

- Smart City supported by Japan ASEAN Mutual Partnership –  
**Smart JAMP**

**APPLICATION FORM for Smart City Project Formulation Study**

1. Project digest

(1) Project Title: Feasibility and pilot project for Sungai Johor Smart Disaster Risk Management

(2) Name of the city: Johor Bahru, Malaysia

(3) Category of the study: C and E

\*Choose one (or more, if item D and/or E included) from below

A) Masterplan (M/P) study

To formulate a masterplan for an entire smart city or a partial area of the target city, including the direction, comprehensive plan, and individual projects.

B) Pre-feasibility study

To determine priority among several alternatives on a particular field or part of an entire smart city project.

**C) Feasibility study**

**To examine the feasibility or concrete details of an individual project composing the smart city project.**

D) Capacity building program

To build the capacity of the stakeholders including government officials or municipal staff through training programs or seminars (may be done online).

**E) Experimental implementation**

**To confirm applicability of a particular solution or technology for the smart city project in cooperation with Japanese solution provider(s).**

(4) Justification of the Project

\*Provide detailed information of the project regarding the items below.

-Present condition of the smart city project in the target city:

Johor Bahru City (Iskandar Malaysia (hereinafter referred to as “IM”)) is one of Malaysia’s economic growth corridor covering a total area of 2,217 sq km (12% of Johor State), and contribute to more than 70% of the State’s economic development to date.

In year 2012, IM has been selected as a pilot region for the smart city model for Malaysia. Accordingly, to achieve a smart city in the region, an overall framework so called “Smart City Iskandar Malaysia (SCIM)” was formulated and Iskandar Malaysia Regional Authority (IRDA) plays a role as an implementing agency for this framework.

The SCIM includes 3 areas, 6 dimensions, 28 characteristics and 35 programs shown in the right.

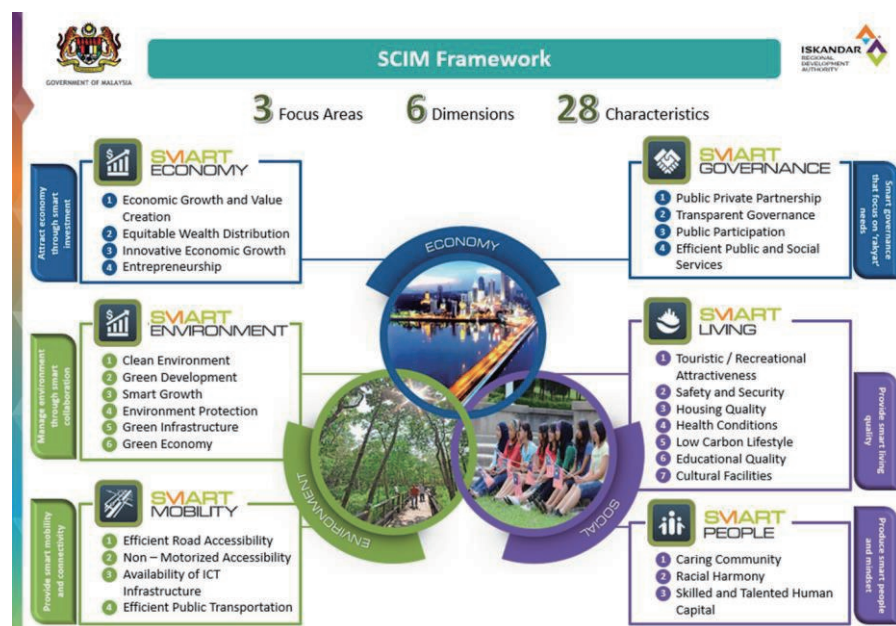
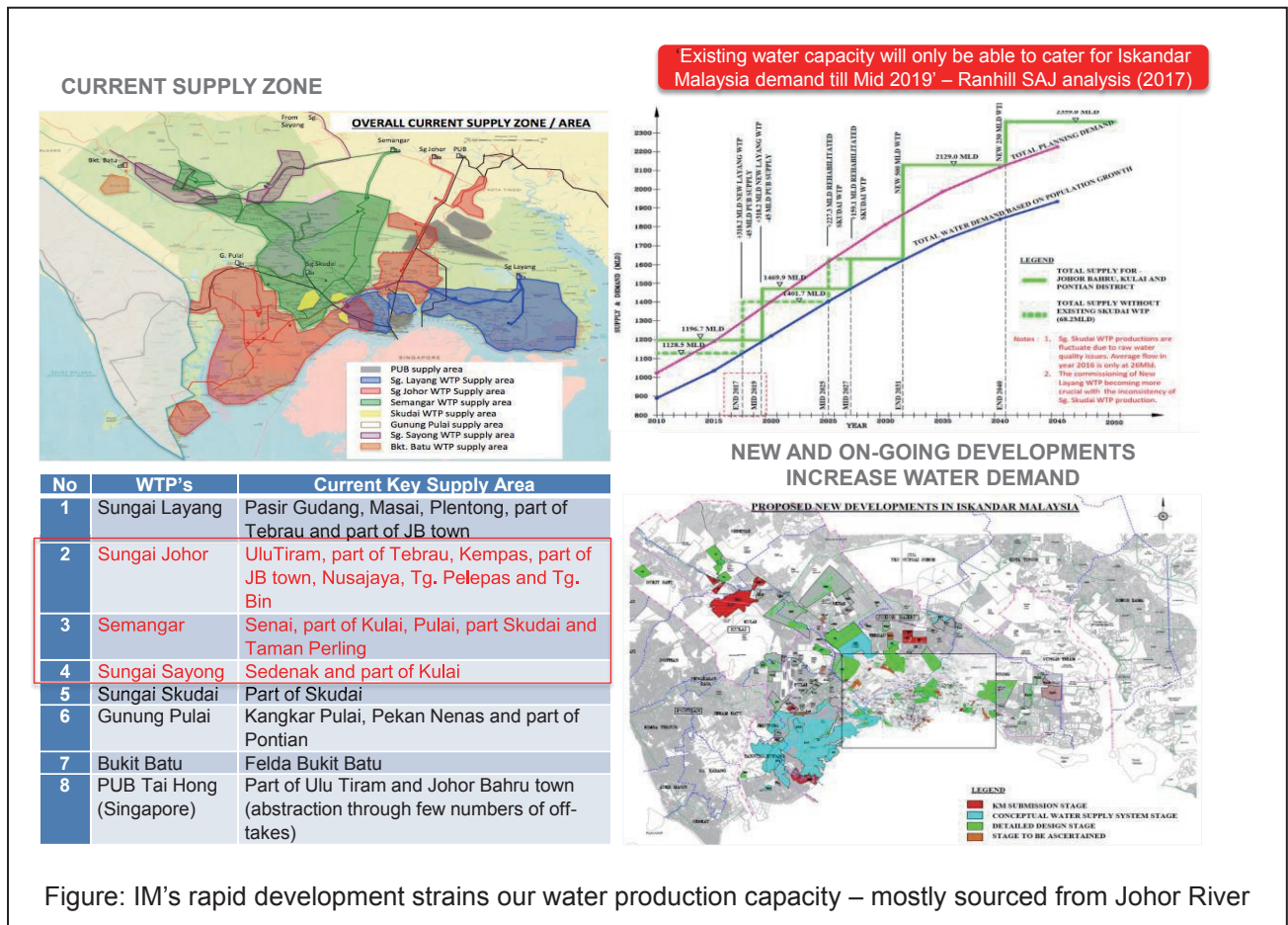


Figure: SCIM Framework

As a holistic approach to sustainable development for the economic region, SCIM gave equally emphasis to economic growth, quality of life by adopting sustainable environmental management. The Johor River is one of the main water source supplying treated water for Iskandar Malaysia. However, the combined effects of rapid development and climate change have caused occurrences of flash-flood at several locations along the river to be more frequent and unpredictable.



-Sectoral development policy of the local government / municipality on the smart city project in the target city:

1) IMUO As one of the important approaches to realize SCIM, the region's Comprehensive Development Plan II (CDPii, 2014-2025), the top policy in the region, proposes Iskandar Malaysia Urban Observatory (IMUO). IMUO is a data centre to harvest, update, analyse, manage and disseminate data and information on IM. The IMUO acts as a knowledge centre to enhance the knowledge of cities of the whole Iskandar Malaysia. The figure below shows key components of IMUO.

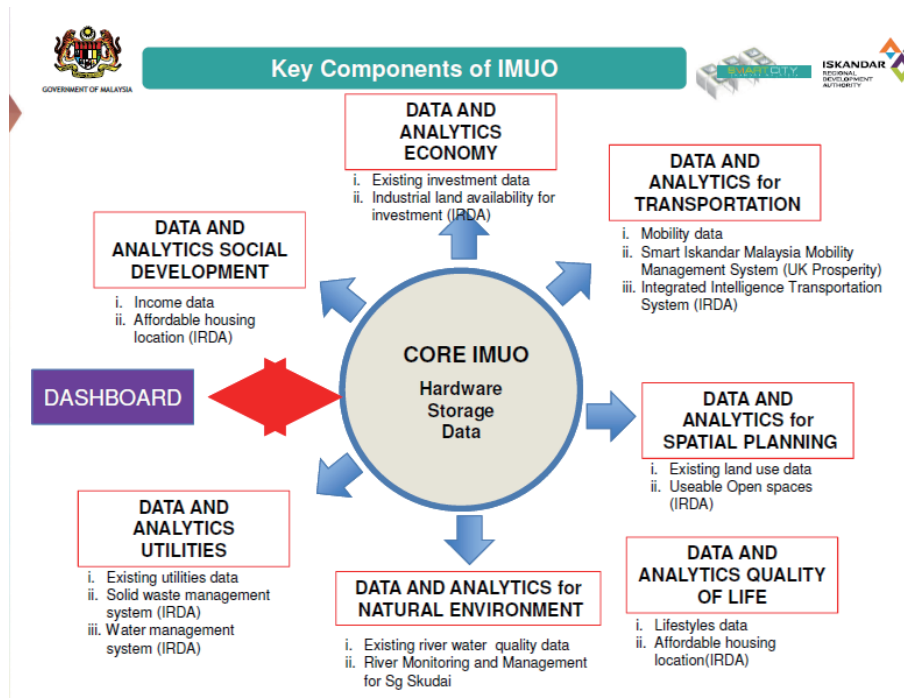


Figure: Key components of IMUO

The IMUO contributes to realize SCIM by aiming the following objectives:

- To be developed as an effective and sustainable Urban Observatory development model.
- To enhance collaboration and information sharing among agencies through 'shared performance target'.
- To transform government agencies to make 'informed decision' using big data analytics on 'authoritative data'.
- To utilize Sustainable Development Goals (SDGs) and Iskandar Malaysia Region monitoring indicators which have been identified as effective and principled.
- Data trends over the years have shown increased frequency of flooding caused by uncertain rainfall patterns and intensity.

One of the necessary pilot project identified is the Smart Disaster Risk Management (SDRM) for the Johor River. The Smart Disaster Risk Management can become a model of data analytics tool which can assist the relevant agencies, local authorities, State and Federal Government to best plan and assign preventive measures as part of realizing a balanced SCIM development in the future. This will be described below.

## 2) SDRM

IM's rapid development and reliance to Johor River as a major water source underscores more erratic incidences of major flooding caused by combined factors of rain intensity and river shallowing:

- Rapid development and urbanization have created rapid increase in water demand.
- Global weather changes have accelerated signs of water related problems within this region.



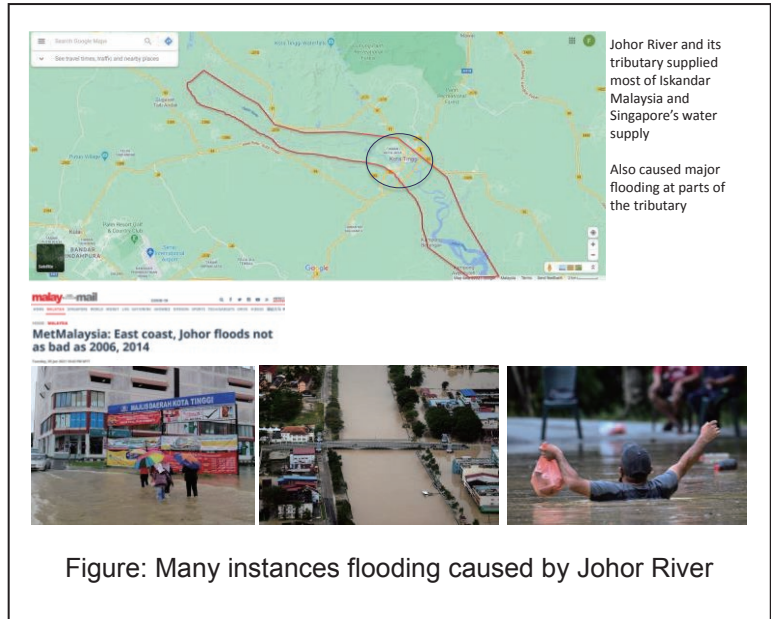
- Johor River has been shallowing in several parts due to sedimentation caused by land clearing for development

As a matter of fact, the town of Kota Tinggi – located along the riverbanks have been hit by major flood in 2006, 2014 and recently this year (see the figure right)

To address this issue, a masterplan for the river rejuvenation and flood mitigation program, in consideration with river as a main water resource, has been completed by the Department of Irrigation and Drainage.

However, the challenge to fully realize the masterplan and mitigation action includes:

- Serious solid waste pollution and sedimentation from upstream caused by land development
- The length of the river and complex conditions limits the resource and fund from various agencies and authorities to implement an effective river monitoring;
- Lack of inter-agency data sharing and coordinated responses to incidences of flooding and preventive action presented opportunities for improvement.



## Data Integration & Visualization (sample screens)

### ■ Weather info.



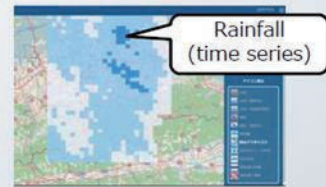
Log-in screen

### ■ Road condition



Road/ Traffic info.

### ■ Tide and river level



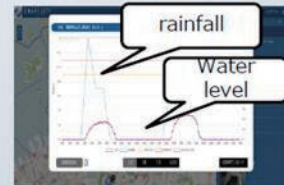
Weather info.



Tide/ river level



Live video feeds



Monitoring and predictions

- Easily see scattered information and the relationship on one screen.
- Allows officers to recognize necessary actions and prompt decision making.
- Make it possible for mutual collaboration with neighboring cities.

Figure: Benchmarking a success story

To address the above challenges, IRDA proposed to establish the SDRM. IM SDRM is a monitoring and management tool for river environment to consolidate data, analyse issues and formulation of necessary actions and monitoring. In addition, due to the nature of SDRM, it is to be integrated in the Urban Observatory, and

plays role as a core and model of data platform for IMUO. SDRM also is expected to improve natural resource management, rejuvenation, and reduce the socio-economic cost through effective and timely preventive maintenance, loss of material and compensation.

Now, IRDA needs this SDRM to be initiated with Japanese experience and technologies to manage the river environment accurately in order to solve issues stated above, and eventually SDRM contributes to IMUO and SCIM as well.

#### -Outline of the Study:

Targeting Johor River, the river environment monitoring will be implemented and countermeasures will be formulated. Johor River Skudai is one of the main rivers in the State at 123 km in length is too long to cover the entirety of the length. Further discussions with the DID will identify a more reasonable and strategic length for the study. The study is also expected to have the following features:

The scope of the study includes:

##### <Understanding the current situation>

- Study on the actual situation (pollution, stakeholders, policy/strategy/plan etc.);
- Identifying areas and flood causes in the river;

##### <Initial SDRM design>

- Consideration of SDRM users (river administrators, residents, public space to be installed (digital signage, notice board etc.), computers and smartphone as monitoring devices);
- Setting monitoring areas and points;
- Designing monitoring equipment in consideration of specifications, cost, easy maintenance, durability, theft prevention, easy procurement of spare parts, easy repairing, communication ability etc.)
- Consideration of operation and maintenance structure;
- Estimating budget required;
- Setting a framework of system (communication method, server etc.);
- Consideration of easy and understandable user interface for stakeholders (citizens and private companies) to get them involved into the project.

##### <Prototyping>

- Prototyping with real sensors and systems.

##### <Mid-long term roadmap formulation>

- Consider countermeasures for the river environment improvement;
- Formulate a plan and roadmap (pilot project planning, fund raising, incorporating Japanese companies etc.).

#### -Purpose (short-term objective) of the Study:

\*A path to improving urban services through digital solutions like robotics, IoT, AI or big data, is expected.

In a short term, the project aims to the following:

- Collection, analysis and forecasting of local rainfall information (introduction of rainfall forecasting system)
- Collection and analysis of flood and sedimentation disaster information
- Introduction of flood forecasting system: estimation of inundation depth based on rainfall data / forecast, and river water level
- Proposal of Disaster Management Center to provide information to citizens based on forecasting of rainfall, flood and inundation

-Goal (long-term objective) of the Study or entire project:

\*The applicant may choose from two layers of the goal of the Study including a) an entire urban development goal with a nexus of concrete construction, transport and infrastructure projects with ICT solutions, or b) a specific goal with a certain solution or technology in a particular field such as public health, disaster risk reduction, urban safety and security, mobility service (e.g. MaaS), energy solution, circular economy, advanced administrative services like public facility management or tourism promotion, as well as other fields like education, agriculture or supply chain management.

After F/S completes with a concrete pilot project planning, it will move to the next phase for pilot project which expands the outcome of the F/S to the identified span.

In this phase, data of various fields, disaster prevention, tourism, transportation, energy, environment, etc. and areas dispersed in cities and regions are collected by IoT technology for the purpose of solving problems in cities such as regional revitalization and security. The data is to be stored on the cloud, analyzed, provided and shared in common.

The IMUO platform will potentially use various data sourced from multiple sources for the purpose disaster risk management and prediction.

In the future, it is necessary to continue to utilize this IMUO platform and promote the utilization of data in fields other than the disaster risk management, such as tourism, traffic, safety security, welfare, etc.

Though Phase 1 is now considered as an F/S which will be targeted in Smart JAMP, fund raising for after that is necessary. IRDA is now considering the budget for these phases using;

- USD400,000 project budget for international bidding competition
- Matching grant from either State or Federal government (or both) will be sought upon successful bid for international grant.
- State and Federal annual budget can also be applied to expand the project scope for the same river or other rivers in the State or in Malaysia
- Funds from specific ministries such as **Ministry of Environment and Water** (in charge of rivers, both DID and DoE are under this ministry), **Ministry of Housing and Local Government** (in charge of municipal governments) and **Ministry of Science, Technology and Innovation** can be sought to fund different aspects of the same pilot project based on the feasibility study
- CSR fund contributed by private companies based along the river Skudai
- Other, if any.

-Other relevant projects, if any.

We expect the following structures for this F/S

- F/S to be led by both experienced engineering entity and machine learning analytics on Smart Disaster Risk Management
- The team to include vendors/suppliers/manufactures for monitoring systems
- The future plan to be proposed by the team shall be feasible and reasonable cost.