

Penstrukturan Semula

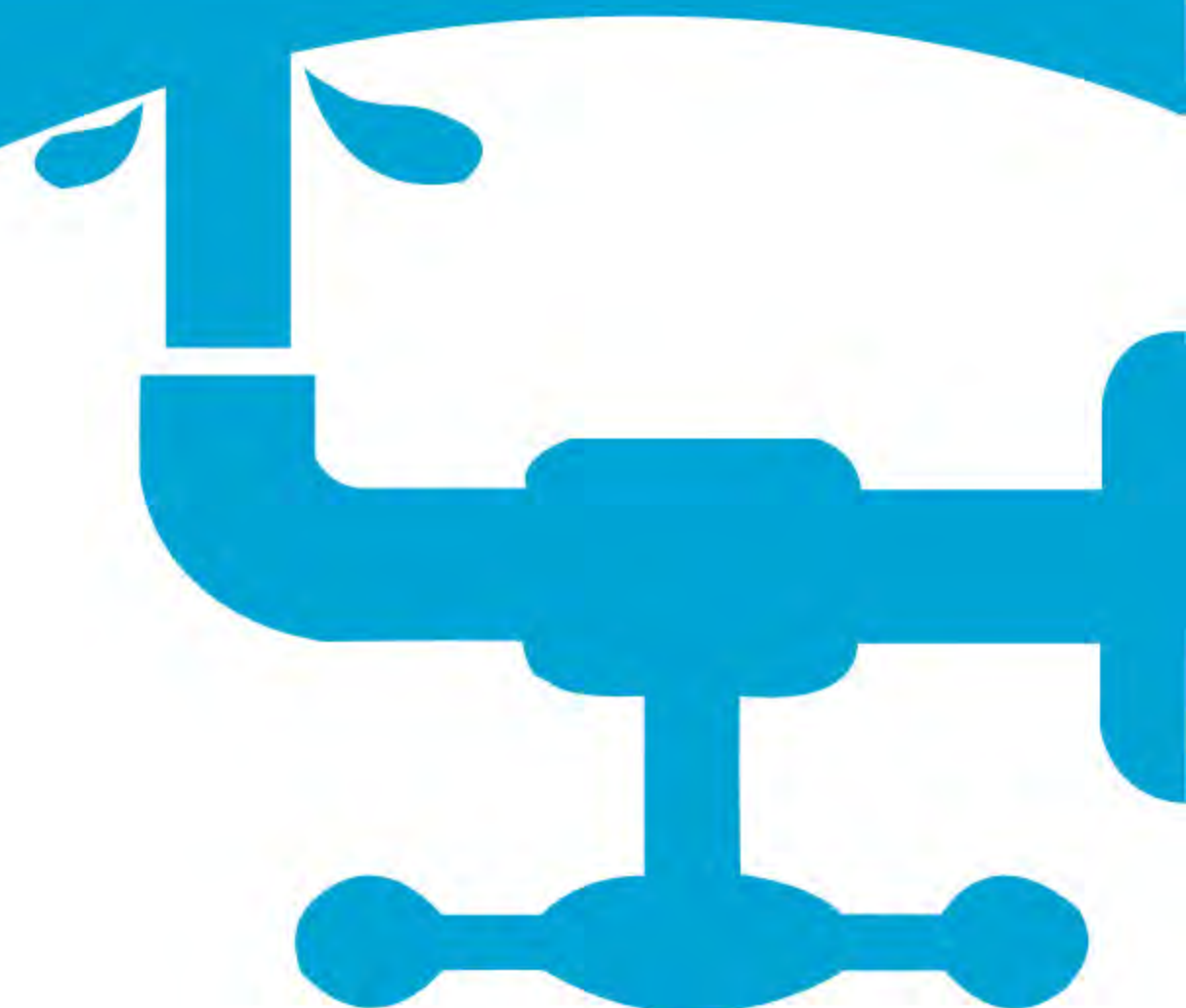
Industri Perkhidmatan Air Negara

-HAKIKATNYA

National Water Services Industry

Restructuring

**-THE
TRUTH**



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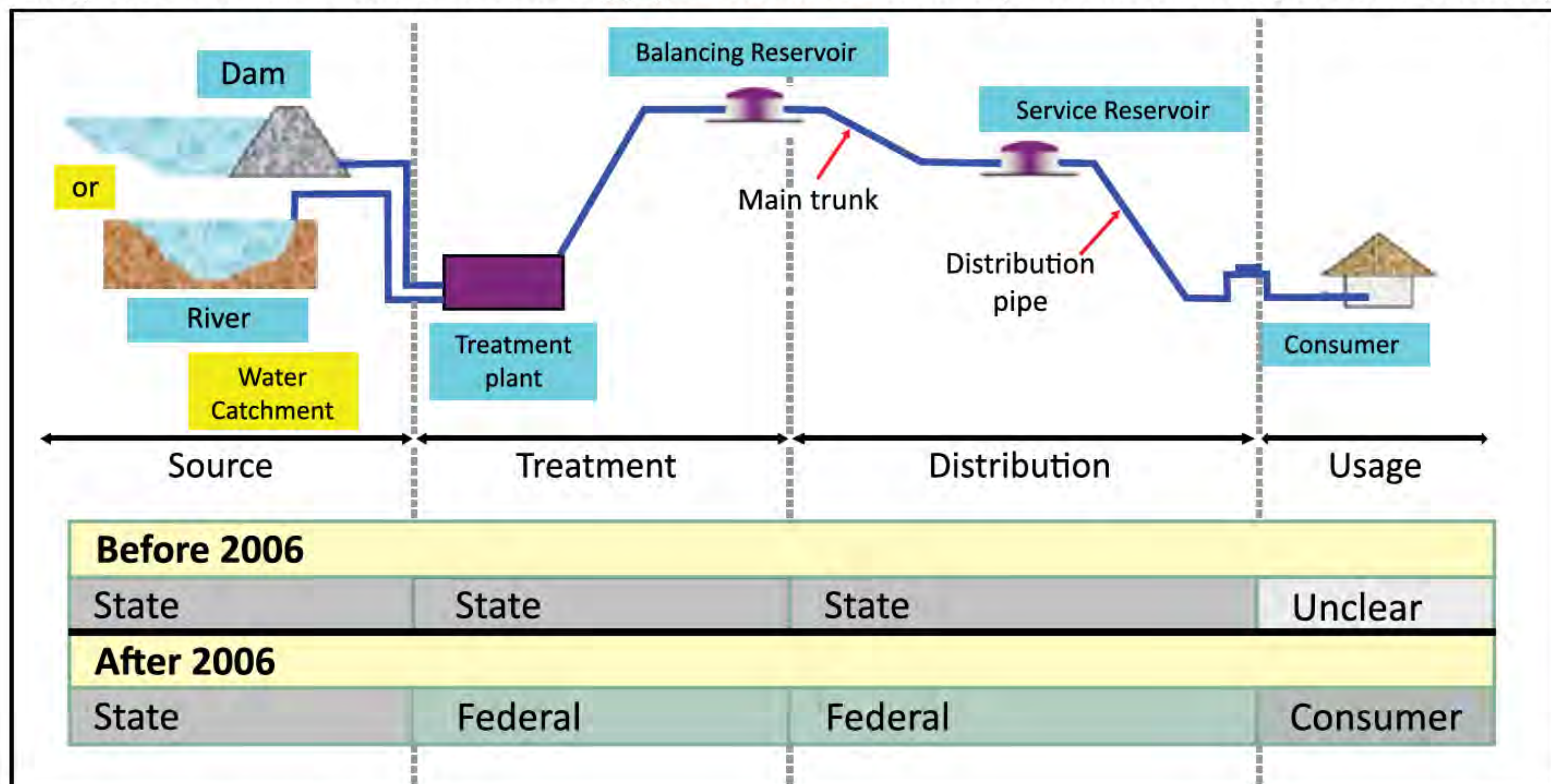
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PART 1: INTRODUCTION

1.1 Segmentation of Jurisdiction

Diagram 1: Water Treatment and Supply Process Structure (Peninsular Malaysia and Labuan)



Before year 2006:

State government controlled the entire water services industry prior to year 2006. With increasing population and water resources being polluted, the industry began to carry huge liabilities. The separation of responsibilities between water companies and consumers was also not clear. This has caused more misunderstanding.

Therefore, to restructure the national water services industry and to ensure the quality of supplied water is secured, Federal Constitution was amended at the end of year 2006 to allow Federal Government to have executive power over the treatment and supply of water.

After year 2006:

State government is still responsible for the water resources (rivers and water catchment areas). Water treatment and supply has been placed under the Federal Government. After the water meter, the responsibility is under the consumers. Prior to the amendment, if the pipe in front of a consumer's house is broken, the consumer is required to repair it. Now, the responsibility is only after water meter, just like electricity supply.

1.2 Core Components of Water Services Industry Act 2006 (WSIA)

I. Asset-Light Model

Restructuring of water services industry is aimed to ensure water operators place their priority in delivering good water quality and services quality. Water Operators do not need to worry about financial burden, debt (liability) and new water services infrastructure development projects. Their duties will be bound to operating, maintaining, and carry out the core responsibility, which is supplying safe and continuous supply of water to the people efficiently.

II. Prevents any type of CONCESSION AGREEMENT in future

Concession agreements have caused too many issues in national water services industry. WSIA do not encourage any type of concession agreements. Through National Water Services Commission (SPAN), operation license will be given with Key Performance Index (KPI). Such licenses will only be renewed every 3 years with the condition that the water operator fulfills KPIs set by SPAN.

III. Enforcement by SPAN

SPAN will regulate water operators in terms of technical, service quality and profit. Pengurusan Aset Air Berhad (PAAB) which is a wholly owned company by Ministry of Finance, will also be licensed by SPAN to manage water assets. PAAB is regulated by SPAN in terms of technical, service quality and profit as well to protect people's interest.

IV. Full Cost Recovery

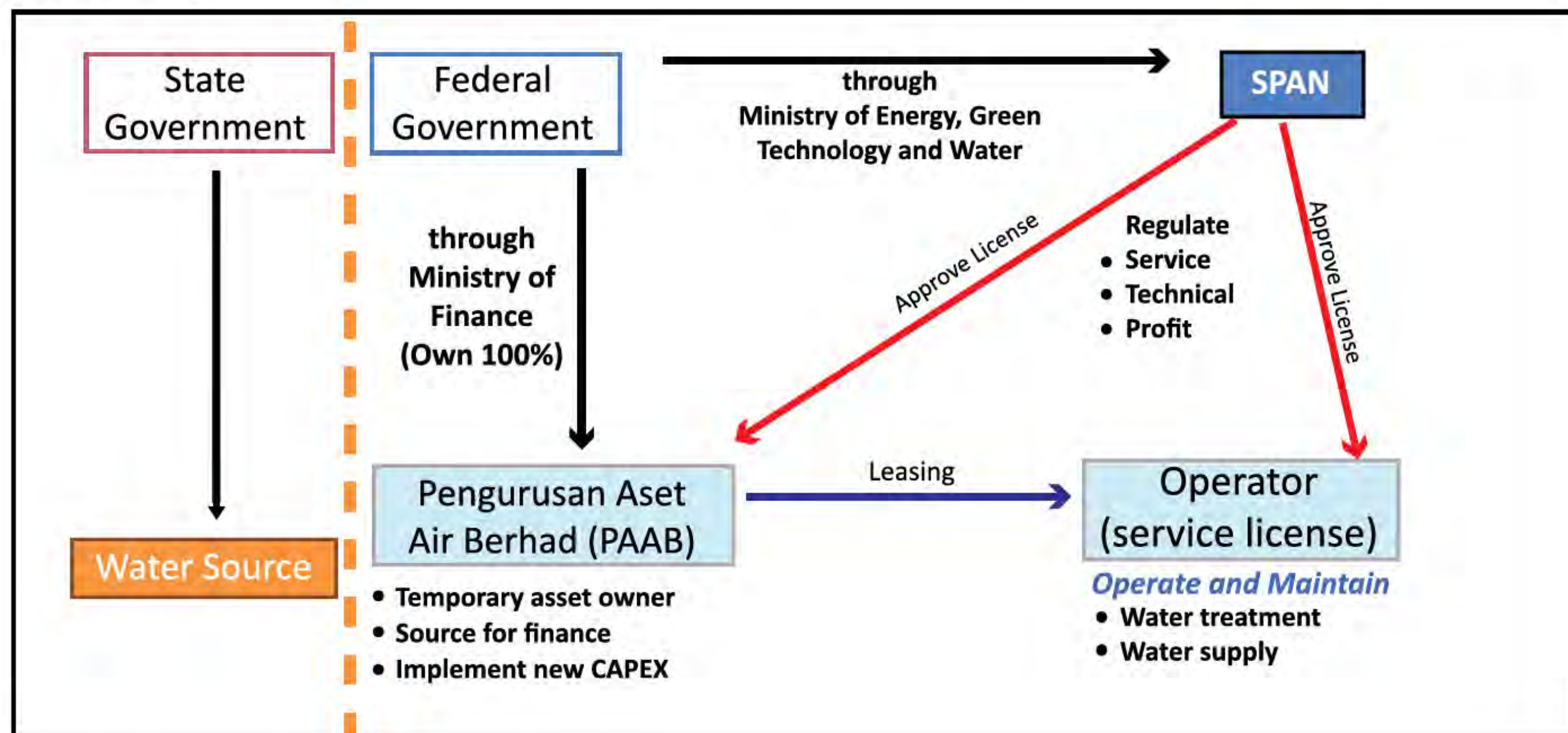
Till date, the liabilities in water services industry are ever increasing. This has deterred many water infrastructure and technologies developments for the need of future generation. 'Unpaid Debts' like this will burden our descendants if left unresolved. The Asset-Light Model and Full Cost Recovery approach together will protect the people's well being and ensure Water Supply Security (a component of national security) is achieved.

V. Reasonable and transparent water tariff

SPAN and Ministry of Energy, Green Technology and Water (KeTTHA) will ensure that the tariff does not burden the people. Formation of PAAB will reduce the liability burden while increasing the standard of water services industry via continuous development of water services infrastructures. Through WSIA, water services industry will be transformed into a stable economic sector and not 'high profit' oriented like private sector. In near future, all of us also can participate in tariff setting process. Such process is practiced in OFWAT Model from United Kingdom which was the reference model for the formation of SPAN and WSIA. A transition process will be put in place to encourage members of public to participate in tariff setting process.

1.3 Regulatory Structure under WSIA 2006

Diagram 2: Regulatory Structure of National Water Services Industry (Peninsular Malaysia and Labuan)



I. State Government

- Has power over water resources
- Enforcement for water resources that may be used for water treatment, industrial use (direct usage) and agriculture

II. Federal Government through KeTTHA and SPAN

- Regulate water treatment and supply
- Regulate financial resources for water treatment and supply infrastructures (PAAB)
- Regulate CAPEX (Capital Expenditure) and OPEX (Operational Expenditure)
- Regulate profit of national water services industry

1.4 Financial Sources for Water Services Infrastructures

Table 1: Information on Financial Sources for Water Services Infrastructures

<i>Item</i>	<i>Water Resource</i>		<i>Treatment Plant / Reservoir / Main Trunk</i>
	<i>Water Catchment</i>	<i>Dam</i>	
Ownership	State Government	Federal Government	PAAB/State Government
Financial source	-	Federal Government	PAAB (to construct new infrastructure)
Construction	-	KeTTHA	PAAB (to construct new infrastructure)
Leasing	-	Licensed Operator	Licensed Operator
Enforcement	State Government	SPAN	SPAN

From Table 1, we can see that the Federal Government provides the financial sources for dam construction and water services infrastructures even though the water resources are under the jurisdiction of the State Government.

Financial source for the new infrastructure projects (Treatment Plant / Reservoir / Main Trunk) are from PAAB. Water operators do not need to obtain commercial loans with high interest rates for this purpose. Therefore, impact to tariff can be reduced. In addition to that, the tender process and implementation of the projects does not involve water operators. So, the water operators can fully focus in delivering good quality of water and services. Once construction is completed, water operator will lease the infrastructure as well as carry out operation and maintenance of the infrastructures.

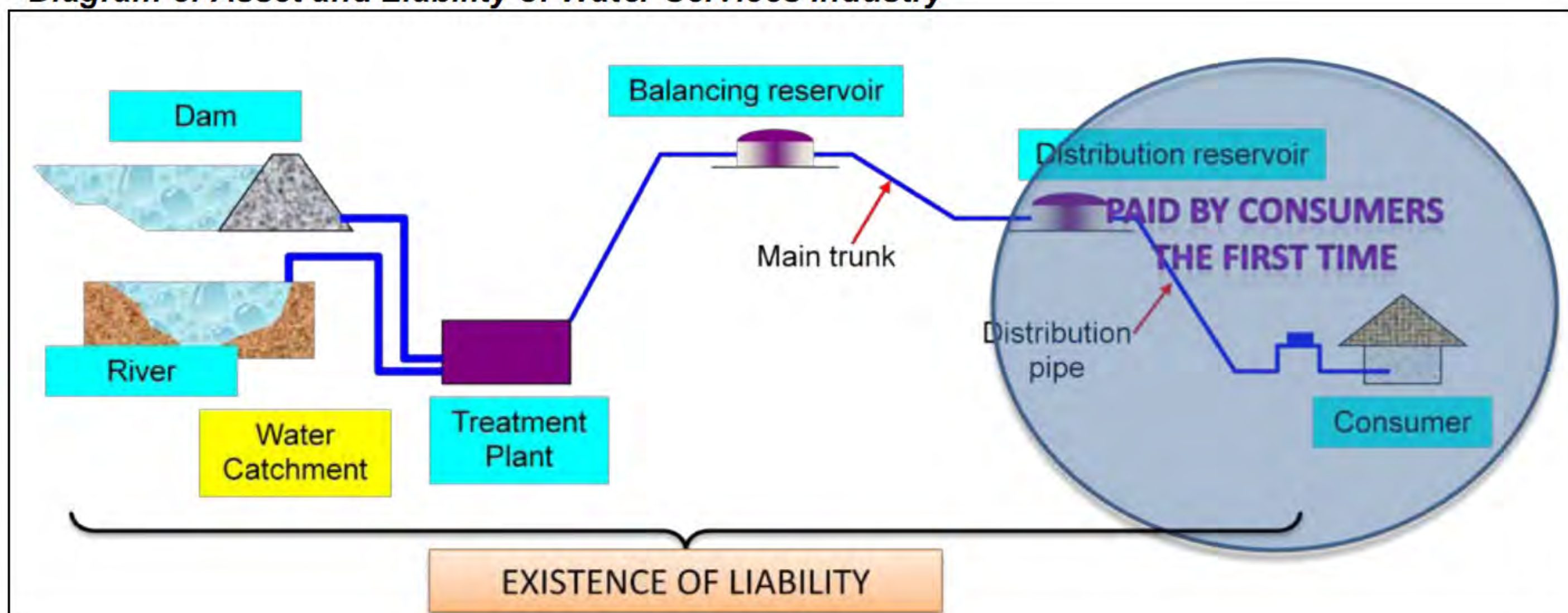
PAAB is licensed and regulated by SPAN. This is to ensure PAAB meets the KPI and transparency in projects' implementation. The removal of such work burden from water operators is vital to ensure that the operation and maintenance of current water supply system is not affected. The national water services performance can be enhanced more efficiently through it.



PART 2: ASSET

2.1 Water Services Asset

Diagram 3: Asset and Liability of Water Services Industry

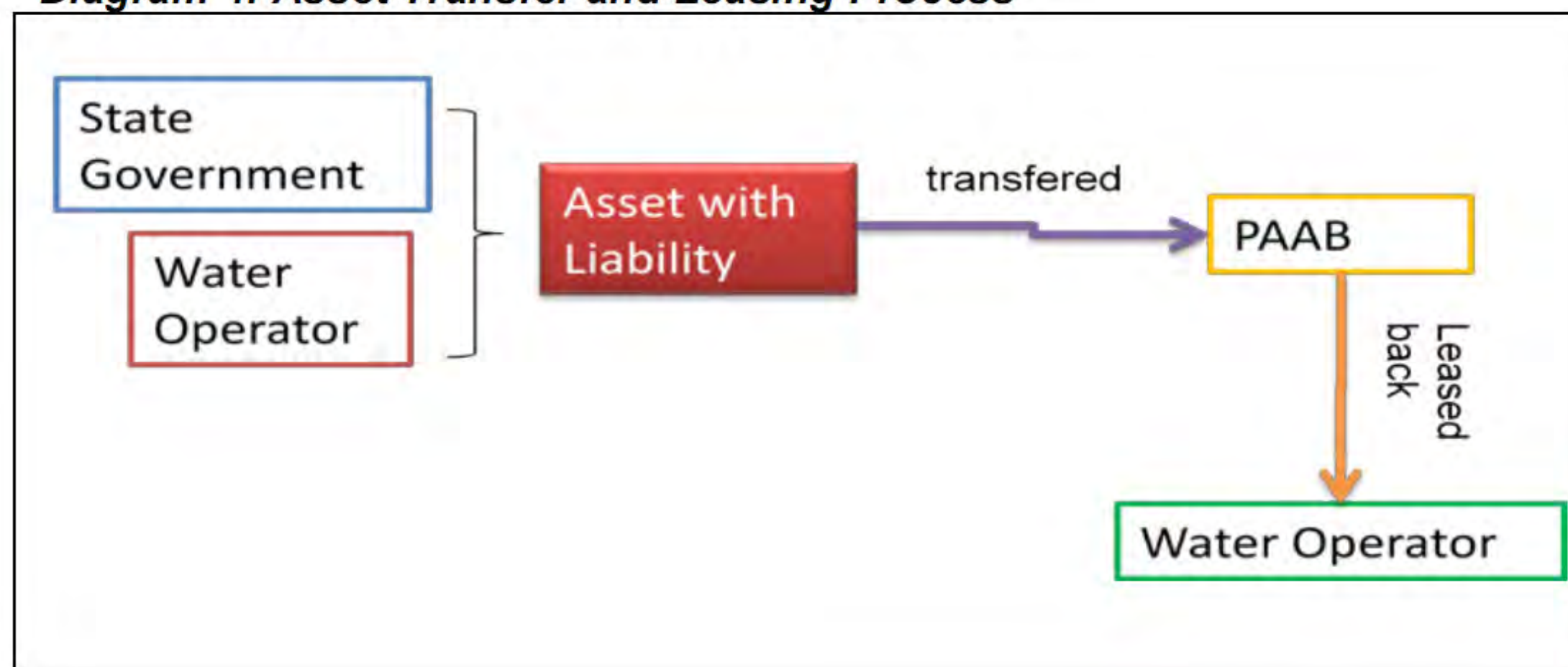


Water services assets can be categorised into the following:

- I. **Asset with liability (debt)**
Asset with liability has unpaid debt. These assets need to be recovered through tariff. These assets are usually developed by State Government or Federal Government or Water Operator. Such assets need to be transferred to PAAB for restructuring of the loan and reduce the impact of tariff to people.
- II. **Asset owned by State Government or Water Operator**
Assets that were developed by State Government or Water Operator from allocation or commercial loans.
- III. **Paid up asset by house owners (through housing developers)**
Assets that are developed by housing developers (from Distribution Reservoir until water meter) are assets paid by consumers for the first time round. The operation and maintenance of these assets are paid through tariff. This includes maintenance of Distribution Reservoir, Replacement of Old Pipes, Meter Changing, leakage repairs and many more.
- IV. **Asset that is recovered through water tariff (jointly owned assets placed under State Government)**
Assets with liability and are recovered through tariff. Such assets actually belong to the people and placed under the State Government. These assets need not to be transferred to PAAB. If transferred, the transfer value will increase the leasing fees and eventually causing tariff increase.

2.2 Asset Transfer to PAAB and Leasing

Diagram 4: Asset Transfer and Leasing Process



Current Liability

Diagram 4 shows the simple outline of Asset-Light Model. Assets with liability that are either owned by State Government or Water Operator will be transferred to PAAB. This process is monitored and regulated by SPAN and KeTTHA. PAAB will obtain short term and long term loans with interest rate that are far lower compared to commercial loans obtained by Water Operators. Therefore, the impact to tariff can be reduced because of lower interest rates.

Once the restructuring of financial loan is completed for the assets with liability, these assets will be leased back to the Water Operator.

Once the loan period is over, PAAB will return the assets that are recovered through tariff to the State Government. State Government will be the owner for the water assets which are joint property.

Expenditure for new projects

For new infrastructure projects, water operator will not be involved. Through Asset-Light Model approach, such project will be developed and implemented by PAAB. Once completed, a leasing agreement for a specified period will be determined and signed. This will be regulated by SPAN. This is to prevent sudden high increase in tariff due to the needs of improving and preparing water services infrastructures to cater the ever increasing demand.

Once the loan period is over, PAAB will return the assets that are recovered through tariff to the State Government. State Government will be the owner for the water assets which are joint property.



PART 3: TARIFF

3.1 Treatment and Supply Cost as Tariff

Cost for water is categorised as below:

- I. Water Treatment Cost
 - Raw water – royalty / bulk rate payment
 - Treatment Process – electricity / chemicals
 - Labour cost
 - Infrastructure cost, etc.
- II. Water Supply Cost
 - Service cost
 - Maintenance cost
 - Treated water cost (from water treatment plant)
 - Labour cost
 - Infrastructure cost, etc.

All these cost will be simplified as tariff. Tariff is calculated in Ringgit Malaysia for every cubic meter (m^3). **1 cubic meters (m^3) = 1000 liters (l)**

Example of Current Tariff: Domestic Usage (Selangor, Kuala Lumpur, Putrajaya)

Range (m^3)	Tariff rate (RM)
0 – 20	0.57 / m^3
21 – 35	1.03 / m^3
Above 35	2.00 / m^3

Example of water bill calculation:

If water usage is 18 m^3 a month				
Range (m^3)	Tariff (RM)	Reading (m^3)	Subtotal (RM)	Total bill (RM)
0 – 20	0.57 / m^3	18	10.26	10.26
21 – 35	1.03 / m^3	0	0	
Above 35	2.00 / m^3	0	0	

If water usage is 26 m^3 a month				
Range (m^3)	Tariff (RM)	Reading (m^3)	Subtotal (RM)	Total bill (RM)
0 – 20	0.57 / m^3	20	11.40	17.58
21 – 35	1.03 / m^3	6	6.18	
Above 35	2.00 / m^3	0	0	

If water usage is 40 m^3 a month				
Range (m^3)	Tariff (RM)	Reading (m^3)	Subtotal (RM)	Total bill (RM)
0 – 20	0.57 / m^3	20	11.40	36.85
21 – 35	1.03 / m^3	15	15.45	
Above 35	2.00 / m^3	5	10.00	

3.2 Core Components of Tariff Setting by SPAN

OFWAT model which is the fundamental of WSIA and SPAN outlines the transparency of tariff setting process. Some of the core components that will be implemented in near future are:

I. Audit of Capital Expenditure (CAPEX) and Operational Expenditure (OPEX)

Under the enforcement of SPAN, all Water Operators must get their CAPEX and OPEX approved. The determination of the costs will be monitored and regulated by SPAN to ensure it does not burden the people.

II. Comparing operational costs to fix a Benchmark Value

Benchmark Value is an important value to be used as a reference value to cross check CAPEX and OPEX. These values are obtained from the daily operation by the Water Operators. These values will be later classified based on different treatment and supply system.

III. Differentiate the water services related costs and non-water services related cost

SPAN will also audit the operators' costs related to water services and non-water services. This means only cost related to water treatment and supply will be allowed to be channelled to tariff.

IV. Reinvestment Cost

Any water treatment system and supply system need to be maintained and upgraded. Investment in latest technologies is one of the methods to improve the efficiency of water treatment and supply to reduce cost. In an engineering system, this is a fact. Through such tariff system, water quality can be improved with enhancement in the technology used.

V. Tariff setting to be punitive

Tariff system will also be punitive. Such system will impose lower tariff to lower water consumption (sustainable) and penalise the wasteful usage. This will help to increase water efficiency in all sectors.

VI. Involvement of members of public in tariff setting process

Involvement of members of public in tariff setting process is an important element in the national water services industry restructuring. Through this method, all level of people can provide their opinion and know the costs of treatment and supply which is audited. This process will be implemented phase by phase.



PART 4: CASE STUDY 1 – SELANGOR WATER SERVICES INDUSTRY RESTRUCTURING ISSUE

The core element in Asset-Light Model is to transfer the liability of the Water Operator so that the Water Operator can focus in delivering water service and water quality. Now, let us investigate the chaos in Selangor Water Restructuring process.

4.1 Water Asset and Liability of State Government and Concessionaire

I. *State Government's Asset*

The estimated value of State Government's asset is between RM 1.5 Billion to RM 2 Billion. We also observed the hard push from State government to transfer the pipes which are said to be valued close to **RM 8.2 Billion** to PAAB. In actual practice, pipes cannot be valued like property. Once fixed, pipes need to be replaced or maintained after a specified period.

The question is, if PAAB only need to take over assets with liability according to Asset-Light Model, why Selangor State Government needs to transfer the pipes to PAAB, whereby some of these pipes are paid by consumers and the balance are recovered through tariff?

The Selangor State Government's move will only cause people in Selangor, Kuala Lumpur and Putrajaya to be burdened with **2 times of RM 8.2 Billion** liabilities. The first RM 8.2 Billion liability comes from the pipes transfer plan by the Selangor State Government to PAAB in the water services industry restructuring process.

Moreover, many pipes in Selangor are aged and need to be replaced. Within 10 to 15 years, these pipes need to be replaced with a cost may be higher than RM 8.2 Billion. This is the second RM 8.2 Billion liability that will be passed on to the people in Selangor, Kuala Lumpur and Putrajaya as water tariff. Eventually, this will cause a drastic increase of water tariff.

So, is it wise for Selangor State Government to transfer the pipes to PAAB?

II. *Asset of Syarikat Bekalan Air Selangor Sdn Bhd (SYABAS)*

SYABAS has CAPEX projects that will be implemented throughout the concession period. These projects will obtain commercial loans with high interest rates. The restructuring of water services industry will be able to reduce such financing impact to the tariff. In another word, high increase in tariff can be prevented.

III. *Asset of Water Treatment Companies*

In fact, water treatment companies have completed their CAPEX, which are construction of treatment plant and related infrastructures. This means these companies will not have new CAPEX project that may require high expenditure.

4.2 Impact to Water Tariff

Details	Estimated Liability (RM)	Source
Selangor State Government Assets (without pipe)	2,000,000,000.00	SPAN (2010)
Selangor State Government Assets (with pipe)	10,200,000,000.00	THE EDGE (2010)
SYABAS Assets	2,600,000,000.00	THE STAR (2010)
Water Treatment Concessionaires' Assets	3,857,900,000.00	THE STAR (2010)

Some estimation to calculate the impact to water tariff:

Item	Value
Total metered water consumption for Selangor, KL and Putrajaya for the year 2009 (m ³)	967,353,000
Estimated average monthly metered water usage for Selangor, KL and Putrajaya for the year 2009 (m ³)	80,612,750
Domestic water tariff for the first 20 m ³ (RM / m ³)	0.57

Selected scenario: **PAAB takes over the pipes from Selangor State Government**

Estimated value: **RM 8,200,000,000.00**

Table 2: Calculation of Impact to Water tariff from Situation Modelling (based on Amortization formula)

Total loan period (years)	Total payment (RM Billion)			Total interest (RM Billion)			Monthly payment (RM Million)			Estimation of tariff increase for every cubic meters (RM / m ³)			Estimation of tariff increase for domestic sector (%)		
	With annual interest rate that is *			With annual interest rate that is *			With annual interest rate that is *			With annual interest rate that is *			With annual interest rate that is *		
	1%	3%	5%	1%	3%	5%	1%	3%	5%	1%	3%	5%	1%	3%	5%
30	9.49	12.45	15.85	1.29	4.25	7.65	26.37	34.57	44.02	0.33	0.43	0.55	57.40	75.24	95.80
40	9.95	14.09	18.98	1.75	5.89	10.78	20.73	29.35	39.54	0.26	0.36	0.49	45.12	63.89	86.05
50	10.42	15.84	22.34	2.22	7.64	14.14	17.37	26.40	37.24	0.22	0.33	0.46	37.81	57.46	81.04

(Table 2 extract)

Total loan period (years)	Estimation of tariff increase for every cubic meters (RM/m ³)			Estimation of tariff increase for domestic sector (%)		
	With annual interest rate that is *			With annual interest rate that is *		
	1%	3%	5%	1%	3%	5%
30	0.33	0.43	0.55	57.40	75.24	95.80
40	0.26	0.36	0.49	45.12	63.89	86.05
50	0.22	0.33	0.46	37.81	57.46	81.04

(*Interest Rate of 1% is used as reference annual interest rate, Interest Rate of 3% is used as estimated annual interest rate provided by PAAB, Interest Rate of 5% is used as estimated annual interest rate provided by Banks and Financial Institutions. The interest rate values are used for calculation purpose ONLY. PAAB's annual interest rate will always be lower than the annual interest rate provided by Banks and Financial Institutions.)

From Table 2 (as in the extract above), we can notice that the impact to tariff due to pipe transfer is very high, that is more than 50%. This value will increase with higher interest rate or shorter term of loan.

Other situations that we need to take into considerations are including:

- If follow SYABAS application based on the concession agreement, tariff increase is 37%
- After auditing SYABAS's application, SPAN limits the tariff increase to be between 31% - 32% based on Concession Agreement
- According to SPAN, if asset (without pipe) of State Government and SYABAS's assets are transferred as well as Water Concessionaires enter to WSIA regime, water tariff increase is estimated to be within 20%.

Therefore, transfer of pipe will cause **additional tariff increase of more than 50%**. Based on our modelling study, the proposal by Selangor State Government to transfer the pipes to PAAB is a burden to people. In the mean time, all the other states that have transferred to WSIA regime did not transfer pipes to PAAB. The situation also proves that Selangor State Government's promise of 12% tariff increase could not be met.

4.3 Problems of Concession Agreement

I. Concession Agreement Cannot be Canceled

Although State Government is citing the sections in WSIA under national interest, the Concession Agreement that was signed cannot be cancelled just like that. This is against Article 13 (1) and (2) in the Federal Constitution. To cancel the concession agreement, all parties must jointly agree. However, concession agreement usually will have the review clause. Therefore, State Government and Federal Government may use the review clause to review the Concession Agreement.

II. Tariff increase under the Concession Agreement

Tariff increase under the concession agreement is high. This is mainly due to high interest rates from the commercial loans. National water services industry restructuring through Asset-Light Model not only can reduce the financial burden in developing water services industry infrastructure, it also prevents high tariff burden to people.

III. Water Treatment Companies (Konsortium Abass, Puncak Niaga dan SPLASH)

These companies have carried out their CAPEX through construction of plant and big scale upgrading of treatment plant. If the liabilities of these companies are to be transferred to PAAB, SPAN and PAAB need to carry out a detailed study to ensure there is reduction in Bulk Supply Rate after restructuring.

IV. SYABAS will have new CAPEX

As a water supply company, SYABAS will always have new CAPEX. If SYABAS operates with concession agreement, tariff increase will also be influenced by commercial loans taken by SYABAS. Therefore, restructuring as suggested through WSIA is important to prevent high tariff increase.

4.4 Cost of Delay

The Selangor State has similar water treatment and supply structure as Johor State. Johor was one of the early states to migrate to WSIA regime. This is an example of how cost of delay can be avoided.

With the delay in restructuring, we will see the following:

- i. Increase in interest payment for the loan amount
- ii. Unpaid liability will give negative impact to the ranking of national water services industry
- iii. Delay in improving the water services
- iv. Water quality is still not improved further due to delay in pipe replacement programmes
- v. NRW reduction programmes are also delayed and causes the wastage of treated water continues

Liability and increase in cost due to such delays will be eventually passed back to people as tariff. Such delay may be seen as not damaging water services industry. In actual fact, all these cost will increase over time and will give direct impact to the tariff.

Restructuring of water treatment and supply structure in Selangor can still be pursued by the Selangor State Government even after the concessionaires transferred to WSIA regime. Core element of WSIA is to prevent concession agreements totally to protect people from high tariff burden. This is mainly due to high interest rate for commercial loans. In long run, such loans are burdening and not practical.

4.5 Solution Proposed by AWER

4.5.1 Water Asset Issue

I. *Liability of state government's asset that worth between RM 1.5 Billion to RM 2 Billion needs to be transferred to PAAB*

State government's liability should be transferred to PAAB as it is still within the WSIA model approach. Once these liabilities are recovered through tariff, asset will be returned to state government (jointly owned asset).

II. *Pipes need not be transferred to PAAB as pipes have NO VALUE*

Transfer of pipes to PAAB is unnecessary. At the same time, we observe that other states which had migrated to WSIA regime like Johor, Malacca and Negeri Sembilan did not transfer their pipes. Pipe transfer will only burden the people in the form of tariff.

III. *Asset and liability of SYABAS needs to be transferred to PAAB*

Compared to other concessionaires, PAAB can take over the assets and liabilities of SYABAS to stabilise the tariff. Water supply company usually will have a lot of CAPEX works in future. Therefore, this would be a wise step to take to help to protect people from high tariff burden.

IV. *Transfer of asset and liability of water treatment companies to PAAB needs to be studied carefully (but they still need to be licensed by SPAN)*

For water treatment companies, differences between transfer cost and saving that can be achieved from the transfer must be studied carefully. If the transfer does not give any impact to reduce Bulk Supply Rate and its impact to tariff, AWER advises all parties not to carry out asset transfer for water treatments assets. However, all water treatment companies must be licensed by SPAN under WSIA.

4.5.2 Concessionaires Must Transfer to WSIA Regime

For water services industry restructuring in Selangor, Johor model can be a good example. This is basically due to Johor has similar water treatment and supply structure with Selangor.

Once transferred to WSIA regime, SYABAS, Puncak Niaga, SPLASH and Konsortium Abass will be licensed by SPAN and the license needs to be renewed once in every 3 years. The license will only be renewed if the companies fulfill all the regulations and KPIs set by SPAN. **This also means that the Concession Agreement will be canceled immediately.** As a competitive and caliber industry, this is a wise step to take. These companies need not to “hide behind” concession agreements.

If the companies are licensed, people will benefit more through:

- KPIs set by SPAN
 - o License can be cancelled if the companies fail to achieve KPI set
 - o KPI is also an important component in tariff setting process
- Audited CAPEX and OPEX
 - o The audit process is to ensure that unwanted costs are not parked under the tariff
 - o Such process will also ensure the efficiency of water companies' services and operations is at a determined level
- Regulated profit
 - o Because of the nature of business of water services industry is linked closely to social rights and national security, profit in this industry must be regulated
 - o From the CAPEX and OPEX audit process, unreasonable and unnecessary costs will not be included into tariff setting
 - o Any increase in cost beyond approved CAPEX and OPEX will be borne by the companies themselves

4.5.3 Tariff

I. Pipes cannot be transferred to PAAB

(Extract of Table 2)

Total loan period (years)	Estimation of tariff increase for every cubic meters (RM / m ³)			Estimation of tariff increase for domestic sector (%)		
	With annual interest rate that is*			With annual interest rate that is*		
	1%	3%	5%	1%	3%	5%
30	0.33	0.43	0.55	57.40	75.24	95.80
40	0.26	0.36	0.49	45.12	63.89	86.05
50	0.22	0.33	0.46	37.81	57.46	81.04

Based on extract from Table 2, AWER does not agree to transfer the pipe 'value' (which actually has no value) to PAAB. This is not the core value of 'Asset-Light Model'. This step will burden the public with additional 50% tariff increase on top of any tariff hike that is being planned now. State Government should not try, selling assets that has already been paid by the people.

II. Tariff Increase

Any tariff increase must be transparent and if WSIA model is implemented fully, the benefit is for the people. Tariff increase can also be minimized if the concessionaires transfer to WSIA regime.

III. Promise by state government to give low water tariff increase

If the recovery of liability is not carried out properly as outlined in transfer to WSIA regime, State Government has to use other financial resources to pay. If not, the future generation will have to shoulder this responsibility. If this takes place, developments that need to reach to the people will be deterred.

Furthermore, based on extract from Table 2, the pipe transfer not only cannot prevent high tariff increase, it will also cause **ADDITIONAL 50% TARIFF INCREASE** on top of any tariff that is being planned now.

Therefore, it is evident that the value of tariff increase promised by Selangor State Government is not viable.



PART 5: CASE STUDY 2 – IMPORTANCE OF REGULATING WATER SERVICES INDUSTRY IN SABAH AND SARAWAK

5.1 Importance of Sabah and Sarawak to be regulated under WSIA

The state of Sabah and Sarawak is currently not governed under the WSIA 2006. This has placed both of the states in difficulties to further enhance the water services industry. In addition to that, the need to develop almost 40% additional water services infrastructures to cater the demands for rural areas will require a lot of investment. Therefore, Sabah and Sarawak is in need of 'Asset-Light Model' implementation to assist both states to have a good outreach of water services and improve the water quality.

Based on the service performance indicator reported by Malaysia Water Industry Guide 2010, the water service coverage for Sabah and Sarawak is as below:

State	service coverage rural (%)		service coverage urban (%)	
	2008	2009	2008	2009
Sabah	52.0	52.3	99.0	99.0
Sarawak	56.5	61.5	99.0	99.5

(Source: Malaysia Water Industry Guide 2010, 2010)

However, according to 10th Malaysia Plan's Chart 4-10, the rural water supply service coverage in rural areas differs from Malaysia Water Industry Guide 2010 for the year 2009 as below:

State	Rural water coverage (%)
	2009
Sabah	59.0
Sarawak	59.0

(source: 10th Malaysia Plan, 2010)

Such a difference can be avoided if only a particular agency is responsible in regulating the water services industry and placing same mode of comparison for all.

5.2 Justification by AWER

- I. High Capital Expenditure is needed to have wider water supply services coverage. In this case, implementation of 'Asset-Light Model' can assist both state governments to reduce the impact of infrastructure development cost to tariff.
- II. Financial burden to the water operators/state government will divert the focus of water operators/state government to improve the services and quality of water supply. Therefore, agencies such as SPAN and PAAB can play vital role to ensure water supply services in Sabah and Sarawak is reliable through 'Asset-Light Model'.

- III. With additional 40% increase in water supply coverage in Sabah and Sarawak, the cost of operational and maintenance such as pipe replacement will increase tremendously. It is advisable that the financial burden is transferred to PAAB based on 'Asset-Light Model'.
- IV. The people of Sabah and Sarawak have the right to have continuous, safe and reliable water supply with service quality that are same with other states. Therefore, national level regulator like SPAN can assist in ensuring the service and quality of water supply is maintained and reliable.

5.3 Suggestion by AWER

- I. KeTTHA, Economic Planning Unit, Sabah state government and Sarawak state government must conduct a feasibility study on proposal to regulate the water services industry in Sabah and Sarawak through WSIA and implication of 'Asset-Light Model' towards Sabah and Sarawak.
- II. Clear plan and strategy must be outlined to ensure both of the states can catch up with the on going national water services industry restructuring process.
- III. Sabah and Sarawak state governments must carry out benchmarking with state water operators to ensure a smooth transition.



PART 6: CASE STUDY 3 – NON-REVENUE WATER

6.1 What is Non-Revenue Water (NRW)?

Non-revenue water (NRW) is the difference between the volume of water put into a water distribution system and the volume of water that is billed to customers. NRW comprises three components: physical losses, commercial losses, and unbilled authorised consumption.

- Physical losses comprise leakage from all parts of the system and overflows at the water operators' storage tanks. They are caused by poor operations and maintenance, the lack of active leakage control, and poor quality of underground assets.
- Commercial losses are caused by customer meter under registration, data handling errors, and theft of water in various forms.
- Unbilled authorised consumption includes water used by water operators for operational purposes, water used for firefighting, and water provided for free to certain consumer groups.

6.2 Estimated revenue loss due to NRW in Malaysia

Table 3: NRW percentage and estimated revenue loss using financial modelling derived by AWER according to state

No.	State	NRW (%)*		Estimated revenue loss due to NRW (RM)**	
		2008	2009	2008	2009
1	Selangor (including KL & Putrajaya)	33.95	32.49	582,256,047.36	557,987,210.88
2	Sabah	55.73	49.41	150,600,600.00	142,392,600.00
3	Labuan	33.19	25.85	5,143,500.00	4,110,300.00
4	Kelantan	49.39	48.32	39,960,710.40	39,665,152.15
5	Perak	31.19	30.68	90,330,825.60	90,442,400.23
6	Perlis	41.66	44.67	9,914,314.86	11,274,730.64
7	Terengganu	38.01	37.85	56,300,895.98	58,107,856.40
8	Kedah	44.99	44.97	116,178,177.60	118,016,700.80
9	Pulau Pinang	16.90	19.08	23,794,255.20	26,568,356.40
10	Sarawak	29.38	29.52	79,162,370.82	83,670,791.40
11	Negeri Sembilan	50.51	49.16	102,226,991.00	108,389,664.24
12	Melaka	30.09	29.71	36,319,283.04	42,857,985.60
13	Johor	31.30	31.95	208,723,970.62	220,714,921.32
14	Pahang	52.86	59.90	120,093,842.72	136,582,674.96
	Total :			1,621,005,785.20	1,640,781,345.02

(*: taken from Malaysia Water Industry Guide 2010; **: based on AWER's financial modelling)

Table 3 outlines the percentage of NRW recorded in each state. The same table also outlines the financial modelling derived from official statistics to represent the estimated revenue loss incurred due to NRW.

Financial modelling done by World Bank is actually referring to average tariff and NRW recorded in certain countries. Meanwhile, AWER's financial modelling used official statistics, that are the NRW and lowest tariff in each state instead of average tariff (by World Bank). Average tariff is higher in value compared to lowest tariff. In Malaysia, the lowest tariff is also said to be of very low value and it is not recovering both Capital Expenditure (Capex) and Operational Expenditure (Opex) in the water treatment and supply for every cubic meters. Therefore, this is in actual fact a very low estimate loss of revenue.

The World Bank has also published report in comparing NRW between developed and developing nations. In the year 2006 report, the average NRW recorded for developing nations is 35% and developed nations recorded NRW at 15%. Malaysia aspires to be developed nation by year 2020 and AWER is proposing to keep our national NRW levels at 20%. This is actually higher than the 15% average NRW recorded by developed nations and it is achievable.

AWER proposes a task force to be formed to prepare a detailed NRW reduction plan. It is important to plan rather than leaving it to the water operators to decide on the way forward in reducing NRW levels. The plan should be divided as following:

STEP 1: Identification of critical, sub-critical, and non-critical areas through NRW monitoring system. This will allow the government and water operators to plan to tackle the 'lower hanging fruits' first, the critical areas. The saving from these locations definitely can assist to help to reduce the NRW in the sub-critical and non-critical areas. The classification of criticalness will be based on results of NRW monitoring in each supply area. Each state will have different target as the NRW values varies.

STEP 2: As Technical Regulator, SPAN is also entitled to determine the types of replacement materials and other technical specification in water services. Without a detailed regulation on NRW monitoring and types of replacements that should be carried out, water operators will definitely put up individual extend of NRW solution system. There should be a common stand in this to ensure a proper and equitable cost can be estimated for NRW reduction. Therefore, technical standards or regulation must be developed through the task force.

STEP 3: To prevent escalated cost claimed by water operators, all water operators must be licensed and regulated under WSIA 2006. This further supports the need of Sabah and Sarawak to be regulated under WSIA 2006. This also means that SPAN will regulate the water operators. SPAN needs to audit all Capex and Opex of licensed water operators to ensure there is no element of 'BLOATED COST'. Pengurusan Aset Air Berhad (PAAB) will be financing the development of all water services' infrastructures to minimize the impact to tariff. The 'Asset-Light Model' approach is vital in ensuring NRW reduction takes place while ensuring equitable tariff.

STEP 4: SPAN should monitor achievements of water operators based on targets set on NRW reduction. SPAN should also constantly publish water operators achievements to inform the public of the service quality of water operators. This will

keep all level of users informed and be assured that the water quality and services are constantly monitored.

Table 4 outlines NRW achievements by selected Asian cities which records NRW levels below 20% as published in the Asian Green City Index by Siemens. Densely populated areas will give quick returns as the connection per kilometer is high. This will improve the overall NRW achievements for the whole state. Eventually, saving from these densely populated areas can be used to carry out NRW reductions programmes for other locations.

Table 4: NRW achievement by major Asian cities as reported in the Asian Green City Index by Siemens

No.	City	NRW recorded (%)	Year of record
1	Beijing, China	12.5	2008
2	Guangzhou, China	14.8	2007
3	Mumbai, India	13.6	2005
4	Osaka, Japan	6.9	2007
5	Seoul, South Korea	7.0	2009
6	Singapore	4.6	2009
7	Tokyo, Japan	3.1	2008

(source: Asian Green City Index, Siemens, 2011)

In short, NRW needs proper national plan and strategy. All water operators must be licensed and regulated under WSIA 2006 to ensure 'Asset-Light Model' can be implemented to reduce the impact to tariff while reducing NRW levels. AWER hopes that relevant agencies will take our suggestion into consideration so that Malaysia can achieve better NRW targets.



PART 7: SUMMARY BY AWER

AWER would like to reiterate that WATER IS NATIONAL SECURITY and it is the basic need for people to survive. WSIA 2006 is paving a path forward to ensure safe, reliable and continuous water supply in Malaysia. AWER congratulates the state that have migrated to WSIA regime and taking a step forward in protecting the public interest.

For states that have not transferred into WSIA regime, we hope that they do so as soon as possible. Improvements of water treatment and supply infrastructures as well as service to end users are vital. The target of achieving 'Asset-Light Model' fully by year 2010 as outlined in 9th Malaysia Plan is now delayed due to failure of many states transfer to WSIA regime. This will further delay full cost recovery and improving water services standard in Malaysia.

All the delays will only cost us more. We should be responsible and not to let the future generation to bear the cost of our wrong doings.

The future is in your hands.