SPACE TECHNOLOGY FOR SOCIO-ECONOMIC DEVELOPMENT IN MALAYSIA

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* Malaysia socio-economy scenario
* Use of space technology for development
* The Malaysian Space Programme
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MALAYSIA SOCIO-ECONOMY SCENARIO

- Agriculture – 1957 - 1980
- Industrial – 1980 - 1990
- Knowledge-based – 1990 - now
- Innovation led – 2000 - now
- VISION 2020
TRANSFORMING MALAYSIA
The Two Pillars of the National Transformation Programme

1Malaysia – People First, Performance Now
Preservation and Enhancement of Unity in Diversity

Government Transformation Plan (GTP)
- Effective Delivery of Government Services

Economic Transformation Programme (ETP)
- New Economic Model
  - A High Income, Inclusive And Sustainable Nation
  - High Income
  - Inclusiveness
  - Sustainability

10th & 11th Malaysia Plan Roll-Out
Macroeconomic growth targets & expenditure allocation
Implementation of Government’s Development Programmes

www.neac.gov.my
THE GOALS OF THE NEW ECONOMIC MODEL (NEM)
Aspirations of a united and advanced nation in line with the 1Malaysia concept

Goals of the New Economic Model

High Income
Targets US$15,000 - 20,000 per capita by 2020

Rakyat
Quality of Life
Enables all communities to fully benefit from the wealth of the country

Inclusiveness

Sustainability
Meets present needs without compromising future generations

Characteristics of Malaysia in 2020

- Market Led
- Well-Governed
- Regionally Integrated
- Entrepreneurial
- Innovative
USE OF SPACE TECHNOLOGY FOR DEVELOPMENT

* EARLY 70’S
  * Satellite broadcasting
* 80’S
  * Remote sensing, meteorology
* 90’S
  * GNSS, GIS

* CURRENT
  * Remote Sensing
  * Satellite Communications
  * GNSS
REMOTE SENSING

Malaysian Agency for Remote Sensing (ARSM)

* Integrated Geospatial Database and Planning (IGDP) System
* Fishing Site Identification System
* Rice Monitoring and Yield Prediction System
* Monitoring of Environmentally Sensitive Areas
* Disaster Management
* Biodiversity Inventory
Integrated Geospatial Database and Planning (IGDP) System

* IGDP System and application packages utilizes the advantages of remote sensing technology in generating data and geospatial information, full geographic information system (GIS) analytical capabilities, Global Positioning System (GPS) and related technologies.
  * integrated database
  * standardised data
  * readily available for use
  * full geospatial analysis
  * fast data and information dissemination through web-based

* The development of IGDP system spatial database at 1:50,000 scale which includes base data of agriculture, forestry, geology, coastal zone and socio-economic were completed in 2007.
A collaborative project between ARSM, Department of Fisheries Malaysia (DOF), National Fishermen Association (NEKMAT), Fisheries Development Authority of Malaysia (LKIM) and MIMOS Bhd.

The first phase of the system; 'now casting' has been successfully developed in 2009.

Through 'now casting' system, fishing location is identified based on sea surface temperature and phytoplankton parameters which were extracted from remote sensing satellite images.

Potential fishing zone maps were then produced and distributed to fishermen through fishermen's association office either by fax, e-mail, sms, internet (web portal) or satellite phone.
Fishing Site Identification System

1. Satellite Image Processing and Analysis (MODIS, OCM & NOAA)
2. Fish Location Prediction Model and Fisheries Database
3. Field Data Collection (Oceanographic and Fish Catch Data)
4. Potential Fishing Zone Map
5. Information Distribution System (E-mail, Satellite Phone, Fax, SMS, Web Portal)
6. User (Fishermen)
A collaboration project between ARSM, Multimedia University (MMU) and MUDA Agricultural Development Authority (MADA)

The objective is to develop rice monitoring and yield prediction system based on remote sensing technology using RADARSAT satellite data.

Upon completion, the system will enable estimation of rice yield to be made one month before harvest compared to 6-12 months after harvest for the conventional method of the crop cutting survey (CCS).
Precision Farming

The right input, the right amount, the right time and the right place

Technologies employed:
- Remote sensing, satellite navigation system
- Geographical Information Systems
- Automatic yield recording systems
- Automatic soil sensor
- Variable Rate Technology
- Advanced agronomy
- Advanced farm management
Disaster management system is supporting the National Security Council of the Prime Minister's Department and relevant agencies in the management of major disasters in the country.

- Natural disaster addressed are forest fire, flood and landslide.
- The system consists of three components
  - (i) Early Warning
  - (ii) Detection and Monitoring, and
  - (iii) Mitigation and Relief.
Biodiversity Inventory
Other RS Applications

Agriculture
• Irrigation
• Soil Management

Geology
• Stratigraphy & Structure
• Mineral & Mining
• Geomorphology
• Petroleum Exploration

Land Information System
• Rural & Cadastral

Urban Planning
• Urban Sprawl
• Fringe Area Development
• Urban Agglomeration

Environment
• Conservation & Monitoring
• Planning & Policy
• Wetland Management
• Wildlife Management
• Forest Management
• Water Pollution
• Air Pollution
SATELLITE COMMUNICATIONS

- Wireless networks
- Telephony
- Messaging
- Satellite phones
- Internet broadband
- VSATs
- Credit card validation
- National communication system
ASTRO Satellite Services
Direct to Home Services
**VSAT**

- VSAT applications
  - Government
  - Businesses
  - Military
Smart School Project

The Implementation Plan:

* Wave 3 – Making All Schools Smart (2005-2010)
* Wave 4 – Consolidate and Stabilise (2010-2020)
GNSS applications:

- Navigation
- Positioning
- Precise Time scale
- Surveying and mapping
- Search and rescue
- Air traffic control
- Asset tracking
- Automated farming
GNSS

* Surveying and mapping

* JUPEM RTKNet
GNSS

* GPS Navigation and tracking
THE MALAYSIAN SPACE PROGRAMS

* The National Space Policy
* The Satellite Development Programme
* The Ground Infrastructures
* The Local Space Industry
* The Malaysian Outer Space Act
THE NATIONAL SPACE POLICY

VISION
Embracing space as a strategic sector for national well-being towards achieving Vision 2020 and beyond.

MISSION
The National Space Policy aims to develop the country’s potential in the space sector to support the development of the new economy, and strengthening the national security.

OBJECTIVES
To build up space infrastructure and industry for economic benefit and safeguarding the nation’s sovereignty.
To empower the civil society in enriching their quality of life through information from innovative application of space technology.
THE NATIONAL SPACE POLICY

THE PROGRAMMES AND ACTION PLANS …

Thrust 1
• PROGRAM 1: NURTURING THE SPACE INDUSTRY

Thrust 2
• PROGRAM 2: ENHANCING THE NATIONAL SPACE PROGRAMS
THE NATIONAL SPACE POLICY

PROGRAM 1: NURTURING THE SPACE INDUSTRY

Setting up the Space Government-Industry Council

Identify and cluster local space industry

incubation programs for startups

special space-status company

Tax incentives
THE NATIONAL SPACE POLICY

PROGRAM 2: ENHANCING THE NATIONAL SPACE PROGRAMS

Developing the National Satellite Programme

- Earth Observation Satellite
- Communication Satellite
- GNSS
Satellite Development Programme

* The Earth Observation Satellite
* The Communication satellite
* The GNSS
Earth Observations Satellite Programme

- TiungSAT-1: 2000-2003
- RazakSAT: 2009-2010
- RazakSAT-2: 2015-2020
Earth Observation Satellite

RazakSAT

- Collaboration project with SaTReCi, Korea
- Mass: 180kg
- Camera resolution: 5 m multispectral; 2.5 m panchromatic
- Orbit: Near Equatorial
- Launch: 2008
- Rocket: Falcon1 500kg capacity
RazakSAT2

MISSION

* Infrastructure mapping
RazakSAT2

- Technical Specifications:

<table>
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<tr>
<th>Technical</th>
<th>Spec</th>
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<tbody>
<tr>
<td>GSD</td>
<td>1.0 m PAN, 4.0 m MS</td>
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<tr>
<td>Swath</td>
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<td>Orbit</td>
<td>SSO</td>
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<tr>
<td>Altitude</td>
<td>650 km</td>
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<tr>
<td>Lifespan</td>
<td>5 + 2 years</td>
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- Expected Launch date: 2015
- Operations: 2015 – 2020 (5 + 2 years)
The National Satellite Communication Programme

- Endorsed in 2008
- Phase A completed in 2010
- Development (7 years) yet to commence

The Mission

- Providing communication linkages to government and related agencies

MEASAT satellite series

- Private player since 1996
  - Serving the world
The GNSS Programme

- Multi-GNSS
  - Development of GNSS and DGPS Integrity Monitoring Systems in Malaysia
  - Multi GNSS Monitoring Network – collaboration with JAXA
- Regional SBAS
  - QZSS, GAGAN
- GLONASS
The Mission Operation Centre
The Ground Receiving Stations
The Optical Lab
The Assembly, Integration and Test (AIT) Facility
The Archive and Data Centre
THE MISSION CONTROL FACILITY

Completion 2005

Equipment fully operational 2006
THE AIT FACILITY
THE AIT FACILITY

ACOUSTIC CHAMBER

EMC TEST FACILITY
THE OPTICAL CALIBRATION LAB
Calibration of RazakSAT camera
The Downstream Space Industries

- Communication
- Remote Sensing
- Satellite Navigation
THE MALAYSIA OUTER SPACE ACT (MOSA)

* In the drafting process
* PURPOSES;
  * To regulate domestic space-related activities
  * To enable ratification of UN Outer Space Treaties
  * To set-up regulatory body
Space will remain for along time, a high-risk sector of fragile economic viability, even if the potential of its applications is ever increasing.

Requires careful and precise strategic planning.

Regional/international collaborations is one strategic plan.

Strong priority should be given to capacity building.
THANK-YOU