VOLUME 4 - SECTOR VII

INSTITUTIONAL SETUP PLAN

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

FINAL REPORT

VOLUME 4: SUPPORTING REPORT ON FEASIBILITY STUDY

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1. INTRODUCTION

The preliminary study on the Institutional Aspects of Urban Drainage in the Supporting Report on Drainage Structure Plan provided a summary of the roles and responsibilities of various agencies responsible for urban drainage. A brief review of the laws and regulations affecting urban drainage is also contained in the report. Phase 2 of the study will attempt to address some of the issues raised in the earlier report as well as matters specified by the Steering Committee. These aspects will be contained in this Chapter and in the guidelines in Volume 5. This chapter will address institutional and legal aspects of the following:

- Organisational framework
- Urban drainage and the Land development process
- Funding and cost recovery method
- Enforcement capacity.

2. ORGANISATIONAL FRAMEWORK

The organisational framework for urban drainage depends on what the law ascribes as roles and responsibilities of the various agencies. Malaysia practices a Federal system of Government with governmental functions and responsibilities shared by three tiers of government i.e. Federal, State and Local Government. Local government however is not independent but is part of the State Administration. Functional responsibilities between the Federal and State Government with respect to drainage are contained in the Federal Constitution, Federal Acts, State Enactments and Cabinet Directives. Fundamentally drainage is listed under the 9th Schedule of the constitution under the Concurrent List which means it comes under both Federal and State competence. While both Federal and State governments have powers to legislate on matters under the concurrent list, executive powers normally vest with the State unless expressly provided otherwise by Federal or State law [Art 80(2)]. The enabling Act on Urban Drainage is the Streets, Drainage and Building Act (Act 133) which empowers Local Authorities to be responsible for drainage within their areas of jurisdiction. Similarly the Constitution bestows absolute ownership of all rivers within the boundaries of the state to the State and all state works on water supply, river and canals, control of silt and riparian rights as within State competence. Only federal works relating to water supply, rivers and canals shared by more than one State is under Federal competence. Clearly the laws

suggest that rivers and drains come within the purview of the State. Notwithstanding this, Federal involvement is especially important on matters pertaining to the following; National Policy, planning and strategy formulation; ensuring uniformity of laws and regulations on urban drainage; research and development and the protection of the environment.

In order to ensure consistency of policy between Federal and State and ensure adequate co-ordination between the several agencies involved in urban drainage, it is important that adequate interagency council and committees are established both at the federal and state level. These councils or committees must by supported by a competent Technical Department as the Secretariat to initiate policy papers and technical guidelines.

Demarcation of responsibilities is also contained in the Ministerial Functions Act 1969 (MFA) and the Cabinet Directive of June 1996. Under the MFA, the Minister of Agriculture through DID is entrusted with the responsibility for flood mitigation and river conservancy works. Federal allocations are a major source of funds for flood mitigation works. In the past, most of the funds were utilised for river channel improvement works, river diversion schemes and construction of weirs and floodgates. In the course of these works, trunk drains were some times constructed or improved under this programme. However the legal responsibility for drainage within local authority areas still lies with the Local authorities. The Cabinet Directive of 1996 divided this responsibility between DID and Local Authority with the former being responsible for all rivers while the latter for all drains in local authority areas. This responsibility covered all aspects of planning, design, construction and management of facilities. Practically however it is difficult to separate the planning of urban drainage independent of the river as most final discharge is to the river or the sea. This will require a great deal of co-ordination between DID and the Local Authority. It is important therefore that integrated urban drainage master plans are prepared for all local authority areas, preferably complementing the Local Plans prepared for these areas to provide the basis for co-ordinated work between the agencies. Most local authorities however do not have the necessary financial and technical capability to undertake integrated urban drainage works. Hence it is imperative that a clear demarcation of responsibilities between Federal, State and Local Authorities are established supported by adequate Interagency Councils and Committees.

The proposed Organizational Framework for Integrated Urban drainage is shown in Figure VII-1. The responsibility for the management of urban drainage is spread over a number of Federal and State Government agencies. The functional responsibilities of these agencies are shown in Table VII-1.

2.1 Federal Level

The departments at the federal level that have relevance to urban drainage are the Department of Drainage and Irrigation (DID); the Department of Local Government; the Town and Country Planning Department; the Economic Planning Unit; NAHRIM; the Department of Environment; and, the Dept.artment of Sewerage Services. The strategic Federal - State coordination bodies are the National Council for Local Government, the National Land Council, the proposed National Spatial Planning Council, and the National Rivers Council. The roles and responsibilities of these agencies were discussed in the Interim Report.

The two key agencies responsible for urban drainage at the Federal Level are the Department of Local Government (MHLG) and the DID (MOA). The Department of Local Governments current programmes on urban drainage are on an ad-hoc basis and are limited to allocations for drainage improvement works and drainage cleanliness campaigns. The Ministry has yet to undertake comprehensive programmes on the urban drainage planning although in the past the Department had one off allocations to address problems pertaining to flash floods in municipal areas. The department however lacks qualified technical staff to undertake comprehensive planning and programmes for urban drainage for local authority areas. However it is responsible for the formulation of policies and co-ordinating the distribution of development grants and development projects from federal to local government via the state government. DID on the other hand have sufficient technical expertise and is responsible for urban drainage projects connected with flood mitigation works or conservancy of rivers. Within this overall framework, Federal Government involvement is especially important on matters pertaining to the following:

- National Policy, planning and strategy formulation
- Interagency Co-ordination Council
- Establishing a programme for urban drainage
- Providing Technical Assistance and Capacity Building
- Ensuring uniformity of laws and regulations on urban drainage
- Research and development including data collection and documentation
- Public Awareness and Education
- Emergency response management
- Federal government Financial support including development grants, loans and subsidy
- Protection of the environment particularly with reference to the quality of storm water runoff.

(1) National Policy, Planning and Strategy Formulation

Urban drainage is intimately linked to water resources planning and management and rivers conservancy management. At the Federal level there is a lack of consistent policy for urban drainage due partly to the lack of clear-cut administrative responsibility. Current policy statements emanate from several agencies such as DID, EPU, Department of Local Government (DLG) and even Cabinet. A consistent policy is necessary as urban drainage is essentially a State/ Local Authority matter and may lead to confusion if each state adopts different policies, standards and guidelines. It is clear from the preceding arguments that DLG and DID will be main initiators of policy on urban drainage at the Federal Level. Notwithstanding this however there is a need for a Federal – State Interagency coordination councils to serve as a suitable platform for the formulation of national policies and strategies on urban drainage.

(2) Interagency Federal - State Coordination Council

A National Rivers Council (NRC) with its secretariat at the Federal DID was recently proposed with the function to deliberate and formulate policies and programs on nationwide river management including flood control and urban drainage. However, the Ministry of Agriculture had argued against the setup of the new NRC. Instead, the Ministry suggested that the function should be entrusted to the existing National Water Resources Council, or it could be involved in the function of the Natural Resources Council whose establishment is still under consideration.

This present Study believes that it is virtually difficult for the existing National Water Resources Council as well as the Natural Resources Council to deal with the objective coordination of functions of agencies involved including flood control and urban drainage. Therefore, the reconsideration of the NRC is proposed as the most appropriate platform at the Federal Level to undertake the formulation of a uniform policy on urban drainage improvement for all states, in view of the following reasons:

(a) The existing National Water Resources Council (NWRC) has its secretariat at JKR (Public Works Department) and its principal function is to formulate policies and strategies for potable water supply and interstate water transfer. The NWRC may be the appropriate platform for ensuring the national policy on water resources development, but not for flood control and urban drainage improvement. Likewise, the proposed Natural Resources Council has the

function to deliberate on policies and regulations pertaining to land resources, mineral resources, forest resources, marine resources and other various natural resources. The above functions on water and land resources are very different from those of flood control and urban drainage.

(b) A comprehensive hydraulic and hydrological knowledge related to flood runoff and flood flow is required in flood control and urban drainage improvement. Hence, DID would be the most appropriate agency as the secretariat for the interagency coordination body for flood control and urban drainage because of its intensive hydraulic and hydrological knowledge.

(c) The objective interstate coordination body needs to involve various agencies such as DID, JKR, DOE , Department of Town and Country, and Department of Local Government. Accordingly, it is virtually difficult for the existing National Water Resources Council or the proposed Natural Resources Council to undertake the objective coordination in addition to their originally conceived functions.

At present, requests for federal funding are made by three agencies, namely the Local Authority, the State Authority and the Federal DID. These requests are coordinated by EPU and the Treasury, prioritized through a bidding process and incorporated into the 5-Year Malaysia Plan. Other sources of funding are the State Government and the Local Authority using their own resources. There is an obvious need to coordinate these programmes in tandem with the preparation of local plans, prioritize them before allocating funds. The proposed NRC may again be a suitable forum to address the request before submitting it to EPU and the Treasury for funding approval.

(3) Establishing a Programme for Integrated Urban Drainage

The request for funding for drainage master plan studies may originate from three main sources, i.e. DID, the Local Authority or the State Authority. Most of the projects are initiated by DID under the programme on 'Drainage and Flood Mitigation in Urban Areas. To date DID have undertaken Master Drainage Plans for 26 towns and cities. Under the 7th Malaysia Plan, master planning studies was carried out in Kemaman, Ipoh, Alor Setar and Sg. Petani. However most of the earlier projects focussed on river channel improvement and methods that favored the 'Quick Disposal System'. The focus of more recent projects are on source control programmes such as the 'Storm Water Management and Drainage Master Plan Study

for Ipoh. The new approach calls for an integration of storm water management in the urban planning process. As such the Local Plan programme undertaken by the Dept. of Town Planning should coincide with Drainage Master Plan Studies. Request for funding is coordinated at the EPU and Treasury usually with advice from DID. The State may sometimes fund its own programmes for example the Drainage Master Plan Study for Kuantan was undertaken using State Funds. Request from Local Authorities is usually channeled through the State and the Local Government Department of the Ministry of Housing before it is sent to EPU and Treasury. In order to ensure consistency in co-ordination and policy it is suggested that the initial screening and prioritization of urban drainage projects could be done by the proposed National Rivers Council before it is forwarded to EPU and Treasury.

(4) Functional Demarcation between DID and Local Authorities

Except for the City of Kuala Lumpur which has its own drainage division, functional responsibilities on urban drainage in other local authority areas are shared between DID and the Local Authority. Rivers and its tributaries that flow within Local Authority areas are the responsibility of DID while other drains that feed into the river system are the responsibility of Local Authority. This responsibility covers all aspects of planning, design, construction and management of facilities. There is currently an exercise to identify rivers and drainage channels that will be the responsibility of the respective agency. The general guidelines for identifying DID rivers are:

(a) Rivers and tributaries whose catchment comprise a mixture of agricultural drainage and urban drainage,

(b) Rivers and tributaries whose catchment extends over a number of local authorities,

(c) Other natural rivers and tributaries which do not satisfy the above but upon the specific request of the Local Authority,

(d) In addition to the above, the Study Team also recommends the size of the catchment area as a possible criteria:

Objective Work	Catchment Area	Responsibility
River Improvement Projects	> 4km^2	DID
Trunk Drains (related to flood mitigation)	< 4km^2	DID
Secondary and Tertiary Drains	< 2km^2	Local Authority
Retention and Detention Facilities		Local Authority

(e) It is also suggested that DID is responsible for drainage facilities at a Drainage Basin Level such as community detention pond facilities and trunk drains while facilities at the sub-basin level should be the responsibility of Local Authority.

(5) Providing Technical Assistance and Capacity Building

DID provide technical assistance to other government agencies involved in urban drainage. Most local authorities also consult DID on drainage matters and incorporate the comments and requirements of DID as part of the conditions of approval for land development. DID is also exploring possibilities of seconding drainage engineers to Local authorities and the Local Governments Department of MHLG. Drainage engineers from DID may also be absorbed by Research Institutions such as NAHRIM or State Waters / Rivers Management Authority. Foreign expertise for specific projects is arranged by EPU through bilateral agreements such as JICA and Danced. There is also a need for capacity building and the training of drainage engineers on Best Management Practices on Storm Water Planning and Management. This is particularly important at project planning and implementation agencies such as Local Authorities and State DID. Local Authorities that have achieved Municipal or City status should have a Drainage Division/Unit within the Engineering Department.

(6) Uniformity of Laws and Regulations on Urban Drainage

The enabling law on urban drainage is the Streets, Drainage and Building Act (Act133). Under the provisions of the Act, uniform bylaws have been applied for Buildings (UBBL) and Earthworks. There are currently no bylaws on urban drainage as the conventional view was that drains were part of road design. There are however several guidelines and standards being applied in practice. This include the Urban Drainage Design Standards (DID) and the Guidelines on the application of detention ponds to meet open space requirements (JPBD). DID has also a commissioned a consultant to prepare a comprehensive Urban Storm Water Management manual. Proposals for the changes to the law on urban drainage will have to be tabled to the NCLG and subsequently adopted by the respective State Governments. Under the

Act s133 (xviii) SDBA, State Authority may also make bylaws for the provision, construction, maintenance and repair of drains.

(7) Research and Development

The Universities and National Hydraulic Research Institute of Malaysia (NAHRIM) will have to spearhead research and development of BMP involving planning, design, implementation and management techniques and methodologies on integrated urban drainage. Innovative research on urban drainage involving eco-soils is currently undertaken by the University of Science Malaysia. Adequate budgets and programmes for R&D have to be established and better linkages forged with the industrial and construction sector on the manufacture and application of these new methods.

(8) Public Awareness and Education

Public awareness and concerns of drainage have increased over the years. Complaints on clogged drains, flash floods and river floods are directed to the Local Authorities. There is a need for greater community education and active local authority participation in the planning, promotion and the enforcement of non-structural measures. Both the DID and the Local authority should take an active role in educating the public against polluting drains especially with garbage and silt.

(9) Emergency Response Management

Emergency Response Management (ERM) involves several agencies and has to be well coordinated. ERM is applied in situations of floods, haze, fire or collapse of buildings. The national disaster center is at the Ministry of Information and coordination works are administered by the National Security Council. The aftermath of the collapse of the Highland Towers the government has initiated Standard Operation Procedures (SOP) for a disaster situation. Most works related to flood emergency are coordinated by the District Office. Very often a District Disaster Operation Room is activated with supporting inputs from several agencies such as the army, police, fire department, DID, TNB, Telekom, Hospitals, etc. ERM for urban flooding should also be an important function of local authorities. As the country becomes more urbanized and more countryside areas incorporated into local authority areas it is important for local authorities to undertake ERM. It is necessary for local authorities to prepare flood risk maps and adopt SOP to tackle emergencies. In most

cases of emergencies the respective agencies use their own resources and are subsequently reimbursed by the Federal Government.

(10) Funding for Urban Drainage

Integrated Urban drainage will require funding for infrastructure development, operations and maintenance (O&M) and the implementation of non-structural measures. Most funding for infrastructure development is provided by the federal government in the form of development grants. Drainage infrastructure within land development areas are usually constructed by the developer and handed over to the local authority. DID projects implemented by federal funds are also maintained by federal financial assistance whereas State funded projects are maintained using State funds. Local Authorities sometimes obtain grants from the MHLG to address cleanliness of drains and flash flood problems. There are also a number of provisions within the Local Governments Act and the Streets, Drainage and Building Act that empowers Local Authority to charge ratepayers, frontagers and developers for drainage improvement works. This will be discussed under the section on cost recovery system.

(11) Environmental Protection

The DOE is the principal agency for environmental protection with respect to the discharge or deposit of any waste into any inland waters, rivers, drains or lakes (s25 EQA 1974) in contravention of acceptable standards. Under this Act there are several regulations in place to establish the standards of emission of waste water from prescribed premises such as Palm Oil Factories and Rubber Factories. The other relevant regulation is the Environmental Quality (Sewage and Industrial Effluents) Regulations 1979, which establishes standards for discharge from industries and Sewerage Treatment Plants. The Selangor Waters Management Authority Enactment also provides for control of pollution in water sources while at the Local Authority level the LGA provides for control of littering, blockages and nuisance on drains and waterways. Further deliberations on this will be discussed under the section on Enforcement Capacity.

2.2 State Level

At the State level, the policy aspects of urban drainage may be deliberated at the State Planning Committee (SPC) and the State Waters Management Authority. The SPC is established under the Town and Country Planning Act is the main forum for the formulation

of policies on the conservation, development and use of all land in the State. The SPC also gives direction to the Local Authorities on matters pertaining to physical planning and development. It also approves the Structure Plans and in practice the Draft Local Plan before it is adopted by the Local Authority. In view of the growing importance of river management, flood control and urban drainage in urban planning and development, it is recommended that the State Director of DID be made a permanent member of the SPC.

The rapid pace of urban development and lack of effective controls has also resulted in deterioration of the river systems in the country. Some of the problems that have arisen include:

- Deterioration of the quality of river water, for example, the Sepang river and the Langat river in Selangor have been categorised as very polluted.
- Downstream flooding due lack of controls in the catchment areas.
- Loss of habitat of flora and fauna that are dependent on riparian ecosystem.
- Recent crisis on water supply and management.
- Weaknesses in the institutional framework for the management of water resources.

The above issues prompted the Cabinet to direct the Ministry of Agriculture and the Respective State Governments to explore the possibility of establishing a River Authority / Corporation. In response to this directive the State of Selangor established the Selangor Waters Management Authority (SWMA) by way of a state enactment. The Enactment (SWMAE) provided for the management and protection of river basins, water bodies, ground water, coastal waters and wetlands and for the sustainable development of water sources in any designated area including catchment areas and river basins. Wide ranging powers are given to the Authority. These include:

(a) Advise the state authority on the declaration of designated areas (s56) (river basins, catchment areas, ground water, wetlands and water bodies), protected areas (s48), river reserves (s46) and formulate and implement development and management plans for such areas.

(b) Formulate policies, methods and measures to be adopted for sustainable development, use and conservation of water sources.

(c) There is a duty under the law to consult and obtain advise from the SWMA in preparing development plans (Structure and Local Plans) in designated and protected areas (s58 SWMAE). There is a also duty on the Local Authority to invite the Director to participate in the preparation of Structure and Local Plans

for the adoption of measures related to the management, conservation and development of water resources in such plans (s67).

(d) The Authority may develop and implement guidelines, standards, methods and procedures for sustainable development and management of water sources.

(e) Undertake research.

(f) Provide training and maintain training facilities.

(g) The Authority may also impose a charge for the abstraction of water or the discharge of wastewater into any water source.

(h) The Authority also has powers to issue licenses for the extraction of resources from water, or any recreational activity that may adversely affect the hydraulics and quality of water source.

(i) Undertake Flood defense programme and prescribe such measures for the proper management of flood defense.

(j) Complement the powers of DOE in requiring environmental impact assessments of projects within designated areas and in consultation with DOE prescribe acceptable standards for the emission, discharge or deposit of waste in any designated area (s78).

(k) The Authority has also powers of enforcement, power to compound offences, power to arrest an also powers to prosecute with the consent of the Public Prosecutor.

(l) Advise the State Authority on privatization projects.

The Authority is chaired by the Menteri Besar with the State Secretary as the Deputy Chairman. The Director General of Federal DID is also a permanent member of the Authority while the Director appointed by the Authority is the Secretary of the Authority. The current Director is seconded from the DID. Other members of the Authority are the State Legal Adviser, the State Financial officer, two members of the State Exco, and five other members appointed by the State Authority. The Authority is assisted by a Technical committee, which is chaired by the State Secretary and represented by Directors of Technical Departments and Presidents of Local Authorities. The functional linkages between SWMA and other agencies in the State are shown in Figure VII-2, while the proposed organizational structure is shown in Figure VII-3. There are four divisions proposed, that is; (a) Planning Division; (b) Development, Operations and Maintenance; (c) Law and Enforcement; and (d) Corporate Services. In addition, there will be four regional offices, one each in the main river basin areas

of Sg. Selangor, Sg. Bernam, Sg. Kelang and Sg. Langat. With an initial launching grant of RM10million for two years, its other sources of income are from Federal and State Grants as well as its own sources of income. At a manpower level the staffing is expected to increase from the current 5 to about 200. Clearly this Authority is expected to be the principal agency in the State to formulate policies and strategies on urban drainage and storm water management. It is also likely that other States will follow suit in establishing their own Waters Management Authority.

In addition to the foregoing SPC and the State Water management Authority, the key agencies involved in urban drainage at the State Level are the State Economic Planning unit, State Drainage and Irrigation Department, State Town and Country Planning Department, State Public Works Department, the Department of Local Government within the State Secretary's Office, the State Director of Lands and Mines. All the states also have a federal branch of the DOE. The functions of these agencies were elaborated in Volume 3. Essentially the authority on urban drainage lies with the State Government. State initiated Urban Drainage Projects are co-ordinated by the SEPU before it is forwarded to EPU and Federal Treasury. The state may also fund its own projects using its own revenue. The State and in particular the Local Authorities also play a significant role in ensuring that drainage infrastructure are built in new land development projects. Most states also collect drainage contributions from land developers which is deposited into a State Consolidated Fund. A significant portion of these funds (about 75%) is utilized for Drainage Improvement Works.

Similar to the Federal agencies, State government involvement in urban drainage are as described in the following:

(1) State Level Policy, Planning and Strategy Formulation

Policies on urban drainage at the state level are developed by DID, Local Authorities and Town and County Planning department. It is clear from the law that extensive powers are given to the State for the development and management of rivers, water bodies and drains. However in the past there had not been many policy initiatives emanating from the State. This would undoubtedly change with the establishment of the State Waters Management Authority. There is an urgent need to integrate river basin and catchment area management plans with the Structure and Local Plans, which are approved by the State Planning Committee. In the future it is envisaged that the SPC and the SWMA will be key initiators of policy on urban drainage at the State Level.

(2) Infrastructure Development and Management

Drainage infrastructure that is funded by the state is usually maintained by the state. Again if the project is implemented by DID then it is maintained by DID and similarly with project implementation by the Local Authority. Usually the design and construction of these facilities is undertaken by private consultants and registered contractors under the supervision of DID or the Local authority as the case may be.

(3) Legislative Support

While enabling laws on urban drainage may be passed under a Federal Act, such as the SDBA 133, all bylaws under the Act will have to promulgate by the State Authority. In order to ensure uniformity of bylaws it is common practice to table it first to the National Council for Local Government (NCLG) prior to its adoption by the respective State Governments. Similarly all rules under the TCPA, SWMA, Waters Act, and the Drainage Works Ordinance are made by the respective State Authority. This gives full powers to the SA to promulgate subordinate legislation with respect to urban drainage. In practice however standards, manuals, guidelines are promoted by the line agencies at the Federal Level and are usually adopted by the State Authorities as technical advice.

(4) Development Approvals and Licensing

It is probably at the development plan stage that effective strategies on integrated urban drainage could be applied. Development plan approvals are vested in the state authority. This power is sometimes devolved to state agencies or local authorities. For example land conversion approval is vested in the SA while approval of subdivision plan is devolved on the Land Administrator (Director of Lands and Mines). Similarly licensing powers are conferred on the State Authority or may be devolved on the State Agency (such as the SWMA or the Drainage Board) or Local Authority as the case may be. A further elaboration on the development process will be discussed in later section.

(5) Enforcement

As most powers of approvals and licensing are the responsibility of the state, the concomitant powers of enforcement are also vested with the state agency or local authority as the case may be. The exception is the enforcement of environmental laws and standards, which is the prerogative of DOE. As mentioned earlier the SWMA

may also have limited enforcement powers on the environmental bylaws and standards that is formulated by the Authority (SWMA). A further elaboration on the enforcement capacity is contained in a later section in the report.

(6) Financing

Funding sources from the State level are often limited. The distribution of financial burdens on concurrent matters is clarified in Art 82 of the Federal Constitution. Federal or State projects that is undertaken in accordance to federal policy and specific approval of the Federal government will be financed by the Federal Government. Projects implemented by the State without Federal approval will have to be financed by the state. Hence there is a tendency for State governments to get Federal approval for their projects. Drainage contribution collected at the land development stage is also utilized for drainage infrastructure development. The state also receives annual state road grant which is meant for the maintenance of state roads and local authority roads that meet the qualifying standards of JKR. Part of these grants is also meant for the upkeep of roadside drains and culverts. On the whole state funds are generally insufficient to meet comprehensive drainage infrastructure development cost and federal funding is absolutely essential.

2.3 Local Level

Again the main agencies responsible of urban drainage at the local level are the District DID and the Local Authority. While the legal authority on urban drainage is conferred on the Local authority functional responsibilities are distributed by the several agencies at the local level. Most local authorities are also severely handicapped by a lack of qualified technical manpower.

(1) Policy and Strategic Planning

Most local authorities except for the larger city and municipal councils do not undertake these tasks for lack of qualified staff. In the future, integrated urban drainage planning should be incorporated into the Statutory Local Plans. Integrated Drainage plans have also to be integrated with rivers and water sources management plans (DID and SWMA). To undertake this task, local authorities especially of municipal status should have a drainage division within the Engineering Department of the Local Authority.

(2) Infrastructure Development

Again due to lack of funds and qualified manpower, local authorities generally do not undertake extensive drainage works although they are empowered by law to do so (s51SDBA). Exceptions are City hall of Kuala Lumpur. Most of the drainage infrastructure is built by the private developer as part of the conditions for approval. This includes infrastructure drains and sometimes even drainage improvement works to the final discharge point. DID also constructs drainage infrastructure in local authority areas under the Flood Mitigation programme. Similarly Drainage Boards under the Drainage Works Ordinance may also implement drainage improvement schemes. However most of such schemes are generally applied in agricultural areas.

(3) Making of Bylaws

Local authorities may also make bylaws under the Local Government Act (LGA). These bylaws will have to be approved by the State Authority before it can have effect. Most of the bylaws under the LGA relate to control on litter, nuisance, clogging of drains and discharge of waste into drains. Bylaws under the SDBA have to be made by the State Authority and are not delegated to the Local Authority.

(4) Development Approvals and License

The power of development approval is probably the most cogent power given to the Local Authority to ensure compliance with drainage conditions. In most cases development applications are referred to DID or the Drainage Division of the Local Authority (in the near future the SWMA as well) for their comments. For example the guidelines on Detention Ponds and other guidelines on River front development are applied at the Layout Plan Approval stage. Most developers generally comply with the conditions. Power of licensing is also devolved on the local authority, district land administrators and the SWMA under the respective laws and enactments.

(5) Enforcement

Although the law provides for extensive enforcement powers to the Local authority and district level agencies, the enforcement capacity of these agencies is lacking. Enforcement of non point source pollution such as garbage and siltation is also difficult due to difficulties of identifying the polluter. Environmental standards on discharge water as well as storm water quality are normally enforced by the DOE. Very often there are no DOE offices at the local level. The enforcement capacity at

the local level has to be improved in order to avoid prospective environmental deterioration due to storm water runoff.

(6) Flash Floods and Maintenance

The prevention of flash foods due to clogging of drains with litter and silt is the responsibility of the Local Authority. Most local authorities also receive grants from the MHLG to undertake cleanliness campaigns. The maintenance of drainage infrastructure except for those built by DID are also the responsibility of the Local Authority. While in the past most drainage infrastructure were roadside drains, new concepts on storm water management calls for detention facilities, infiltration facilities and the use of swales as runoff conveyances. The maintenance of these facilities may not be met by State road grants and Local Authorities should seriously consider the imposition of drainage rates to offset some of these cost.

(7) Financing

Local authorities do not receive a specific grant for drainage development. Most drainage infrastructure is built using Federal or State Development Funds which are administered by the DID. For private housing development, the cost is borne by private developers. Except for the larger municipal councils, most local authorities do no have sufficient funds to undertake large investment development projects and may have to apply for soft loans/grants from the State or Federal Government to undertake these works. It is also necessary for local authorities to apply the provisions of s51 SDBA and s 132 LGA to generate finances at the Local authority level. This will be discussed in Section 5.4.

(8) ERM and Promotion of Non Structural Measures

While current ERM to flooding is usually coordinated by the District office, it is anticipated that the responsibility in the future will be with the Local Authority particularly with respect to urban flooding. Adequate reserve funds have to be set aside to meet these eventualities. Similarly the promotion of non-structural measures such as community education, gotong royong projects and encouraging community participation in the planning of infrastructure projects calls for active participation of the Local Authority in line with the Local Agenda 21 programme.