

IMPROVING URBAN SANITATION IN INDIA – LESSONS FROM MALAYSIA

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ABSTRACT

Malaysia is one of the countries in the world to have emerged as leaders in septage management for sanitation improvement. However, this journey witnessed various changes and amendments in the Constitution, policies, Acts and operational mechanisms. India undoubtedly faces the challenge to address issues of sanitation in the country. Through various policy frameworks and government programmes such as SBM (U) and AMRUT, sanitation has received tremendous attention recently. This paper attempts to present Malaysia case of sanitation focusing on governance, evolution of sanitation in the country, various legal frameworks and mechanisms that evolved over a period of time, which India can learn from as it embarks on an arduous path to improve urban sanitation in the country.

POLICY BRIEF

BACKGROUND AND CONTEXT OF URBAN SANITATION IN INDIA AND MALAYSIA

The world is witnessing urbanisation at an exponential rate. As per the UN World Urbanization Prospects (2014 revision), 54% of the world's population was urban in 2014. The urban population is expected to continue growing at a rapid pace in future as well and by 2050, two-thirds of the global population will be living in urban areas.

Urban population in India (377 million as per the 2001 census) has increased from 27.81% in 2001 to 31.16% in 2011 (MoUD, 2011). According to various estimates, by 2030 India's urban population will be 590 million (McKinsey, 2010) to 600 million (World Urbanisation Prospects, UNDESA, 2014 revision). In 2014, India's urban population is about 410 million whereas the urban population of Malaysia stands at 22 million (70% of the total population). Malaysia's urban population is less than that of many individual Indian states. The level of urbanisation in Malaysia has increased from 10% in 1911 to 28.4% in 1970, 61.8% in 2000 and 70% in 2010. The country has witnessed an average annual rate of change of urban population of 2.66%, which is close to India's 2.38% during 2010-2015.

In both countries, small- and medium-sized cities are being added in each census. As per the 2011 census there are 7,935 towns in India. The number of towns has increased by 2,774 since the last census (in 2001). Most of these new towns fall in the category of small towns. These small towns face grave challenges of sanitation as most of them depend on on-site sanitation services. In Malaysia, too, each census has seen an addition of small towns and a corresponding increase in on-site sanitation services.

The 2011 census figures in India present a very dismal picture of sanitation in the country. The census data reveals that in urban areas 18.6% households do not have latrine facilities and 12.63% households practise open defecation (OD); 81.36% households have latrines, out of which 32.68% have a piped sewerage system and 38.15% have septic tanks, while 7.09% have pit latrines and the rest have other types of systems. According to Malaysia's Department of Statistics' Household Income and Basic Amenities of 2007, 99% of the country's urban population has access to latrine facilities – flush latrines (87%) and pour flush latrines (12%) – with only 1% of the population in urban areas having facilities like pit or enclosed space over water surface. OD is not prevalent in Malaysia.

URBAN SANITATION IN INDIA AND MALAYSIA: EFFORTS BY THE NATIONAL GOVERNMENTS

Inadequate sanitation is arguably one of India's most critical development challenges, with diverse and rigorous evidence from epidemiological, medical and economic studies establishing the adverse effects of faecal-oral transmission on various aspects of health. Sanitation is a state subject in India; along with city governments, state governments are expected to play a direct planning and implementation role in improving sanitation. Despite its limited mandate, the Government of India (GoI), realising the scale and scope of the challenge, has over the past three decades launched policies and programmes to: (i) improve sanitation; (ii) eliminate unsafe practices (like manual scavenging) associated with unimproved sanitation systems; and (iii) address the environmental consequences of untreated sewage disposed in surface and ground water bodies. What do we know about OD across cities and towns in India? Are the government's recent efforts to eradicate OD likely to make a significant impact on decreasing OD across India's urban settlements?

As per the 2011 census, at least 7.9 million (11.7%) urban households in India practise OD, which, according to the Joint Monitoring Programme (2013) report, represents 48% of the global urban population without access to toilets. The rationale for government intervention in sanitation stems from the adverse influence of the disease environment on early cognitive development. Deaton et al. (2013) show that although the use of oral rehydration has resulted in decreasing child mortality, chronic enteropathy is increasingly regarded as a cause for stunting and cognitive deficits. In addition, Spears' (2013) conclusions for dense rural settlements with larger negative spill overs – in terms of a steeper association between OD and child height (proxy for early life net nutrition) – has implications for urban settlements. If confirmed that

spatial segregation of households without access to toilets is pervasive, as Sidhwani (2015) shows at the ward level for the top eight most populous Indian cities, it may be a contributory factor in the inequitable distribution of disease burden within urban settlements. The complexity of the urban predicament is also due to the differentiation in technology options for the sanitation value chain, consisting of faecal containment, transportation, treatment and disposal. Consequently, sanitation-related decision-making for urban households also depends upon public investments in sewerage networks and faecal sludge management services, whereas in a rural setting it is primarily a matter of private investments. Urban local bodies have largely ignored the public health and environmental dimensions of untreated faecal sludge and sewerage disposed in open drains and other receiving environments.

Table 1 presents a class-wise breakdown of the concentration of India's urban OD. Although the hypothesis that 'OD in urban India predominantly occurs in slum settlements' might apply to the case of Class 1 towns¹, there exist considerable disparities in access to sanitation both within and across urban settlements. For example, the high rates of OD in smaller settlements (i.e. towns with less than 100,000 households), most with low or absent slum settlements, underscore the need for further research to understand the rationale for the unwillingness of such households to construct toilets.

Prior to 2014, the Indian government did not have a dedicated toilet construction programme for urban settlements. Previous efforts under schemes such as the Environmental Improvement of Urban Slums, Integrated Development of Small and Medium Towns, Urban Basics Services Programme and the Integrated Low Cost Sanitation Scheme had sanitation as a component. In October 2014, the GoI launched the Swachh Bharat Mission (SBM), a focused initiative that

Table 1

City Class	1A	1B	1C	Other towns
Criteria (No. of Households)	Million plus	500,000 million	100,000-500,000	< 100,000
Mean OD	4%	7%	11%	24%
% of Total Urban OD	12%	6%	22%	60%

Source: House listing data from Census 2011.

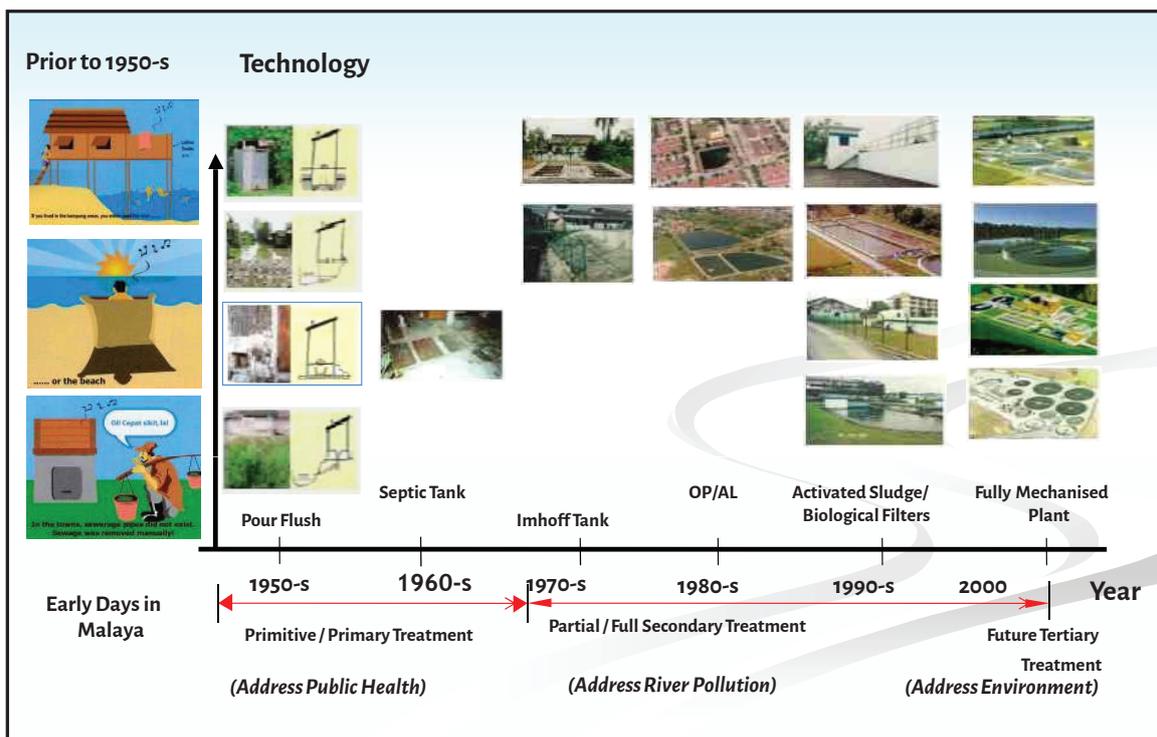
1. For example, looking closely at only the top eight settlements by population size, the contribution of slum households towards total OD is 48%, despite constituting only 22% of the population. In addition to surveying normal and institutional households, the Census of India undertakes counting of houseless households in its population enumeration phase. Assuming houseless households practise OD – as the census does not collect house listing and housing data for such households – the contribution of houseless and slum households towards total OD is more than 60%.

aims to bring substantial improvements in sanitation levels across the country in five years. Presently, under the urban component of SBM (SBM-U), households without access to a toilet within the premises are eligible to claim up to Rs 4,000 towards construction. Although it is safe to assume that the framework laid down by the SBM-U would play a major role in directing efforts and resources towards improving urban sanitation in the coming years, key questions regarding its efficacy remain.

In Malaysia the sewerage system has evolved from a very basic level of pour flush and pit latrines. The 1950s and 60s witnessed the establishment of pour flush and septic tank facilities. These two decades are termed the phase of

primitive treatment in the history of sanitation in Malaysia; they focused on the impacts of sanitation on health, seeking to reduce water-borne diseases in the country. The decades 1970s and 80s saw improvised technologies in the sewerage systems in Malaysia, with Imhoff tanks and oxidation ponds and aerated lagoons. In the period 1990s until the mid-2000s, activated sludge and biological filters were promoted; this is termed the phase of partial and secondary treatment. From 1970 to the mid-2000s, the focus so far as Malaysia's sewerage system was concerned was on the impacts on water resources, including rivers. Since 2006, the focus has broadened to include fully mechanised plants, keeping in mind the overall impact on environment.

Diagram 1: Evolution of sanitation in Malaysia



Source: Sewerage Services Department, Ministry of Energy, Green Technology and Water, Malaysia

INSTITUTIONAL ARRANGEMENTS FOR FAECAL SLUDGE/ SEPTAGE MANAGEMENT IN MALAYSIA AND INDIA

Malaysia

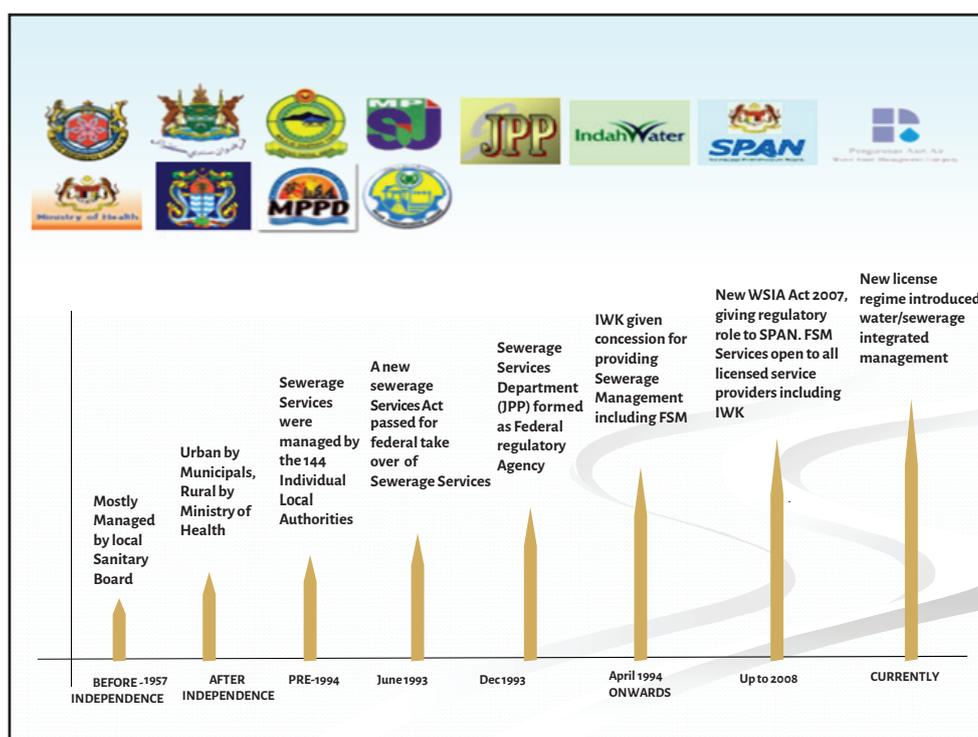
Malaysia is one of the few developing countries to have emerged as leaders in septage management for sanitation improvement. However, it has had to traverse an arduous journey to reach this stage, through various changes and amendments in the Constitution, policies, Acts and operational mechanisms.

Sewerage development and management (including sludge management) was traditionally the responsibility of local authorities. This continued to be the case until 1993 when Malaysia nationalised sewerage services. The power to manage sewerage was provided under the Local Government Act, 1976, and the Street, Drainage and Building Act, 1974, two laws enforced by local authorities. These laws, however, were generally inadequate to address issues of septage as both lacked relevant provisions to regulate the maintenance of septic tanks or the management of sludge that was accumulated in the system. In other words, there was no compulsion for owners of septic tanks to desludge regularly and it was left to the individual owners to determine when desludging was required.

The capability of local authorities to implement more modern sewerage systems varied depending on their financial and human resource capabilities. As a result, sewerage development in many of the smaller and poorer local authorities was largely neglected. Individual septic tanks and communal septic tanks were the most common systems in use for residential, commercial and many industrial developments. It was largely left to private developers to initiate more modern sewerage systems for new (generally large) developments where centralised treatment systems were applied.

In 1993, a new legislation, the Sewerage Services Act (SSA), was promulgated to amend and consolidate existing laws relating to sewerage development and management in Peninsular Malaysia in order to improve sanitation and the environment and promote public health. The traditional responsibility of local authorities to look after sewerage effectively ended and this task was taken over by a federal regulatory agency, the Sewerage Services Department (JPP). SSA required the transfer of title of the sewerage assets-pipes, treatment facilities and staff by the local authorities to JPP. Water services continued to be regulated by the states, with different states having different tariff structures. In 1994, while JPP retained its regulatory function, the Government of Malaysia awarded Indah Water Konsortium SdnBhd (IWK)

Diagram 2: Milestones in Sewerage Development in Malaysia



Source: Adapted from Sewerage Services Department, Ministry of Energy, Green Technology and Water, Malaysia

the contract for providing nationwide sewerage services. It was entrusted with the task of developing and maintaining a modern and efficient sewerage system for the country. Enforcing SSA proved to be difficult as well, as IWK could not force the customer to desludge or pay the waste water bills and JPP did not have any provisions for imposing fines.

In early 2003, the Federal Government of Malaysia stepped up efforts to reform the industry for the benefit of all stakeholders. In January 2005, Parliament approved the amendments to the Ninth and Tenth Schedules of the Federal Constitution. The amendment to the Ninth Schedule involved the transfer of water supplies and services from the State List to the Concurrent List. The Tenth Schedule was also amended and as a result, the revenue from water supplies and services (previously assigned to the states) was now assigned to the Federal Government.

In July 2006, further to these amendments to the Constitution, the Malaysian Parliament passed two new legislations, namely the Suruhanjaya Perkhidmatan Air Negara Act and the Water Services Industry Act (WSIA). The former provided for the establishment of the Suruhanjaya Perkhidmatan Air Negara (SPAN) or National Water Services Commission as the technical and economic regulator. WSIA, on the other hand, provided the legal framework required for the regulation of the water and sewerage service industry. The Acts were passed on 1 February 2007 and came into effect from January 2008. WSIA opened up the water and sewerage sector to private sector involvement as provided for in the National Policy Objectives.

India

The institutional set-up for septage management in India is analysed through the lens of five broad functional responsibilities: (1) policy and standards setting; (2) financing of capital investments; (3) asset creation; (4) Operation & Maintenance (O&M) management; and (5) monitoring and evaluation. We focus on the role of the national government, providing an overview of the various departments involved in the process.

The Ministry of Urban Development (MoUD), Government of India, is the key agency responsible for policy guidance and setting the standards on septage management in cities at the national level with support from the CPHEEO (a technical arm of the MoUD). It adopted the National Urban Sanitation Policy (NUSP) in 2008, with a vision of rendering all Indian cities sanitised, healthy and livable. NUSP calls for an integrated city-wide sanitation planning approach with emphasis on the urban poor and women. It recognises the existence of on-site systems such as septic tanks in the cities and articulates the need for promoting proper disposal and treatment of sludge from these installations.

A Manual on Sewerage and Sewage Treatment was released by MoUD (in 2013) to provide guidelines on the design and construction of septic tanks. An Advisory Note was also circulated for local governments to develop septage management programmes in their respective cities. MoUD may also develop and design schemes/programmes for providing financial resources to implement septage management projects at the city level.

The Central Pollution Control Board (CPCB), under the aegis of the Ministry of Environment, Forests and Climate Change (MoEF), Government of India, was set up by the Water (Prevention and Control of Pollution) Act, 1974. This Act and the Environment Protection Act, 1986, mandate the prevention, control and abatement of environmental pollution. They lay down standards for the discharge of sludge and liquid effluent from septic tanks into the environment. Currently, CPCB sets the discharge standards for waste water that may be applied to effluent discharge from on-site sanitation systems. Similarly, the Bureau of Indian Standards (BIS) has released specific guidelines called IS 2470 (Part 1 and Part 2) on the design and construction of septic tanks as well as treatment and disposal of effluents from them.

All the policies, schemes and programmes of the central government are monitored by the respective ministries and certain schemes are evaluated by the Independent Evaluation Office (IEO) of the Planning Commission (now called NITI Aayog). Also, the Ministry of Finance, Government of India, is responsible for the central government's budget as well as distribution of funds to the states.

THE INSTITUTIONAL FRAMEWORK IN MALAYSIA

Another reason for Malaysia's success in the management of septage and faecal sludge is its strong institutional and legal framework. Sewerage management or Faecal Sludge Management (FSM) is regulated by SPAN under provisions within WSIA, with the Department of Environment (DOE) playing a secondary regulatory role through the enforcement of the Environmental Quality Act (EQA), 1974. DOE has the responsibility of protecting the environment through the control of pollution from sewage and faecal sludge discharge or disposal. The other main players in sewerage management and FSM are the service providers which include the service licensee (IWK) and permit holders (private contractors) licensed by SPAN.

National Water Services Commission (SPAN)

The National Water Service Commission (SPAN) is a federal statutory body formed under the Ministry of Energy, Green Technology and Water to regulate and oversee the treated water and sewerage services in the country. It was formed to regulate and enforce the provisions of the Water Services Industry Act

(WSIA), 2006, and any subsidiary legislation created under it. As a regulator of the water supply and sewerage services sector, SPAN has key responsibilities with respect to septage such as: appointment and registration of permit holders (licensing); monitoring of desludging of premises according to prescribed cycles; monitoring the activities of permit holders and service licensees on desludging; monitoring septage collection by permit holders and collection by service licensees; and overseeing fair pricing of desludging work.

Department of Environment, Malaysia (DOE)

The Department of Environment (DOE) of Malaysia is responsible for the prevention, control and abatement of pollution in the country through the enforcement of the Environmental Quality Act of 1974 and its subsidiary legislation. The DOE is a federal agency within the Ministry of Natural Resources and Environment and has powers relating to the siting of new sewage and sludge treatment and disposal facilities, and control over discharges and emissions from such facilities. The role of the DOE in relation to septage and faecal management is to ensure that potential threats to the environment posed by treatment and disposal facilities are minimised. This is achieved by ensuring proper siting of such facilities and effective treatment of any emission or discharge that emanates from these facilities.

Service Providers

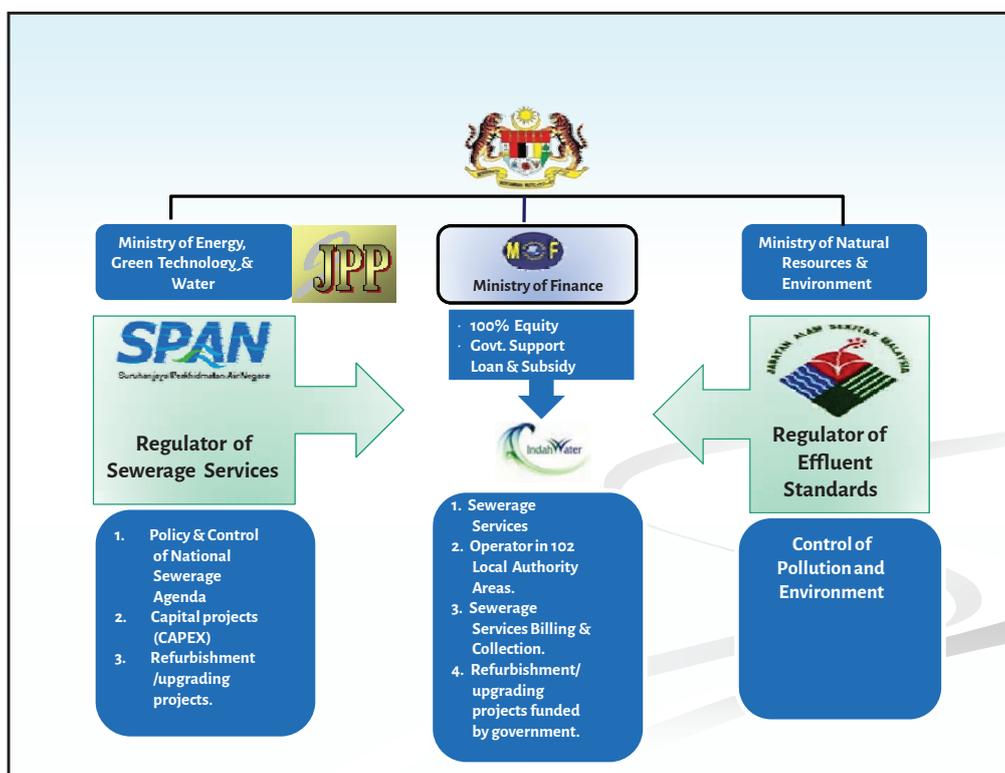
FSM services are presently provided by both IWK (the service licensee) and other independent contractors (as permit holders). IWK operates as a private company although it is a wholly owned company of the Minister of Finance Incorporated. Although desludging activities in the past were mainly done by IWK, as a result of the concessionaire agreement signed during the privatisation of sewerage services in 1994, the core business of IWK became the operation and maintenance of sewerage facilities (including sludge treatment and disposal facilities), from which it derives more than 90% of its revenue. Desludging activities bring in only about 10% of IWK's revenue, with the bulk of it coming from the servicing of government buildings and premises.

The enforcement of WSIA in 2008 opened the desludging business to other independent service providers mainly consisting of entrepreneurs who have invested in equipment to undertake sludge extraction and transportation services. While they have a choice to operate independently, many operate as sub-contractors to IWK.

Waste Generators

According to IWK's National Statistics for 2011, more than 2 million Individual Septic Tanks (ISTs) and pour flush systems

Diagram 3: Governance Structure of Sewerage Services



Source: Adapted from Sewerage Services Department, Ministry of Energy, Green Technology and Water, Malaysia

are still operating in the country. ISTs are widely used as a method of treating domestic sewage in the absence of connected or centrally organised sewerage systems. They are used within domestic, commercial and industrial premises.

Other Stakeholders

Some states and local authorities (such as the states of Kelantan, Sabah and Sarawak, and the local authority of Johor Bahru) have not given up this responsibility to the federal authority and retain their respective roles for sewerage development and management.

The Sewerage Services Department (JPP) was formed in 1994 under the Sewerage Services Act (SSA), 1993, as a federal department under the Ministry of Housing and Local Government. In the light of the formation of SPAN, it is now a department within Kementerian Tenaga, Teknologi Hijau dan Air KeTTHA, and has the main functions of planning and sourcing funding for new sewerage capital works and the rehabilitation of existing sewerage systems. The department's role is primarily administrative; it does not play a direct role in the regulation or management of sewerage services.

Legal Framework

There are relevant legislations for the regulation of sewerage and septage management in Malaysia.

Water Services Industry Act (WSIA), 2006

WSIA provides the legal framework required for the regulation of the water and sewerage service industries in the country. The Act came to force on 1 January 2008. One of WSIA's objectives is to promote the National Policy Objective for water supply and sewerage services industry for the country. In relation to FSM, the main features of WSIA are the following:

- (i) Owner, occupier or management corporation responsible for individual tanks (ISTs) has the responsibility of ensuring desludging of the ISTs.
- (ii) IST and communal septic tank (CST) owners have the choice of engaging the services of permit holders or the service licensee.
- (iii) The service licensee is obliged to provide desludging service in its service area from time to time as may be prescribed.
- (iv) Competition is allowed among the service licensee and permit holders.
- (v) The service licensee (IWK) is to accept and treat septage, as well as operate sludge treatment facilities and arrange for final disposal of treated sludge.

Environmental Quality Act (EQA), 1974

EQA provides various powers to the Minister (of the Ministry of Natural Resources and the Environment) to make regulations or give orders with respect to any matter relating to the protection of the environment. The responsibility for enforcement of these legislations rests with the DOE.

Environmental Quality (Sewage) Regulations, 2009

The Regulations relate to control over sewage and sewage sludge treatment and disposal and apply to any premises which discharge sewage on to or into any soil, or into any inland waters or Malaysian waters. Disposal of sludge on to land is prohibited unless the prior written permission of the Director General (DG) of the DOE is obtained. The DG's approval is required by law for any such activities. The Regulations also specify the acceptable limits for the discharge of effluents from such facilities and allow the DG to impose conditions for the operation of such facilities and for monitoring of their impacts on the environment. Fees may also be charged in the event that a licence is required to allow for contravention of the imposed conditions, where this is approved.

Environmental Quality (Environmental Impact Assessment) (Prescribed Activities) Order, 1987

This Order identifies the construction of municipal sewage wastewater treatment plants (taken to also include sludge treatment facilities) as a 'prescribed activity' for which the DG's approval is required. This approval is subject to the submission of an environmental impact assessment (EIA) report, which is to identify the potential impacts of the project and the measures to be taken to minimise the negative effects on the environment. Construction and operation of such facilities are subject to the approval of the EIA report.

Guidelines for Developers

These regulate the private sewerage infrastructure development in Malaysia. Guidelines for Developers: Septic Tanks provides guidance on when to use septic tanks and how to maintain them, in addition to detailed design requirements. There are penalties imposed for violating construction, maintenance and desludging requirements. In addition, desludging services for septic tanks are conducted at a much longer interval (two or three years) and penalties for noncompliance are imposed under the new arrangement. Fines have been enforced, which are quite expensive compared to the usual monthly tariff for desludging. In contrast, India at present lacks strong legal and regulatory frameworks in the containment, proper disposal and treatment of faecal waste generated.

FINANCIAL MECHANISMS IN MALAYSIA

In Malaysia, investments in the sanitation sector come from the following primary sources: (i) the government, which provides funding for investments to build new systems and treatment plants or upgrade and expand existing systems, as identified in its five-year National Plans; (ii) the government through IWK, which provides funds particularly for the refurbishing and upgrading of existing systems; and (iii) private developers, which are responsible for building individual septic tanks, sewers and sewage treatment plants using their own resources. Customers pay a minimal tariff for septage management, which results in cost recovery concerns for IWK. The construction of centralised and/or regional sludge and public sewage treatment facilities is fully subsidised by the Federal Government². While the budget for O&M has gone up each year, the operating costs have also increased considerably.

Every house owner/tenant has to bear desludging charges and those charges are paid to the service provider (IWK or other authorised desludging operators). The sewerage charges for networked and non-networked systems range from Ringit 2 to Ringit 8 per house per month. The cheapest tariff is accorded to low-income households as well as certain categories of government quarters. There are different charges for Government premises and Industrial premises depending on the no. of users and the capacity of networked and non-networked systems. The desludging rates for residential and government quarters are 180 Ringit per trip and desludging rate for ISTs outside the local authority, residential and commercial establishments, private tanks and for the STP measuring 2.5 cu m is 360 Ringit per service. For the STP measuring in the range of 2.5 to 4.5 cu m, it is 650 Ringit per service. For the capacity more than 4.5 cu m, there is additional charge of 145 Ringit per cu m. Desludging pour flush (residential latrines) upto 2.5 cu.m is 230 Ringit per service and the rates go up to 360 Ringit per service if the capacity of pour flush latrines lies in between 2.5 to 4.5 cu m. Service providers like IWK or other authorised have to bring the sludge to IWK's sludge facility.

WHAT CAN WE LEARN FROM MALAYSIA?

The challenges that India faces – such as the reluctance of communities and individuals to desludge every two years, variations in the septic tank designs, lack of proper transport equipment, treatment facilities and disposal sites, difficulty in finding lands for these facilities – were confronted by Malaysia too. A close study of the main features of Malaysia's strong sanitation programme that laid the foundations for its success can show the way to India.

Enabling Policy Frameworks Including Laws and Regulations
Malaysia saw the success of septage management in the country due to an enabling policy environment and strong laws and regulations in the country.

Clear Demarcation of Responsibilities

There are various agencies involved in the provision and maintenance of septage in Malaysia with each stakeholder's role clearly spelt out. With little or no overlapping of the roles and tasks of these institutions, there is less challenge to implement and oversee the septage management in the country.

Appropriate Guidelines for Management

There are guideline for developers to support and facilitate construction of septage systems for the residents and industries Such as Malaysian Standard- MS 1228: 1991 code of practice for design and installation of sewerage systems in Malaysia.

Strong Education and Communication Mechanisms

Massive people-to-people contact enabled the resolution of issues such as illegal connections, faulty sewerage systems prepared by developers. Various TV and newspaper advertisements, radio commercials, ambience advertising, exhibitions and publications, social media such as Twitter, use of mobile phones and community engagements through meetings and dialogues facilitated the changing of mindsets and behaviours of the people.

Capacity Building

Capacity building is institutionalised in Malaysia and includes inputs like building training modules, implementing technical training, developing certification programmes for operators, and instituting accreditation of training programmes. Training programmes include trainings on planning and design of sewerage systems, testing and commissioning, O&M, sewerage construction, health and safety.

OTHER RECOMMENDATIONS FOR INDIA

India can also revisit the government's NUSP initiative, which recognised the importance of: (i) addressing concerns across the sanitation 'value chain' – consisting of containment, collection, transport, treatment and disposal – without a bias for any particular technology; (ii) reaching the urban poor; and most importantly, (iii) promoting a two-tiered effort for state and city governments to develop their respective State Sanitation Strategies (SSSs) and City Sanitation Plans (CSPs). Since its launch in 2008, there has been a disparate uptake of NUSP's recommendations, with less than half the

2. http://wastewaterinfo.asia/sites/default/files/case-study/cs-notes-001_2.pdf

states submitting a SSS by 2013. The potential role of SSSs and CSPs is starkly illustrated by Chaplin's (1999) comparative analysis of urban sanitation policy in 19th century Britain; the current predicament in Indian cities is attributed to the 'monopolisation of state resources' by the middle class and the lack of pressure from the urban poor for sanitary reform despite political participation. The fact that the SBM guidelines do not reinforce the need for such reform-linked measures requires a relook at the planning and financing architecture of the Centre's urban sanitation programme so as to sufficiently incentivise state governments. It is therefore suggested that the following measures be taken by the national government to reinvigorate its efforts:

- I. Currently, the SBM-U programme has an estimated outlay of Rs 62,009 crore (US\$14 billion) with the share of central assistance at only Rs 14,623 crore (US\$3 billion) – leading to a considerable gap³. Given the paucity of central schemes and programmes for urban areas, the financial deficit for the programme will need to be largely borne by state governments. The Centre's decision to accept the recommendations of the 14th Finance Commission to increase the states' share of divisible pool of taxes is a welcome decision; it shifts the burden of responsibility to the states. It remains to be seen how the states will respond and sustain the call of the 'national bully pulpit' to address sanitation.
- II. Allow greater flexibility in the use of funds allocated under the SBM-U by states and city bodies depending upon

the priorities identified in SSSs and CSPs. Urban local bodies may face financial constraints in managing other parts of the sanitation value chain such as collection, treatment and disposal, whereas central government assistance is only towards the construction of toilets. Further, Duflo et al.'s (2015) work on the complementarities across the sanitation and water infrastructure emphasises the need for integrated programmes, such as embedding toilets into Housing for All 2022 initiative⁴.

- III. Focus on behaviour change and communication through the release of guidelines and manuals, especially for the proper design, construction and maintenance of on-site sanitation systems, for which the burden of responsibility lies with the household. The behaviour change communication should also include campaigns on the full value chain of FSM focusing not just on containment but also on the importance of proper disposal, treatment and reuse.
- IV. Extend support to states and local bodies on developing SSSs and CSPs through model frameworks and monitoring and evaluation tools. Going forward, promoting experimentation and the regular collection of data on latrine ownership and usage through administrative and academic surveys with consistency in survey design, informed by behavioural sciences, will go a long way in understanding the extent of the urban sanitation challenge, and supporting the state's monitoring capacity for conditional financial incentives.

3. Also, these estimates only consider the cost of superstructure of individual and public toilets. Other studies put the cost of providing urban sanitation in the range of US\$40-\$58 billion (2008 prices), including infrastructure for sewerage.

4. Housing for All Initiative is the Pradhan Mantri Awas Yojna (Urban) also called PMAY-HFA, launch by the Gol in June 2015 which aims to provide financial assistance to States/UTs for providing for housing to all eligible families/beneficiaries by 2022.

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