RIVER OF LIFE PROJECT (ROL): RIVER CLEANING

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17 JUN 2014
PUSAT KONVENSYEN ANTARABANGSA
PUTRAJAYA
(PICC)
The Economic Transformation Programme (ETP) is a focused, inclusive and sustainable initiative that will transform Malaysia into a high-income nation by 2020.

These 12 NKEAs are the core of the Economic Transformation Programme (ETP) and will receive prioritised government support including funding, top talent and Prime Ministerial attention. In addition, policy reforms such as the removal of barriers to competition and market liberalisation will be targeted at these NKEAs. The NKEAs will be the drivers to stimulate economic activity that will contribute towards attaining high income, sustainability and inclusiveness to the nation.

- **EPP 1**: Attracting 100 of the world’s most dynamic firms within priority sectors
- **EPP 2**: Attracting the right mix of internal and external talent
- **EPP 3**: Connecting to Singapore via a high speed rail system
- **EPP 4**: Building an integrated urban mass rapid transit system
- **EPP 5**: Revitalising the Klang River into a heritage and commercial centre
- **EPP 6**: Greening Greater KL/KV to ensure every resident enjoys sufficient green space
- **EPP 7**: Creating iconic places and attractions
- **EPP 8**: Creating a comprehensive pedestrian network
- **EPP 9**: Developing an efficient solid waste management ecosystem

**Background Summary**
OBJECTIVES

The overall Greater Kuala Lumpur’s aspiration “to be the metropolis in Asia that simultaneously achieves top-20 economic growth and be among the global top-20 most livable cities by 2020”,

under part of the EPP (Entry Point Project), the River of Life.

The main objectives are:

• Enhancing, rehabilitating and preserving the river and its environment compatible with the envisaged Greater Kuala Lumpur City status for the project area, including improving and sustaining the Klang River and its tributaries within the study area Water Quality to Class IIB (suitable for body-contact recreational usage) by year 2020.

• Providing adequate level of flood mitigation protection to the project area, in support of achieving the Greater Kuala Lumpur City status.
River of Life
Transforming Klang River into a vibrant and liveable waterfront with high economic value

**River Cleaning**
- Clean and improve the 110km stretch along the Klang River basin from current Class III-V to Class IIB by 2020
- Covers the municipal areas of:
  - Selayang (MPS)
  - Ampang Jaya (MPAJ)
  - Kuala Lumpur (DBKL)

**River Beautification**
- Masterplanning and beautification works will be carried out along a 10.7km stretch along the Klang and Gombak river corridor
- Significant landmarks in the area include Dataran Merdeka, Bangunan Sultan Abdul Samad and Masjid Jamek

**River Development**
- Cleaning and beautification works will spur economic investments into the areas immediately surrounding the river corridor
- Potential government land will be identified and tendered out to private developers through competitive bidding
River of Life: River Cleaning
In order to bring life to the river, pollution must be reduced and water must be treated.

**Upstream**

- **Pollution source**
  - 31 polluting factories
  - 484 squatter households
  - 139 multipoint and 1 regional sewage treatment plants (STP) that needs significant and long overdue upgrade

- **Length**: 73km (Sg. Batu-25km, Sg. Gombak-30 km, Sg. Ampang-18 km)

- **Local authority**: Ampang Jaya & Selayang

**Kuala Lumpur**

- **Pollution source**:
  - 304 polluting factories
  - 838 squatter households
  - 204 multipoint and 7 regional STPs that need significant upgrade and regionalisation

- **Length**: 40 km (Sg. Klang)

- **Local authority**: DBKL

1 Squatter households within 500m radius of the river

River of Life: River Cleaning
Current water quality of the river is not suited for body contact & is potentially hazardous.
River of Life: River Cleaning
Source of Pollutions

Food Beverages, Markets
River of Life: River Cleaning
Source of Pollutions

Squatters, Residential, Commercial Area
River of Life: River Cleaning
Source of Pollutions

Workshops
River of Life: River Cleaning
Source of Pollutions

Carwash, Laundry

I'm convinced...we have PCB's, DDT's and mercury in our streams.
River of Life: River Cleaning
Source of Pollutions

**Industry**
Institutional

River of Life: River Cleaning
Source of Pollutions
River of Life: River Cleaning
Source of Pollutions

Existing Sewerage Treatment Plant
River of Life: River Cleaning
Source of Pollutions

Sewerage Line and Service
Area of STP
<table>
<thead>
<tr>
<th>Bil.</th>
<th>Data Collection</th>
<th>Unit</th>
<th>DBKL</th>
<th>MPAJ</th>
<th>MPS</th>
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<tbody>
<tr>
<td>1</td>
<td>Workshop</td>
<td></td>
<td>1183</td>
<td>25</td>
<td>513</td>
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<tr>
<td>2</td>
<td>Restaurant / Food Court / Food Stall</td>
<td></td>
<td>4380</td>
<td>664</td>
<td>506</td>
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<td>3</td>
<td>Slaughter Spot and Livestock</td>
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<td>4</td>
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<td>3</td>
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<td>4</td>
<td>Hotel / Resort</td>
<td></td>
<td>98</td>
<td>5</td>
<td>3</td>
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<tr>
<td>5</td>
<td>Night Market / Uptown</td>
<td></td>
<td>81</td>
<td>3</td>
<td>12</td>
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<tr>
<td>6</td>
<td>Wet market</td>
<td></td>
<td>37</td>
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<td>7</td>
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<tr>
<td>7</td>
<td>Morning Market</td>
<td></td>
<td>38</td>
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<td>1</td>
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<tr>
<td>8</td>
<td>Petrol Station</td>
<td></td>
<td>75</td>
<td>11</td>
<td>7</td>
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<tr>
<td>9</td>
<td>Industries (iron, chemical, fertilizer, etc)</td>
<td></td>
<td>949</td>
<td>99</td>
<td>276</td>
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<tr>
<td>10</td>
<td>Hospital and Clinic</td>
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<td>20</td>
<td>1</td>
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<tr>
<td>11</td>
<td>Nursery</td>
<td></td>
<td>25</td>
<td>3</td>
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<td>12</td>
<td>Residential types</td>
<td></td>
<td>766</td>
<td>128</td>
<td>27</td>
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<tr>
<td>13</td>
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<td>4</td>
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<td>14</td>
<td>Shopping Complex</td>
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<td>96</td>
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<tr>
<td>15</td>
<td>Shop lot / mini market</td>
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<td>20923</td>
<td>5089</td>
<td>4928</td>
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<tr>
<td>16</td>
<td>Landfill / Construction</td>
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<td>537</td>
<td>86</td>
<td>88</td>
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<tr>
<td>17</td>
<td>Carwash (Legal / illegal)</td>
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<td>316</td>
<td>143</td>
<td>81</td>
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<tr>
<td>18</td>
<td>Laundry</td>
<td></td>
<td>320</td>
<td>152</td>
<td>67</td>
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<tr>
<td>19</td>
<td>Sewerage Treatment Plant</td>
<td></td>
<td>334</td>
<td>83</td>
<td>78</td>
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<tr>
<td>21</td>
<td>Water Plant</td>
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<td>56</td>
<td>25</td>
<td>23</td>
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<td>22</td>
<td>Recycling Centre</td>
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<td>4</td>
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## Point Source Sampling for Load Estimation

<table>
<thead>
<tr>
<th>ITEM</th>
<th>SAMPLING LOCATION</th>
<th>PARAMETERS USED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food Stall/ Restaurant</td>
<td>Final Discharge Point</td>
<td>Biological Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Total Suspended Solids (TSS), Ammoniacal Nitrogen (NH₃N)</td>
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<tr>
<td>Squatters</td>
<td>Final Discharge Point</td>
<td></td>
</tr>
<tr>
<td>Landfill</td>
<td>As per JPP/IWK data</td>
<td></td>
</tr>
<tr>
<td>Residential</td>
<td></td>
<td></td>
</tr>
<tr>
<td>STP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workshop</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wet Market</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industry</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Car Wash</td>
<td>Final Discharge Point</td>
<td></td>
</tr>
<tr>
<td>Construction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commercial</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Institutional</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Night Market</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laundry</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Livestock</td>
<td></td>
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</tbody>
</table>
Water Quality
Samplings & Discharge Measurements
Interviews & Secondary Data Collections
Sewerage Treatment Plant (STP) contributes to 52% of pollutants in the river with the remaining by other sources (food, industrial etc).

% of Pollutant Contribution

<table>
<thead>
<tr>
<th>Location</th>
<th>Contribution</th>
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<tbody>
<tr>
<td>STP</td>
<td>52%</td>
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<tr>
<td>Eateries</td>
<td>16%</td>
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<tr>
<td>Institutional</td>
<td>12%</td>
</tr>
<tr>
<td>Industrial</td>
<td>6%</td>
</tr>
<tr>
<td>Workshops</td>
<td>5%</td>
</tr>
<tr>
<td>Squatters</td>
<td>3%</td>
</tr>
<tr>
<td>Wet Markets</td>
<td>2%</td>
</tr>
<tr>
<td>Carwash</td>
<td>2%</td>
</tr>
<tr>
<td>Commercial</td>
<td>1%</td>
</tr>
<tr>
<td>Residential</td>
<td>1%</td>
</tr>
<tr>
<td>Landfill</td>
<td>0%</td>
</tr>
</tbody>
</table>

WQI at Various Locations for Different Options

Legend:
- WQI: Water Quality Index
- WQI – Key Initiatives
- WQI – Best Option
- WQI – Optimum Option

PSM02-GKL-06
River of Life: River Cleaning
WQI Improvement Trends based on Phase I & Phase II implementation at the most downstream of ROL (Midvalley)

April 2014 Progress work = 42%

PLOTTING OF WQI PERCENTAGE ACHIEVED AGAINST TIME

Time:
- Jan-11
- Jan-12
- Jan-13
- Jan-14
- Jan-15
- Jan-16
- Jan-17
- Jan-18
- Jan-19
- Jan-20

WQI (%):
- 50.0
- 55.0
- 60.0
- 65.0
- 70.0
- 75.0
- 80.0
- 85.0

- Class III
- Class II
- ROL KI
- ROL KI + Opt.C (Fasa II)
- WQI Class II
- WQI Class III

April 2014 Progress work = 42%
River of Life: River Cleaning
Source of Pollutions
Government
Multi agency river basin approach
To achieve WQI class IIB
(Clean - Suitable For Body Contact)

- A multi-agency Task Force led by JPS has been formed to spearhead the River Cleaning.

- 26 agencies are involved.

- The Task Force meets every month.

- Covers the municipal areas of:
  - Selayang (MPS)
  - Ampang Jaya (MPAJ)
  - Kuala Lumpur (DBKL)
River of Life: River Cleaning
Transforming the Klang river requires an integrated approach that stops pollution at the source.

Class III & IV
• unsafe for body contact

Class IIB
• recreational use with body contact

<table>
<thead>
<tr>
<th>Key Initiative</th>
<th>Description</th>
<th>Lead Agency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Upgrading existing sewerage facilities is the most impactful and important initiative to reduce Klang river pollution</td>
<td>JPP</td>
</tr>
<tr>
<td>2</td>
<td>Existing regional sewage treatment plants must be expanded to cater for future growth</td>
<td>JPP</td>
</tr>
<tr>
<td>3</td>
<td>Wastewater treatment plants need to be installed at 5 wet markets to decrease rubbish and pollutants</td>
<td>DBKL</td>
</tr>
<tr>
<td>4</td>
<td>Install additional gross pollutant traps will improve the river aesthetics and water quality</td>
<td>JPS Selangor / DBKL</td>
</tr>
<tr>
<td>5</td>
<td>Utilise retention ponds to remove pollutants1 from sewage and sullage</td>
<td>JPS WPKL</td>
</tr>
<tr>
<td>6</td>
<td>Relocation of squatters will significantly reduce sewage, sullage, and rubbish in the Klang river</td>
<td>MB Sel office/MPAJ</td>
</tr>
<tr>
<td>7</td>
<td>Implement the Drainage and Stormwater Management Master Plan to upgrade drainage systems</td>
<td>BPB JPS</td>
</tr>
<tr>
<td>8</td>
<td>Systematic hydrological study and rehabilitation of the river are needed for flow control</td>
<td>BSP JPS</td>
</tr>
<tr>
<td>9</td>
<td>Promote, enforce, and manage river cleanliness and health – erosion from urban development</td>
<td>BSMA JPS</td>
</tr>
<tr>
<td>10</td>
<td>Promote, enforce, and manage river cleanliness and health – restaurants, workshops, and other commercial outlets</td>
<td>JKT</td>
</tr>
<tr>
<td>11</td>
<td>Promote, enforce, and manage river cleanliness and health – industries that generate wastewater/effluent</td>
<td>DOE</td>
</tr>
<tr>
<td>12</td>
<td>Promote, enforce, and manage river cleanliness – general rubbish disposal</td>
<td>JPS /JPSPN</td>
</tr>
</tbody>
</table>
River of Life: River Cleaning

- **Structure Measure**
- **Non-structure Measure**
River of Life: River Cleaning
Structure Measure for River Cleaning

KI 1 & KI 2: JPP
Menaiktaraf loji kumbahan

KI 3 & KI 4b: DBKL
Waste Water Treatment Plant

KI 4a: JPS
Gross Pollutant Trap

KI 5: JPS
Puah Pond

KI 5: JPS
Floating Wetland

KI 7: JPS
Gross Pollutant Trap

KI 5: JPS
River Water Treatment Plant

KI 5: JPS
Mechanically Stabilized Earth Wall
River of Life: River Cleaning
Structure Measure for River Cleaning

KI 10 : JKT
Grease Trap

KI 13 : JPS (Phase 2)
Interceptor

Interceptor
KI 1 & 2 : JPP

Kerja-kerja desludging di KLR 033

Kerja-kerja korekan receiving pit di B3/15 (7.5 m)
River of Life: River Cleaning
Bunus Centralized Sewage Treatment Plant & Network

- Capacity of the CSTP: 750,000 PE
- Estimated Pipe Length: 59.5 km
- STPs to be rationalised: 73

Diagram showing the Before and After plans for the Bunus Centralized Sewage Treatment Plant (CSTP) and the network.
KI 3 & 4B : DBKL

Static Screen at Sungai Untut

Floating Boom at Kg. Bandar Dalam

GPT at Flat W. Maju Seksyen 1 (Blok A13)

Loji Rawatan Air Sisa Di Pasar Jalan Kelang Lama
Gross Pollutant Trap
Ki 5 : JPS

Puah Pond
KI 5 : JPS

Floating Wetland

Sehingga 7/2/2014
KI 7 : JPS

Gross Pollutant Trap

GPT No. 2 – Taman Sri Murni (Sg. Jinjang) - Downstream Defender

GPT No. 18 – Sg Jinjang – Downstream Defender

GPT No. 8 – Kolam Wahyu – ECOSOL model RSF 4600

GPT No. 1 – Up stream Sg. Jinjang – ECOSOL model RSF 4600
River Water Treatment Plant
River widening and riverbank stabilization

KI 7: JPS

MSE WALL

POOL & RIFFLES

SOFT ROCK
KI 10 : JKT

Grease Trap

MEDAN SELERA ANJUNG MELAWATI

MEDAN SELERA TAMAN MELAWATI LAMA

MEDAN SELERA PANDAN, ANGSANA HILIR

MEDAN SELERA DESA KERAMAT
OPERASI SISTEM INTERCEPTOR

Manhole

to RWTP

Combined Stormwater Overflow (CSO)

GPT
River of Life: River Cleaning
Non-Structure Measure for River Cleaning: Public Outreach Program

TARGET GROUPS

General Public
Schools
Developers
Local Communities
Restaurants/ Stalls/ Workshop/ Industries
River of Life: River Cleaning
Non-Structure Measure for River Cleaning: Public Outreach Program
RIVER CARNIVAL

Fun and interactive approach to raise awareness.
Provides visibility to ROL
Celebration of local champions

GENERAL PUBLIC
PRIVATE SECTOR
GOVERNMENT
MPAJ, DBKL, JPS, JPN, MOE

BRING TOGETHER ALL TARGET GROUPS
OPEN CLASSROOM

River education centre
Venue for public activities and Hands-on training.

SCHOOLS
LOCAL COMMUNITIES
PRIVATE SECTOR
GOVERNMENT
MPAJ, DBKL, JPS, JPN, MOE
SMART RANGER

Start Managing All Resources Today
Proven approach for communities & schools in waste management

SCHOOLS

LOCAL COMMUNITIES

PRIVATE SECTOR

GOVERNMENT
MPAJ, DBKL, JPS, JPN, MOE
RIVER RANGER

River mapping and pollution monitoring
Raising awareness about the importance of rivers

SCHOOLS

LOCAL COMMUNITIES

PRIVATE SECTOR

GOVERNMENT
MPAJ, DBKL, JPS, JPN, MOE
Reducing sedimentation from construction sites

CIVIL
Construction Industry Value Improvement Leaders - Coaching Sessions

DEVELOPERS
GOVERNMENT
MPAJ, CIDB, JPS, DOE, UiTM

CONST. INDUSTRY
REHDA, MBAM,

OUTCOME 1
20 RIVER CARE CHAMPIONS

OUTCOME 2
3 GREEN CONSTRUCTION SITES
SC-REVIVE

River beautification

DEVELOPERS

LOCAL COMMUNITIES
GOVERNMENT
MPAJ, DBKL, JPS, DOE, UiTM

CONST. INDUSTRY
REHDA, MBAM,

SC-REVIVE is a joint effort between developers and local communities to beautify and revitalize rivers for bringing back life to Sungai Klang and to the heart of Kuala Lumpur.

For more information, visit: www.myrol.my

SC-REVIVE is one of the River of Life (ROL) initiatives under the Economic Transformation Program

Supported by:
Creating a riverine park that is led by the community. Ownership.

AU3 LINEAR PARK

INDUSTRIES

MASJID

J/KUASA PENDUDUK

GOVERNMENT MPAJ, DBKL, JPS, JLN, PEMANDU, IWK
PROGRAM PELITA

Roping in mosques to save the rivers

MOSQUES / SURAU

RESTAURANTS & FOOD STALLS

RESIDENT ASSOCIATIONS

PRIVATE SECTOR
Used cooking oil collectors

GOVERNMENT
MPAJ, DBKL

Minyak masak terpakai juga boleh dikitar semula menjadi:

Hadith Nabi ada menyebut:
"Kebersihan itu adalah sebahagian daripada Iman"
Kebersihan yang dimaksudkan termasuklah penjagaan alam sekitar

Pilihan di tangan anda!
Wang terus mengalir ke dalam sungai atau didermakan kepada masjid anda?

Kumpul dan hantarkan ke:
Masjid Al-Ridhuan AU 3,
Hulu Kelang, Selangor
Creating environmentally friendly restaurants

RESTAURANTS

FOOD STALLS

PRIVATE SECTOR
Oil and grease trap suppliers

GOVERNMENT
MPAJ, DBKL, JPS
Improving housekeeping among small & medium industries

WORKSHOPS

PRIVATE SECTOR

NGO
SMI-A, NAWAM, PPIBM

GOVERNMENT
MPAJ, DBKL, SME CORP, PUNB

BEST MANAGEMENT PRACTICES
• Good Housekeeping
• Green Practices
• Health and Safety

BUSINESS & DEVELOPMENT
• Business management skills
• Personal development
• Growth & expansion
• Finances
THANK YOU