



# THIRSTY?

## THE IMPORTANCE OF SANITATION

79 YEARS LATER,  
2.5 BILLION PEOPLE  
ARE STILL TOILETLESS



FIG. 1.

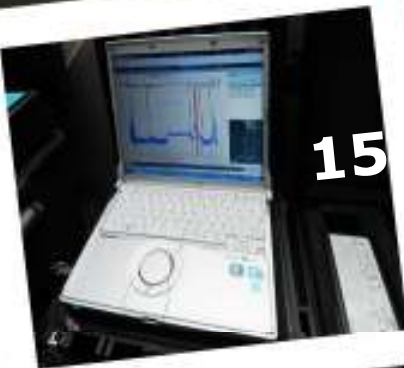


FIG. 2.

INVENTOR  
Arthur A. Byerlein  
BY  
E. B. Thomas  
ATTORNEY

## TOILET BOWL

ARTHUR A. BYERLEIN  
PATENTED AUG. 4, 1936  
NO. 2,049,534



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## Editorial

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We read and hear news about water problems all the time. People get very upset when they do not get the clean water supply they deserve. In Malaysia, supply disruptions are mostly caused by burst pipes, polluted rivers, or simply, dams drying up due to hot weather or water treatment plants being submerged in flood waters!

Now, how many people actually pay attention to sanitation problems? Apparently, solid waste management and sewerage system issues are not problematic to our society. Or are they?

Malaysians are said to generate at least 1.5kg of solid waste per person per day (per capita per day) in highly urbanized areas to less than 1kg in sub-urban and rural areas. About 80% to 90% of our landfills are considered unsanitary (or close to being dumpsites). There are no proper mitigating structures to prevent leaching of waste water from landfills into the rivers and ground water.

Malaysian's recycling rate has not improved over the years and the Department of Irrigation and Drainage pulls out tonnes of rubbish clogging our waterways: drains, channels, streams and rivers. Most of the waste that we discard is organic waste (food and other biological matters). Rotting waste in landfills produce ammonia, and when this ammonia enters our rivers in high concentration, water treatment plants need to be shut down – something which happens very often at the Semenyih Water treatment plant.

A different source of organic pollutants aside from what has been mentioned above is untreated human waste as a result from poorly maintained septic tanks in your homes – yes in your very homes!

You are not aware of the structural and capacity problems of your own septic tank until you de-sludge at least once every two years. Desludging is necessary to get rid of the scum that settles at the base of your septic tank.

When you do not get rid of this scum properly, it limits the capacity of your septic tank and waste water will start to overflow and contaminate waterways - drains, ground water and even rivers. Over years of poor maintenance your septic tank may collapse – a sanitation and environmental nightmare!

So do your part and de-sludge your septic tank. The list of companies which provide these service are easily available on the official websites of FAM and SPAN. We are just a call away.

Sanitation is an extremely important basic service to a country and community which wants to progress. Around the world, governments have invested a lot of time, money and effort to learn more about improving sanitation infrastructure and systems.

Despite these efforts, there are still a lot of policy issues surrounding water and sanitation management, especially in developing countries. Industry monopolization and government-run companies have been counterproductive in getting the system up and running efficiently. Governance, transparency and accountability has always been one of the biggest obstacles to proper functioning of sound water and sanitation services – according to the World Bank.

We hope that readers will be able to understand a little more when it comes to these sanitation and waste management problems and execute their roles responsibly to ensure that our water supply and sources are safe for use now and in the future.





# Importance of sanitation

What is sanitation? Why is it related to the water we use? These might be some of the questions that consumers may ask when they see the words water and sanitation used together in many organizations around the world.

The World Health Organization defines sanitation as “the provision of facilities and services for the safe disposal of human urine and feces. The word ‘sanitation’ also refers to the maintenance of hygienic conditions, through services such as garbage collection and wastewater disposal”.

For consumers, sanitary services basically refer to our sewerage and solid waste management. Of course that is not all of it, but this is where the main concerns lie, especially in regards to sewerage services.

Water and sanitation are inseparable. Any water we use will probably end up in the sewerage. Since clean water is a limited resource, we need to pay attention to how we use, where it goes, and how we handle it. If we put all our focus on our tap water, we would one day end up with a polluted water source, dirty surroundings, and an environment that is very dangerous to health. This is something most of us already know, but human excretion and other waste contains dangerous bacteria and viruses, so it must be separated in a proper manner.

How else is water and sanitation related? Well, as we all know, the water from our tap is not created out of thin air. It is usually water from our rivers which is treated by our water operators. These rivers are also the very same ones where our sewerage is usually discharged. These sanitation services also play a very important role of directing our waste to the correct places. Garbage goes to landfills, and human waste to the sewers. I’m sure most of us would not like to see these waste lying around near our homes, workplaces, or anywhere within our sights.

Statistics from the WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation shows that 32% of the world’s population lacked improved sanitation facilities. That is an estimate of 2.4 billion people. Every day, thousands get sick and some even die because of this inadequate water and sanitation services. That is just how dangerous a place without proper sanitation services is.

One would think that this does not concern Malaysians, as we are currently getting a steady supply of clean water, and our waste does not really bother us. True to a

certain extent, but not for much longer if we don’t start doing something about it.

The only thing we can really see about these water and sanitation services is the water coming out from our taps. The pipes are underground, the water or sewerage treatment plants are a distant away from our home, and the hard work done to maintain these services are out of our sights. Unfortunately, the serious issues that these services are facing go unnoticed by the public.

One major problem is that our water and sewerage companies are not earning enough to cover their cost. This makes it very hard for them to continue providing good services in maybe 10, or 20 years in the future. Another problem is that the pipes we use for water and sanitation are all old and prone to leakage or bursting. We also need to worry about the many areas without a proper sewerage connection. Even in the large cities, there are areas that rely on the old septic tanks, many which have not been maintained for years. Those are actually only the tip of the iceberg, there are actually more problems that one is not likely to take notice of.

The point we want to convey here is, sanitation is just as important as water supply, but it is not getting the attention it really needs. The dangers this silent threat poses will not be visible until the problem turns into a very serious one. It would be great if everyone learns more about it, then play a part in preventing it from really happening.

“For consumers, sanitary services basically refer to our sewerage and solid waste management. Of course that is not all of it, but this is where the main concerns lie, especially in regards to sewerage services.”

# CLEAN CITY





FEATURE

# behind the name

I

W

K





Bandar Tun Razak Sewerage Treatment Plant

## "You don't know what you've got until it's gone."

This statement aptly depicts the challenges faced by Indah Water Konsortium Sdn Bhd (IWK). Every day, IWK staff perform duties that are difficult, dirty & dangerous, but their services are not appreciated as there are some customers who do not understand the importance of sewerage system in our daily lives.

IWK, a company owned by the Minister of Finance Incorporated, is Malaysia's national sewerage company that has been entrusted with the task of developing and maintaining a modern and efficient sewerage system since 1994 to preserve the environment, protect water resources and public health.

Currently, IWK has more than 3,300 staff all over Malaysia and is in charge of sewerage treatment in all states except Sabah, Sarawak, Kelantan; and several parts of Johor Bahru and Pahang.

We are responsible for maintaining 6,318 public sewerage treatment plants, 1,025 network pump stations and 17,372km networks of sewerage pipelines. These numbers are expected to escalate in line with rapid population growth and economic development. IWK treats five million cubic metres of wastewater daily that flows from toilets, bathrooms and kitchen sinks. This volume is equivalent to 1,922 Olympic sized swimming pools.

Our nation has made significant progress in sanitation and wastewater management. We have evolved from

primitive systems such as illegal dumping, pit latrines and pour flush, to more advanced sewerage treatments. Initially, our wastewater management serves to protect public health by preventing the spread of water borne diseases. However, with the advancement in the health-care industry and the increase of human population around the globe; the sewerage industry in many countries are shifting their focus to raising awareness about the importance of preserving our water sources. In fact, one of IWK's aspirations is to minimise the impact of pollution and to care for the sustainability of our environment.

Most people believe that IWK only manages public sewerage system and provides desludging service for individual septic tanks. But in reality, IWK's responsibilities cover all aspects of the nation's sewerage infrastructure and system planning such as refurbishment, constructing or upgrading of sewage treatment system and catchment planning for the development of new sewerage system.

One of IWK's challenges is to educate customers on the importance of an efficient and effective sewerage system. Imagine what will happen in the absence of proper sanitation systems or sewerage services, which are currently provided by IWK.

Wastewater from domestic premises, commercial, industrial and Government buildings will flow untreated and cause pollution in waterways such as rivers & seas. This pollution will then destroy aquatic life and disrupt the sustainability of the environment. Wastewater contains bacteria, viruses, chemical and toxic wastes that can cause deadly diseases such as cholera, typhoid & Hepatitis A.

Rapid urbanisation and economic development has also created other challenges for IWK such as high operation



IWK technicians clearing a blockage in sewerage pipes

and maintenance cost as well as threats to the environment due to non-connected sewerage systems. Operation and maintenance cost for each sewage treatment plant is between one million to three million MYR yearly. Imagine the cost required to maintain more than 6,000 sewage treatment plants in Malaysia. Besides that, IWK also invests heavily in staff training as well as the latest equipments and technology to ensure that the customers enjoy high quality sewerage services.

This initiative is becoming more challenging as there are customers who are reluctant to pay their sewerage bills, despite the fact that the sewerage tariff in Malaysia (RM0.40/m<sup>3</sup>) is much lower compared to other countries such as United States of America (RM5.17/m<sup>3</sup>) and Japan (RM3.30/m<sup>3</sup>). Low collection of sewerage tariff ver-



sus high operational cost has reduced IWK's long term financial sustainability.

Furthermore, in comparison with other countries - especially our neighbours - IWK has managed to provide a systematic and efficient connected sewerage system to a majority of Malaysians. More than 67% of the population under IWK's purview utilise connected services while the rest use individual septic tanks or pour flush.

In line with Vision 2020 and the nation's aspiration to achieve developed nation status, the Government aims to increase the coverage of sewerage connected services to up to 80% for urban cities, through four initiatives:



IWK will rise up to the challenge to fulfill the responsibility as the national sewerage company, and help achieve the Government's aspirations in the Eleventh Malaysia Plan. However, it is essential to garner a strong support from the customers to ensure that IWK continues to improve the quality of sewerage services for the nation. Together, we can do it for our country, following generations and a healthy environment



## History of Sewerage System

**We Have Come A Long Way.**  
Our Determination Never Stops As  
We Continue To Improve On Our Services.

**IndahWater**  
Your National Sewerage Company  
Unit: 401, Menara Telekom, 100, Jalan  
Merdeka, 50100 Kuala Lumpur

**Poo?... Wastewater?...** **IWK**

Indah Water Treats on Average 5 Million Cubic Metres of Wastewater Daily.  
Imagine What Happens if This Goes Untreated.

No. 100, Jalan Merdekah  
P.O. Box 100, 50100 Kuala Lumpur  
Email: iwk@indahwater.com.my • Website: www.indahwater.com.my • 100, Jalan Merdekah

**Facebook!**

**We Clean The Unseen**

In the good old days sewage (human waste) was just an occasional mound in a vast landscape. There was really no time to worry about where to put our sewage.

Pada zaman silam, najis merupakan longgokan di merata tempat. Keadaan amat mencabar untuk memikirkan tentang 'najis'.

Being wanderers, no one worried about leaving a mess behind...

Sebagai pengembara, tiada sesiapa yang menghiraukan longgokan yang tertinggal...

1

"Where can I do it?" soon became an urgent question.

"Di manakah boleh aku melepasi?" tiba-tiba menjadi satu persoalan yang mendesak.

In Medieval Europe, it was downright disgusting what people did with their sewage.

Pada zaman pertengahan di Eropah, cara pelupusan najis oleh sesetengah orang amat menjijikkan.

Look out!

It's here!

2

The streets were so foul, the more sensitive had sweet smelling herbs in the tops of their walking sticks.

Jalanraya pada masa itu amatlah busuk. Golongan yang sensitif kepada bau busuk menghidu herba harum di kepala tongkat mereka.

It was only after hundreds of thousands had died from bubonic plague and cholera that the link between disease and sewage was made. Finally, laws were passed forbidding people from using the streets as sewers.

Seterah banyak kematian akibat wabak dan penyakit kolera, maka penyakit dan najis dihubungkan. Akhirnya, undang-undang terpaksa diluluskan bagi melarang jalannya dijadikan pembuangan.

3







Not all of our towns have proper sewerage systems. And we produce 5 million tonnes of sewage every year. Imagine that!

Tidak semua bandar-bandar mempunyai sistem pembuangan yang sempurna. Setiap tahun kita menghasilkan 5 juta tan kumbahan. Bayangkan!



A lot of it goes straight into our rivers and seas...  
Sejumlah besar kumbahan mengalir terus ke dalam sungai dan laut...

So Indah Water Konsortium Sdn Bhd was established to clean it up! But how? Well, fortunately there is an efficient sewerage treatment procedure.

Oleh itu, Indah Water Konsortium Sdn Bhd telah ditubuhkan untuk menguruskannya! Tetapi bagaimana? Majulah, ada juga kaedah olahan kumbahan yang berkesan.

1. Rubbish such as glass, rings, tins and bits of wood are screened out.  
1. Sampah-sarap seperti kaca, kalen buruk, tin-tin dan cebisan kayu disaringkan.

Screen  
Penyaring

Secondary Screen  
Penyaring Sekunder

2. Sand and grit are removed by allowing it to sink to the bottom of these channels.  
2. Seterusnya, pasir dan kerikil disingkan dan mendap ke dasar alur air.



3. The solid particles then flow into tanks called 'clarifiers' where smaller particles settle to the bottom as sludge.  
3. Pepejal halus seterusnya mengalir ke tangki-tangki 'penjernih' di mana partikel-partikel kecil akan memlap ke dasar tangki menjadi 'enapcemar'.

Trickling Filter  
Turas Cucur



4. The settled sludge is then filtered through beds of stones about 2 metres deep.  
4. Kemudian, enapcemar ditapis di kolam yang mengandungi batu-batu sedalam 2 meter.

4. Kemudian, enapcemar ditapis di kolam yang mengandungi batu-batu sedalam 2 meter.



Bacteria, algae and worms living in the filters use the air between the stones and break down the sewage.

Bakteria, alga dan cacing-cacing yang hidup di dalam turas akan menggunakan udara di celah-celah batu-batu untuk memecahkan kumbahan.

...or into a rectangular tank where the scraper moves backwards and forward. Activated sludge and raw sewage are sometimes mixed together in a tank. This is called activated sludge process.

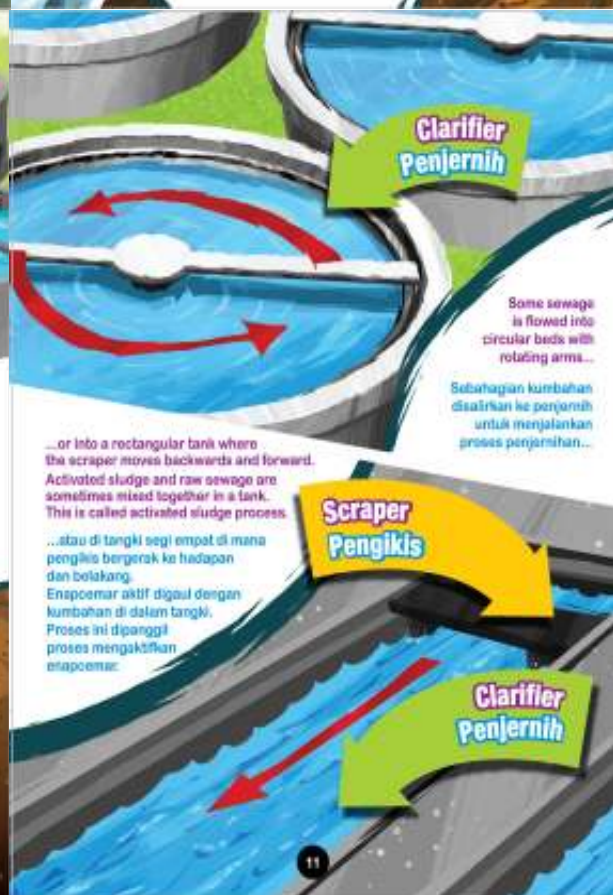
...atau di tangki segi empat di mana pengkilis bergerak ke hadapan dan belakang. Enapcemar aktif digaul dengan kumbahan di dalam tangki. Proses ini dipanggil proses mengaktifkan enapcemar.

Scraper  
Pengkilis

Clarifier  
Penjernih

Some sewage is flowed into circular beds with rotating arms...  
Sebahagian kumbahan disalurkan ke penjernih untuk menjalankan proses penjernihan...

Sebahagian kumbahan disalurkan ke penjernih untuk menjalankan proses penjernihan...





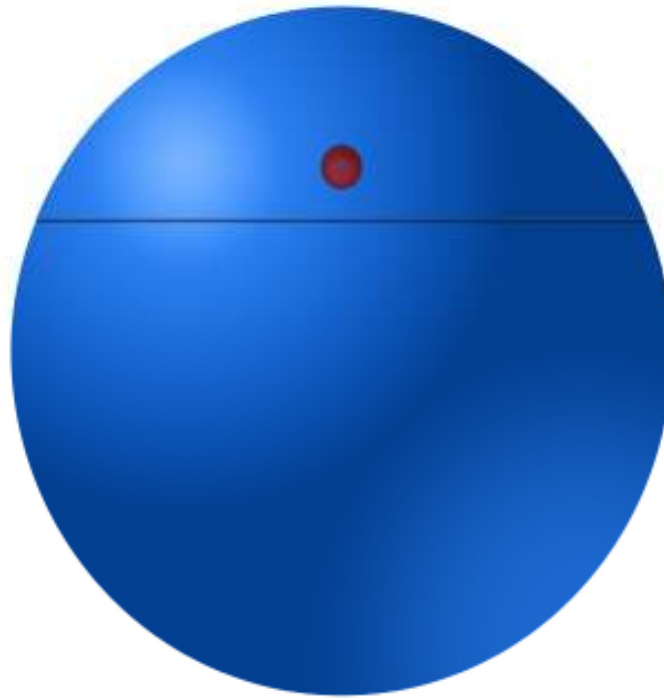


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# Meet SmartBall

Treated water has become a crucial commodity for daily essential needs. With this in mind, Syarikat Bekalan Air Selangor Sdn Bhd (SYABAS), a company which manages water facilities in major industrial cities has risen to the challenge to move beyond its consumers' expectations in providing water supply industry services. SYABAS is the sole provider of treated water to approximately nine million consumers in the state of Selangor, Federal Territory of Kuala Lumpur and Putrajaya and is continuously improving and enhancing its operational efficiency and consumer services.

Often enough, water issues will significantly impact both SYABAS and their consumers. For instance, sudden water disruptions due to pipe leaks or pipe bursts require SYABAS to roll out pipe repair works, which in turn interrupts the consumers' daily water supply. As a result, SYABAS also suffers losses commonly known as Non-Revenue Water (NRW).

Ever since SYABAS took over treated water distribution responsibilities from Perbadanan Urus Air Selangor Berhad (PUAS) - the Selangor State owned corporation - in 2005, it has successfully reduced the NRW rate from 42.78% to 33% in 9 years. SYABAS is in charge of approximately 27,299km of pipelines of various types and sizes. Out of this amount, a total of 6,423km or 27% are made of Asbestos Cement (AC) pipes more than 35 years

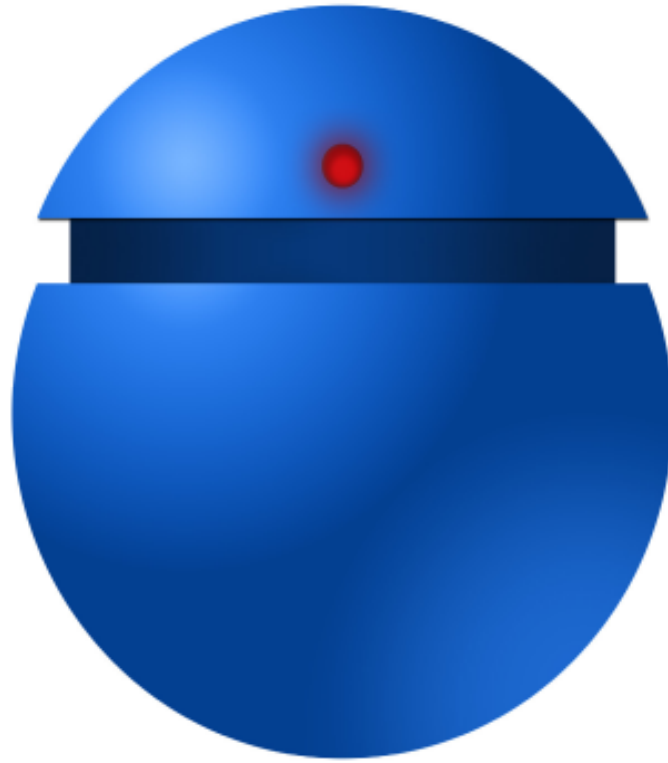
of age. They are no longer able to withhold the high water pressure which causes frequent pipe bursts and pipe leaks in most of the areas. The best solution is to replace the aged pipes. However, there is an ongoing freeze on capital expenditure by relevant authorities and this has made this option difficult to accomplish.

To-date, SYABAS has implemented several alternative solutions to ensure the NRW rate does not rise. These solutions have been put into place should further reduction not be possible due to various external constraints. Through continuous development and investment, SYABAS has finally discovered an effective solution to help reduce the current rate of Non-Revenue Water, reducing dependency on conventional pipe replacements. The solution which uses advanced leak detection equipment is better known as the SmartBall System, developed by Pure Technologies - a Canadian firm.

## About the SmartBall System

- SmartBall is a free-swimming, non-tethered foam ball with an instrumented aluminium core capable of detecting the acoustic activity associated with leaks and pockets of trapped gas in pressurised pipelines.
- SmartBall is inserted into a pipeline exceeding the length of 48km and travels with the water for up





# The Detector

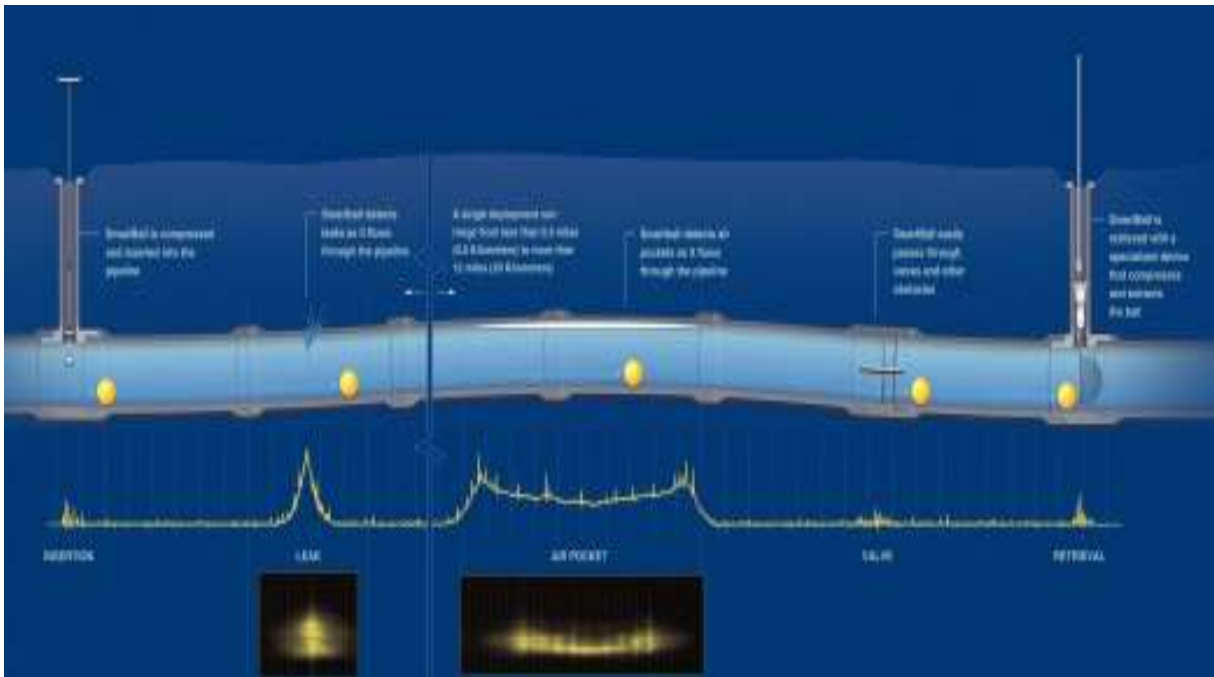
- to 12 hours, collecting information about leaks and pockets of trapped gas along inspected pipelines.
- The tool is equipped with a highly sensitive acoustic sensor that is able to locate 'pinhole' sized leaks.
- SmartBall is composed of an aluminium alloy core that contains a power source (battery), electronic components and instrumentation (acoustic sensor, tri-axial accelerometer, tri-axial magnetometer, GPS synchronized ultrasonic transmitter and temperature sensor).



- The aluminium core is encapsulated inside a protective outer foam shell, which allows the device to be propelled through the pipeline by creating a large surface area for the water to make contact with. The outer foam shell also helps reduce some low frequency ambient noise that is typically present in the pipeline.

## How it works

A leak inside a pressurized pipeline produces an acoustic signal, which is created when the pressurized item inside the pipeline escapes into the lower pressure environment outside the pipe. The SmartBall will continuous-



ly pass through and survey the pipeline to record this acoustic data evaluating it to identify acoustic activity which may be linked to leaks along the pipelines.

The acoustic signal will then increase as the SmartBall tool moves towards a leaking point. Once the tool passes said point, the acoustic signal will reduce once again as it continues to move away from the leak and travel along the pipelines.

#### Category of leaks by the SmartBall System

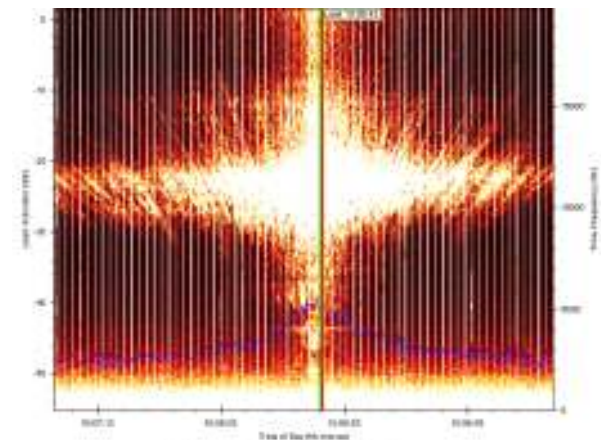
- Small - estimated to be in the range of 0 - 7.5 Litres per minute (L/min)
- Medium - estimated to be in the range of 7 - 37.5 L/min
- Large - estimated to be greater than 37.5L/min



#### How SmartBall detects a leak

The range of frequencies frequencies that appeared earlier grows in intensity as present increases as the ball approaches the leak

- TheSmartBall tool approaches the leak
- The frequencies that appear to indicate a leak become consistent as the SmartBall tool approaches the leak



Leak detected in Analysis Software  
Source: Pure Technologies US, Inc.

#### Strengths of the SmartBall Technology

- Sensitive to leaks as small as 0.1l/min
- Able to detect leaks in all types of pipe materials



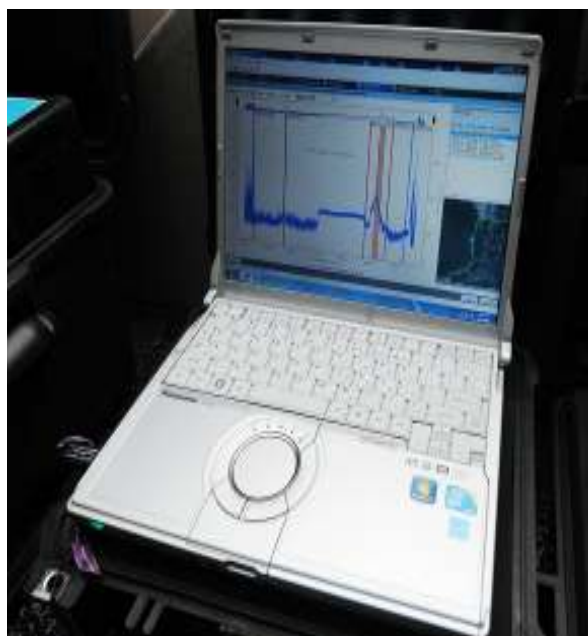
- Accurate to within  $\pm 1$  meter
- Able to estimate size of leaks and leakage rates
- Able to identify obstruction in line

#### **SYABAS's experience**

SYABAS started using the SmartBall leak detection system in February 2013. Since its inception, the system has surveyed a total of 1,227.23 kilometers of pipelines across the state. From these surveys, 439 points of leaks have been identified. Consequently, SYABAS has successfully reduced the NRW and managed to save an estimated 28.18 Million Litre Per Day (MLD).

#### **SmartBall Implementation and Saving Statistics**

SmartBall technology has proven to be cost effective, accurate and efficient in detecting leakages. This innovation is an excellent supplement to conventional NRW reduction programmes, including pipe replacement activities. With the help of this technology, SYABAS envisages that achieving the national level of NRW rate at 20% is indeed a viable outcome.



Year	Total Pipe Length Inspected (KM)	No. of Leaks Detected & Repaired	Water Savings in Million Litre Per Day (MLD)
2013	46.38	25	2.05
2014	380.34	150	8.28
2015 (up till June 2015)	800.51	264	17.85
<b>TOTAL</b>	<b>1227.23</b>	<b>439</b>	<b>28.18</b>

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"Water issues are all around us. I really hope that my contribution will somehow enhance current and future policy development. I believe that every single move will eventually give power to bigger changes in the future. We should always appreciate and conserve water for our future generation"



## YOUNG ACTIVIST

**Ms Jesslyn Pek Yen Lee** is currently a Communications and Policy Manager in Forum Air Malaysia (Malaysian Water Forum) which is a non-governmental organisation formed mainly to address consumer rights in all issues related to water and sewerage services. The Malaysian Water Forum works closely with government agencies such as the National Water Services Council (SPAN), Ministry of Energy, Green Technology and Water, Department of Environment and etc.



## 8.00am

Already at the office. I typically start my day by reading news through online portals and also Mandarin newspapers. This media monitoring task enables me to update myself on current water and sanitation issues and indirectly increase my knowledge of niche areas on a global scale. Additionally, I also prepare letters to be sent to related authorities if I happen to come across any issues related to water and sanitation services.

## 10.30am

Arrive at the office. Dealing with issues related to water quality is a vital daily task for me. Today, I review a report on the water quality of water vending machines which I have previously tested after collecting water samples from those machines. This task was conducted in collaboration with The Star Publication Sdn Bhd. I then forward the report to the Food Safety and Quality Division, Ministry of Health. Our tests concluded that without regular maintenance by vendors, the water in these machines may possibly get contaminated by bacteria such as E.coli which cause diarrhoea and have adverse effects on our health. More importantly, the right to obtain clean and safe water is a basic human right.



## 8.30am

Depart to Taylor's University at Bandar Sunway with my colleague to fulfil an invitation. We are here to give a water conservation talk to their students. We tell them all about the water supply chain and emphasize on the importance of raw water resource management and the public's role in protecting our rivers. We divide students into groups and instruct them to discuss the importance of water and brainstorm ways to reduce their own water consumption. Each group presents the results of their group discussion. The session ends with us sharing some tips on how to save water. I leave Taylor's hoping that the talk has at least increased their awareness on how crucial it is to conserve water.

## 11.00am

Invited as a panelist in The Malaysian Observer - an internet TV portal which covers various issues, including consumer movement. This time I gave a talk about the World Water Day. This year's theme is "Water and Sustainable Development". Working at a consumer based non-government organisation, I always grab the chance to spread any information related to water to the public. I firmly believe that the empowerment of consumer knowledge will definitely encourage a better quality of life in the future.





## 12:00pm

Time to recharge myself for the next half of the day by having lunch with my colleagues. This is a great chance to foster better relationships with all of them. We tell jokes and share our opinions on whatever consumer issue that has made recent news. This is how I get my thoughts churning so that I may come up with new ideas for work. My opinion is that a harmonious working environment is very important to increase working efficiency in the office.

## 1:30pm

Interview session with Oriental Daily, and I am well prepared to talk about the issue of river pollution in Malaysia. Our rivers are a major water resource in our country, and so when they are polluted, there is a higher chance of water supply disruptions. I also grab the opportunity to promote our "Thirsty Runner 2015 - Run for Every Drop" campaign to the media. This is an effort to increase awareness on the importance of water and sustainable consumption among the public.

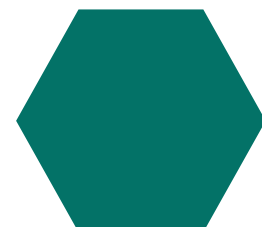


## 2:00pm

To improve my advocacy skills, I attend an Advocacy Training Session at Consumer International. From the training, I manage to boost my communications as well as my planning skills. Advocacy is a long-term process to achieve the changes we wish to make, changes which require great passion and patience. Practice makes perfect, they always say, and in our case, the process is repeated over and over again - starting from the brainstorming of issues and up until the move forward to achieve our goals. Training is thus a vital step to keep our mission going.

## 1:00pm

Fortnightly staff meeting - a chance for me to catch up on the progress of projects and advocacy work that each of my colleagues are currently tasked with so that we can plan our timeline carefully. This way, we can ensure that adequate manpower is available for each event that we will be holding. It is a great platform to solve the challenges we face and share successes and achievements with each other.





## 5.00pm

Prepare materials for meetings I have to attend the following day – this is another everyday task of mine. Once preparations are done, I join in on the day's staff fitness activity. This is an initiative run by the organisation to promote healthy lifestyles among all. As the famous saying goes, "Health is wealth", thus I exercise for at least 15 minutes a day to refresh my brain. Sweating is great, I like it!



## 8.00pm

Arrive at Subang Airport, ready to board my flight to Johor. I will be attending a briefing on the Johor State water tariff review session the following day, organised by the National Water Services Commission (SPAN). An early briefing session will be carried out to collect feedback and comments from related authorities, including my organisation. Getting this feedback is a highly important part of the process before implementations can take place.





# Kelantan, selepas bencana

oleh : Nah Kok Wai, Forum Air Malaysia

Pada 7 Ogos 2015, Forum Air Malaysia telah melakukan lawatan tapak di dua kawasan yang terlibat dengan kejadian banjir besar pada bulan Disember 2014 yang lalu, iaitu Kuala Krai dan Manek Urai, Kelantan untuk meninjau keadaan sebenar mangsa banjir. Lawatan ini dilakukan dengan kerjasama daripada Pn. Hastura dan juga En. Azri sekeluarga yang merupakan penduduk di Kota Bharu.

## Pengalaman Mangsa Banjir

Keadaan banjir telah menenggelamkan hampir seluruh negeri Kelantan, terutamanya di daerah Kuala Krai dan Manek Urai yang paling teruk dilanda banjir. Forum Air Malaysia telah membuat lawatan ini untuk meninjau keadaan kawasan-kawasan ini selepas 8 bulan.

Beberapa penduduk yang ditemui, mempunyai kisah tersendiri yang ingin dikongsi bersama. Majoriti mereka masih mengalami trauma dengan kejadian yang mengerikan itu. Ada juga yang berasa gembira dan lega kerana ada beberapa pihak yang datang memberi bantuan kepada mereka.

Di Kuala Krai, mangsa-mangsa banjir telah menceritakan pengalaman mereka. Mereka terpaksa berlindung di atas bukit setelah air banjir melanda rumah mereka tanpa sebarang amaran. Mereka berkata perkara lain yang mencemaskan mereka ialah bekalan mereka hampir habis, namun bantuan tidak kunjung tiba. Sementara kawasan bukit yang berbahaya menambahkan lagi ketakutan mereka.

Bot-bot yang digunakan untuk tujuan menyelamatkan penduduk tidak banyak. Malah keadaan bot-bot tersebut juga dalam keadaan yang teruk dan ada yang bocor. Satu bot hanya dibenarkan membawa 3 orang sahaja. Ini menyukarkan lagi proses pemindahan mangsa-mangsa banjir yang begitu ramai.

Ketinggian air bukan sahaja melebihi jambatan yang menghubungkan Kampung Manek Urai Lama dan Kampung Manek Urai Baru, malah ia telah mencecah bumbung rumah 2 tingkat mereka.

Mangsa-mangsa banjir juga mengalami sakit cirit birit kerana pengambilan air banjir untuk tujuan makan dan



minum. Kanak-kanak pula tidak dapat menghadirkan diri ke sekolah berikutan kemusnahan barang-barang persekolahan mereka.

### 8 Bulan Selepas Banjir

Sebahagian mangsa banjir di kawasan itu masih lagi mendiami khemah sebagai tempat berteduh. Pihak Forum Air dijemput masuk untuk meninjau keadaan tempat tinggal mereka dan mendapati khemah itu amat panas pada waktu siang. Mangsa banjir ini telah tinggal dalam situasi yang tidak selesa ini selama 8 bulan. Pada waktu malam pula, mereka terpaksa menghadapi masalah yang lain seperti hujan, cuaca yang terlalu panas atau sejuk, kekurangan bekalan elektrik dan masalah binatang berbahaya seperti ular.



Mangsa-mangsa yang lebih bertuah pula mendapat rumah sementara atau rumah rumah kekal, tetapi jumlah mereka ini amat terhad. Apabila ditinjau keadaan rumah sementara mangsa, didapati ruangnya hanya cukup untuk tempat tidur dan satu dapur.

Rumah kekal pula lebih baik kerana semua kemudahan dan bilik mencukupi. Rumah-rumah merupakan sumbangan daripada pelbagai organisasi dan penderma. Apabila ditemu ramah, penduduk rumah kekal ini menyatakan kesusahan mereka mendapatkan rumah ini. Kerenah birokrasi untuk mendapatkan rumah di tanah sendiri pun sangat menyusahkan. Mereka memerlukan banyak masa untuk pulih daripada situasi banjir mereka. Ramai yang tidak mempunyai masa, duit, ataupun pengetahuan untuk mendapatkan rumah yang mereka patut dapat.

Bantuan kewangan pula diberikan secara berperingkat. Bantuan sebanyak RM500.00 (sahaja) ini telah diagihkan pada peringkat pertama dan kedua. Terdapat beberapa penduduk yang masih tidak menerima bantuan ini dan mereka juga tidak dimaklumkan tarikh bantuan di peringkat seterusnya. Hal ini telah menyebabkan rasa tidak puas hati dalam kalangan mangsa banjir kerana bantuan tidak diagihkan dengan adil.

Di negara-negara lain, mangsa-mangsa malapetaka seperti ini biasanya akan diberi kaunseling supaya dapat menyesuaikan diri kepada kehidupan baru mereka. Penduduk Manek Urai dan Kuala Krai tidak diberikan khidmat kaunseling selepas kejadian banjir ini telah memusnahkan hampir ribuan harta benda dan juga nyawa.

Beberapa pihak yang tidak bertanggungjawab pula telah mengambil kesempatan ini untuk meminta bantuan yang



sepatutnya mereka tidak layak untuk mendapatkannya. Perbuatan ini nyata menyukarkan mangsa-mangsa banjir yang memerlukan bantuan sebab barang-barang bantuan itu tidak mencukupi.

Keadaan sanitasi selepas banjir di kedua-dua tempat tersebut diselenggarakan secara persendirian dan tidak ada pihak yang terlibat dalam menyelenggarakan keadaan sanitasi di kawasan tersebut. Sampah-sarap tidak dikutip di sesetengah kawasan banjir ini dan mangsa banjir perlu menguruskan sisa-sisa ini sendiri. Bekalan air pula dibekalkan kepada mangsa-mangsa, tetapi bil air tetap perlu dibayar.

Dalam perjalanan dari Kuala Krai ke Manek Urai sekitar 20 kilometer, terdapat banyak rumah yang masih belum dibaik pulih. Terdapat juga beberapa rumah, ladang kelapa sawit, pokok getah dan bangunan kerajaan sepanjang



laluannya itu masih mempunyai kesan ditenggelami banjir. Terdapat juga banyak bahan, serpihan dan rumah roboh yang membahayakan tetapi masih tidak dibersihkan. Boleh dilihat rumah yang rosak di pinggir jalan dengan pelbagai barang lain yang membahayakan kanak-kanak yang bermain di sekitar kawasan itu.

Harapan mangsa-mangsa banjir agar keadaan akan lebih baik dan mengharapkan satu permulaan hidup yang baru. Langkah-langkah menghadapi bencana banjir perlu dilakukan oleh semua pihak agar kejadian buruk ini dapat ditangani dengan lebih baik lagi pada masa hadapan.





# The Importance of Managing Sewage

## *Enabling People to Live Healthier Lives*

A significant part of the country's population lacks information on the importance of waste management. This problem exists despite the presence of a specialized agency responsible for solving this problem.

Majaari Services is a subsidiary of the Kumpulan Perbadanan Menteri Besar Kelantan (PMBK), set up to help manage the sewerage system in Kelantan. At the end of 2007, the state government created this company to take over sewerage management responsibilities from local authorities.

Majaari Services primarily performs desludging services which is the act of emptying septic tanks. "In 2006, a new act was gazetted under the supervision of the Suruhanjaya Perkhidmatan Air Negara (SPAN), namely Act 655 or the Water Services Industry Act". After the act came into force, only those who have obtained a permit from SPAN can perform desludging services.

Majaari Services also acts as a certifying agency responsible for processing and recommending approvals of any new plans to develop sewerage systems, sewage treatment plants, pumping stations, sewerage networks, connection pipes and septic tanks.

A team of professionally trained and skilled individuals is employed to organize the pipelines which run through the state, as well as sewage treatment plants and private plants. In addition, Majaari Services also clears blockages in public sewerage pipes, as well as private, industrial and commercial properties.

### **What is meant by sewage management?**

Sewage management is an act of maintaining the sewerage system, thus ensuring a clean environment, particularly related to water resources.

Among the methods of sewage management is to perform desludging (emptying septic tanks). The wastewater from the desludging process will be treated and disposed of in authorized landfills. Majaari Services uses the AVC system as a method of sewage disposal. Sewerage systems which are connected to sewage treatment plants must be built for the

development of a population of more than 150PE and serves to treat wastewater prior to discharge. The STP includes Extended Aeration (EA), Hi-kleen (HK), RBC and SBR, in order to comply with the Environmental Quality Act 1974.



### What is the function of Majaari Services as a certifying agency (CA)?

Majaari Services was appointed as CA by SPAN to process and recommend approval of any plans to develop sewerage systems, sewage treatment plants, pumping stations, sewerage networks, plumbing links and septic tanks. Therefore, all new development plans must

be submitted to Majaari for review and recommendation of approval, on behalf of SPAN.

### The effects of improper sewage management

Septic tanks should be emptied once at least every two to three years. Failing to do so on a regular basis could potentially cause sewage to flow into the irrigation system and adversely affect aquatic life in oceans and rivers.



Additionally, it may cause serious health issues because raw sewage contains *Campylobacter*, *Cryptosporidium Parvum*, a parasite found in feces-contaminated food and water. This parasite carries water-borne diseases such as Cholera, Typhoid and Hepatitis A.

Approximately 50% of the Kelantanese population use groundwater resources to perform daily activities. Therefore, they are advised to empty their septic tanks regularly so as to ensure that these water sources remain clean. Failure to do so will result in future complications of the water treatment process.

### Constraints faced

Normally, when a change is made, a cost is incurred which is not borne by the developer or the buyer. In some states, centralized sewage management systems are built into residential areas and the construction cost is shared collectively.



The WSIA Act by SPAN states that any development of a residential area consisting of more than 30 houses requires a centralized sewage system. It may seem like a burden, but this perception would be greatly reduced if there is a proper understanding of the situation and the willingness to collectively bear the cost of maintenance.

The campaign "*Cakno Kumbahan Kito*" (Care for our sewerage) is expected to bring awareness to the public on the importance of maintaining and managing the sewage system.

Most of the residents lack the consciousness of the importance of maintaining and managing the sewage system, until something happens that interferes with their daily activities.

Several programmes have been undertaken to raise public awareness, including sweepstakes, presentations in government departments and agencies; and even free septic tank inspections.

Prevention is better than cure. With these ongoing efforts, particularly the campaign run by Majaari Services, we are optimistic that public awareness will be increased and that they will one day realise the importance of managing sewage.

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# HI! I AM MR. TOILET



“

Dreams of better world, identify and remedy social gaps; Mobilize people to act and not lead alone; Build strong institutions for the mission to reduce dependency in you ”

**Jack Sim**, Founder of World Toilet Organization (WTO), has been a successful businessman since age 24. Having achieved financial success in his 40s, Jack felt the need to change his direction in life and give back to humanity – he wanted to live his life according to the motto “Live a useful life”. Jack soon left his business and embarked on a journey that saw him being the voice for those who cannot speak out and fighting for the dignity, rights and health for the vulnerable and poor worldwide.

**FAM :** *Hi Jack, thank you for agreeing to an interview . First of all, tell us about your background and what are you working on before embarking on the World Toilet Organization(WTO)?*

**Jack Sim :** I was a businessman since age 25 and at 40, I realized since our average life-span is 80, time is the currency of life and I need to use it meaningfully with a sense of urgency. Money becomes not an interesting pursuit anymore because I have to exchange time for money. It is better to exchange time for more meaningful impact for others.



**FAM : What inspired you to start the World Toilet Organization?**

**Jack Sim :** In my search for meaning, I read one morning in the newspaper when PM Goh Chok Tong mentioned that we should measure our graciousness according to the cleanliness of our public toilets. I thought this is my calling and started Restroom Association of Singapore. After LianHe Zao Bao's report, the public's response was; "Somebody ought to have started this long ago." They like it.

In 1999, I went to Tokyo for the Asia-Pacific Toilet Symposium and found 15 countries represented there. I wanted to bring that meeting to Singapore. Thailand and Vietnam also wanted to do the same. After my impromptu presentation about how the event will be organized and run like a swiss-watch, no traffic jams, global media coverage, professional management, great shopping, high impact, etc, both Vietnam and Thailand said: " We are not presenting, we all going to Singapore."

Next, I asked where is the world's HQ for our movement. They said there was none. The Japanese host declined to lead because of language difficulty. So I offered to start World Toilet Organization in Singapore as a service platform and HQ. They agreed.

Later, the inaugural meeting became World Toilet Summit and our birthday 19 November became celebrated as World Toilet Day.

The first World Toilet Summit took the global media by storm and suddenly we are booked for 2002 in Seoul ( host Mayor of Suwon City/ Korea Clean Toilet Association), 2003 Taipei (host Taipei Vice Mayor/ Taiwan Toilet Association), 2004 Beijing ( host Beijing Tourism Bureau). Later, 2005 Belfast Lord Mayor/ British Toilet Association, 2006 Moscow Mayor/ Russian Toilet Association, 2007 New Delhi President of India/ Sulabh International, 2008 Macao Asian Development Bank, and 2009 in Singapore this year.

It started as a hobby but got so addictive that I left my business operation to my managers and work full-time pro bono at WTO since 2005.

**FAM : What is the mission of the World Toilet Organization?**

**Jack Sim :** We started as a clean toilet movement to improve design, cleaning and behavior. Later, we also extend to poverty, rural and slums toilets, sewerage, to meet the MDGs.



Through the massive media engagement globally, politicians and the global community found legitimacy to speak about toilets and we can attribute ourselves to the success in breaking the global taboo and bringing the issues to mainstream and center-stage attention.

**FAM : How does the organization facilitate many governments of the world towards clean sanitation?**

**Jack Sim :** WTO membership grew from the initial 15 now to 200 chapters and we facilitate these chapters around the world with knowledge sharing, branding, media coverages and matching resources. We did some development program in Aceh, Sri Lanka, China.

**FAM : Are there any new initiatives which the organization is moving towards?**

**Jack Sim :** Now we see donation is alone is not going to solve the problem of 2.5 billion people without access to proper sanitation. So we are mobilizing many factions: Businessmen, government, banks, micro-finance institution NGOs, UN system, academia to enter the sanitation marketplace which we calculate to be worth about USD 1 trillion. With profit motive, the solution will be sustainable.



**Jack Sim :** Innovators are often seen as troublemakers because they disrupt the norms and status quo breaking people's comfort zones to move into a new mindset. Our journeys are met with resistance every day. But our intention are good and this drives us forward. We are seen as unreasonable people because we seek to remedy social gaps that are unreasonable in the first place.

Many innovators are also under-resourced and this is another unreasonableness because somehow, we dream and make it happen regardless of circumstances. We want others to succeed doing what we do mobilize others into action.

**FAM :** *How do you think that we can do more to promote social entrepreneurship, particularly in the realm of social innovation?*

**Jack Sim :** As consumers become more conscious of the behavior of companies, they demand that companies behave responsibly. We are in early stage of this trend but I see it growing fast. While many companies still see corporate social responsibility (CSR) as low-cost advertising, they'll soon learn that trends are pushing them to become real McCoys. You can't say one thing and do another.

**FAM :** *What do you think are the three most important traits for an entrepreneur?*

**Jack Sim :** Dreams of better world, identify and remedy social gaps; Mobilize people to act and not lead alone; Build strong institutions for the mission to reduce dependency in you.

**FAM :** *The World Toilet Organization have been involved in setting the standard for lavatories in Beijing prior to the Olympics in 2008? What are the challenges you encounter in convincing the local authorities to adopt the standards?*

**Jack Sim :** It's not so difficult actually except that you need to find the right party at the right time.

For Beijing, the Olympics was a great motivator, so getting standards set, and investments for renovating public toilets to receive the guests is no problem.

In Singapore, we lobbied NEA to change the Code of Practice so ladies get more cubicles and do not need to queue up anymore for new buildings since 2005. We want to spread this law globally and so we partnered International Code Council of USA to start working on this.

**FAM :** *The World Toilet Organization has been cited as a case study on scaling social innovations to solve world's problems in John Elkington's "The Power of Unreasonable People". Do you think that social entrepreneurs are really "unreasonable people"?*



# Antibiotic-resistant Bacteria in River Water

In this day and age, antibiotics are being used widely with the purpose of treating diseases in agriculture, aquaculture, as well as animal and human activities. Antibiotics should be prescribed when the patient has at least three symptoms, i.e. fever, cough, and the presence of tonsillar exudate [1]. In many cases, however, antibiotics were prescribed without a thorough diagnosis of the patient's symptoms. It was reported that 64.8% of patients who received treatment for Upper Respiratory Tract Infection (URTI) in Sarawak were given antibiotics [2].

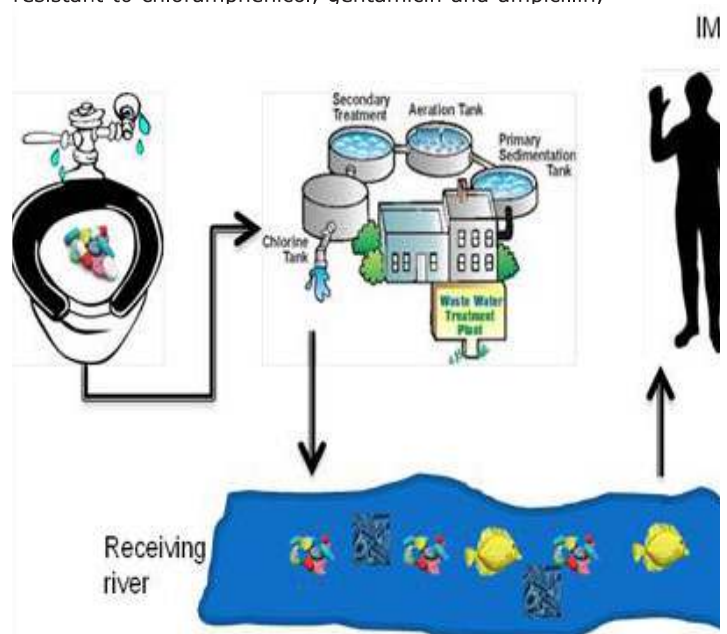
The widespread use of antibiotics to treat diseases has triggered the phenomenon of antibiotic-resistant bacteria. Excessive intake of antibiotics and drugs without proper medical consultation has exacerbated the situation. Only a portion of antibiotics can be absorbed by our bodies once ingested. The remainder will be excreted out through faeces as well as urine; and flushed through the toilet.

In some cases, the unused and/or expired medications which were disposed through the toilet resulted in the presence of medication residue in the sewage water. Previous researches in Malaysia showed that antibiotics were two times more likely to be prescribed by private clinics as compared to general clinics, and the most popular antibiotics were penicillin and macrolides [4,5]. Researchers also found that antibiotics such as sulphonamides, trimethoprim, macrolides, tetracycline and lincomycin are the most commonly found in Asian waters [9].

To-date, there are no mechanisms in place to monitor antibiotic-resistant bacteria in Malaysia [3]. The prevalence of antimicrobial resistance is one of our most serious health threats. Infections from antibiotic-resistant bacteria are very common of late, and some pathogens have even become resistant to multiple types or classes of antibiotics (antimicrobials are used to treat bacterial infections). The ineffectiveness of antibiotics will undermine our ability to fight infectious diseases and man-

age complications, particularly in vulnerable patients who are undergoing chemotherapy for cancer, dialysis for renal failure, and other surgeries - especially organ transplantation - in which the ability to prevent secondary infections is crucial [10]. The used antibiotic will be discharged directly into the bodies of water if there is no appropriate treatment being applied.

Antibiotic-resistant bacteria, i.e. *Vibrio*, *Salmonella*, *E.coli*, *Shigella* and *Pseudomonas*, all of which are pathogenic bacteria [7], will become immune to these antibiotics and grow stronger due to the high concentration of antibiotics in wastewater. From 70 tested isolates, 81.4% of *E.coli* were resistant to tetracycline and kanamycin; and 75.7%, 74.3% and 72.9% isolates were resistant to chloramphenicol, gentamicin and ampicillin,



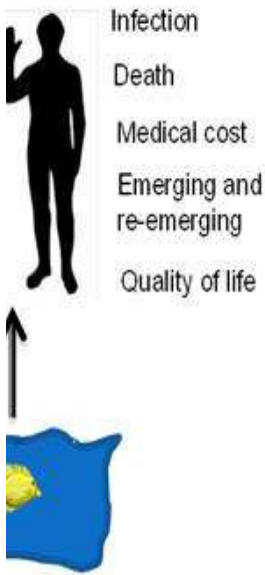




respectively [6]. This indicates that one type of antibiotic-resistant bacteria may be able to resist multiple types of antibiotics.

The prevalence of antibiotic-resistant bacteria in river water might be influenced by the sewage treatment plant near the river [8]. Direct contact with these pathogenic bacteria may be harmful to humans. Water that contains antibiotic-resistant bacteria should not be taken directly by humans for daily consumption. It is clear, therefore, that the emergence and spreading of antibiotic-resistant bacteria has to be stopped. Prescription of antibiotics should be left to the medical practitioners who are qualified to recommend the optimal doses according to different cases.

#### IMPACT TO HUMAN:



Misuse of antibiotics should also be exterminated and the public should be provided with adequate information on the proper daily usage of antibiotics in order to avoid excessive use. Figure 1.0 illustrates the fate of antibiotics and antibiotic-resistant bacteria in water systems as well as their impact to human lives.

It is obvious that the conventional process in wastewater treatment plant is inadequate as the final barrier against emerging and re-emerging pathogenic bacteria. Therefore, it is crucial to conduct the appropriate treatment – using proper technology – in order to remove any antibiotics and antibiotic-resistant bacteria from wastewater before it is released into larger bodies of water.

#### About the author



**Zummy Dahria Binti Mohamed Basri** was a lecturer at Polytechnic Kuching of Sarawak before pursuing her PhD in Universiti Teknologi MARA Shah Alam. She is graduated from Universiti Tun Hussein Onn Malaysia in Civil Engineering. Her current research interests are water and wastewater treatment technology, microbiology and antibiotic resistance bacteria.



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# GOOD WASHROOM PRACTICES



**DO NOT SQUAT  
ON THE TOILET  
SEAT !!**



**WASH HAND WITH  
SOAP AND WATER**



**DISCARD WASTE IN  
RUBBISH BIN**



**DO NOT VANDALISE  
FACILITIES INSIDE  
THE TOILET!!**



**DRY HANDS AFTER  
WASHING !!**



**SWITCH LIGHT  
WHEN NOT IN USE!**



**CLOSE WATER TAP  
AFTER USE!!**



**DON'T FLUSH  
SANITARY PAD INTO  
THE TOILET BOWL**



**PLEASE FLUSH THE  
TOILET AFTER USE**



**PLEASE USE THE  
TOILET PAPER  
MODERATELY**



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