. Salak	-	-	100	130	720	
Flood Mitigation of Sg. Simpang Ampat	-	-	100	130	720	
Flood Mitigation of Sg. Lendu	-	-	100	130	720	
Flood Mitigation of Sg. Nyalas	-	-	100	130	720	
Sub-total	3,000	3,000	500	650	3,600	

Source : DID/HQ

Table VIII-4 Budget of Kedah State

Unit: RM thousand.

	1995	1996	1997	1998	1999	Average
<b>Current Budget</b>						
<b>Revenue</b>						
Tax Revenue	98,028	107,580	103,926	187,380	117,335	122,850
Non-Tax Revenue	24,095	21,158	26,507	42,394	34,007	29,632
Other sources	138,124	139,125	162,575	109,981	108,791	131,719
Total	260,242	267,865	293,009	339,755	260,133	284,201
<b>Expenditure</b>						
Emolument	82,363	55,845	101,718	84,154	58,494	76,515
Supplies Vote	257,264	244,960	237,896	254,435	232,053	245,322
Total	339,627	300,805	339,613	338,589	290,547	321,836
Balance	-79,185	-32,940	-46,605	1,166	-30,414	233
<b>Development Budget</b>						
<b>Revenue by Sources</b>						
State Fund	202,165	168,169	299,358	223,084	180,093	214,574
Federal Fund	3,023	8,860	21,250	23,000	23,000	15,827
Financial Agency Fund	39,000	23,305	111,101	70,828	30,000	54,847
Total	244,188	200,334	431,708	316,911	233,094	285,247
<b>Allocation by Department</b>						
State Government Secretariat Office	152,290	127,615	307,698	177,199	77,900	168,540
Agriculture Dept.	5,220	5,415	5,985	6,248	6,095	5,793
Land and Mining Dept.	500	500	500	750	500	550
Drainage and Irrigation Dept.	6,429	6,100	7,450	7,335	8,050	7,073
Forestry Dept.	9,815	4,750	10,000	13,000	11,730	9,859
Public Works Dept.	64,722	50,699	60,810	62,750	53,931	58,582
Veterinary Dept.	3,711	3,755	3,765	3,129	3,387	3,549
State Financial Dept..	1,500	1,500	35,500	46,500	71,500	31,300
Total	244,188	200,333	431,708	316,911	233,094	285,247
<b>Utility (Water Supply)</b>						
<b>Revenue by Sources</b>						
State Fund	87,518	101,651	113,159	131,082	147,299	116,142
Financial Agency Fund	176,358	208,783	181,775	116,522	87,439	154,175
Federal Fund	-	3,557	3,230	2,508	4,000	2,659
Total	263,876	313,991	298,164	250,113	238,738	272,976

Source : Kedah State Budget, Kedah State (Negeri Kedah Darul Aman)

Table VIII-5 Budget for Melaka State

	Unit: RM thousand.					
	1995	1996	1997	1998	1999	Average
<b>Current Budget</b>						
<b>Revenue</b>						
Tax Revenue	21,954	29,429	36,161	40,282	39,171	33,399
Non-Tax Revenue	91,432	96,769	101,130	101,137	45,233	87,140
Other sources	28,382	27,848	31,723	32,420	16,066	27,288
Total	141,768	154,046	169,014	173,840	100,470	147,828
<b>Expenditure</b>						
Emolument	24,842	22,770	21,543	31,810	25,829	25,359
Supplies	118,565	132,415	151,446	140,931	81,625	124,996
Total	143,407	155,185	172,989	172,741	107,453	150,355
Balance	-1,639	-1,139	-3,975	1,098	-6,684	220
<b>Development Budget</b>						
<b>Revenue by Sources</b>						
State Fund	59,504	70,493	56,494	63,457	29,150	55,820
Financial Agency Fund	51,450	57,500	132,175	90,841	23,500	71,093
Federal Fund	6,532	3,750	3,200	-	500	3,496
Total	117,486	131,743	191,869	154,298	53,150	129,709
<b>Allocation by Department</b>						
Public Works Dept.	30,630	31,200	34,789	18,520	7,605	24,549
Drainage and Irrigation Dept.	7,332	4,550	4,200	1,000	1,500	3,716
Agriculture Dept.	469	1,080	930	550	1,400	886
Veterinary Dept.	300	500	690	680	1,000	634
Land and Mines Dept.	42	47	45	48	45	45
Chief Minister's Office(Housing)	7,600	7,500	23,475	10,200	10,700	11,895
Chief Minister's Office(Infrastructure)	58,213	59,566	112,440	41,300	18,050	57,914
State Development Office	7,900	5,300	6,300	6,500	5,750	6,350
State Financial Office	5,000	22,000	9,000	75,500	7,100	23,720
Total	117,486	131,743	191,869	154,298	53,150	129,709

Source : Melaka State Budget, Melaka State

Table VIII-6 State Budget for Urban Drainage Development and Maintenance to DID / State of Kedah and / State of Melaka

	Unit: RM 1,000			
	State of Kedah		State of Melaka	
	Drainage development	Drainage maintenance	Drainage development	Drainage maintenance
1995	n.a.	-	-	2,282
1996	535	-	-	2,754
1997	500	-	-	2,122
1998	685	-	-	2,070
1999	1,077	-	-	2,107
Average	699	-	-	2,263

Table VIII-7 State Budget for Urban Drainage Development and Maintenance to DID / Sg Petani and Melaka Tengah

	Unit: RM 1,000			
	Sungai Petani		Melaka Tengah	
	Drainage development	Drainage maintenance	Drainage development	Drainage maintenance
1995	n.a.	-	-	840
1996	180	-	-	820
1997	170	-	-	871
1998	180	-	-	791
1999	374	-	-	801
Average	226	-	-	821

Source : DID/Sungai Petani and DID/Melaka.

- Remark : (1) As for Sungai Petani, drainage maintenance is included in drainage development.  
 (2) As for Melaka Tengah, drainage development is included in drainage maintenance.  
 (3) The figures of Table-2/2 are disbursed from Table-1/2.

Table VIII-8 Local Government Budget Allocation for Urban Drainage Development and Maintenance of State of Kedah and State of Melaka

Unit: RM 1,000

	Town Counsel of Sungai Petani			Municipal Counsel of Melaka			Total revenue of the council
	Drainage development maintenance (1)	Drainage maintenance (2)	Total (1) + (2)	Drainage development (1)	Drainage maintenance (2)	Total (1) + (2)	
1995	250	400	650	2,000	1,700	3,700	39,015
1996	250	400	650	7,000	1,700	8,700	47,838
1997	200	450	650	5,000	1,700	6,700	61,582
1998	550	100	650	4,000	3,700	7,700	66,000
1999	250	400	650	3,400	2,200	5,600	65,000
Average	300	350	650	4,280	2,200	6,480	55,887

Source : Town council of Sungai Petani and Municipal Council of Melaka.