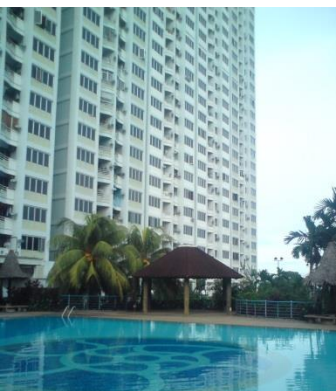




# JIMAT AIR

## The N Park Condominium Water Saving Project – A Best Management Practice of Stakeholders Engagement in Urban Water Management Towards Green Growth



By

Ngai Weng Chan, PhD

School of Management



# JIMAT AIR

## OUTLINE

1. INTRODUCTION TO THE WATER SITUATION IN MALAYSIA & PENANG
2. METHODOLOGY
3. THE N-PARK PROJECT: A BEST MANAGEMENT PRACTICE (BMP) INVOLVING GOVERNMENT-INDUSTRY-NGO SMART-PARTNERSHIPS - DISCUSSION & RESULTS
4. ISSUES & CHALLENGES
5. LESSONS LEARNT



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## 1. INTRODUCTION TO THE WATER SITUATION IN MALAYSIA



# PER CAPITA RENEWABLE WATER (M<sup>3</sup>/YEAR)

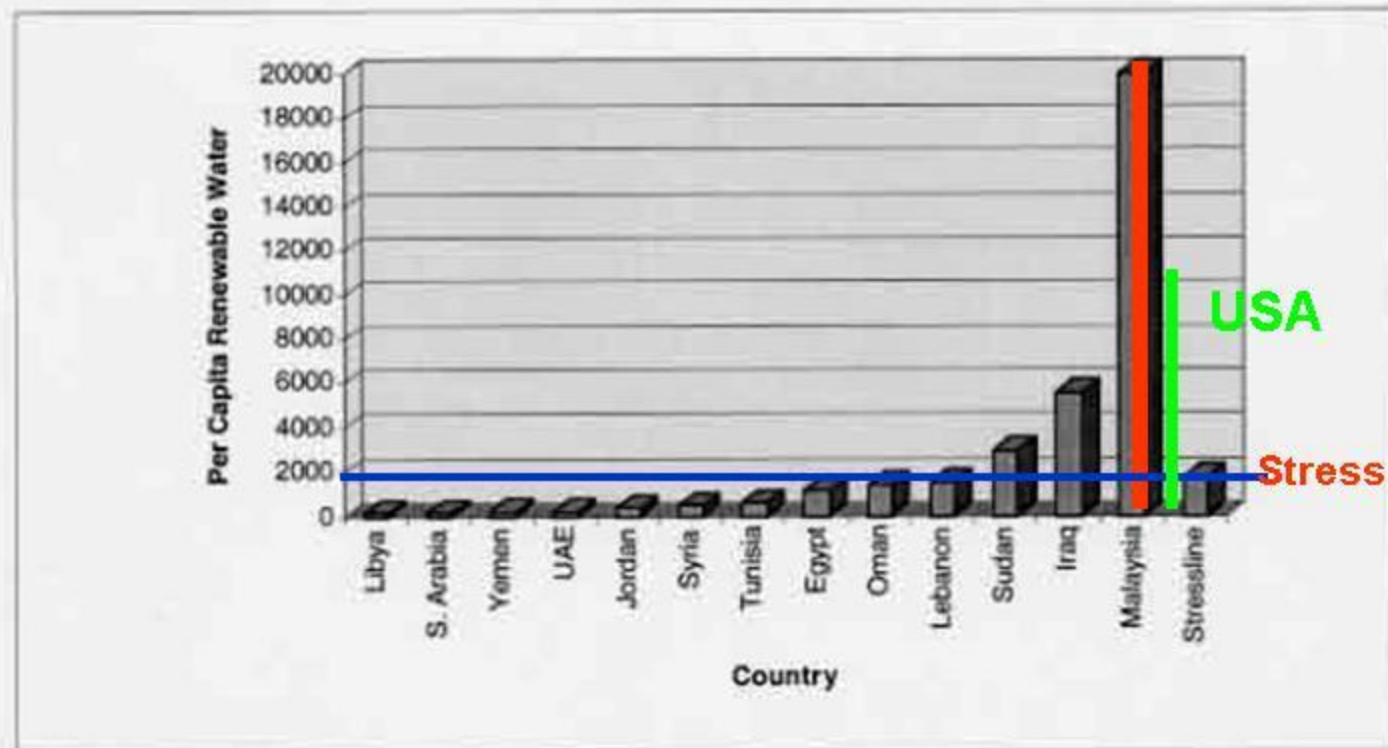


Figure 1: Per capita renewable water (m<sup>3</sup>/year) in water stressed countries compared with Malaysia. Note the stress line of 1,700 m<sup>3</sup>/year in which countries will face water stress when availability is less than this amount.

# BUT PENANG & MANY STATES ARE VERY “POOR” IN WATER RESOURCES WHEN COMPARED TO THE REST OF MALAYSIA

Table 1: Classification of States according to water availability in Malaysia.

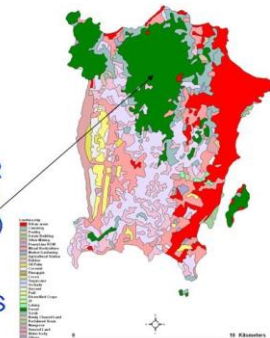
| Water-Rich States | Moderately Water-Rich States | Water-Poor States |
|-------------------|------------------------------|-------------------|
|-------------------|------------------------------|-------------------|

|  |       |  |
|--|-------|--|
| Perak<br>Pahang<br>Terengganu<br>Johor<br>Kelantan<br>Sabah<br>Sarawak | Kedah | Perlis<br><b>PENANG</b><br>Selangor<br>Melaka<br>Negeri Sembilan |
|--|-------|--|

PENANG IS ONE OF THE MOST DEVELOPED STATES IN MALAYSIA BUT IT IS A “WATER-POOR” STATE EXPOSED TO DOUGHTS, WATER POLLUTION, WATER RATIONING, POOR WATER QUALITY, ETC

80 % OF PENANG’S WATER SUPPLY  
COMES FROM SG MUDA WHICH  
HAS ITS ORIGINS IN KEDAH

PENANG ISLAND IS HIGHLY URBANISED, WITH VERY LITTLE WATER CATCHMENTS (GREEN AREA) SUPPLYING < 20 % OF ITS WATER NEEDS



80 % OF PENANG'S WATER SUPPLY COMES FROM THE MUDA RIVER WHICH IS IN KEDAH STATE

Published: Tuesday April 29, 2014 MYT 12:00:00 AM  
Updated: Tuesday April 29, 2014 MYT 10:23:21 AM

## Who is to blame for Selangor water woes?

BY KHAIRY JAMALUDDIN



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On Your Side

Published: Friday February 28, 2014 MYT 12:00:00 AM  
Updated: Friday February 28, 2014 MYT 7:13:00 AM

## The water crisis isn't over yet

BY BRIAN MARTIN



## Community Home > News > Community

Published: Wednesday March 19, 2014 MYT 12:00:00 AM  
Updated: Wednesday March 19, 2014 MYT 11:17:16 AM

## Current water crisis caused by over development and lack of planning

BY KW MAK



r-rationing-in-selangor-from-tomorrow/

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## Water rationing in Selangor from tomorrow

Alfian ZM Tahir | February 24, 2014

The MB says water would be rationed in stages so that all areas would receive supply every two



PETALING JAYA: The Selangor state government will start water rationing in the state from tomorrow. Menteri Besar Khalid Ibrahim said the focus will be on areas that have been facing water disruption.

Khalid said that he has met local authorities to discuss the possible ways to resolve the water crisis.



## 2. Methodology

- ▶ **GOVT-INDUSTRY-NGO-PUBLIC SMART-PARTNERSHIP:** This is a pilot WDM project for apartments. Funded by the Malaysian Government (via EPU), managed by the Department of Irrigation and Drainage (DID) Malaysia, and carried out by Water Watch Penang (WWP) (NGO), N-Park Management Corporation (NGO), and Residents of N-Park (Public)
- ▶ **3 COMPONENTS:** (i) Installation of a rainfall harvesting system; (ii) Installation of water savings fittings in the common toilets; and (iii) Installation of minor water saving fittings in 100 selected residential units, coupled with increasing awareness and education amongst residents in the entire condominium. Water saving equipment are installed in the kitchen and toilets of each participating households as the main objective of this project is to reduce the water consumption of the condominium. The project targets of this pilot project is to reduce piped water usage by 10 % annually.
- ▶ **WATER AWARENESS & SAVING CAMPAIGN:** Another method was to change human behaviour in relation to the way they perceive water and the way they use water. Questionnaires, talks and workshops were held to achieve this aim. Following the launch, the water conservation project for household units kicked-off.

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## 3.THE N-PARK PROJECT: A BEST MANAGEMENT PRACTICE (BMP) INVOLVING GOVERNMENT- INDUSTRY-NGO SMART PARTNERSHIPS - DISCUSSION & RESULTS





# BENEFITS OF URBAN WATER DEMAND MANAGEMENT

- **PROVEN SUCCESSFUL** in many countries (e.g. Singapore; Japan; Denmark; 1992 droughts - city of Windhoek put in place WDM practices and reduced water consumption by 30-50%; In South Africa, in the Greater Hermanus area, WDM strategies reduced water demand by 16.5% in 1<sup>st</sup> 12 months).
- **SIGNIFICANT SAVINGS**, both water and money, were made.
- **REDUCED CAPEX** as water infrastructures can be postponed and reserved for future generations.
- **INCREASES WATER SECURITY AND RESILIENCE.**
- **LESS WATER STRESS** on consumers (e.g. less disruptions)
- **BETTER ENVIRONMENT** - Reduced demands will result in more water flowing in rivers
- **SUSTAINABLE DEVELOPMENT** of water resources & ensuring that future water supplies are not jeopardized.



**WHY URBAN WATER DEMAND MANAGEMENT FOR DOMESTIC CONSUMERS?**

# Water Saving Fittings/Equipment

- (i) "Low volume" WC (flushes only 4.5 litres). A Normal WC flushes 9 litres.
- (ii) "Dual-Flush" WC system
- (iii) "Sink on top of the WC"
- (iv) Rainwater harvesting
- (v) Water Saving Washing Machines
- (vi) Water Saving Dishwashers
- (vii) Water Saving Shower Heads
- (viii) Faucet Aerators
- (ix) Water Balance Regulators
- (x) Others



200,400 litres/year (27.5% of household needs)



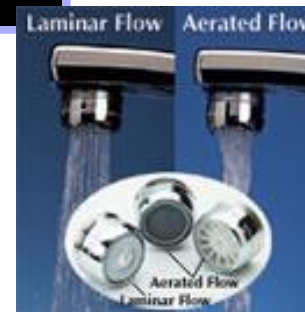
1 Pint (0.5 litre) low-flush toilet. Pedal opens a valve which is sealed after flush



Patented 2-flow valve for maximum water and energy savings



Sink for washing is on top of cistern. Water is used twice, i.e. washing & flushing



Faucet aerators - increase spray velocity, reduce splash, save water & energy



Water saving dishwasher – water used in normal cycle is 11.4 litres (Normal dishwasher uses 34 litres)



43 litres for 7 kg clothes. Normal machine uses about 105 litres

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- ▶ The N-Park Water Conservation Project started with the launching of Water Saving and Conservation Project in N-Park on 21 Aug 2009.





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- ▶ But before that we had already consulted the residents of N-Park on whether they wanted/supported the project on 18 Nov 2006



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## The Launching of Rainwater Harvesting Project

- ▶ 31<sup>st</sup> of October 2009
  - The launching of Rainwater Harvesting Project took place
  - 6 sets of rainwater harvesting tanks were installed
  - The launching was officiated by the (then) Director of DID Penang, Tuan Haji Hanapi bin Mohamad Noor
- ▶ The rainwater harvesting project is also the first in the nation for condominium units.





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**PERBADANAN  
PENGURUSAN  
N-PARK**



## MAJLIS PELANCARAN PROJEK PENJIMATAN AIR N-PARK KONDOMINIUM

DIRASMIKAN OLEH:  
Tuan HJ. HANAPI BIN MOHAMAD NOOR  
( PENGARAH JPS NEGERI PULAU PINANG )

TARIKH : 21 OGOS 2009  
MASA : 3.00 PETANG

Prof Dr Chan Ngai Weng, President of Water Watch Penang and Tuan Haji Hanapi bin Mohamad Noor, the (then) Director of DID Penang, showing off the rainwater harvesting unit in N- Park, 31.10.09









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## Gauge installation

- ▶ No accurate data to show the exact volume of rainwater consumed
- ▶ Water consumption data for the year 2008 and 2009 on the common ground of N-Park is to be acquired from PBAPP, was not adequate to show the total of water save over the month after the installation of the rainwater harvesting tank.
- ▶ A gauge is to be installed on each rainwater harvesting tank to monitor the total volume of rainwater used.
- ▶ Weekly monitoring was carried out on the total volume of rainwater used as well as the remaining

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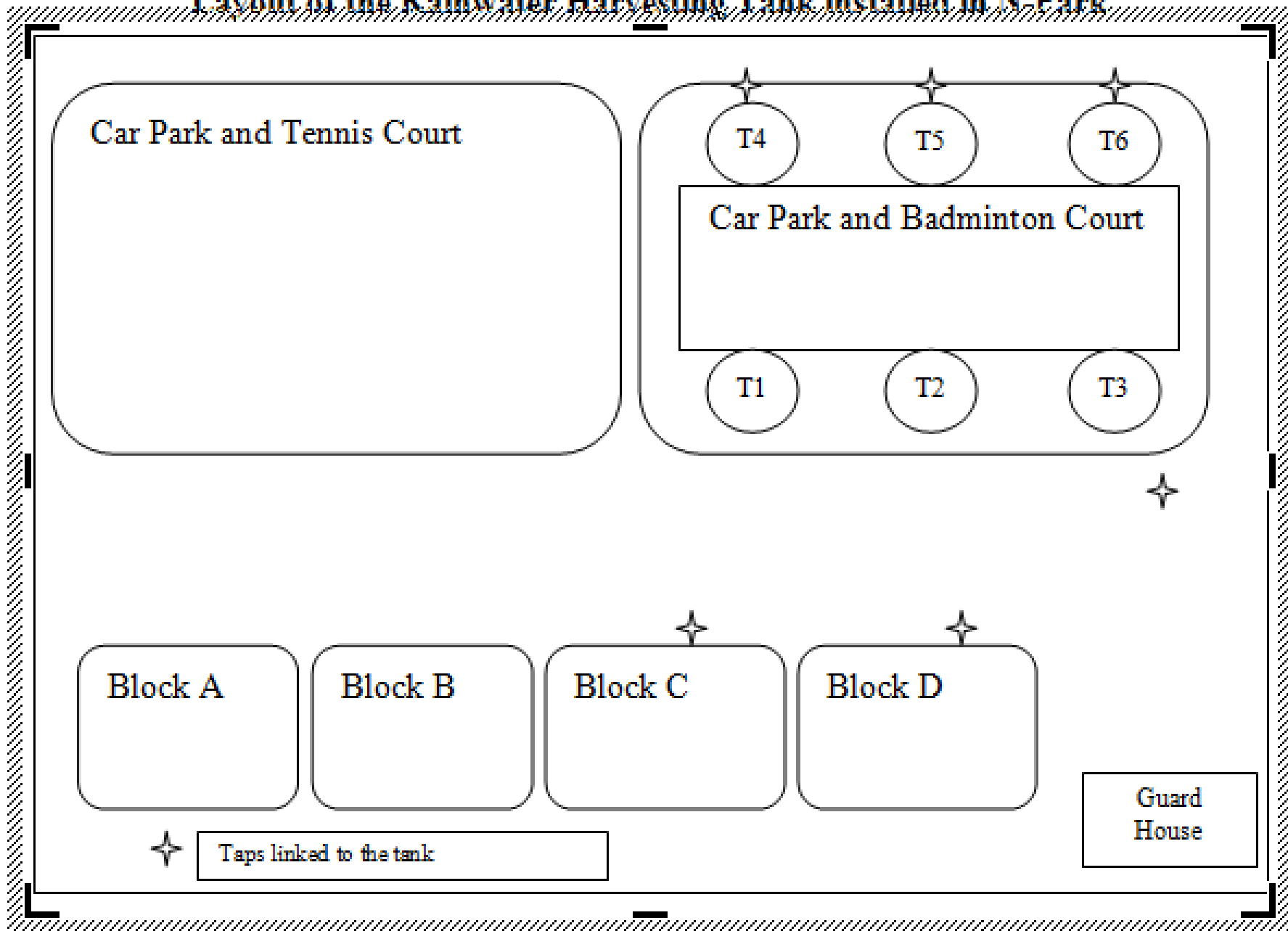




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## Layout of the Rainwater Harvesting Tank installed in N Park



# Total Amount of Rainwater Collected & Used

|            | Tank 1    |           | Tank 2    |           | Tank 3    |           | Tank 4    |           | Tank 5    |           | Tank 6    |           |
|------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Date       | Acc. Cons | Vol. Rem. | Acc. Cons | Vol. Rem. | Acc. Cons | Vol. Rem. | Acc. Cons | Vol. Rem. | Acc. Cons | Vol. Rem. | Acc. Cons | Vol. Rem. |
| 14/5/2010  | 17        | nil       | 124       | nil       | 708       | nil       | 9         | nil       | 20        | nil       | 9         | nil       |
| 21/5/2010  | 17        | 5000      | 367       | 4000      | 1257      | 7000      | 10        | 5000      | 20        | 4500      | 16        | 9000      |
| 2/6/2010   | 21        | 5000      | 747       | 4900      | 1902      | 8250      | 11        | 5000      | 20        | 4750      | 18        | 9500      |
| 9/6/2010   | 22        | 5000      | 959       | 4400      | 2705      | 6500      | 11        | 5000      | 21        | 4750      | 18        | 9500      |
| 19/6/2010  | 24        | 5000      | 1211      | 4100      | 3669      | 2900      | 12        | 5000      | 21        | 5000      | 19        | 9500      |
| 1/7/2010   | 30        | 5000      | 1347      | 5000      | 5083      | 9200      | 14        | 5000      | 22        | 5000      | 20        | 9500      |
| 10/7/2010  | 33        | 5000      | 1420      | 5000      | 6124      | 7500      | 17        | 5000      | 23        | 4800      | 27        | 9500      |
| 17/7/2010  | 34        | 5000      | 1528      | 5000      | 6858      | 4500      | 17        | 5000      | 23        | 4900      | 46        | 9500      |
| 18/8/2010  | 50        | 5000      | 1992      | 5000      | 10270     | 4700      | 21        | 5000      | 27        | 5000      | 80        | 9500      |
| 25/8/2010  | 51        | 5000      | 2099      | 5000      | 12030     | 5000      | 22        | 5000      | 27        | 5000      | 120       | 9500      |
| 2/9/2010   | 55        | 5000      | 2205      | 5000      | 15067     | 5000      | 23        | 5000      | 28        | 5000      | 205       | 9500      |
| 9/9/2010   | 58        | 5000      | 2290      | 5000      | 17023     | 4000      | 24        | 5000      | 30        | 5000      | 301       | 9500      |
| 19/9/2010  | 60        | 5000      | 2350      | 5000      | 20103     | 5000      | 24        | 5000      | 31        | 5000      | 354       | 9500      |
| 30/9/2010  | 63        | 5000      | 2390      | 5000      | 23367     | 5000      | 26        | 5000      | 32        | 5000      | 430       | 9500      |
| 6/10/2010  | 70        | 5000      | 2439      | 5000      | 26300     | 4500      | 27        | 5000      | 32        | 5000      | 520       | 9500      |
| 13/10/2010 | 76        | 5000      | 2501      | 5000      | 30193     | 1250      | 29        | 5000      | 34        | 5000      | 612       | 9500      |
| 20/10/2010 | 85        | 5000      | 2557      | 5000      | 33503     | 500       | 31        | 5000      | 35        | 5000      | 741       | 9500      |



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## Installation of Water Saving Equipment in Common Ground

Types of Water Saving Equipment Installed:

- Dual flush
- Push tap
- Push Urinal



Areas Involved:

- Toilets in Block A, Block B, Block C & Block D

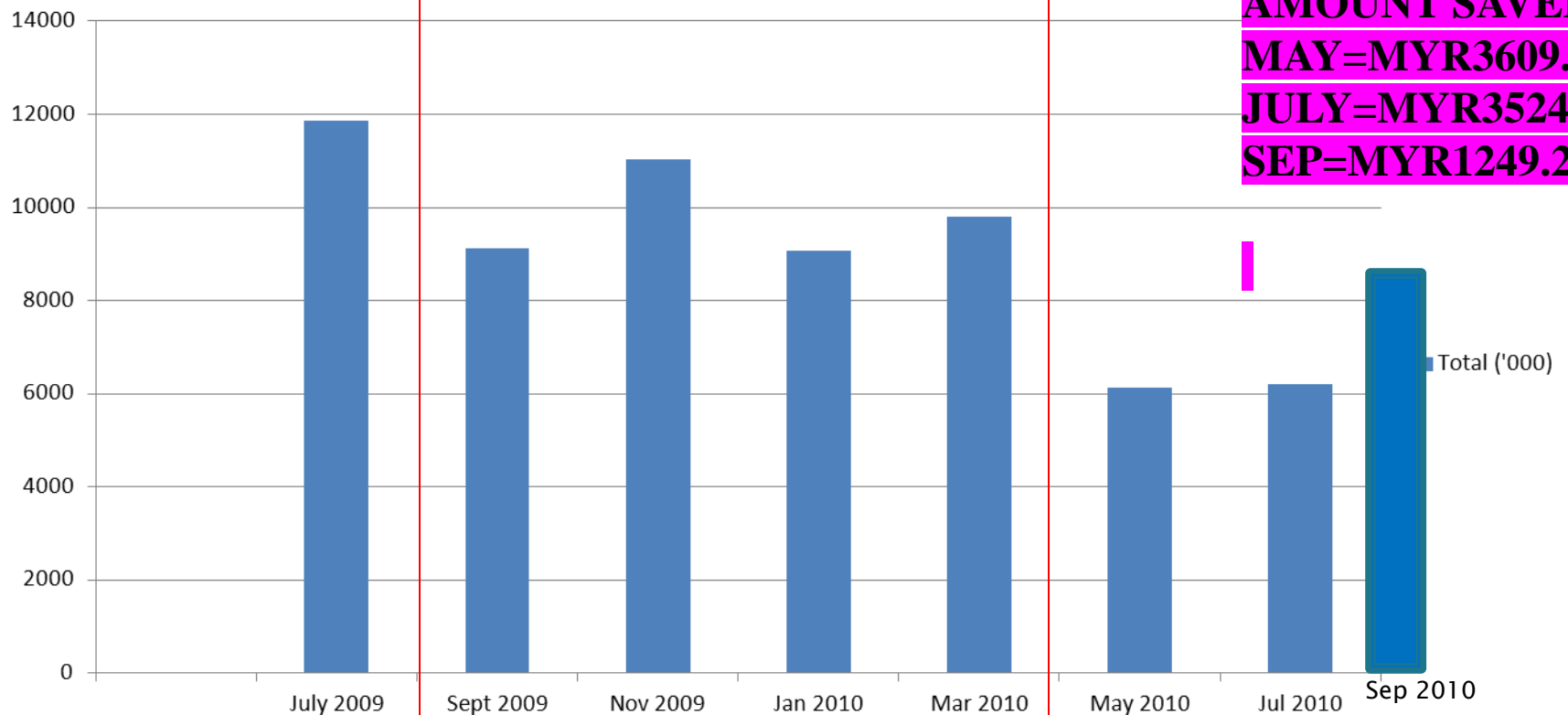


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1.00 USD = 3.64700 MYR

**1 MYR = 0.274198 USD**

## Total Water Consumption in Common Area of N-Park Condominium ('000)



**AMOUNT SAVED**  
**MAY=MYR3609.1**  
**JULY=MYR3524.7**  
**SEP=MYR1249.20**

Installation of Rainfall Harvesting System 31 Oct 2009

Installation of Water Saving Equipment 20 April 2010



# Percentage of Water Saved in the month of May, July & Sep after installation of Water Saving Equipment (based on the water bill from the month of March)

## Month of May

- ▶  $9792 \text{ (March '09)} - 6132.1 \text{ (May '09)} = 3659.9$
- ▶  $3659.9 / 9792 \times 100 = 37.38\%$

## Month of July

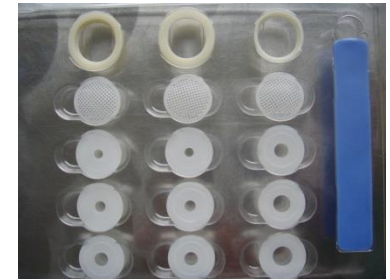
- ▶  $9792 \text{ (March '09)} - 6216.5 \text{ (July '09)} = 3575.5$
- ▶  $3575.5 / 9792 \times 100 = 36.51\%$

## Month of September

- ▶  $9792 \text{ (March '09)} - 8542.8 \text{ (Sep '09)} = 1249.2$
- ▶  $1249.2 / 9792 \times 100 = 12.75\%$

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## Installation of Water Saving Equipment's in Household Units



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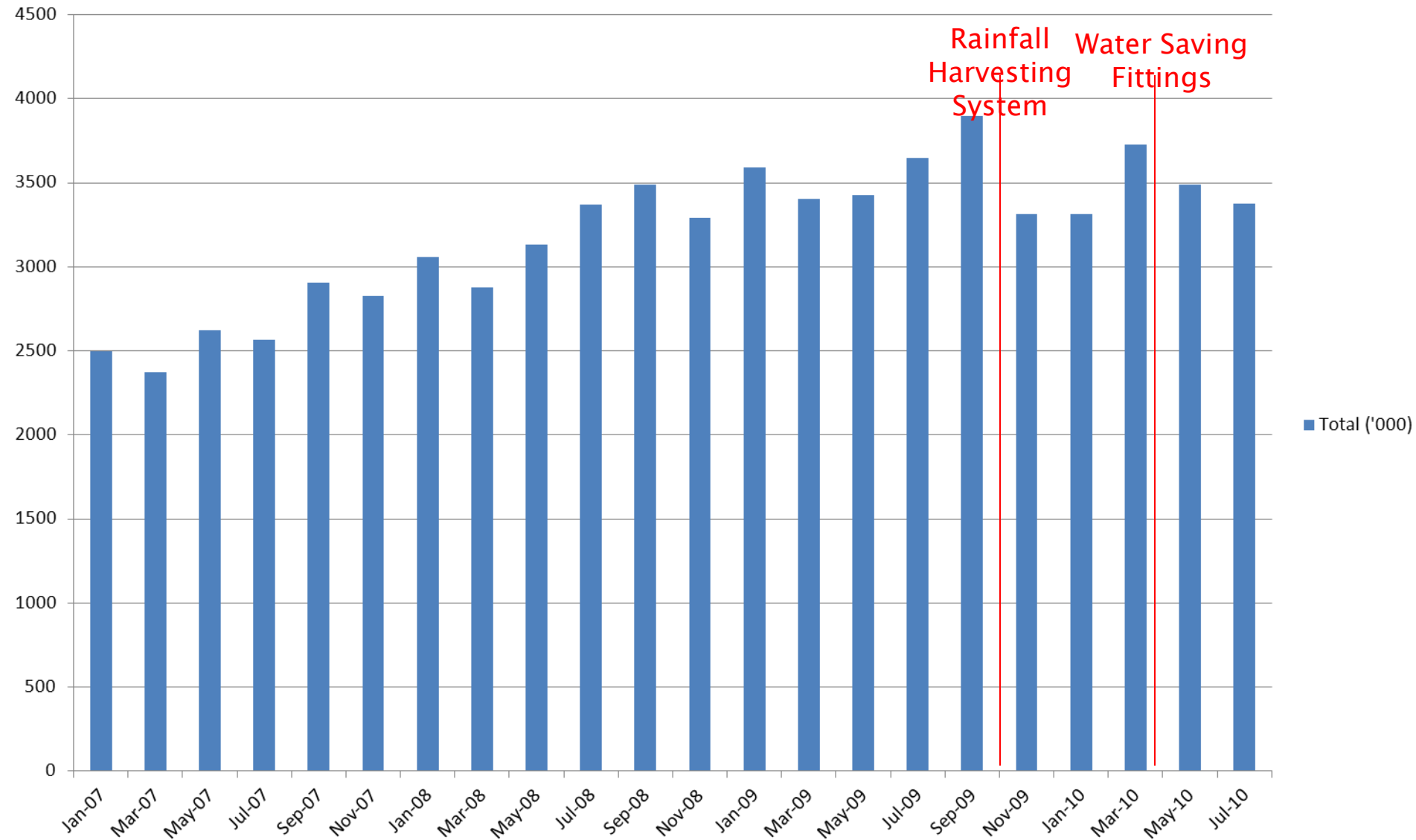
## Types of water saving equipment installed

- ▶ Internal Regulator
- ▶ External Regulator

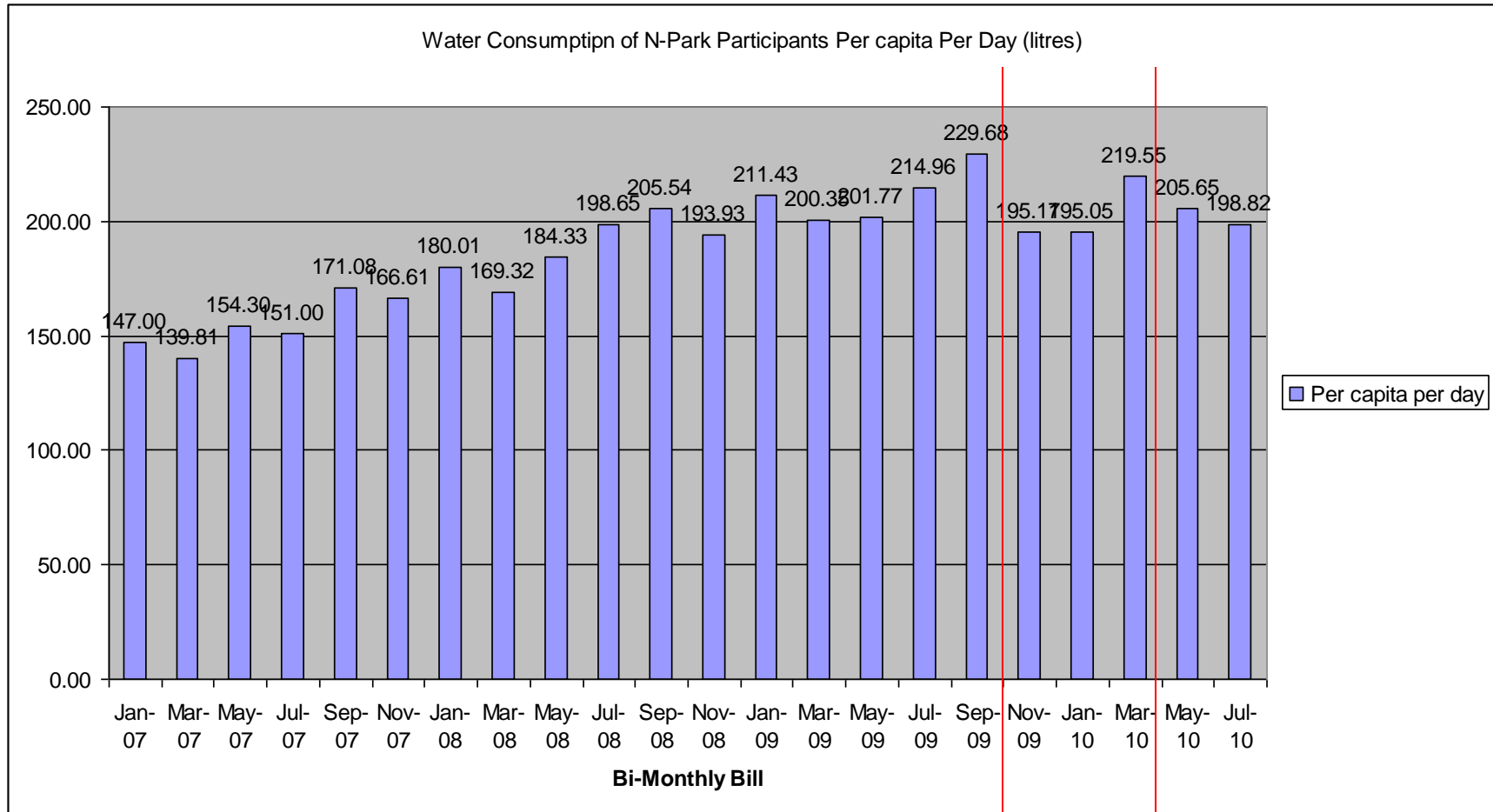




# Total Water Consumption in 86 participating households, 2007–2010



# Per Capita Water Consumption in 86 participating households, 2007–2010



Rainfall  
Harvesting  
System

Water Saving  
Fittings

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## ▶ OTHER ACTIVITIES RELATED TO WATER CONSERVATION IN THE NEGALITRES PROJECT











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## REASON TO SAVE WATER

### Environmental Reason

-  You will help prevent forest and trees to be destroyed and cleared to make way for water infrastructure such as water dams.
-  You will help reduced the amount of energy and electricity (fuel) need to treat and pump water to your home and in turn will help contributing in controlling global warming.
-  You will discharge less wastewater that could pollute the environment, especially to our ocean.

### Economic Reason

-  You will help save money off your bill immediately.
-  You can help to prevent multi-million or multi-billion ringgit of water project that will cause higher water tariff in Penang.
-  Your hard earned money for income tax will be used on other welfare related project instead of into expensive water project.

*For Futher Information,contact:*



c/o School of Humanities,  
University Sains Malaysia,  
11800 Penang.  
Tel (604) 6533829  
Fax (604) 6563707  
Email: [nwchan@usm.my](mailto:nwchan@usm.my)  
[www.waterwatchpenang.org](http://www.waterwatchpenang.org)



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Jalan Penang,  
10000 Penang.  
Tel (604) 263 4200  
Fax (604) 262 5233  
Call Center: (604) 509 6509



Jabatan Pengairan dan Saliran



Paras 55 KOMTAR 10000  
Jalan Penang , Penang.  
Tel (604) 2613435  
Fax (604) 2621957

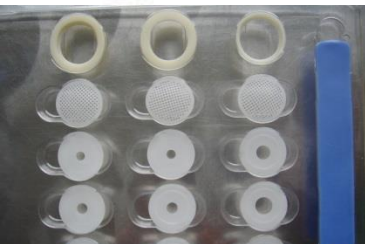
N-Park Condominium  
Jalan Batu Uban, Gelugor,  
11700, Penang

## Water Saving Tips



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## Installation of Water Saving Equipment for 200 JPS Households







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JABATAN PENGALIRAN DAN SALIRAN  
NEGERI PULAU PINANG

**PERBADANAN  
PENGURUSAN  
N-PARK**



Persatuan Pengamatan Air Pulau Pinang



**PBA**  
Perbadanan Bekalan Air  
Pulau Pinang Sdn Bhd  
(672961-2)

## SEMINAR PENGURUSAN PENJIMATAN AIR

**DIRASMIKAN OLEH:**  
**IR TUAN HAJI HANAPI BIN MOHAMAD**  
**TARIKH 25<sup>TH</sup> OKTOBER 2010**  
**TEMPAT: TANJUNG BUNGAH HOTEL**

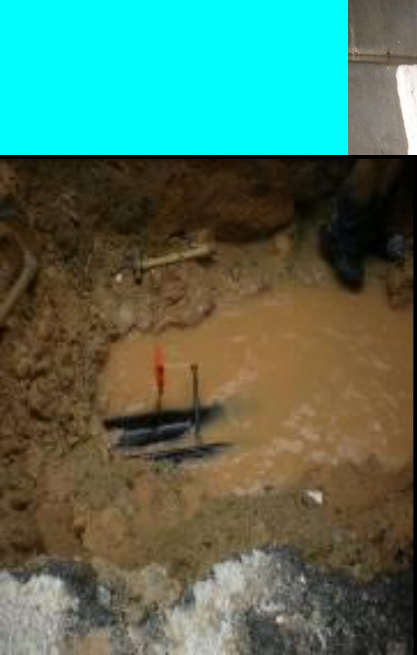


# 4. ISSUES & CHALLENGES

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- **INCENTIVES/ATTRACTIONS** – Difficult to Motivate People to get involved. Incentives/Attractions Needed.
- **SENSITISING CONSUMERS** - Need to get people to view water conservation as a Responsibility & as an Investment
- **AESTHETICS** - Rainfall Tanks not aesthetically pleasant
- **HIGH COSTS OF RAINFALL HARVESTING SYSTEM** proved to be a **STUMBLING BLOCK**. Need to find the funds.
- **LOW TARIFFS DISCOURAGE WATER SAVING**
- **PUBLIC APATHY ON WATER ISSUES**
- **LOW AWARENESS & PUBLIC APATHY**
- **LACKS COOPERATION BETWEEN DIFFERENT LEVELS OF GOVERNMENT**

# OTHER CHALLENGES/PROBLEMS AFFECTING THE SUCCESS OF THE PROJECT (NRW)



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## 5. LESSONS LEARNT

- **GREEN ECONOMY** to begin at the Household level (**GREEN HOME**)
- **GREEN ECONOMY** to include **GREEN BUSINESSES** (e.g. Hotels, etc.)
- **ECONOMY CANNOT BE GREEN UNLESS IT IS FIRST BLUE**
- **WATER SAVINGS** via Partnership (Government-Private-NGO-Public)
- **WDM** has Great Potentials - Apartments & Large Buildings (Universities, Schools, Hotels, Factories, etc.) have great potentials
- **RAINFALL HARVESTING SYSTEM** promising in Equatorial Climate
- Easy to change **HARDWARE**, Hard to change **SOFTWARE** (People)
- **N-PARK PROJECT** easily replicated (Apartments, Hotels, Schools etc)
- **MANY BENEFITS** – Savings (H<sub>2</sub>O & \$), Partnerships, Neighbourliness, Capacity Building, Increased Awareness & Education, etc
- **POLITICAL COMMITMENT & COOPERATION** is Vital.



# JIMAT AIR

## TERIMA KASIH



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**SAVE WATER &  
HELP CREATE  
A “WATER  
SAVING  
SOCIETY” IN  
MALAYSIA**



**Make Every  
Drop Count**