CHAPTER 7
STATE SPATIAL MANAGEMENT PLANS

A State Spatial Management Plan is the basic framework that guides the translation of the strategies and actions of NPP4 into the context of each state within the NPP4 planned area.

The preparation of NPP has gone through several phases, from the First NPP to the current 4th NPP, or NPP4. It has also undergone a series of planning reforms and advancements that need to be implemented to form a strong and integrated spatial planning in order to drive sustainable and balanced development between regions (inter and intra) and between urban and rural areas.

In line with the main functions of the NPP, the preparation of State Spatial Management Plans is a necessity in ensuring that planning strategies and actions can be translated and rationalised at the regional and state levels.

Functions and Objectives of State Spatial Management Plan

State Spatial Management Plans are formulated to translate the strategic direction of the country into implementation at the state level, which includes all the states in Peninsular Malaysia and the Federal Territory of Labuan.

The plans take into consideration the major contents of State Structure Plans (SP), Local Plans (LP), Special Area Plans (SAP) and other relevant documents being in force at the time of NPP4 preparation. The State Spatial Management Plans should become the basis for all implementing agencies in planning for growth centres, preservation of resource areas, and in ensuring natural disaster risk management are considered in planning process.

There are three (3) types of state spatial management plan prepared for each state in Peninsular Malaysia and F.T. Labuan, namely:

i. Spatial Growth Framework Plan.

ii. Resource Management Plan.

iii. Natural Disaster Risk Area Management Plan.

The main objectives of a State Spatial Management Plan are:

- Guide the current and future state development direction in line with the national development strategic direction.
- Ensure effective and optimal infrastructure development in state spatial development.
- Become a reference to the State Planning Authority in identifying the capability of the state to achieve the development proposed and the targets set at the national level.
- Encourage involvement and collaboration at the national and state levels in advancing the growth and development of the country.

Boh Tea Plantation at Sungai Palas, **Cameron Highland**

List of NPP4 Growth Centres

The Spatial Growth Framework Plan focuses on development in the Conurbations and Promoted Development Zones (PDZs). The proposed polycentric development pattern for these growth areas can enhance their competitiveness, especially in terms of strengthening the growth and development in these areas.

Besides the Conurbations and the PDZs, NPP4 has also identified Catalysts Centres which consist of medium-sized towns located outside the Conurbations and the PDZs. The selection of Catalysts Centres was based on their potential to serve as growth nodes for the surrounding areas. For these Centres, NPP4 proposes a monocentric development pattern to ensure the concentration of economic activities and urban services in these towns so that they can function as the centre of development and growth.

Additionally, NPP4 also identifies Agropolitan Centres to serve as major agricultural service centres, with the potential to become centres for agricultural marketing and trade as well as to generate local economic growth. The Catalyst Centres differ from Agropolitan Centres in the sense that economic activities in the former are more diverse that the latter. Agropolitan Centres are mainly limited to agricultural economy and activities.

4 **Conurbations**
(Excluding 2 Conurbations in Sabah and Sarawak)

11 **Promoted Development Zones (PDZs)**

24 **Catalyst Centres**

23 **Agropolitan Centres**

Table 7-1: List of Conurbations, PDZs, Catalyst Centres and Agropolitan Centres for the NPP4

State	Conurbation	Promoted Development Zone (PDZ)	Catalyst Centre	Agropolitan Centre
Perlis	-	• Kuala Perlis - Kangar - Arau - Pauh Putra • Padang Besar - Lembah Chuping	• Berseri • Kaki Bukit - Wang Kelian	-
Kedah	**Northern Conurbation** • Kulim - Sungai Petani - Bandar Baharu - Yan • The entire State of Penang • Part of Selama, Perak **National Conurbation** Part of Tanjung Malim	• Alor Setar - Jitra - Pendang	• Kuah • Bukit Kayu Hitam	• Kuala Nerang • Sik • Baling • Air Hitam
Penang		-	-	-
Perak		• Ipoh - Seri Iskandar - Lumut	• Taiping - Kamunting • Lenggong • Gerik • Teluk Intan • Bagan Datuk	• Pengkalan Hulu • Manong • Trolak
Kelantan	-	• Kota Bharu (Bachok- Kota Bharu - Machang - Pasir Mas - Pasir Puteh - Tanah Merah - Tumpat)	• Jeli • Gua Musang	• Kuala Krai • Lojing
Terengganu	**Eastern Conurbation** • Chukai • Kerteh • Kuantan	• Kuala Terengganu	• Jertih	• Bandar Permaisuri • Jertih
Pahang		• Jerantut - Bandar Tun Razak (Maran) - Temerloh - Mentakab	• Bentong • Bandar Muadzam Shah	• Raub • Kuala Lipis • Kuala Rompin
Selangor	**National Conurbation** Almost the entire State of Selangor • The entire Federal Territories • Malaysia Vision Valley (MV) comprising Seremban District dan Port Dickson District	-	• Kuala Selangor • Sungai Besar	• Sekinchan • Sabak
Federal Territories of Kuala Lumpur and Putrajaya		-	-	-
Negeri Sembilan		-	• Tampin • Gemas • Seri Jempol	• Gemas • Seri Jempol • Rembau • Kuala Pilah
Melaka	-	• Malacca Historical City	• Kuala Linggi • Pulau Sebang • Sungai Rambai	-
Johor	**Southern Conurbation** Johor Bahru to Bandar Tenggara	• Tangkak - Bandar Maharani Bandar Diraja - Pagoh • Bandar Penggaram - Kluang	• Segamat • Mersing	• Labis • Tenggaroh • Rengit
Federal Territory of Labuan	-	• Labuan (covering the whole of the archipelago)	-	-

Source: NPP4, 2020

PERLIS

SPATIAL GROWTH FRAMEWORK

Spatial Management is a framework in managing the availability of land, transport, growth areas, population settlement hierarchy and community involvement in creating a quality and liveable living environment. The intensification of development is emphasised through effective and holistic spatial management to facilitate implementation of proposals for land use development in the future.

PD 2.1 PD 3.6 PD 2.6 Sustainable and Competitive Economic Growth

1. Strengthen the Promoted Development Zones (PDZs) and Catalyst Centres, namely Kuala Perlis - Kangar - Arau - Pauh Putra PDZ, Padang Besar - Lembah Chuping PDZ, Beseri Catalyst Centre and Kaki Bukit - Wang Kelian Catalyst Centre.
2. Strengthen the role of the PDZs by focusing on the exploration of new agrobusinesses and cross-border cooperation with Thailand.
3. Enhance the role of the border towns and gateways of Wang Kelian and Padang Besar as well as special towns (Arau as the Royal Town).
4. Enhance the development of economic activities particularly involving the Chuping Valley Industrial Area (CVIA) and the Special Border Economic Zone (SBEZ) to support and complement each other.
5. Boost the tourism industry through the utilisation of biodiversity assets with extensive branding and promotion.

PD 3.1 PD 3.4 PD 3.2 Integrated and Strategic Transport Network

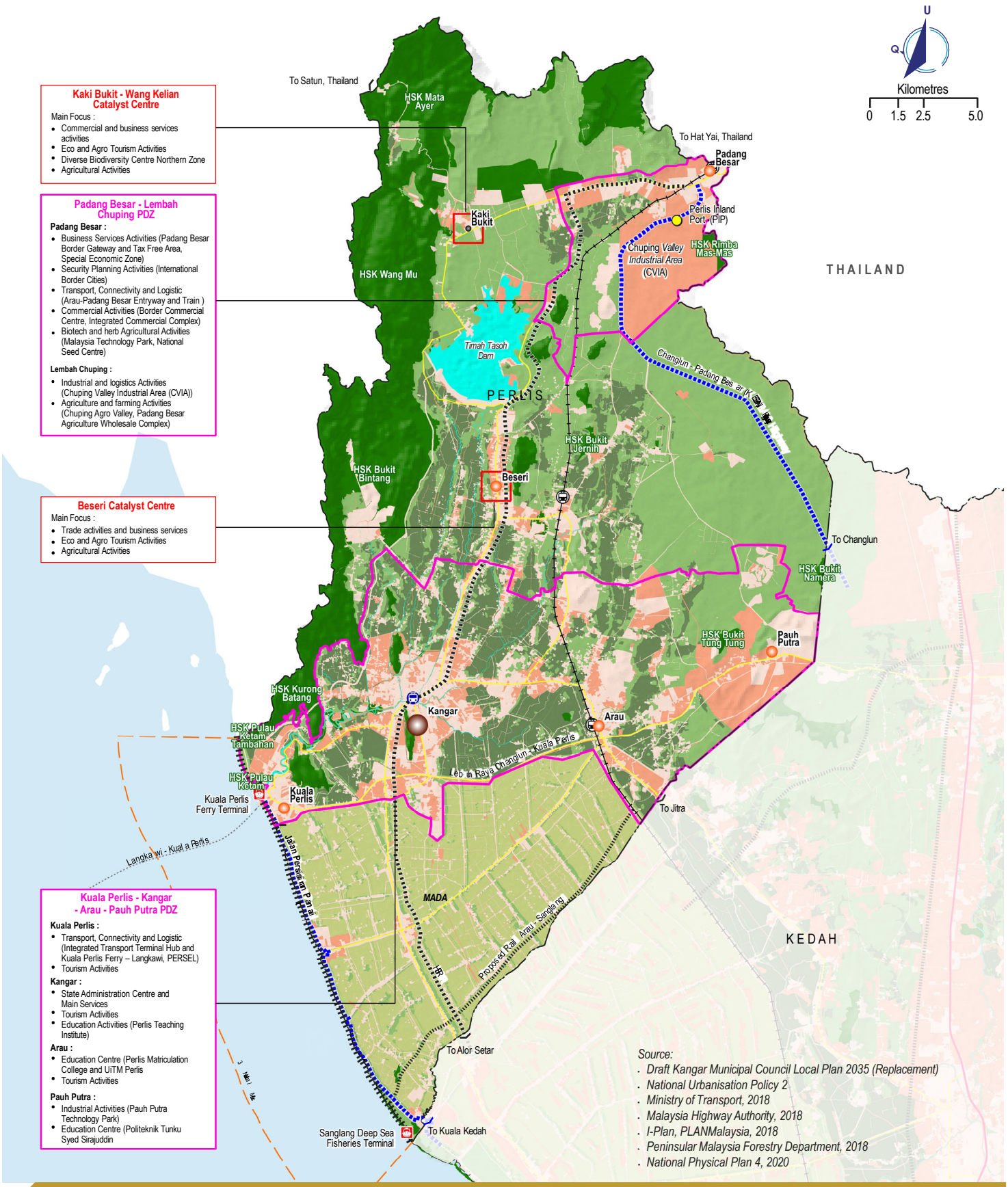
1. Strengthen the road network to improve linkages between the regions through the proposed coastal road and the connection of the Northern Corridor Highway (NCH) via the Padang Besar - Sintok Highway (KESBAN).
2. Expand and integrate the existing rail network with new lines connecting Padang Besar - Perlis Inland Port (PIP) and Arau - Sanglang.
3. Expand the high-speed rail network connecting Padang Besar to Alor Setar (proposed HSR).

KD 2.2 Coastal Area Development and Protection

1. Manage development and land reclamation activities in coastal areas.
2. Manage and protect marine habitats and ecological diversity in coastal zones in accordance with the RFZPPN2.

KI 1.1 KI 3.3 KI 2.1 KI 4.1 KI 3.2 Liveable Environment and Inclusive Community

1. Provide adequate and affordable housing for the B40 and M40 target groups in urban areas.
2. Improve the quality of housing and neighbourhoods in rural areas through planned development.
3. Provide adequate and suitable facilities to nurture a smart society, which will become one of the building blocks of a developed and smart nation.
4. Promote green practices, healthy and safe lifestyle among communities and in residential surroundings.
5. Strengthen the role of the community in the planning and development process to ensure community needs are considered in the process.



MAP 7-1 : PERLIS STATE SPATIAL GROWTH FRAMEWORK

Growth Area
- Promoted Development Zone
- Catalyst Centre
- Agropolitan Centre
- State City
- Local Town
- Town

Land Use
- Current Built-up
- Proposed Built-up
- Forest
- Water Bodies
- Agriculture
- National Rice Bowl
- Outside National Rice Bowl

Coastal Development and Protection Area
- Coastal Development Zone

Land and Water Transport
- Highway
- Road
- Proposed Highway
- Existing Rail Line
- Proposed High Speed Rail Line
- Proposed Inter City Rail Line
- Water Route
- Rail Station
- Proposed Rail Station
- Passenger / Fisheries Terminal
- Inland Port

Others
- 3 Nautical Miles Boundary
- State Boundary
- District Boundary

PERLIS RESOURCE MANAGEMENT

Resource management in NPP4 consists of five (5) main categories, namely natural, water, energy, food and heritage resources. These resources are national assets that provide important life support system. Good governance and appropriate laws are required to preserve and conserve the country's archeological assets and to ensure their benefits remain into the future.

KD 2.1 KD 2.6 KD 2.5 Sustainable Management of Natural, Food and Heritage Resources

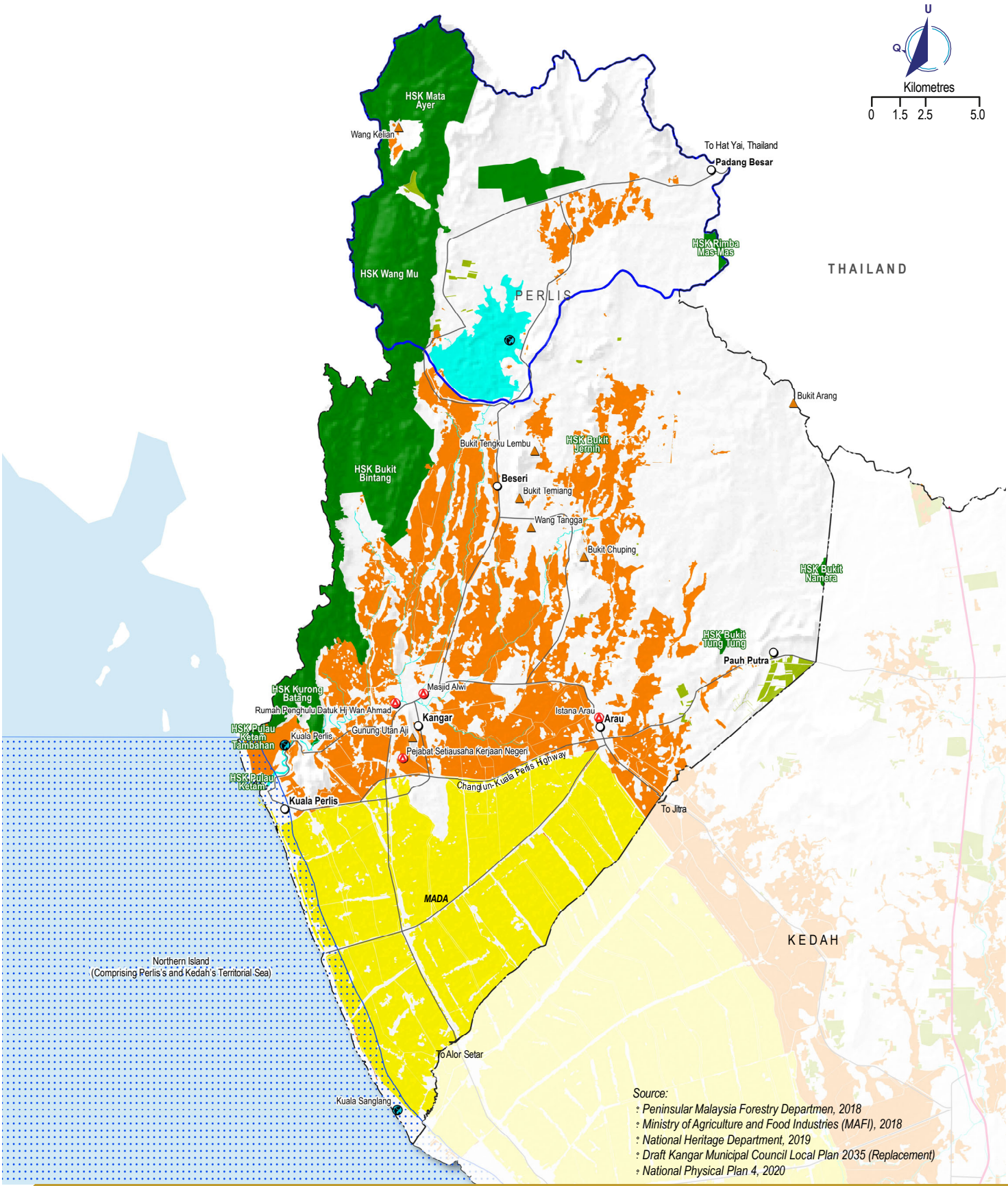
1. Preserve HSK Mata Ayer, HSK Wang Mu, HSK Bukit Bintang, HSK Kurong Batang, HSK Pulau Ketam and HSK Pulau Ketam Tambahan, HSK Bukit Gua Sami, HSK Bukit Jernih, HSK Rimba Mas-Mas, HSK Bukit Namera and HSK Bukit Tung-Tung to protect wildlife habitats and to ensure the continuity of the forest landscape.
2. Gazette, protect and conserve marine protected areas and coastal areas (including Perlis waters in the Northern Islands).
3. Preserve and protect major food resource areas. This includes the Perlis Muda Agricultural Development Authority (MADA) paddy area (20,304 hectares) as well as large-scale farms and livestock areas [NCER Agro Economic Zone (NAEZ)].
4. Gazette natural sites of outstanding value and of historical, artistic or scientific significance under the National Heritage Act (Act 645).
5. Protect Aquaculture Industrial Zones (ZIA) as source of national food security.
6. Maintain and preserve key agricultural areas (KPU) in Perlis.
7. Maintain MADA paddy areas as the national food source and increase rice self-sufficiency level.

KD 2.3 Improve Sustainable Water Resource

1. Gazette the Perlis River Basin reserve.
2. Control the development and activities in water catchment areas (Timah Tasoh Dam).
3. Apply the concept of "Sponge City" for urban water management (focus on built-up areas).
4. Encourage the use of grey water and groundwater as alternative water supply sources.
5. Reduce the rate of non-revenue water (NRW) by increasing the efficiency of water supply system management.

KD 3.1 KD 3.3 KD 3.2 Implement Low-carbon City and Sustainable Alternative Energy Resource Approaches

1. Increase usage of smart technology, low-carbon mobility and green building practices in development.
2. Encourage the development of biogas and biomass energy generation in plantation, cattle ranching and landfill areas.
3. Increase the production and generation of renewable energy (RE) by strengthening solar energy generation.
4. Develop micro-hydro power plants for rural areas to support agricultural activities and daily life of the people.



MAP 7-2: PERLIS STATE RESOURCE MANAGEMENT

Natural Resources
- Forest Reserve

Natural Heritage Resources
- Proposed Marine Protection Area
- Proposed Natural Heritage Geological Area

Water Resources
- Dam Reservoir
- Water Body

Energy Resources
- River
- Dam Location (Hydro Powered and Mini Hydro)
- Oil Palm Plantation

Food Resources
- National Rice Bowl
- Paddy Field Outside National Rice Bowl
- Aquaculture Industrial Zone

Cultural Heritage Resources
- Building/Monument/Site Heritage
- Proposed Building/Monument/Site Heritage

Others
- Main Towns
- Roads
- State Boundary

PERLIS

NATURAL DISASTER RISK AREA MANAGEMENT

The management of risk area includes identification of areas affected by natural disaster, as well as re-examination of the radius for areas prone to natural disaster.

KD 1.5 Landslide Risk

1. Map and classify slope 'hotspot' areas according to the categories of stable (safe), showing signs of instability, and high risk.
2. Adopt the Guidelines for Development in Slope and Highland Areas (2009) as the basis for development control and for evaluation of the suitability of proposed development involving highlands and areas with slope in Perlis.
3. Adopt community-based landslide management approach to encourage local community involvement in the management of slope and highland areas.

KD 1.5 Flood Risk

1. Expand the coverage of flood risk map to flood vulnerability areas in Perlis which include major settlement areas namely in parts of Kangar, Arau and Padang Besar.
2. Translate the integrated land use management of flood risk area into SP, LP and SAP for the purpose of development control and planning approval evaluation.
3. Apply the concept of 'living with flood' to increase community preparedness towards flood risk.

KD 1.5 Earthquake and Tsunami Risk

1. Map tsunami risk areas in detail by taking into account the aspects of vulnerability and hazard of tsunami-prone areas, especially on the coast of Perlis.
2. Some areas in the state of Perlis may be exposed to tsunami and the possibility of radiation (as these areas are within 1,500 kilometer from the Anak Krakatua volcano and tsunami along the Andaman sea).

KD 1.5 KD 2.2 Coastal Erosion Risk

1. Adopt the RFZPPN2 as the main reference in the planning and control of development in coastal erosion risk areas in Perlis.
2. Implement the Perlis State Coastal Vulnerability Index (CVI) for coastal erosion risk as a guide to development control in the coastal zones.
3. Regulate land reclamation activities in coastal areas.
4. Adapt Nature Based Solution (NBS) approach and green infrastructure for the protection of environmentally sensitive coastal areas.

KD 1.5 Sea Level Rise Risk

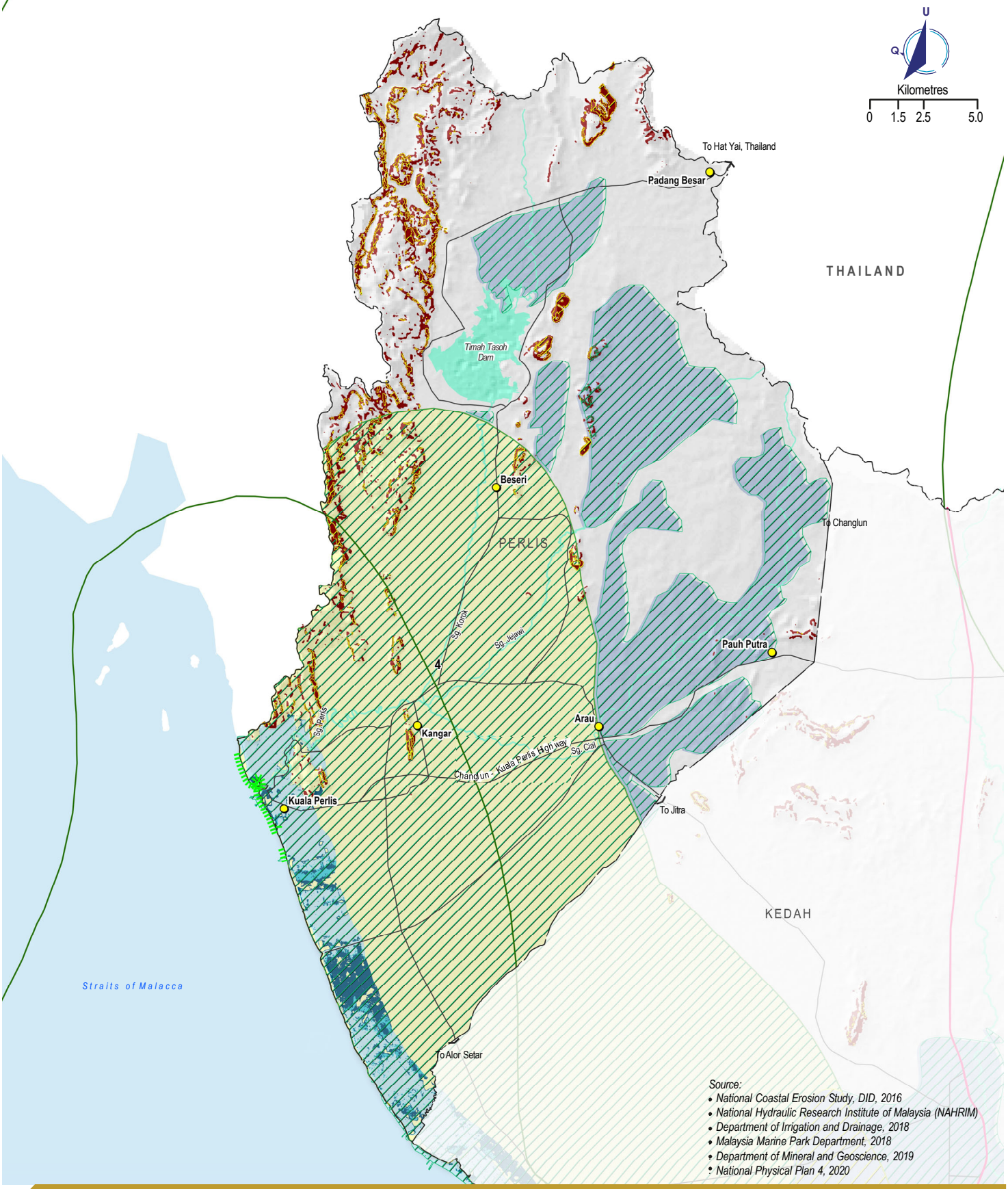
1. Adopt the RFZPPN2 as the main reference in the planning and control of coastal development in Perlis.
2. Implement the Perlis State Coastal Vulnerability Index (CVI) as a guide to development control in the coastal zones of Perlis.
3. Control development and land reclamation activities along the coastal waters of Perlis.

KD 1.5 Drought Risk

1. Apply the concept of sponge-city development for urban water management (focus on built-up areas).
2. Expand the use of rainwater harvesting as an alternative water supply source during the dry season.
3. Explore and diversify alternative water sources such as riverside water reservoirs (TAPS) and groundwater to reduce dependence on rivers and dams.

KD 1.5 Forest and Peatland Fire Risk

1. Prepare peat soil fire risk map according to the categories of non-disaster risk zone and disaster risk zone.
2. Encourage community participation in peatland forest management.



MAP 7-3 : PERLIS STATE NATURAL DISASTER RISK AREA MANAGEMENT

Landslide Risk Areas
- Landslide Risk (Slope >25°)

Flood Risk
- Flood Risk

Earthquake and Tsunami Risk
- Fault Line
- Tsunami Risk

Coastal Erosion Risk
- Not Serious / Acceptable

Sea Level Rise Risk
- Projection Year 2030 (0.12m)
- Projection Year 2050 (0.23m)
- Projection Year 2100 (0.73m)

Disaster Risk Category
- Low Risk Area

Others
- River and Dam
- Main Towns
- Roads
- State Boundary

KEDAH

SPATIAL GROWTH FRAMEWORK

Spatial Management is a framework in managing the availability of land, transport, growth areas, settlement hierarchy and community involvement in creating a quality and liveable living environment. The intensification of development is emphasised through effective and holistic management to facilitate implementation of proposals for future land use development.

PD 2.1 PD 2.6 PD 2.4 PD 3.5 Sustainable and Competitive Economic Growth

1. Strengthen the Northern Conurbation (Kulim - Sungai Petani - Bandar Baharu - Yan), the Alor Setar - Jitra - Pendang Promoted Development Zone (PDZ), and the Kuah and Bukit Kayu Hitam Catalyst Centres.
2. Bandar Jitra, Kuala Kedah and Baling have the potential to be upgraded into main towns.
3. Develop Kuala Nerang, Baling, Sik and Air Hitam Agropolitan Centres as rural growth nodes.
4. Strengthen the role of the Bukit Kayu Hitam Catalyst Centre by focusing on the exploration of new agrobusinesses and cross-border cooperation with Thailand.
5. Strengthen the role of Bandar Baharu District as a hub to focus on major agricultural products such as *durian* (Durian Duri Hitam).
6. Enhance the role of the Teluk Ewa Port to support the manufacturing and production activities in the surrounding areas.
7. The Yan Port has the potential to be developed a logistics hub.
8. Enhance cruise ship services at the Porto Malai Ferry Terminal, Langkawi and the Teluk Apau Domestic Ferry Terminal, Kuah to promote tourism activities.
9. Increase development of economic activities especially involving the Special Border Economic Zone (SBEZ) in Bukit Kayu Hitam (Duty Free City) - Changlun and the Kedah Science and Technology Park (KSTP) to support and complement each other.
10. Boost the tourism industry by leveraging on biodiversity assets of Limestone Cave Complex, Gunung Jerai, Tasik Pedu and Tasik Muda with extensive branding.

PD 3.1 PD 3.4 PD 3.2 Integrated and Strategic Transport Network

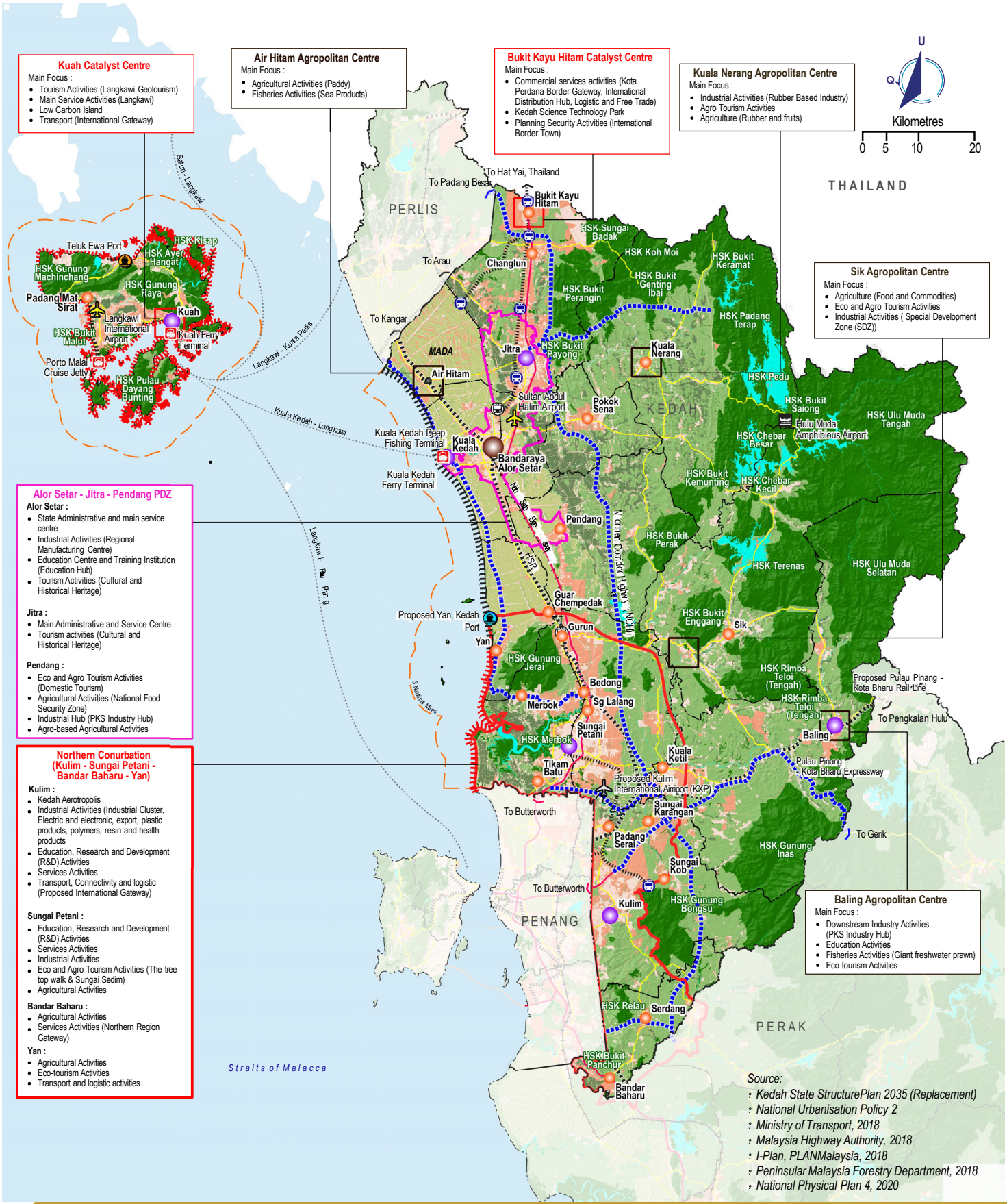
1. Strengthen the road network between the regions through the proposed Coastal Road, the Northern Corridor Highway (NCH), a new extension from the East-West Road, the Kota Bharu - Penang Highway Link, and the Tikam Batu - Kuala Ketil (KXP Link Road).
2. Expand and integrate the existing rail network with new lines that connect Bukit Kayu Hitam - Alor Setar, Bukit Kayu Hitam - Changlun, and Sungai Petani - Kulim.
3. Expand the high-speed rail network connecting Alor Setar - Kulim - Butterworth, and Kulim - Pengkalan Hulu (Proposed HSR).
4. Strengthen the role of the Langkawi International Airport and the proposed Kulim International Airport (KXP) as Regional Airports (Category 2), and Sultan Abdul Halim Airport as a Domestic Airport (Category 3).

KD 2.2 Coastal Area Development and Protection

1. Manage development and land reclamation activities in coastal areas.
2. Manage and protect marine habitats and ecological diversity in coastal zones in accordance with the RFZPPN2.

KI 1.1 KI 3.3 KI 2.1 KI 4.1 KI 3.2 Liveable Environment and Inclusive Communities

1. Provide adequate and affordable housing for the B40 and M40 target groups in urban areas.
2. Improve the quality of housing and neighbourhoods in rural areas through planned development.
3. Provide adequate and suitable facilities to nurture a smart society, which will become one of the building blocks of a developed and smart nation.
4. Promote green practices, healthy and safe lifestyles among communities and in residential surroundings.
5. Strengthen the role of the community in the planning and development process to ensure community needs are considered in the process.



MAP 7-4 : KEDAH STATE SPATIAL GROWTH FRAMEWORK

Growth Area
- Conurbation
- Promoted Development Zone
- Catalyst Centre
- Agropolitan Centre
- State City
- Main City
- Local Town
- Town

Land Use
- Current Built-up
- Proposed Built-up
- Forest
- Water Bodies
- Agriculture
- National Rice Bowl
- Outside National Rice Bowl

Coastal Development and Protection Area
- Coastal Development Zone
- Coastal Protection Zone

Land, Air and Water Transport
- Highway
- Road
- Proposed Highway
- Existing Rail Line
- Proposed High Speed Rail Line
- Proposed Inter City Rail Line
- Water Route
- Rail Station
- Proposed Rail Station
- Airport
- Proposed Airport
- Proposed Amphibious Airport
- Port
- Proposed Port
- Passenger / Fisheries Terminal

Others
- 3 Nautical Miles Boundary
- State Boundary
- District Boundary

KEDAH

RESOURCE MANAGEMENT

Resource management in NPP4 consists of five (5) main categories, namely natural, water, energy, food and heritage resources. These resources are national assets that provide important life support system. Good governance and appropriate laws are required to preserve and conserve the country's archeological assets and to ensure their benefits remain into the future.

KD 2.1 KD 2.6 KD 2.5 Sustainable Management of Natural, Food and Heritage Resources

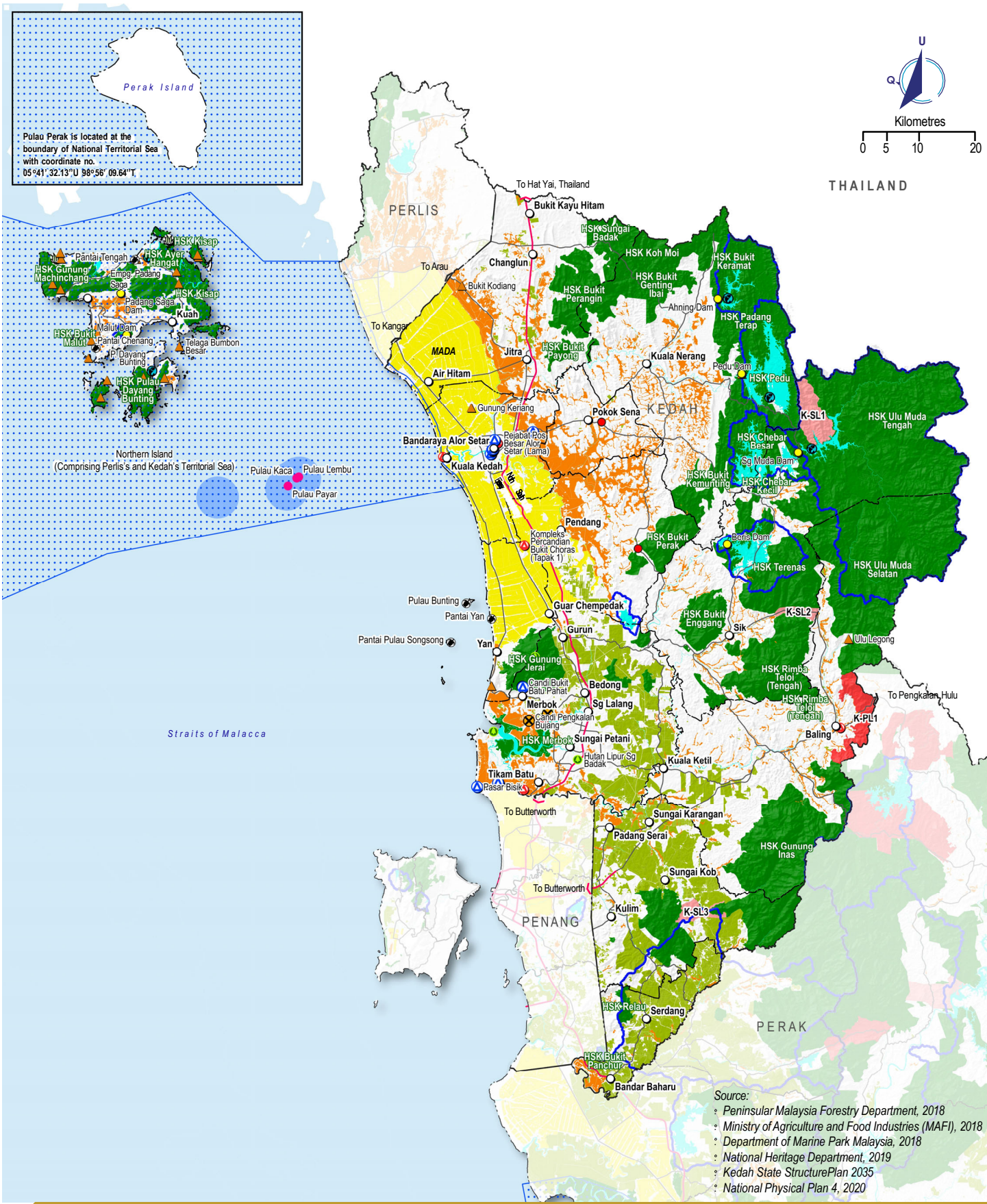
1. Preserve HSK Bukit Machinchang, HSK Bukit Malut, HSK Pulau Dayang Bunting, HSK Gunung Raya, HSK Ayer Hangat, HSK Kisap, HSK Sungai Badak, HSK Bukit Perangin, HSK Koh Moi, HSK Bukit Payong, HSK Bukit Genting Ibai, HSK Bukit Keramat, HSK Padang Terap, HSK Pedu, HSK Chebar Besar, HSK Chebar Kecil, HSK Bukit Saiong, HSK Ulu Muda Tengah, HSK Ulu Muda Selatan, HSK Bukit Kemunting, HSK Terenas, HSK Bukit Perak, HSK Bukit Enggang, HSK Rimba Teloi (Tengah) , HSK Merbok, HSK Gunung Inas, HSK Gunung Bongsu, HSK Relau, HSK Bukit Panchur and HSK Gunung Jerai to protect the ecosystem and wildlife habitats.
2. Gazette, protect and conserve marine protected areas and coastal areas (including Kedah waters in the Northern Islands).
3. Conserve the ecological corridors K-SL2 HS Ulu Muda - HS Rimba Telui and K-SL3 HS Gunung Bongsu - HS Gunung Inas to maintain the continuity of the forest landscape.
4. Preserve natural eco-tourism assets namely Tasik Pedu (Padang Terap) and Tasik Muda (Sik).
5. Preserve and protect major food source areas. This includes the Perlis & Kedah Muda Agricultural Development Authority (MADA) paddy area (100,685 hectares) as well as large-scale farms and livestock area [NCER Agro Economic Zone (NAEZ)].
6. Gazette natural sites of outstanding value and historical, artistic or scientific significance under the National Heritage Act (Act 645).
7. Gazette endangered habitats as protected areas (turtle landing sites and seaweed areas).
8. Protect Permanent Food Production Park (TKPM) and Aquaculture Industrial Zone (ZIA) as sources of food security.
9. Maintain and preserve Key Agricultural Area (KPU) in Kedah.
10. Maintain paddy areas (MADA) as source of staple food for the country and increase rice self-sufficiency level.

KD 2.3 Improve Sustainable Water Resource

1. Gazette the Sungai Kedah, Sungai Yan Kecil, Sungai Merbok and Sungai Muda basin reserves.
2. Control the development and activities in water catchment areas (Malut Dam, Padang Saga Dam, Ahning Dam, Pedu Dam, Muda Dam and Beris Dam).
3. Apply the concept of "Sponge City" for urban water management (focus on built-up areas).
4. Encourage the use of grey water and groundwater as alternative water supply sources.
5. Reduce the rate of non-revenue water (NRW) by increasing the efficiency of water supply system management.

KD 3.1 KD 3.3 KD 3.2 Implement Low-carbon City and Sustainable Alternative Energy Resource Approaches

1. Increase usage of smart technology, low-carbon mobility and green building practices in development.
2. Encourage the development of biogas and biomass energy generation in plantation, cattle ranching and landfill areas.
3. Increase the production and generation of renewable energy (RE) by strengthening solar energy generation.
4. Develop micro-hydro power plants for rural areas to support agricultural activities and daily life of the people.



MAP 7-5 : KEDAH STATE RESOURCE MANAGEMENT

Natural Resources
- Forest Reserve
- CFS Ecological Link

Natural Heritage Resources
- Natural Heritage Site
- Turtle Landing Location
- Seaweed Areas
- Coral Reef Areas
- Proposed Marine Protection Area
- Proposed Natural Heritage Geological Area
- Marine Park

Water Resources
- Dam Reservoir
- Water Body

Energy Resources
- River
- Dam Location (Hydro Powered and Mini Hydro)
- Oil Palm Plantation

Food Resources
- National Rice Bowl
- Paddy Field Outside
- Permanent Food Production Park
- Aquaculture Industrial Zone

Cultural Heritage Resources
- Archeological Heritage Site
- Building/ Monument/ Site Heritage
- Proposed Bulding/ Monument/ Site Heritage

Others
- Main Towns
- Highway
- Roads
- State Boundary
- District Boundary

KEDAH — NATURAL DISASTER RISK AREAS MANAGEMENT

The management of risk area includes identification of areas affected by natural disaster, as well as re-examination of the radius for areas prone to natural disaster.

KD 1.5 Landslide Risk

1. Map and classify slope 'hotspot' areas according to the categories of stable (safe), showing signs of instability, and high risk.
2. Adopt the Guidelines for Development in Slope and Highland Areas (2009) as the basis of development control and for evaluation of the suitability of proposed development involving highlands and areas with slope in Kedah.
3. Prohibit logging and land use change in highland area more than 1,000 metres above sea level.
4. Adopt community-based landslide management approach to encourage local community involvement in the management of slope and highland areas.

KD 1.5 Flood Risk

1. Expand the coverage of flood risk map to flood vulnerability areas in Kedah which include major settlement areas namely in Alor Setar, Jitra, Kuala Kedah, Baling, Kuala Ketil, Sungai Karangan, Padang Serai and Tikam Batu.
2. Translate the integrated land use management of flood risk area into SP, LP and SAP for the purpose of development control and planning approval evaluation.
3. Apply the concept of 'living with flood' to increase community preparedness towards flood risk.

KD 1.5 Earthquake and Tsunami Risk

1. Map tsunami risk area in detail by taking into account the aspects of vulnerability and hazard of tsunami-prone areas, especially on the coast of Kedah.
2. Some areas in the state of Kedah may be exposed to tsunami and the possibility of radiation (as these areas are within 1,500 kilometer from the Anak Krakatua volcano and tsunami along the Andaman sea).

KD 1.5 KD 2.2 Coastal Erosion Risk

1. Adopt the RFZPPN2 as the main reference in the planning and control of development in coastal erosion risk areas in Kedah.
2. Implement the Kedah State Coastal Vulnerability Index (CVI) for coastal erosion risk as a guide to development control in the coastal zones.
3. Manage and regulate land reclamation activities in coastal areas.
4. Adapt Nature Based Solution (NBS) approach and green infrastructure for the protection of environmentally sensitive coastal areas.
5. Implement development control for coastal waters around Langkawi Island.

KD 1.5 Sea Level Rise Risk

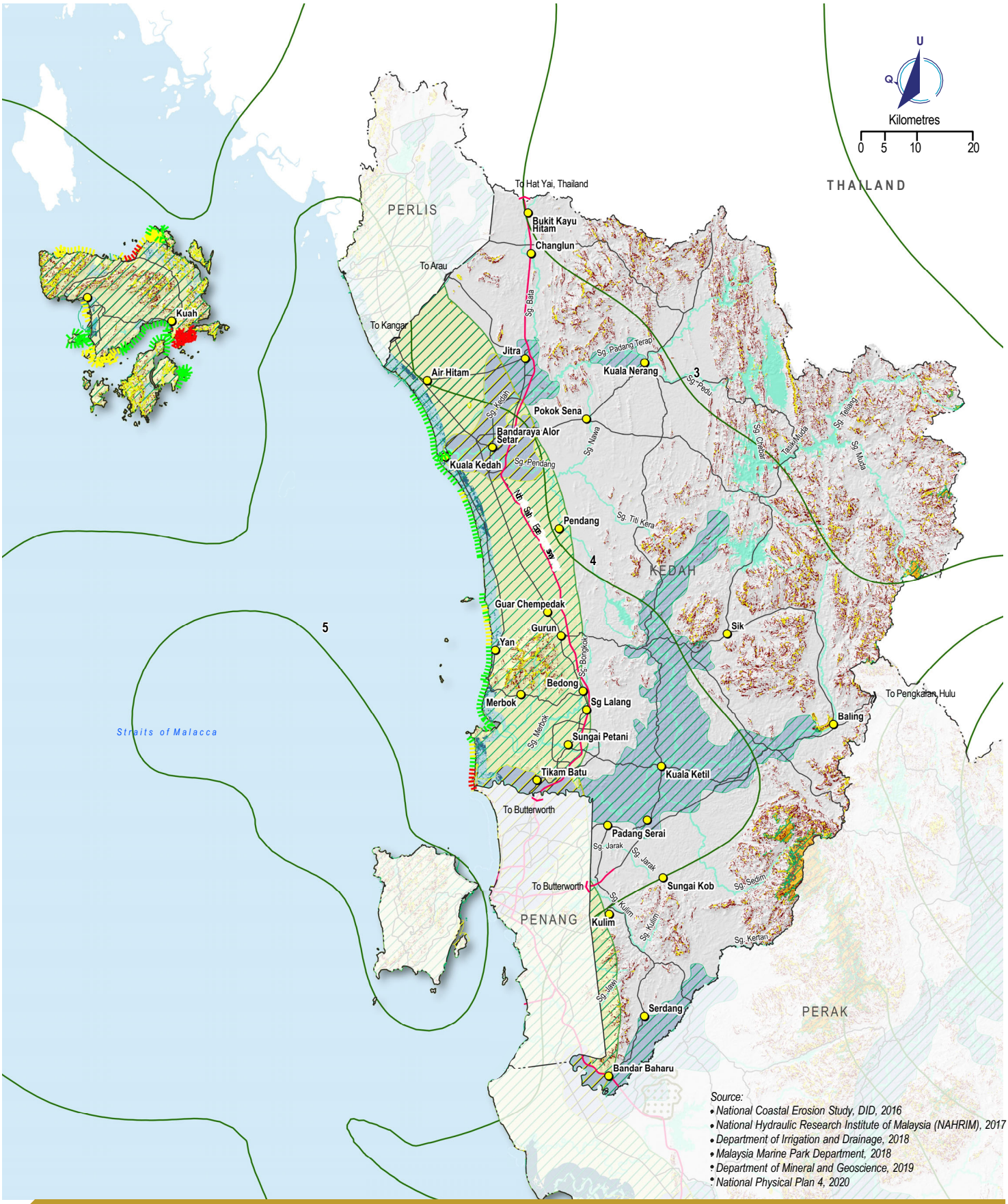
1. Adopt the RFZPPN2 as the main reference in the planning and control of coastal development in Kedah.
2. Implement the Kedah State Coastal Vulnerability Index (CVI) as a guide to development control in the coastal zones of Kuala Kedah and Kuala Muda.
3. Control development and land reclamation activities along the coastal waters of Kedah.

KD 1.5 Drought Risk

1. Apply the concept of sponge-city development for urban water management (focus on built-up areas).
2. Expand the use of rainwater harvesting as an alternative water supply source during the dry season.
3. Explore and diversify alternative water sources such as riverside water reservoirs (TAPS) and groundwater to reduce dependence on rivers and dams.

KD 1.5 Forest and Peatland Fire Risk

1. Prepare peat soil fire risk map according to the categories of non-disaster risk zone and disaster risk zone.
2. Encourage community participation in peatland forest management.



Source:
- *National Coastal Erosion Study, DID, 2016*
- *National Hydraulic Research Institute of Malaysia (NAHRIM), 2017*
- *Department of Irrigation and Drainage, 2018*
- *Malaysia Marine Park Department, 2018*
- *Department of Mineral and Geoscience, 2019*
- *National Physical Plan 4, 2020*

MAP 7-6 : KEDAH STATE NATURAL DISASTER RISK AREA MANAGEMENT

Landslide Risk Areas
- Landslide Risk (Slope >25°)
- Highland (> 1,000m)

Flood Risk
- Flood Risk

Earthquake and Tsunami Risk
- Fault Line
- Tsunami Risk

Coastal Erosion Risk
- Critical
- Significant
- Not Serious / Acceptable

Sea Level Rise Risk
- Projection Year 2030 (0.12m)
- Projection Year 2050 (0.23m)
- Projection Year 2100 (0.73m)

Disaster Risk Category
- High Risk Area
- Moderate Risk Area
- Low Risk Area

Others
- River and Dam
- Main Towns
- Highway
- Roads
- State Boundary
- District Boundary

PENANG SPATIAL GROWTH FRAMEWORK

Spatial Management is a framework in managing the availability of land, transport, growth areas, settlement hierarchy and community involvement in creating a quality and liveable living environment. The intensification of development is emphasised through effective and holistic management to facilitate implementation of proposals for future land use development.

PD 2.1 PD 3.6 PD 2.6 Sustainable and Competitive Economic Growth

1. Strengthen development in the Northern Conurbation (entire Penang State).
2. George Town has the potential to be upgraded into a global city.
3. Strengthen South Seberang Perai and its surrounding areas as one of the key agriculture hubs by focusing on downstream agricultural and consumer activities.
4. Enhance the high value chain of services, industrial and tourism activities.
5. Develop Butterworth as a tourism hub in Seberang Perai.
6. Enhance the role of the Prai Inland Port as a logistics hub.
7. Strengthen health tourism by making Penang a major health tourism destination in the region.
8. Enhance the role of the Penang Port as a hub for the country and the region to handle all types of cargo.
9. Enhance cruise ship services at the Swettenham Pier Cruise Terminal to promote tourism activities.

PD 3.1 PD 3.4 PD 3.2 PD 3.6 Integrated and Strategic Transport Network

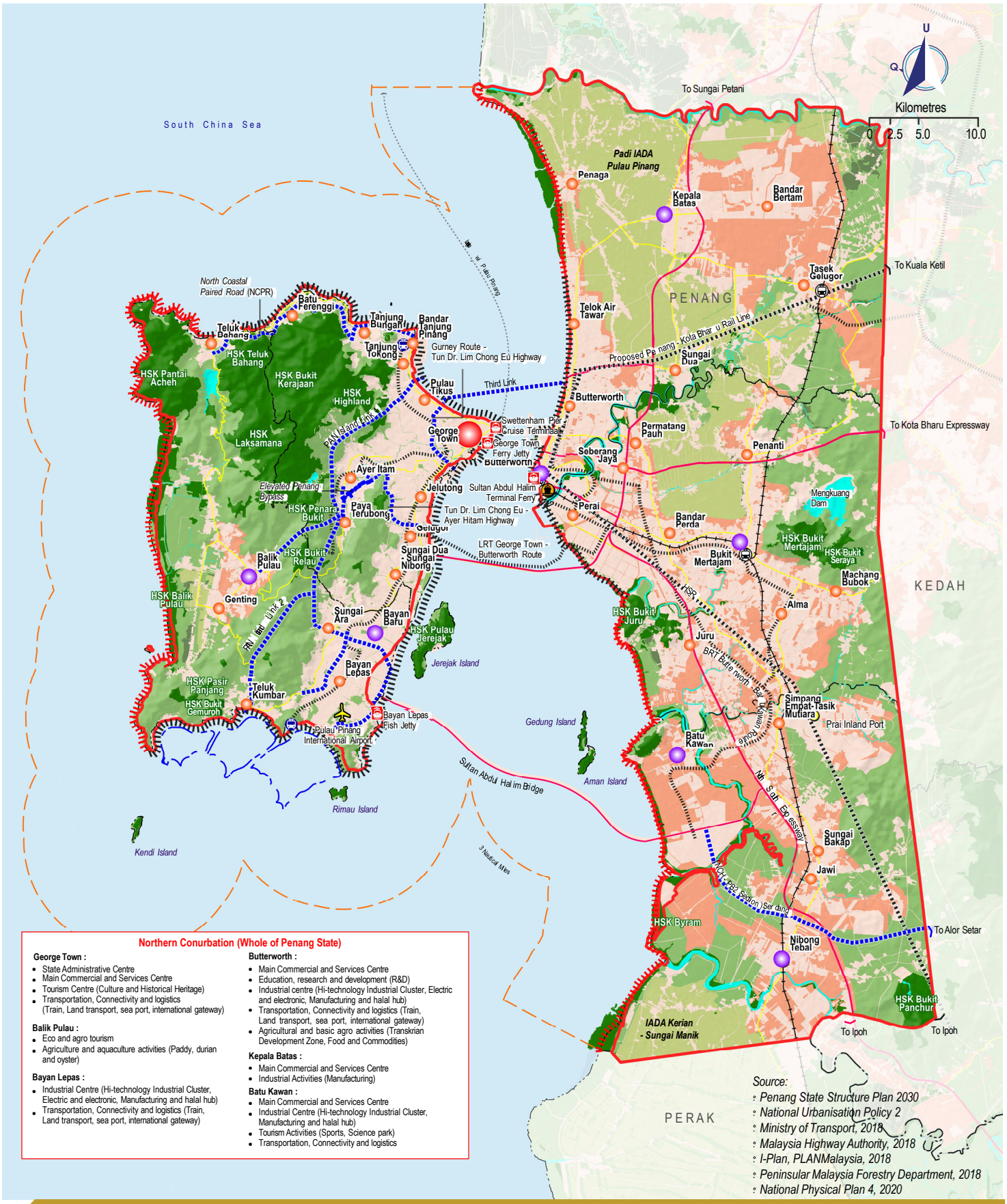
1. Strengthen the road network between the regions through the proposed bypass roads from the Tun Dr. Lim Chong Eu Highway to Ayer Itam (Package 2) and to Persiaran Gurney (George Town) (Package 3), the Pan Island Link 1 (PIL 1) - Persiaran Gurney to Tun Dr. Lim Chong Eu Highway, the Pan Island Link 2 (PIL 2) - Relau to Pulau B (Penang South Reclamation - PSR), the Pan Island Link 2A (PIL 2A) - Tun Dr. Lim Chong Eu Highway to Pulau A (Penang South Reclamation - PSR), the Third Route (Package 4) from Persiaran Gurney to Bagan Ajam, the new road (NCH - PB2 Section) Serdang, Kedah to Second Bridge, the Elevated Penang Bypass via Sg Dua to Juru and the North Coastal Paired Road (NCPR) - Package 1
2. Expand and integrate the existing rail network with new lines that connect to Bayan Baru LRT Line, George Town - Butterworth LRT Line, Butterworth BRT Line - Batu Kawan.
3. Expand the high-speed rail network connecting Kulim - Butterworth - Taiping Town (Proposed HSR) and the proposed Penang - Kota Bharu rail line (Proposed ECRL 3).
4. Strengthen the role of the Penang International Airport as a Regional Airport (Category 2) with increased passenger and cargo capacity.
5. Increase port capacity, namely the North Butterworth Cargo Terminal (NBCT), the Butterworth Cargo Terminal, the Perai Bulk Cargo Terminal and the Swettenham Pier Cruise Terminal (SPCT).
6. Upgrade public transport in George Town with a modal split target of 50:50 between public transport and private vehicle.

KD 2.2 Coastal Area Development and Protection

1. Manage development and land reclamation activities in coastal areas.
2. Manage and protect marine habitats and ecological diversity in coastal zones in accordance with the RFZPPN2.

KI 1.1 KI 3.3 KI 2.1 KI 4.1 KI 3.2 Liveable Environment and Inclusive Communities

1. Provide adequate and affordable housing for the B40 and M40 target groups in urban areas.
2. Improve the quality of housing and neighbourhoods in rural areas through planned development.
3. Provide adequate and suitable facilities to nurture a smart society, which will become one of the building blocks of a developed and smart nation.
4. Promote green practices, healthy and safe lifestyles among communities and in residential surroundings.
5. Strengthen the role of the community in the planning and development process to ensure community needs are considered in the process.



Northern Conurbation (Whole of Penang State)

George Town :
- State Administrative Centre
- Main Commercial and Services Centre
- Tourism Centre (Culture and Historical Heritage)
- Transportation, Connectivity and logistics (Train, Land transport, sea port, international gateway)

Balik Pulau :
- Eco and agro tourism
- Agriculture and aquaculture activities (Paddy, durian and oyster)

Bayan Lepas :
- Industrial Centre (Hi-technology Industrial Cluster, Electric and electronic, Manufacturing and halal hub)
- Transportation, Connectivity and logistics (Train, Land transport, sea port, international gateway)

Butterworth :
- Main Commercial and Services Centre
- Education, research and development (R&D)
- Industrial centre (Hi-technology Industrial Cluster, Electric and electronic, Manufacturing and halal hub)
- Transportation, Connectivity and logistics (Train, Land transport, sea port, international gateway)
- Agricultural and basic agro activities (Transkrian Development Zone, Food and Commodities)

Kepala Batas :
- Main Commercial and Services Centre
- Industrial Activities (Manufacturing)

Batu Kawan :
- Main Commercial and Services Centre
- Industrial Centre (Hi-technology Industrial Cluster, Manufacturing and halal hub)
- Tourism Activities (Sports, Science park)
- Transportation, Connectivity and logistics

MAP 7-7 : PENANG STATE SPATIAL GROWTH FRAMEWORK

Growth Area
- Conurbation
- Global City
- Main City
- Local Town

Land Use
- Current Built-up
- Proposed Built-up
- Forest
- Water Bodies
- Agriculture
- National Rice Bowl
- Outside National Rice Bowl

Coastal Development and Protection Area
- Coastal Development Zone
- Coastal Protection Zone

Land, Air and Water Transport
- Highway
- Road
- Proposed Highway
- Existing Rail Line
- Proposed High Speed Rail Line
- Proposed Inter City Rail Line
- Water Route
- Rail Station
- Proposed Rail Station
- Airport
- Port
- Passenger / Fisheries Terminal
- Inland Port

Others
- Reclaimed Area
- 3 Nautical Miles Boundary
- State Boundary
- District Boundary

PENANG

RESOURCE MANAGEMENT

Resource management in NPP4 consists of five (5) main categories, namely natural, water, energy, food and heritage resources. These resources are national assets that provide important life support system. Good governance and appropriate laws are required to preserve and conserve the country's archeological assets and to ensure their benefits remain into the future.

KD 2.1 KD 2.6 KD 2.5 Sustainable Management of Natural, Food and Heritage Resources

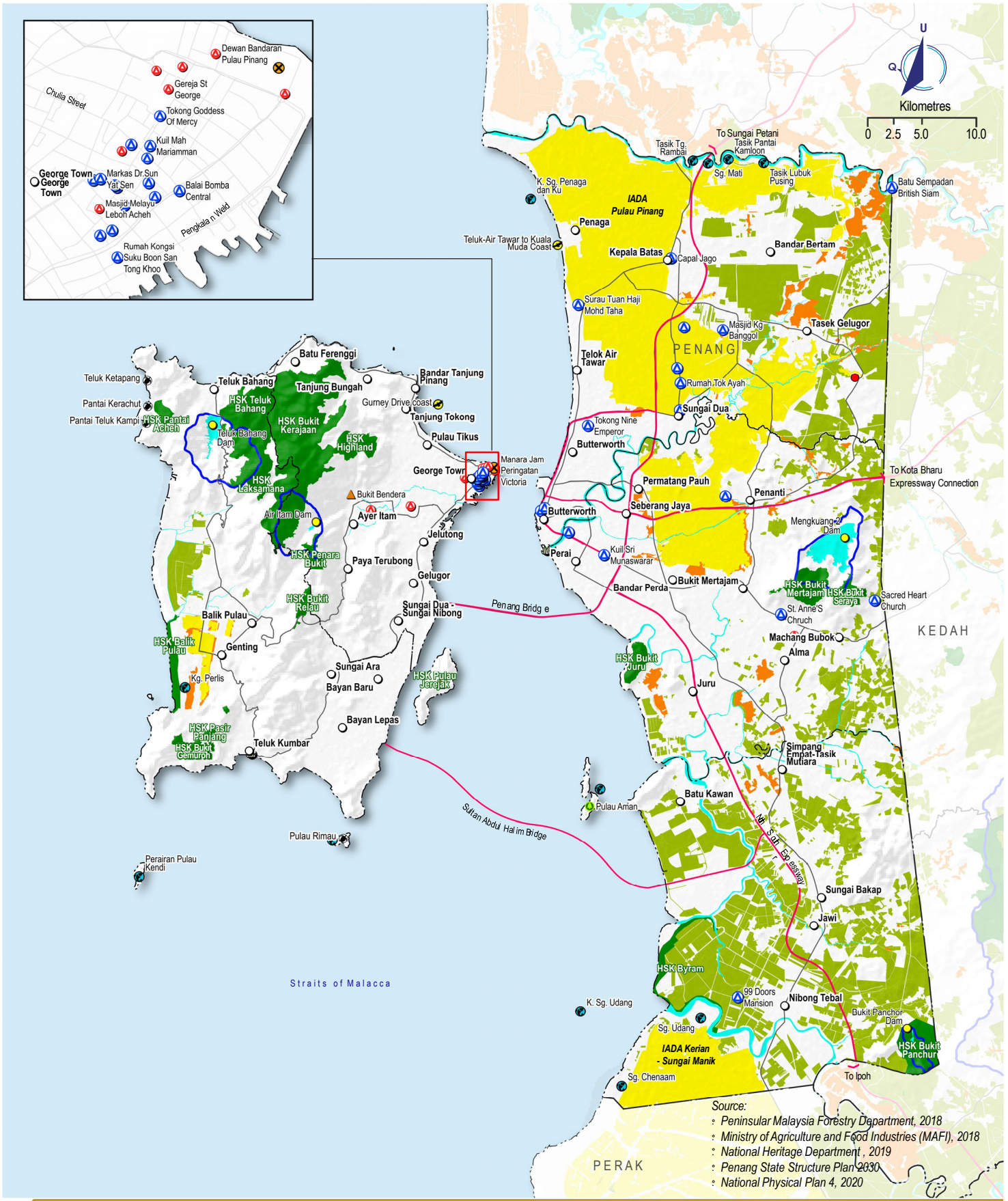
1. Preserve HSK Pantai Acheh, HSK Teluk Bahang, HSK Bukit Kerajaan, HSK Highland, HSK Laksamana, HSK Penara Bukit, HSK Bukit Relau, HSK Balik Pulau, HSK Bukit Gemuruh, HSK Bukit Genting, HSK Bukit Mertajam, HSK Juru, HSK Bukit Panchur, HSK Byram, HSK Bukit Seraya, HSK Pasir Panjang and HSK Pulau Jerejak to protect the ecosystem and wildlife habitats.
2. Maintain and retain paddy areas in the Penang Integrated Agricultural Development Area (IADA) (12,782 hectares), (IADA) Kerian - Sungai Manik (21,108 hectares) and also outside IADA area to protect national food security.
3. Gazette natural sites of outstanding value and historical, artistic or scientific significance under the National Heritage Act (Act 645).
4. Gazette endangered habitats as protected areas (turtle landing sites, important bird areas and seaweed areas).
5. Protect Permanent Food Production Park (TKPM) and Aquaculture Industrial Zone (ZIA) as sources of national food security.
6. Maintain the ecosystem and diversity of natural resources in Bukit Bendera and its surroundings as a 'Biosphere Reserve' for sustainable development.
7. Maintain and preserve key agricultural areas (KPU) in Penang.
8. Maintain the paddy area (IADA) Penang and (IADA) Kerian-Sungai Manik as the national food sources and increase the rice self-sufficiency level.
9. Maintain large-scale farms and livestock areas [NCER Agro Economic Zone (NAEZ)].

KD 2.3 Improve Sustainable Water Resource

1. Gazette the Sungai Perai, Sungai Juru and Sungai Jawi basin reserves.
2. Control the development and activities in water catchment areas (Teluk Bahang Dam, Air Hitam Dam, Mengkuang Dam and Bukit Panchor Dam).
3. Apply the concept of "Sponge City" for urban water management (focus on built-up areas).
4. Encourage the use of grey water and groundwater as alternative water supply sources.
5. Reduce the rate of non-revenue water (NRW) by increasing the efficiency of water supply system management.

KD 3.1 KD 3.3 KD 3.2 Implement Low-carbon City and Sustainable Alternative Energy Resource Approaches

1. Increase usage of smart technology, low-carbon mobility and green building practices in development.
2. Encourage the development of biogas and biomass energy generation in plantation, cattle ranching and landfill areas.
3. Increase the production and generation of renewable energy (RE) by strengthening solar energy generation.
4. Develop micro-hydro power plants for rural areas to support agricultural activities and daily life of the people.



MAP 7-8 : PENANG STATE RESOURCES MANAGEMENT

Natural Resources
- Forest Reserve

Natural Heritage Resources
- Natural Heritage Site
- Turtle Landing Location
- Important Bird Area
- Seaweed Areas
- Coral Reef Areas

Water Resources
- Dam Reservoir
- Water Body

Energy Resources
- River
- Dam Location (Hydro Powered and Mini Hydro)
- Oil Palm Plantation

Food Resources
- National Rice Bowl
- Paddy Field Outside National Rice Bowl
- National Rice Bowl Permanent Food Production Park
- Aquaculture Industrial Zone

Cultural Heritage Resources
- Archeological Heritage Site
- Building/ Monument/ Site Heritage
- Proposed Building/ Monument/ Site Heritage

Others
- Main Tower
- Highway
- Roads
- State Boundary
- District Boundary

PENANG — NATURAL DISASTER RISK AREAS MANAGEMENT

The management of risk area includes identification of areas affected by natural disaster, as well as re-examination of the radius for areas prone to natural disaster.

KD 1.5 Landslide Risk

1. Map and classify slope 'hotspot' areas according to the categories of stable (safe), showing signs of instability, and high risk.
2. Adopt the Guidelines for Development in Slope and Highland Areas (2009) as the basis for development control and for evaluation of the suitability of proposed development involving highlands and areas with slope in Penang.
3. Adopt community-based landslide management approach to encourage local community involvement in the management of slope and highland areas.

KD 1.5 Flood Risk

1. Expand the coverage of flood risk map to flood vulnerability areas in Penang (involving settlement areas in Penaga, Kepala Batas, Bandar Bertam, Sungai Pinang, Sungai Air Terjun, Sungai Kecil/Parit Lumba Kuda, Sungai Jelutung, Sungai Ayer Hitam, Sungai Gelugor, Sungai Air Putih, Sungai Dondang, Sungai Batu Feringghi, Sungai Dua, Sungai Mas, Sungai Relau and Sungai Jermal, Telok Air Tawar, Butterworth, Permatang Pauh, Seberang Jaya, Perai and part of Penanti).
2. Translate the integrated land use management of flood risk areas into SP, LP and SAP for the purpose of development control and planning approval evaluation.
3. Apply the concept of 'living with flood' to increase community preparedness towards flood risk.

KD 1.5 Earthquake and Tsunami Risk

1. Map tsunami risk area in detail by taking into account the aspects of vulnerability and hazard of tsunami-prone areas, especially on the coast of Penang.
2. Some areas in the state of Penang may be exposed to tsunami and the possibility of radiation (as these areas are within 1,500 kilometer from the Anak Krakatua volcano and tsunami along the Andaman sea).

KD 1.5 KD 2.2 Coastal Erosion Risk

1. Adopt the RFZPPN2 as the main reference in the planning and control of development in coastal erosion risk areas in Penang.
2. Implement the Penang State Coastal Vulnerability Index (CVI) for coastal erosion risk as a guide to development control in the coastal zones.
3. Regulate land reclamation activities in coastal areas.
4. Adapt Nature Based Solution (NBS) approach and green infrastructure for the protection of environmentally sensitive coastal areas.
5. Implement development control for coastal waters in Butterworth - Penaga, Sungai Dua - Sungai Nibong, Tanjung Tokong, Tanjung Bungah and Pulau Jerejak.

KD 1.5 Sea Level Rise Risk

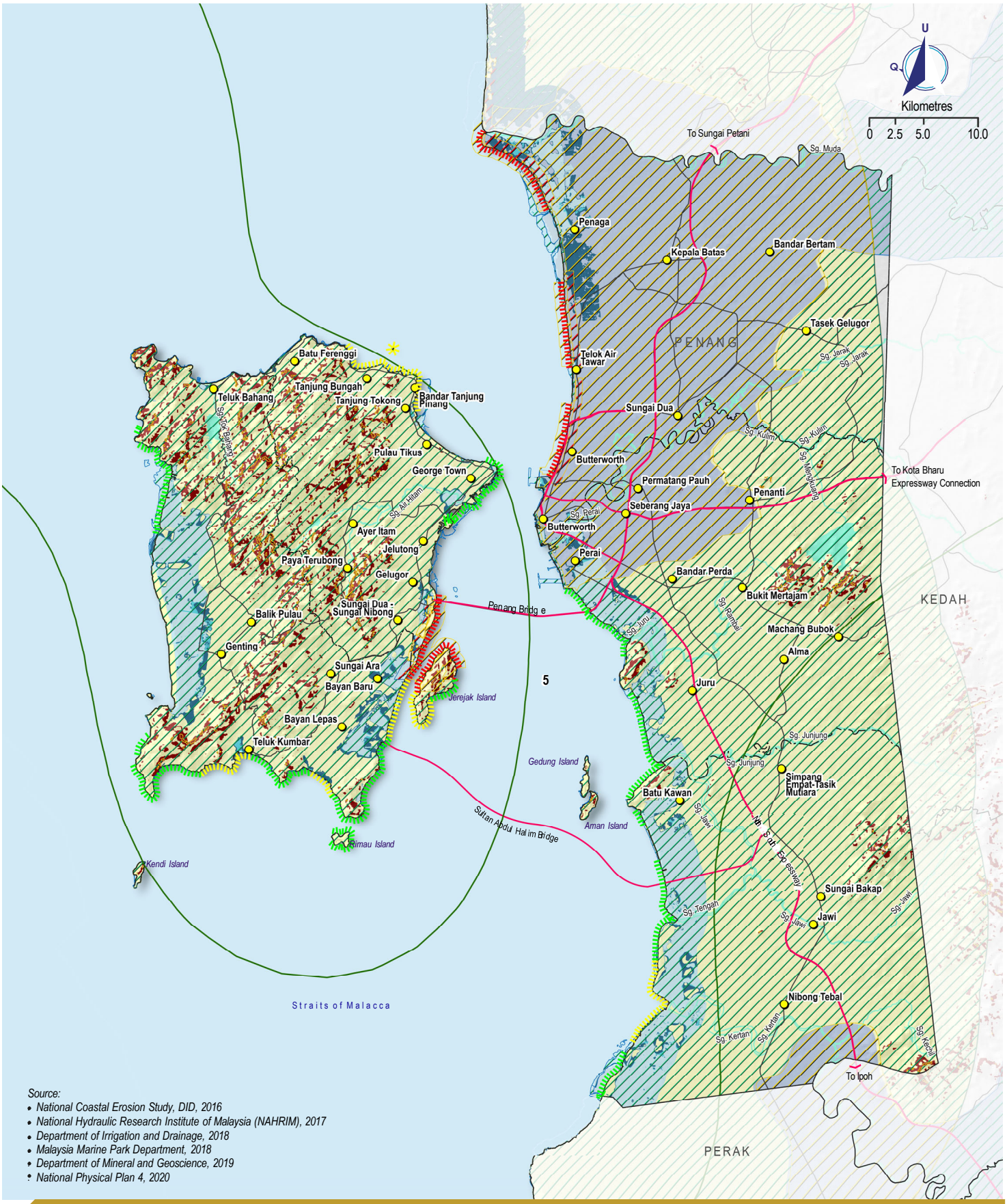
1. Adopt the RFZPPN2 as the main reference in the planning and control of coastal development in Penang.
2. Implement the Penang State Coastal Vulnerability Index (CVI) as a guide to development control in the coastal zone of Seberang Perai.
3. Control development and land reclamation activities along the coastal waters of Penang.

KD 1.5 Drought Risk

1. Apply the concept of sponge-city development for urban water management (focus on built-up areas).
2. Expand the use of rainwater harvesting as an alternative water supply source during the dry season.
3. Explore and diversify alternative water sources such as riverside water reservoirs (TAPS) and groundwater to reduce dependence on rivers and dams.

KD 1.5 Forest and Peatland Fire Risk

1. Prepare peat soil fire risk map according to the categories of non-disaster risk zone and disaster risk zone.
2. Encourage community participation in peatland forest management.



Source:

- *National Coastal Erosion Study, DID, 2016*
- *National Hydraulic Research Institute of Malaysia (NAHRIM), 2017*
- *Department of Irrigation and Drainage, 2018*
- *Malaysia Marine Park Department, 2018*
- *Department of Mineral and Geoscience, 2019*
- *National Physical Plan 4, 2020*

MAP 7-9 : PENANG STATE NATURAL DISASTER RISK AREA MANAGEMENT

Landslide Risk Areas
- Landslide Risk (Slope >25°)

Flood Risk
- Flood Risk

Earthquake and Tsunami Risk
- Fault Line
- Tsunami Risk

Coastal Erosion Risk
- Critical
- Significant
- Not Serious/ Acceptable

Sea Level Rise Risk
- Projection Year (0.12m)
- Projection Year (0.24m)
- Projection Year 2100 (0.73m)

Disaster Risk Category
- High Risk Area
- Moderate Risk Area
- Low Risk Area

Others
- River/ Dam
- Main Towns
- Highway
- Roads
- State Boundary
- District Boundary

PERAK

SPATIAL GROWTH FRAMEWORK

Spatial Management is a framework in managing the availability of land, transport, growth areas, population settlement hierarchy and community involvement in creating a quality and liveable living environment. The intensification of development is emphasised through effective and holistic management to facilitate implementation of proposals for future land use development.

PD 2.1 PD 3.6 PD 2.6 Sustainable and Competitive Economic Growth

1. Strengthen the National Conurbation (part of Tanjung Malim), the Northern Conurbation (North Perak including Parit Buntar - Bagan Serai - Alor Pongsu and Selama), the Ipoh - Seri Iskandar - Lumut Promoted Development Zone (PDZ) and also the Taiping - Kamunting, Teluk Intan, Lenggong, Gerik and Bagan Datuk Catalyst Centres.
2. Bandaraya Ipoh has the potential to be upgraded into a regional city, while Bandar Gerik, Kuala Kangsar, Sungai Siput, Batu Gajah, Kampar, Tapah and Bagan Datuk into main towns.
3. Develop the Pengkalan Hulu, Manong and Trolak Agropolitan Centres as rural growth nodes.
4. Enhance the role of the Batu Gajah Land Port as a logistics hub.
5. Enhance the role of the Lumut Port and the proposed Bagan Datuk Port to support the manufacturing and production activities in the surrounding areas.
6. Boost the tourism industry by leveraging on biodiversity assets through extensive branding and promotion.

PD 3.1 PD 3.4 PD 3.2 Integrated and Strategic Transport Network

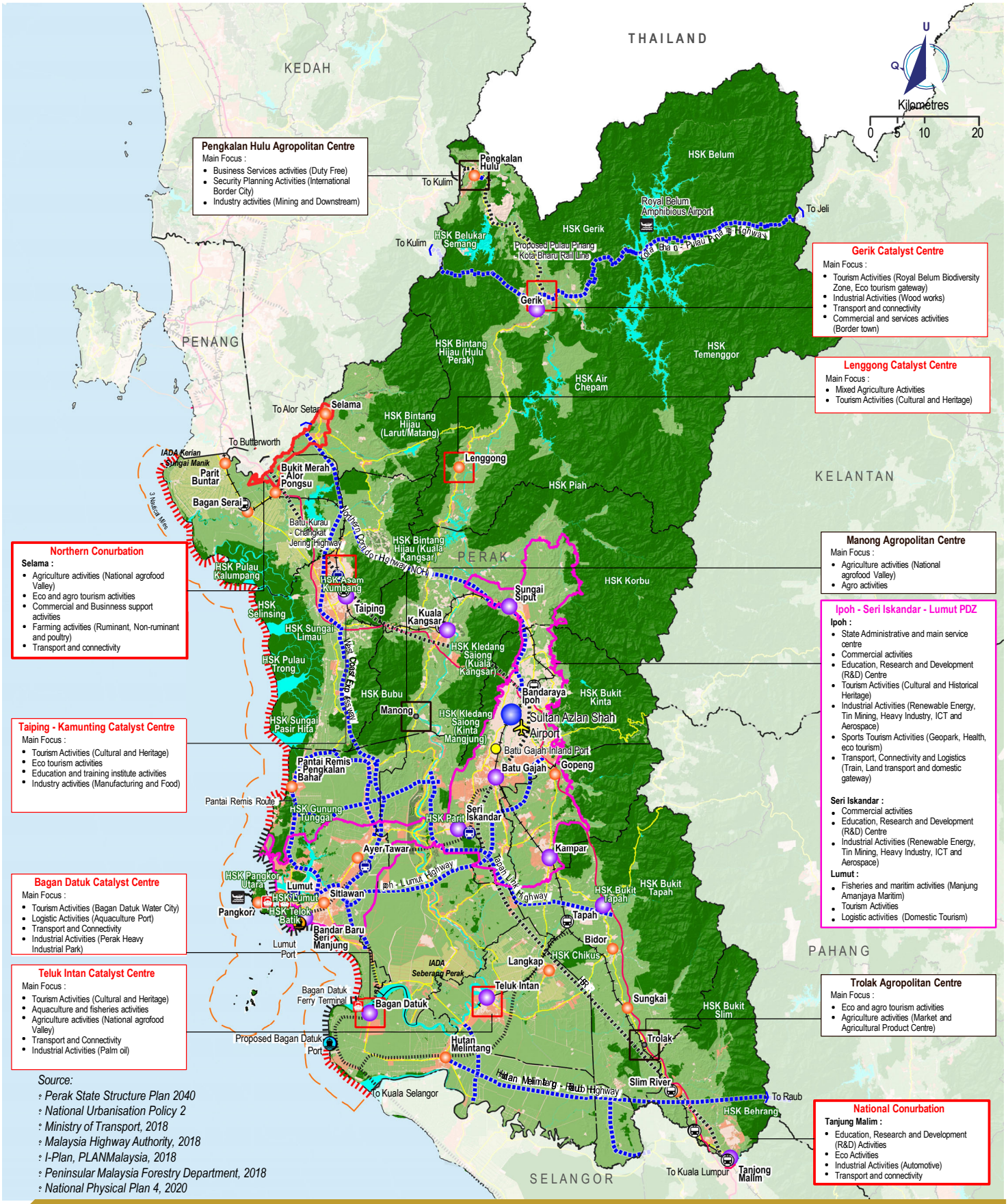
1. Strengthen the road network between the regions through the proposed Kota Bharu - Penang Highway via Gerik, the West Coast Highway (WCE), the Northern Corridor Highway (NCH), the Hutan Melintang - Raub Highway, the Pantai Remis - Parit Road, the Tapah Link Highway, the Ipoh - Lumut Highway and the Batu Kurau - Changkat Jering Highway.
2. Expand and integrate the existing rail network with new lines that connect Batu Gajah - Seri Iskandar - Lumut, Tapah Road - Bagan Datuk, and Lumut - Bagan Datuk - KLIA, Selangor.
3. Expand the high-speed rail network connecting Taiping Town - Ipoh - Tanjung Malim (Proposed HSR) and Proposed Penang - Kota Bharu Rail via Bandar Gerik and Pengkalan Hulu (Proposed ECRL 3).
4. Strengthen the role of the Sultan Azlan Shah Airport as a Domestic Airport (Category 3).

KD 2.2 Coastal Area Development and Protection

1. Manage development and land reclamation activities in coastal areas.
2. Manage and protect marine habitats and ecological diversity in coastal zones in accordance with the RFZPPN2.

KI 1.1 KI 3.3 KI 2.1 KI 4.1 KI 3.2 Liveable Environment and Inclusive Communities

1. Provide adequate and affordable housing for the B40 and M40 target groups in urban areas.
2. Improve the quality of housing and neighbourhoods in rural areas through planned development.
3. Provide adequate and suitable facilities to nurture a smart society, which will become one of the building blocks of a developed and smart nation.
4. Promote green practices, healthy and safe lifestyles among communities and in residential surroundings.
5. Strengthen the role of the community in the planning and development process to ensure community needs are taken into account.



MAP 7-10 : PERAK STATE SPATIAL GROWTH FRAMEWORK

Growth Area
- Conurbation
- Promoted Development Zone
- Catalyst Centre
- Agropolitan Centre
- Regional City
- Main City
- Local Town
- Town

Land Use
- Current Built-up
- Proposed Built-up
- Forest
- Water Bodies
- Agriculture
- National Rice Bowl
- Outside National Rice Bowl

Coastal Development and Protection Area
- Coastal Development Zone
- Coastal Protection Zone

Land, Air and Water Transport
- Highway
- Road
- Proposed Highway
- Existing Rail Line
- Proposed High Speed Rail Line
- Proposed Inter City Rail Line
- Rail Station
- Proposed Rail Station
- Port
- Proposed Port
- Airport
- Proposed Amphibious Airport
- Terminal Ferry
- Inland Port

Others
- 3 Nautical Miles Boundary
- State Boundary
- District Boundary

PERAK RESOURCE MANAGEMENT

Resource management in NPP4 consists of five (5) main categories, namely natural, water, energy, food and heritage resources. These resources are national assets that provide important life support system. Good governance and appropriate laws are required to preserve and conserve the country's archeological assets and to ensure their benefits remain into the future.

KD 2.1 KD 2.6 KD 2.5 Sustainable Management of Natural, Food and Heritage Resources

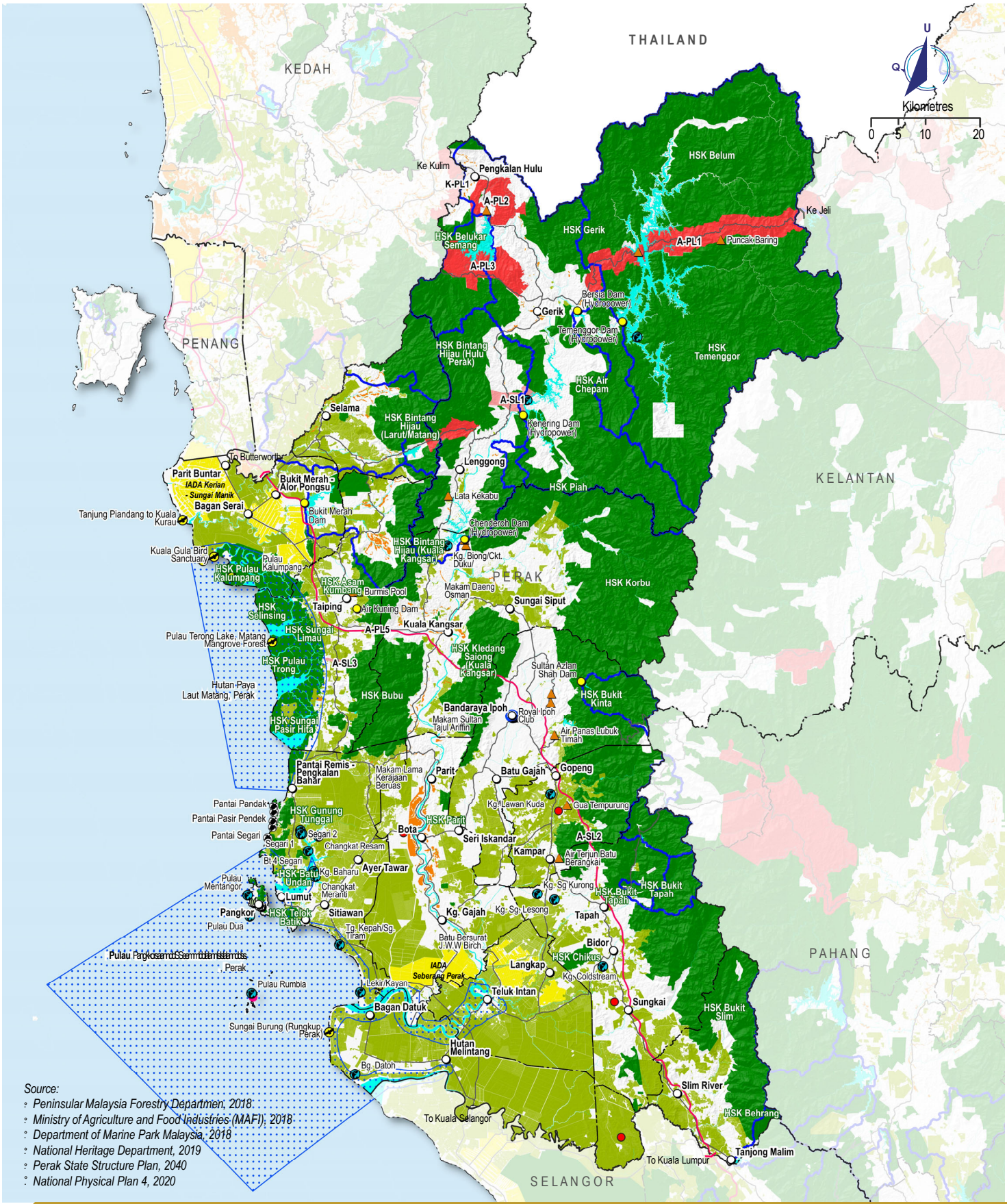
1. Emphasise the maintenance of existing forest areas. Perak has the potential to become a Carbon Neutral State as it has a forest area of more than 50%.
2. Preserve HSK Belum, HSK Gerik, HSK Lempang Nering, HSK Sungai Kuak, HSK Gunung Lang, HSK Padang Chong, HSK Belukar Semang, HSK Kenderong, HSK Aman Jaya, HSK Banding (Belum), HSK Temenggor, HSK Air Cepam, HSK Papulut, HSK Bintang Hijau, HSK Piah, HSK Palong Tinggi, HSK Korbu, HSK Bukit Kinta, HSK Kledang, HSK Bukit Larut, HSK Bubu, HSK Pulau Kalumpang, HSK Selinsing, HSK Sungai Limau, HSK Pulau Trong, HSK Sungai Pasir Hitam, HSK Gunung Tunggal, HSK Segari Melintang, HSK Parit, HSK Bujang Melaka, HSK Bukit Tapah, HSK Chikus, HSK Kampung Gajah, HSK Gunung Besout, HSK Bukit Slim and HSK Behrang to protect the ecosystem and wildlife habitats.
3. Gazette, protect and conserve marine protected areas and coastal area (including Perak waters around the Matang Mangrove Forest, Pulau Pangkor and Kepulauan Sembilan, Perak).
4. Conserve the ecological corridors A-SL1 HS Bukit Bintang Hijau - HS Papulut - HS Piah, A-SL2 HS Bujang Melaka - HS Bukit Tapah - HS Bukit Kinta, A-SL3 HS Bubu - Hutan Paya Bakau Matang, and A-PL2 HS Padang Chong (Green Star) - HS Sg. Kuak (Main Range) - HS Lapang Ninering to maintain the continuity of the forest landscape.
5. Preserve and protect major food source areas as sources of staple food for the country. These include the Kerian - Sungai Manik Integrated Agricultural Development Authority (IADA) paddy area (21,108 hectares) and the Seberang Perak Integrated Agricultural Development Area (IADA) (12,782 hectares) as well as large-scale farms and livestock area [NCER Agro Economic Zone (NAEZ)]. Increase the rice self-sufficiency level of the paddy area.
6. Gazette natural sites of outstanding value and historical, artistic or scientific significance under the National Heritage Act (Act 645).
7. Gazette endangered habitats as protected areas (turtle landing sites, important bird areas and seaweed areas).
8. Protect Permanent Food Production Park (TKPM) and Aquaculture Industrial Zone (ZIA) to ensure national food security.
9. Maintain and preserve key agricultural areas (KPU) in Perak.

KD 2.3 Improve Sustainable Water Resource

1. Gazette the Sungai Kerian, Sungai Kurau, Sungai Sangga Besar, Sungai Larut, Sungai Temerloh, Sungai Jarum Mas, Sungai Beruas, Sungai Manjung, Sungai Tiram and Sungai Perak basin reserves.
2. Control the development and activities in water catchment areas (Temenggor Dam, Bersia Dam, Kenering Dam, Chenderoh Dam, Mahang Dam, Bukit Merah Dam, Air Kuning Dam, Sultan Azlan Shah Dam, Gopeng Dam and Jor Dam).
3. Apply the concept of "Sponge City" for urban water management (focus on built-up areas).
4. Encourage the use of grey water and groundwater as alternative water supply sources.
5. Reduce the rate of non-revenue water (NRW) by increasing the efficiency of water supply system management.

KD 3.1 KD 3.3 KD 3.2 Implement Low-carbon City and Sustainable Alternative Energy Resource Approaches

1. Increase usage of smart technology, low-carbon mobility and green building practices in development.
2. Encourage the development of biogas and biomass energy generation in plantation, cattle ranching and landfill areas.
3. Increase the production and generation of renewable energy (RE) by strengthening solar energy generation.
4. Develop micro-hydro power plants for rural areas to support agricultural activities and daily life of the people.



Source:
- *Peninsular Malaysia Forestry Department, 2018*
- *Ministry of Agriculture and Food Industries (MAFI), 2018*
- *Department of Marine Park Malaysia, 2018*
- *National Heritage Department, 2019*
- *Perak State Structure Plan, 2040*
- *National Physical Plan 4, 2020*

MAP 7-11 : PERAK STATE RESOURCES MANAGEMENT

Natural Resources
- Forest Reserve
- CFS Ecological Link

Natural Heritage Resources
- Natural Heritage Site
- Turtle Landing Location
- Important Bird Area
- Seaweed Areas
- Coral Reef Areas
- Proposed Marine Corridor Area
- Proposed Natural Heritage Geological Area

Water Resources
- Dam Reservoir
- Water Body

Energy Resources
- River
- Dam Location (Hydro Powered and Mini Hydro)
- Oil Palm Plantation

Food Resources
- National Rice Bowl
- Paddy Field Outside National Rioce Bowl
- National Rice Bowl Permanent Food Production Park
- Aquaculture Industrial Zone

Cultural Heritage Resources
- Archeological Heritage Site
- Bulding/ Monument/ Site Heritage
- Proposed Building/ Monument/ Site Heritage

Others
- Main Towns
- Highway
- Roads
- State Boundary
- District Boundary

PERAK NATURAL DISASTER RISK AREAS MANAGEMENT

The management of risk area includes identification of areas affected by natural disaster, as well as re-examination of the current framework for areas prone to natural disaster.

KD 1.5 Landslide Risk

1. Map and classify slope 'hotspot' areas according to the categories of stable (safe), showing signs of instability, and high risk.
2. Adopt the Guidelines for Development in Slope and Highland Areas (2009) as the basis for development control and for evaluation of the suitability of proposed development involving highlands and areas with slope in Perak.
3. Prohibit logging and land use change in highland area more than 1,000 metres above sea level.
4. Adopt community-based landslide management approach to encourage local community involvement in the management of slope and highland areas.

KD 1.5 Flood Risk

1. Expand the coverage of flood risk map to flood vulnerability areas in Perak (involving settlement areas in Gerik, Selama, Parit Buntar, Bukit Merah - Alor Pongsu, Kuala Kangsar, Pantai Remis - Pengkalan Bahar, Parit, Seri Iskandar, Bota, Kampung Gajah, Teluk Intan, Langkap, Bidor, Kampar and Slim River).
2. Translate the integrated land use management of flood risk area into SP, LP and SAP for the purpose of development control and planning approval evaluation.
3. Apply the concept of 'living with flood' to increase community preparedness towards flood risk.

KD 1.5 Earthquake and Tsunami Risk

1. Map tsunami risk area in detail by taking into account the aspects of vulnerability and hazard of tsunami-prone areas, especially on the coast of Perak.
2. Some areas in the state of Perak may be exposed to tsunami and the possibility of radiation (as these areas are within 1,500 kilometer from the Anak Krakatua volcano and tsunami along the Andaman sea).

KD 1.5 KD 2.2 Coastal Erosion Risk

1. Adopt the RFZPPN2 as the main reference in the planning and control of development in coastal erosion risk areas in Perak.
2. Implement the Perak State Coastal Vulnerability Index (CVI) for coastal erosion risk as a guide to development control in the coastal zones.
3. Regulate land reclamation activities in coastal areas.
4. Adapt Nature Based Solution (NBS) approach and green infrastructure for the protection of environmentally sensitive coastal areas.
5. Implement development control for coastal waters in Bagan Serai and Bagan Datuk.

KD 1.5 Sea Level Rise Risk

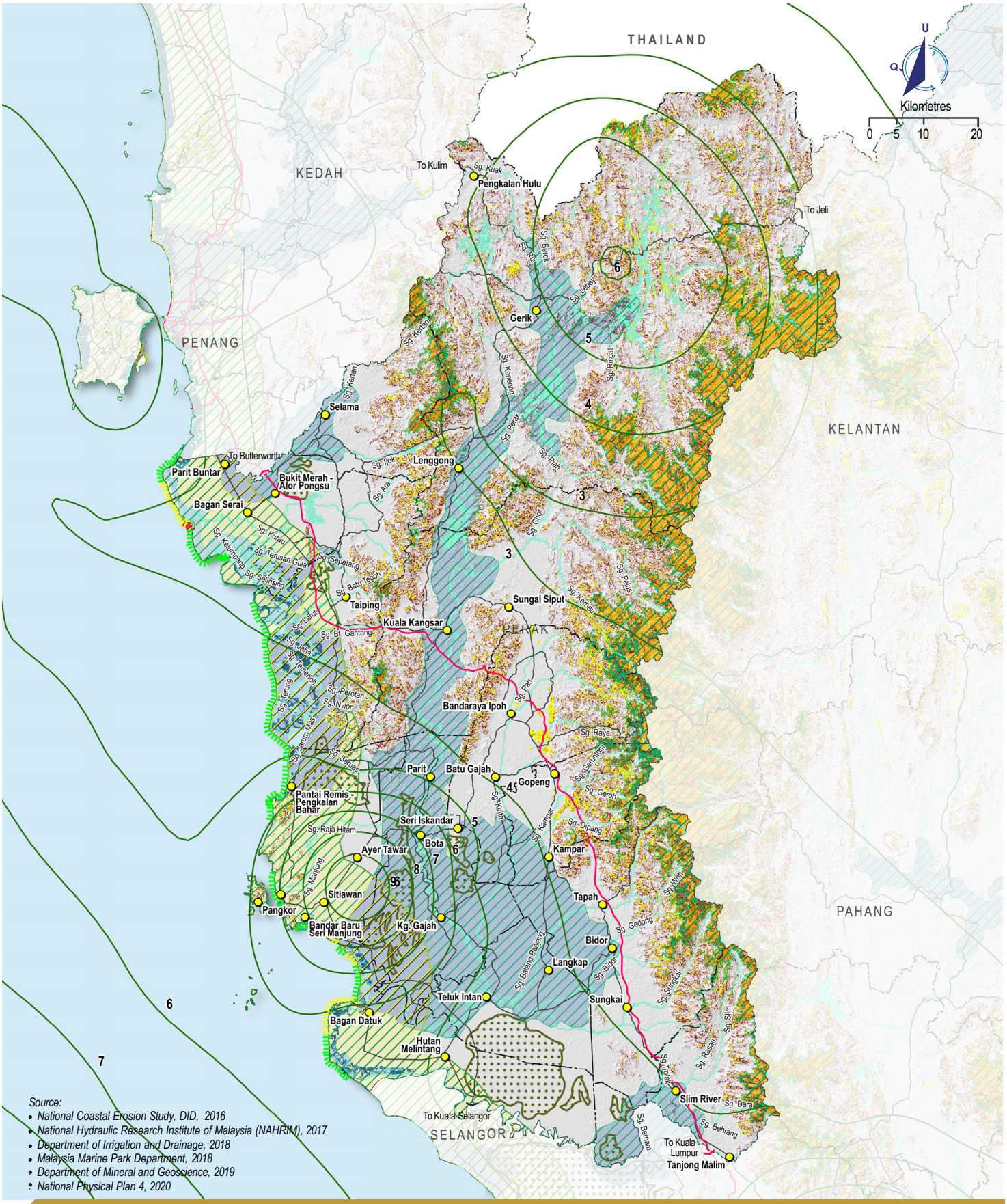
1. Adopt the RFZPPN2 as the main reference in the planning and control of coastal development in Perak.
2. Implement the Perak State Coastal Vulnerability Index (CVI) as a guide to development control in the coastal zones of Seri Manjung and Bagan Datuk.
3. Control development and land reclamation activities along the coastal waters of Perak.

KD 1.5 Drought Risk

1. Apply the concept of sponge-city development for urban water management (focus on built-up areas).
2. Expand the use of rainwater harvesting as an alternative water supply source during the dry season.
3. Explore and diversify alternative water sources such as riverside water reservoirs (TAPS) and groundwater to reduce dependence on rivers and dams.

KD 1.5 Forest and Peatland Fire Risk

1. Prepare peat soil fire risk map according to the categories of non-disaster risk zone and disaster risk zone.
2. Encourage community participation in peatland forest management.



Source:

- *National Coastal Erosion Study, DID, 2016*
- *National Hydraulic Research Institute of Malaysia (NAHRIM), 2017*
- *Department of Irrigation and Drainage, 2018*
- *Malaysia Marine Park Department, 2018*
- *Department of Mineral and Geoscience, 2019*
- *National Physical Plan 4, 2020*

MAP 7-12 : PERAK STATE NATURAL DISASTER RISK AREA MANAGEMENT

Landslide Risk Areas
- Landslide Risk (Slope >25°)
- Highland (> 1,000m)

Flood Risk
- Flood Risk

Earthquake and Tsunami Risk
- Fault Line
- Tsunami Risk

Coastal Erosion Risk
- Critical
- Significant
- Not Serious/ Acceptable

Sea Level Rise Risk
- Projection Year 2030 (0.12m)
- Projection Year 2050 (0.24m)
- Projection Year 2100 (0.73m)

Forest and Peat Soil Fires
- Peat Soil

Disaster Risk Category
- High Risk Area
- Moderate Risk Area
- Low Risk Area

Others
- River/ Dam
- Main Towns
- Highway
- Roads
- State Boundary
- District Boundary

KELANTAN

SPATIAL GROWTH FRAMEWORK

Spatial Management is a framework in managing the availability of land, transport, growth areas, population settlement hierarchy and community involvement in creating a quality and liveable living environment. The intensification of development is emphasised through effective and holistic management to facilitate implementation of proposals for future land use development.

PD 2.1 PD 3.6 PD 2.6 Sustainable and Competitive Economic Growth

1. Strengthen the Kota Bharu Promoted Development Zone (PDZ) (covering Bachok - Kota Bharu - Machang - Pasir Mas - Pasir Puteh - Tanah Merah - Tumpat), and the Jeli and Gua Musang Catalyst Centres.
2. Develop the Kuala Krai and Lojing Agropolitan Centres as rural growth nodes.
3. Tok Bali Port has the potential to be developed as a logistics hub and as a port to support the manufacturing and production activities in the surrounding areas.
4. Enhance economic activities, especially involving the Special Border Economic Zone (SBEZ) in Pengkalan Kubor, Rantau Panjang and Bukit Bunga to support and complement each other.
5. Boost the tourism industry by leveraging on biodiversity assets through extensive branding and promotion.

PD 3.1 PD 3.4 PD 3.2 Integrated and Strategic Transport Network

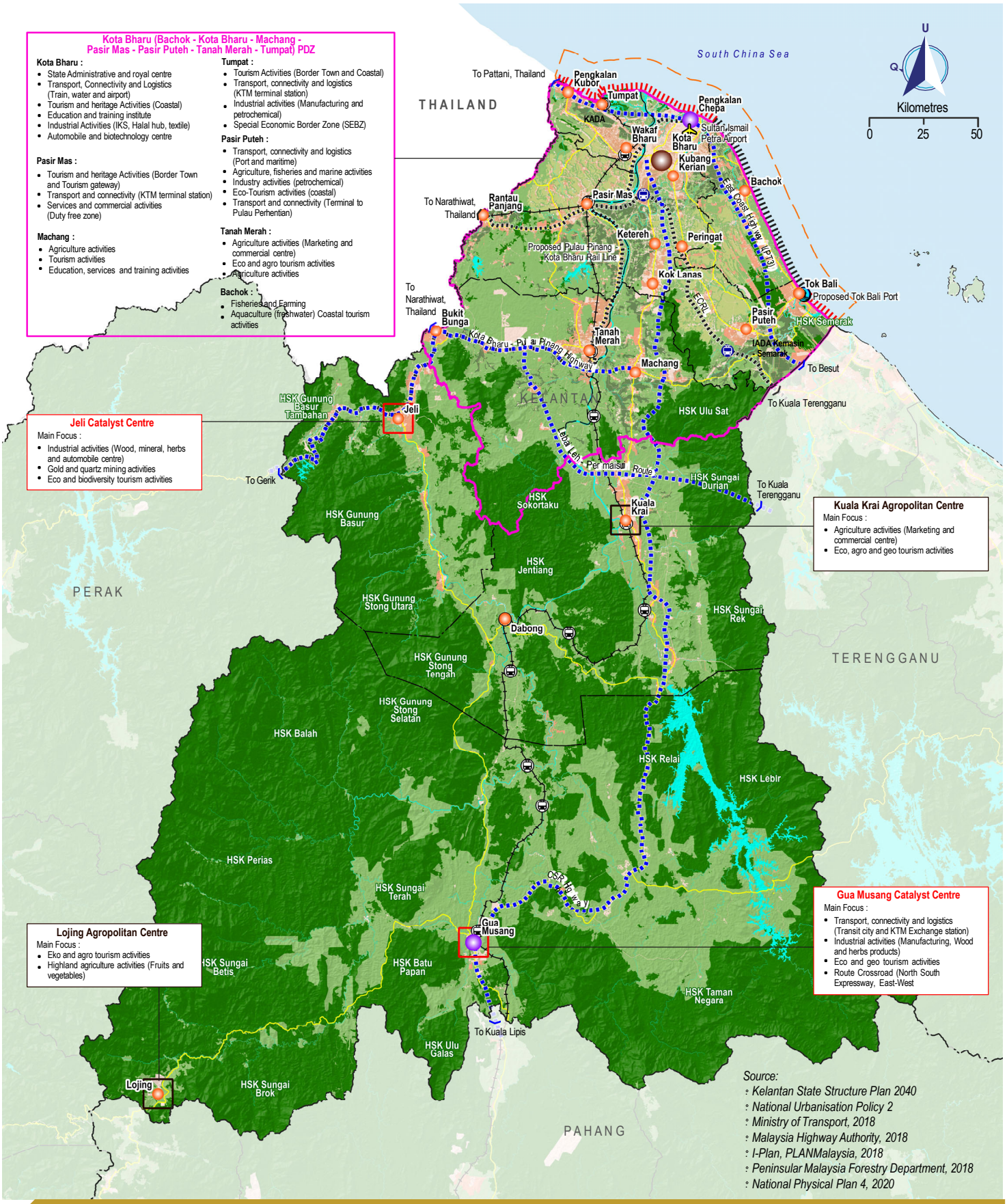
1. Strengthen the road network between the regions through the proposed connection of the Kota Bharu - Penang Highway, the East Coast Highway (LPT3), the Central Spine Road (CSR) and the Lebai Leh - Permaisuri Road.
2. Expand the high-speed rail network connecting Pasir Puteh - Kota Bharu Town (ECRL 1) and the Penang - Kota Bharu rail proposal via Jeli Town - Tanah Merah - Kota Bharu (ECRL Proposal 3).
3. Strengthen the role of the Sultan Ismail Petra Airport as a Regional Airport (Category 2).

KD 2.2 Coastal Areas Development and Protection

1. Manage development and land reclamation activities in coastal areas.
2. Manage and protect marine habitats and ecological diversity in coastal zones in accordance with the RFZPPN2.

KI 1.1 KI 3.3 KI 2.1 KI 4.1 KI 3.2 Liveable Environment and Inclusive Communities

1. Provide adequate and affordable housing for the B40 and M40 target groups in urban areas.
2. Improve the quality of housing and neighbourhoods in rural areas through planned development.
3. Provide adequate and suitable facilities to nurture a smart society, which will become one of the building blocks of a developed and smart nation.
4. Promote green practices, healthy and safe lifestyles among communities and in residential surroundings.
5. Strengthen the role of the community in the planning and development process to ensure community needs are taken into account.



MAP 7-13 : KELANTAN STATE SPATIAL GROWTH FRAMEWORK

Growth Area
- Promoted Development Zone
- Catalyst Centre
- Agropolitan Centre
- State City
- Main City
- Local Town

Land Use
- Current Built-up
- Proposed Built-up
- Forest
- Water Bodies
- Agriculture
- National Rice Bowl
- Outside National Rice Bowl

Coastal Development and Protection Area
- Coastal Development Zone
- Coastal Protection Zone

Land, Air and Water Transport
- Highway
- Road
- Proposed Highway
- Existing Rail Line
- Proposed High Speed Rail Line
- Rail Station
- Proposed Rail Station
- Airport
- Proposed Port

Others
- 3 Nautical Miles Boundary
- State Boundary
- District Boundary

KELANTAN RESOURCE MANAGEMENT

Resource management in NPP4 consists of five (5) main categories, namely natural, water, energy, food and heritage resources. These resources are national assets that provide important life support system. Good governance and appropriate laws are required to preserve and conserve the country's archeological assets and to ensure their benefits remain into the future.

KD 2.1 KD 2.6 KD 2.5 Sustainable Management of Natural, Food and Heritage Resources

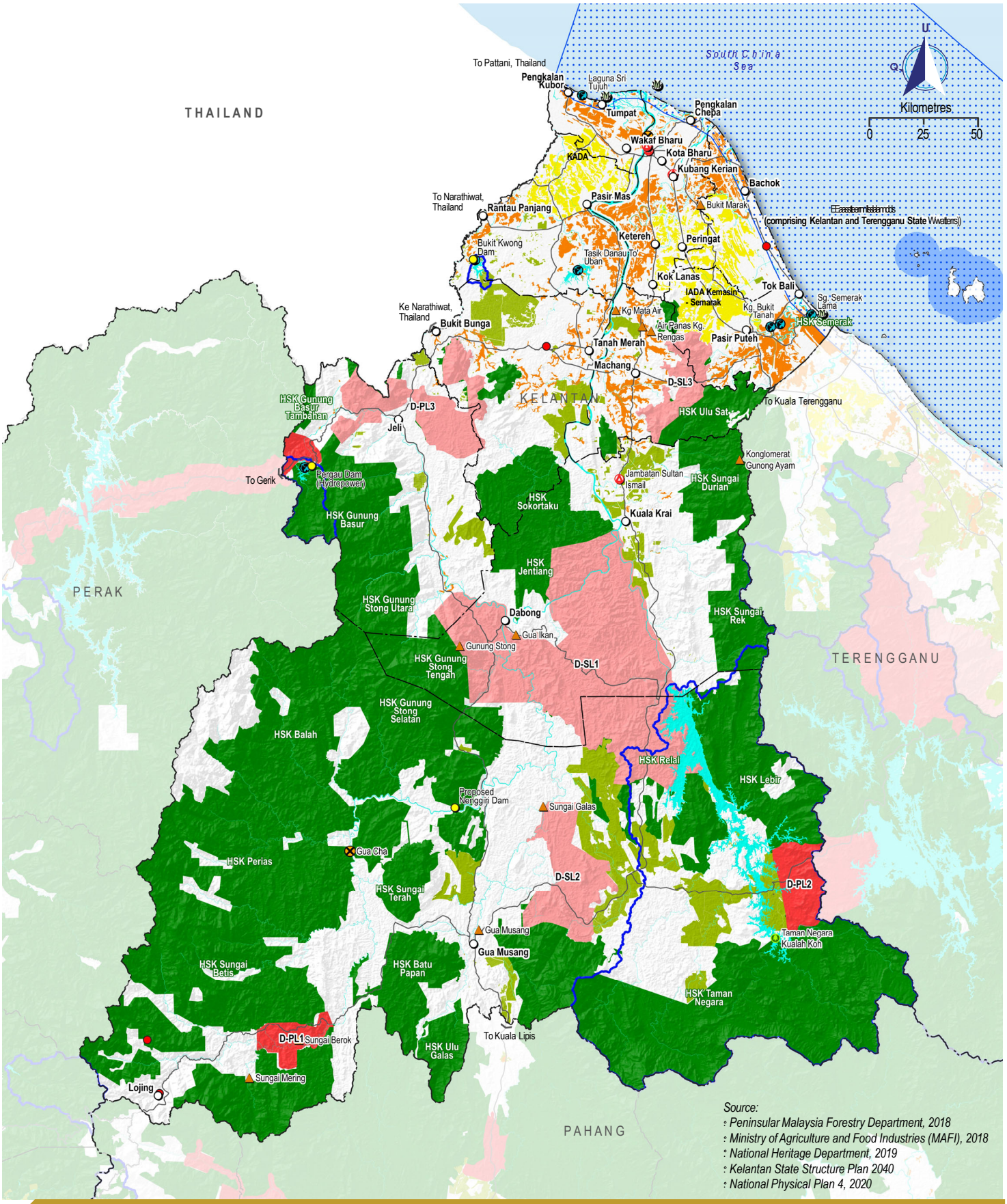
1. Emphasise the maintenance of existing forests to retain the State's potential to become a Carbon Neutral State.
2. Preserve HSK Ulu Sat, HSK Sungai Durian, HSK Sungai Rek, HSK Sakortaku, HSK Jentiang, HSK Ulu Temiang, HSK Sungai Sam, HSK Serasa, HSK Gunung Basur, HSK Stong Utara, HSK Stong Tenggara, HSK Stong Selatan, HSK Baloh, HSK Berangkat, HSK Lebir, HSK Relai, HSK Sungai Terah, HSK Nenggiri, HSK Perias, HSK Sungai Betis, HSK Batu Papan, HSK Ulu Galas, HSK Gunung Rabong, HSK Bukit Hantu and HSK Sungai Brok to protect the ecosystem and wildlife habitats.
3. Conserve the ecological corridors D-SL1 HS Lebir - HS Relai - HS Ulu Temiang - HS Jentiang - HS Serasa - Gunung Stong State Park, D-SL2 Taman Negara - HS Chiku, D-SL3 HS Gunung Basor (Tasik Pergau) - HS Jeli - HS Sg. Sator-HS Sokortaku and D-SL4 HS Chabang Tongkat - HS Ulu Sat to maintain the continuity of the forest landscape.
4. Maintain and protect the Kemubu Agricultural Development Authority (KADA) and Kemasin - Semerak Integrated Agricultural Development Area (IADA) paddy areas.
5. Gazette natural sites of outstanding value and historical, artistic or scientific significance under the National Heritage Act (Act 645).
6. Gazette endangered habitats as protected areas (seaweed areas).
7. Protect Permanent Food Production Park (TKPM) and Aquaculture Industrial Zone (ZIA) as sources for food security.

KD 2.3 Improve Sustainable Water Resource

1. Gazette the Sungai Semerak, Sungai Kemasin, Sungai Kelantan and Sungai Golok basin reserves.
2. Control the development and activities in water catchment areas (Pergau Dam, Bukit Kwong Dam and Nenggiri Dam).
3. Apply the concept of "Sponge City" for urban water management (focus on built-up areas).
4. Encourage the use of grey water and groundwater as alternative water supply sources.
5. Reduce the rate of non-revenue water (NRW) by increasing the efficiency of water supply system management.

KD 3.1 KD 3.3 KD 3.2 Implement Low-carbon City and Sustainable Alternative Energy Resource Approaches

1. Increase usage of smart technology, low-carbon mobility and green building practices in development.
2. Encourage the development of biogas and biomass energy generation in plantation, cattle ranching and landfill areas.
3. Increase the production and generation of renewable energy (RE) by strengthening solar energy generation.
4. Develop micro-hydro power plants for rural areas to support agricultural activities and daily life of the people.



Source:
- *Peninsular Malaysia Forestry Department, 2018*
- *Ministry of Agriculture and Food Industries (MAFI), 2018*
- *National Heritage Department, 2019*
- *Kelantan State Structure Plan 2040*
- *National Physical Plan 4, 2020*

MAP 7-14 : KELANTAN STATE RESOURCE MANAGEMENT

Natural Resources
- Forest Reserve
- CFS Ecological Link

Natural Heritage Resources
- Natural Heritage Site
- Seaweed Areas
- Proposed Marine Corridor Area
- Proposed Natural Heritage Geological Area

Water Resources
- Dam Reservoir
- Water Body

Energy Resources
- River
- Dam Location (Hydro Powered and Mini Hydro)
- Oil Palm Plantation

Food Resources
- National Rice Bowl
- Paddy Field Outside National Rice Bowl
- Permanent Food Production Park
- Aquaculture Industrial Zone

Cultural Heritage Resources
- Archeological Heritage Site
- Bulding/ Monument/ Site Heritage

Others
- Main Towns
- Roads
- State Boundary
- District Boundary

KELANTAN NATURAL DISASTER RISK AREAS MANAGEMENT

The management of risk area includes identification of areas affected by natural disaster, as well as re-examination of the current framework for areas prone to natural disaster.

KD 1.5 Landslide Risk

1. Map and classify slope 'hotspot' areas according to the categories of stable (safe), showing signs of instability, and high risk.
2. Adopt the Guidelines for Development in Slope and Highland Areas (2009) as the basis for development control and for evaluation of the suitability of proposed development involving highlands and areas with slope in Kelantan.
3. Ensure efficient management and control of logging and other land use activities in highland area more than 1,000 metres above sea level.
4. Adopt community-based landslide management approach to encourage local community involvement in the management of slope and highland areas.

KD 1.5 Flood Risk

1. Expand the coverage of flood risk map to flood vulnerability areas in Kelantan (involving settlement areas in most parts of northern Kelantan including Kota Bharu, Pengkalan Kubor, Tumpat, Pengkalan Chepa, Bachok, Tok Bali, Peringat, Mulong, Kubang Kerian, Kadok , Ketereh, Pasir Puteh, Machang, Tanah Merah, Kok Lanas, Bandar Baru Pasir Mas, Pasir Mas, Wakaf Bharu, Rantau Panjang, Bukit Bunga and Kuala Krai).
2. Translate the integrated land use management of flood risk area into SP, LP and SAP for the purpose of development control and planning approval evaluation.
3. Apply the concept of 'living with flood' to increase community preparedness towards flood risk.

KD 1.5 Earthquake and Tsunami Risk

1. Map tsunami risk area in detail by taking into account the aspects of vulnerability and hazard of tsunami-prone areas, especially on the coast of Kelantan.

KD 1.5 KD 2.2 Coastal Erosion Risk

1. Adopt the RFZPPN2 as the main reference in the planning and control of development in coastal erosion risk areas in Kelantan.
2. Implement the Kelantan State Coastal Vulnerability Index (CVI) for coastal erosion risk as a guide to development control in the coastal zones.
3. Regulate land reclamation activities in coastal areas.
4. Adapt Nature based solution (NBS) and green infrastructure for the protection of environmentally sensitive coastal areas.
5. Implement development control for coastal waters in Pengkalan Chepa - Tumpat.

KD 1.5 Sea Level Rise Risk

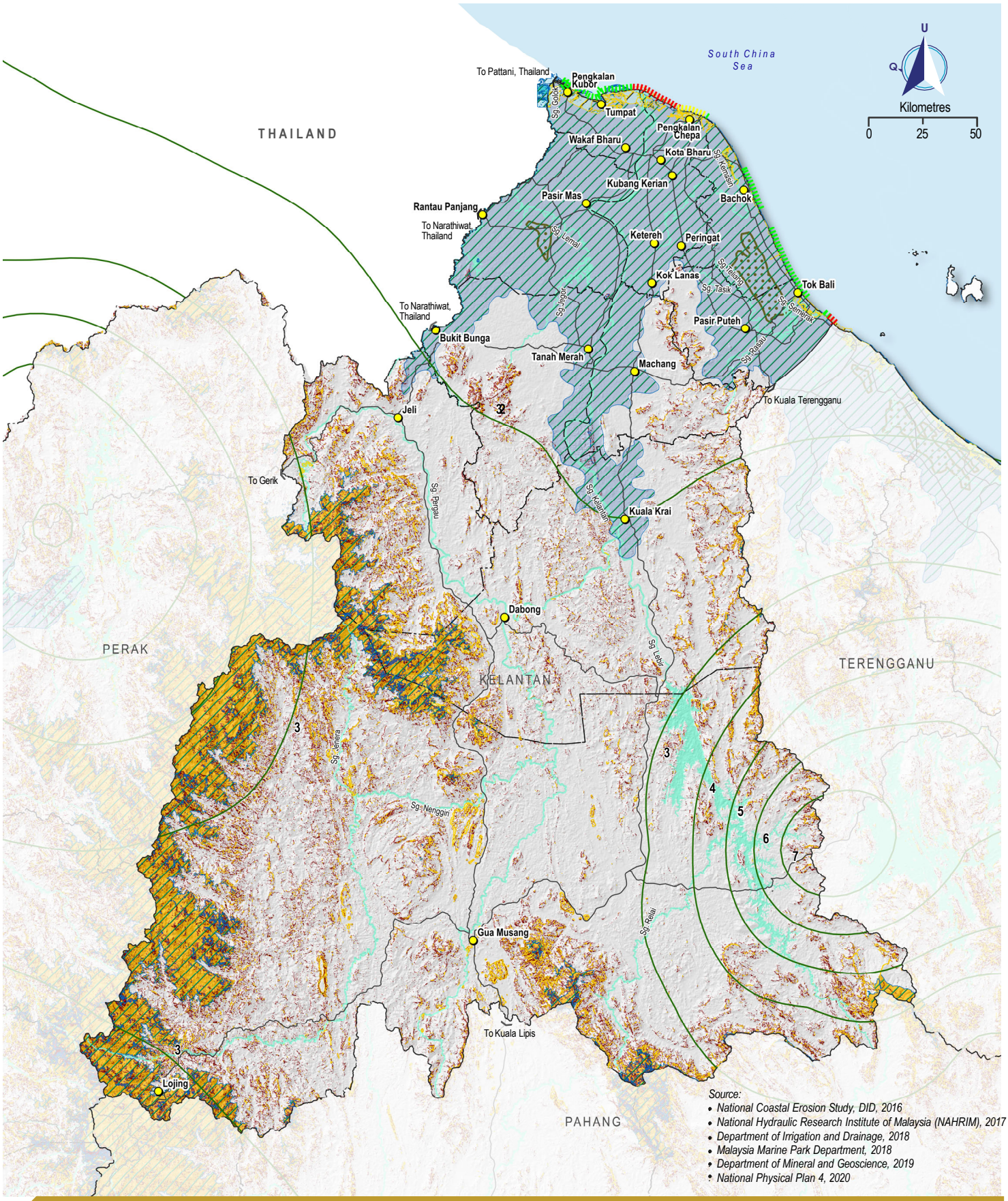
1. Adopt the RFZPPN2 as the main reference in the planning and control of coastal development in Kelantan.
2. Implement the Kelantan State Coastal Vulnerability Index (CVI) as a guide to development control in the Tumpat coastal zone.
3. Control development and land reclamation activities along the coastal waters of Kelantan.

KD 1.5 Drought Risk

1. Apply the concept of sponge-city development for urban water management (focus on built-up areas).
2. Expand the use of rainwater harvesting as an alternative water supply source during the dry season.
3. Explore and diversify alternative water sources such as riverside water reservoirs (TAPS) and groundwater to reduce dependence on rivers and dams.

KD 1.5 Forest and Peatland Fire Risk

1. Prepare peat soil fire risk map according to the categories of non-disaster risk zone and disaster risk zone.
2. Encourage community participation in peatland forest management.



Source:

- *National Coastal Erosion Study, DID, 2016*
- *National Hydraulic Research Institute of Malaysia (NAHRIM), 2017*
- *Department of Irrigation and Drainage, 2018*
- *Malaysia Marine Park Department, 2018*
- *Department of Mineral and Geoscience, 2019*
- *National Physical Plan 4, 2020*

MAP 7-15 : KELANTAN STATE NATURAL DISASTER RISK AREA MANAGEMENT

Landslide Risk Areas
- Landslide Risk (Slope >25°)
- Highland (> 1,000m)

Flood Risk
- Flood Risk

Earthquake and Tsunami Risk
- Fault Line

Coastal Erosion Risk
- Critical
- Significant
- Not Serious/ Acceptable

Sea Level Rise Risk
- Projection Year 2030 (0.12m)
- Projection Year 2050 (0.24m)
- Projection Year 2100 (0.73m)

Forest and Peat Soil
- Peat Soil

Disaster Risk Category
- High Risk Area
- Moderate Risk Area
- Low Risk Area

Others
- River/ Dam
- Main Towns
- Roads
- State Boundary
- District Boundary

TERENGGANU SPATIAL GROWTH FRAMEWORK

Spatial Management is a framework in managing the availability of land, transport, growth areas, population settlement hierarchy and community involvement in creating a quality and liveable living environment. The intensification of development is emphasised through effective and holistic management to facilitate implementation of proposals for future land use development.

PD 2.1 PD 2.6 PD 2.4 PD 3.5 Sustainable and Competitive Economic Growth

1. Strengthen the Eastern Conurbation (Chukai - Kerteh), the Kuala Terengganu Promoted Development Zone (PDZ) and the Jertih Catalyst Centre .
2. Bandar Jertih, Bandar Kuala Berang, Bandar Dungun and Bandar Chukai have the potential to be upgraded into main towns.
3. Develop the Bandar Permaisuri and Jertih Agropolitan Centres as rural growth nodes.
4. Enhance the role of the Kerteh and Kemaman Ports as regional hubs to support the manufacturing and production activities in the surrounding areas.
5. The proposed Kuala Terengganu Terminal has the potential as a stopover port for cruise ships to promote tourism activities.
6. Boost the tourism industry by leveraging on biodiversity assets such as the Kenyir Lake, the islands and marine parks, the Setiu Wetlands, the Islamic Civilisation Park, the Batu Bersurat Museum, the Pasar Payang, Kampung China and urban heritage with extensive branding and promotion.
7. Enhance services and industry high value chain through knowledge-based manufacturing sector to increase the State's economic productivity.

PD 3.1 PD 3.4 PD 3.2 Integrated and Strategic Transport Network

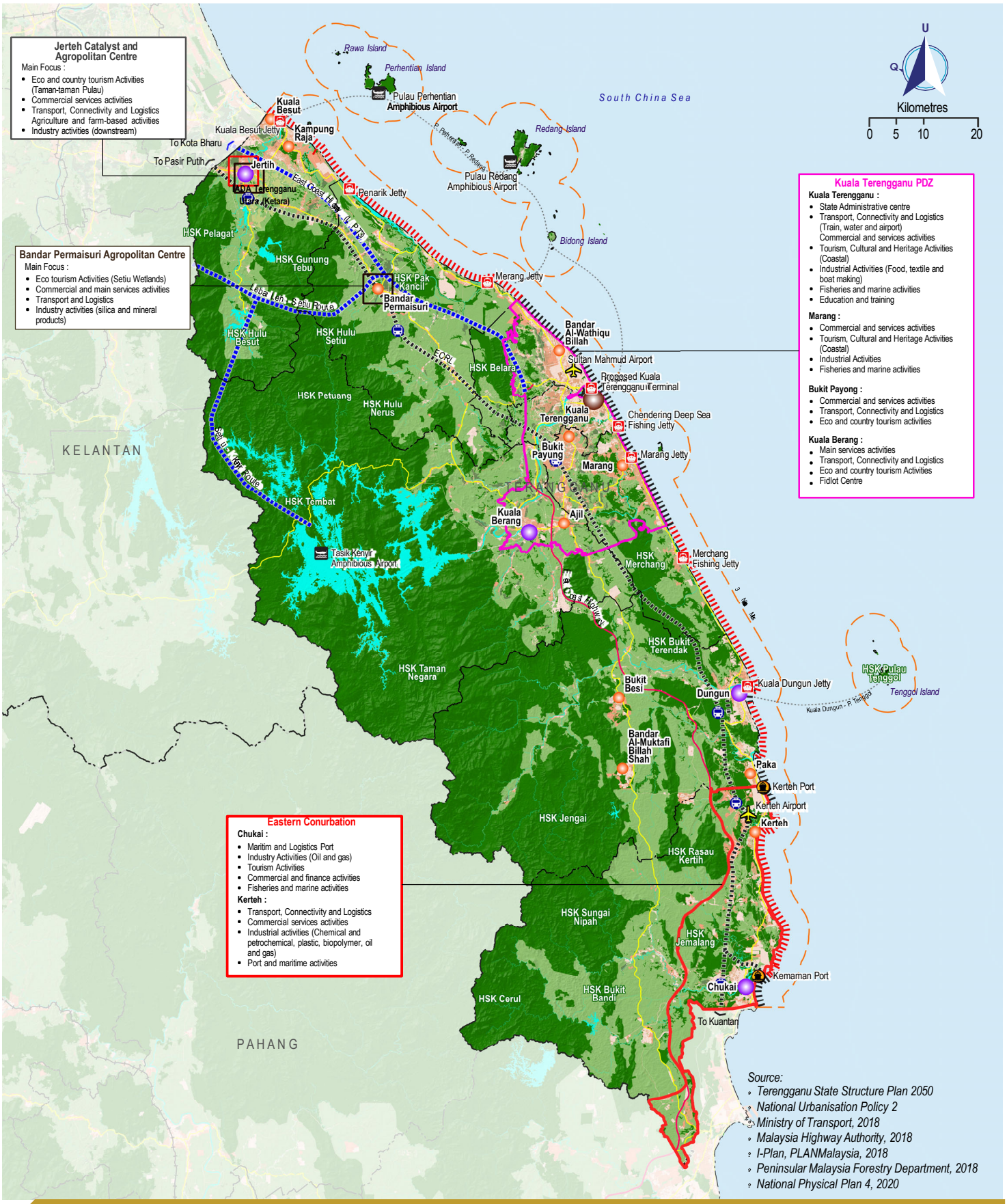
1. Strengthen the road network between the regions through the proposed East Coast Highway (LPT3), the Lebai Leh – Permaisuri Road, the Setiu Road to Kenyir, the Kuala Berang - Kuala Terengganu Road, the Tengku Ampuan Intan Zaharah Road, the Ajil - Kg. Pulau Kerengga Road and the Kerteh - Kg. Chabang Road.
2. Expand the high-speed rail network connecting Pasir Puteh - Jertih - Bandar Permaisuri - Pengkalan Berangan - Dungun - Kerteh - Chukai (ECRL 1).
3. Strengthen the role of the Sultan Mahmud Airport and the Kerteh Airport as Domestic Airports (Category 3).
4. Strengthen the infrastructure facilities at the Merchang fishing jetty and the Pulau Duyung and Chendering marine fishing jetties to encourage fish breeding and increase catches.

KD 2.2 Coastal Area Development and Protection

1. Manage development and land reclamation activities in coastal areas.
2. Manage and protect marine habitats and ecological diversity in coastal zones in accordance with the RFZPPN2.

KI 1.1 KI 3.3 KI 2.1 KI 4.1 KI 3.2 Liveable Environment and Inclusive Communities

1. Provide adequate and affordable housing for the B40 and M40 target groups in urban areas.
2. Improve the quality of housing and neighbourhoods in rural areas through planned development.
3. Provide adequate and suitable facilities to nurture a smart society, which will become one of the building blocks of a developed and smart nation.
4. Promote green practices, healthy and safe lifestyles among communities and in residential surroundings.
5. Strengthen the role of the community in the planning and development process to ensure community needs are considered in the process.



MAP 7-16 : TERENGGANU STATE SPATIAL GROWTH FRAMEWORK

Growth Area
- Conurbation
- Promoted Development Zone
- Catalyst Centre
- Agropolitan Centre
- State City
- Main City
- Local Town

Land Use
- Current Built-up
- Proposed Built-up
- Forest
- Water Bodies
- Agriculture
- National Rice Bowl
- Outside National Rice Bowl

Coastal Development and Protection Area
- Coastal Development Zone
- Coastal Protection Zone

Land, Air and Water Transport
- Highway
- Road
- Proposed Highway
- Proposed High Speed Rail Line
- Water Route
- Proposed Rail Station
- Airport
- Proposed Amphibious Airport
- Port
- Passenger / Fisheries Terminal

Others
- 3 Nautical Miles Boundary
- State Boundary
- District Boundary

TERENGGANU RESOURCE MANAGEMENT

Resource management in NPP4 consists of five (5) main categories, namely natural, water, energy, food and heritage resources. These resources are national assets that provide important life support system. Good governance and appropriate laws are required to preserve and conserve the country's archeological assets and to ensure their benefits remain into the future.

KD 2.1 KD 2.6 KD 2.5 Sustainable Management of Natural, Food and Heritage Resources

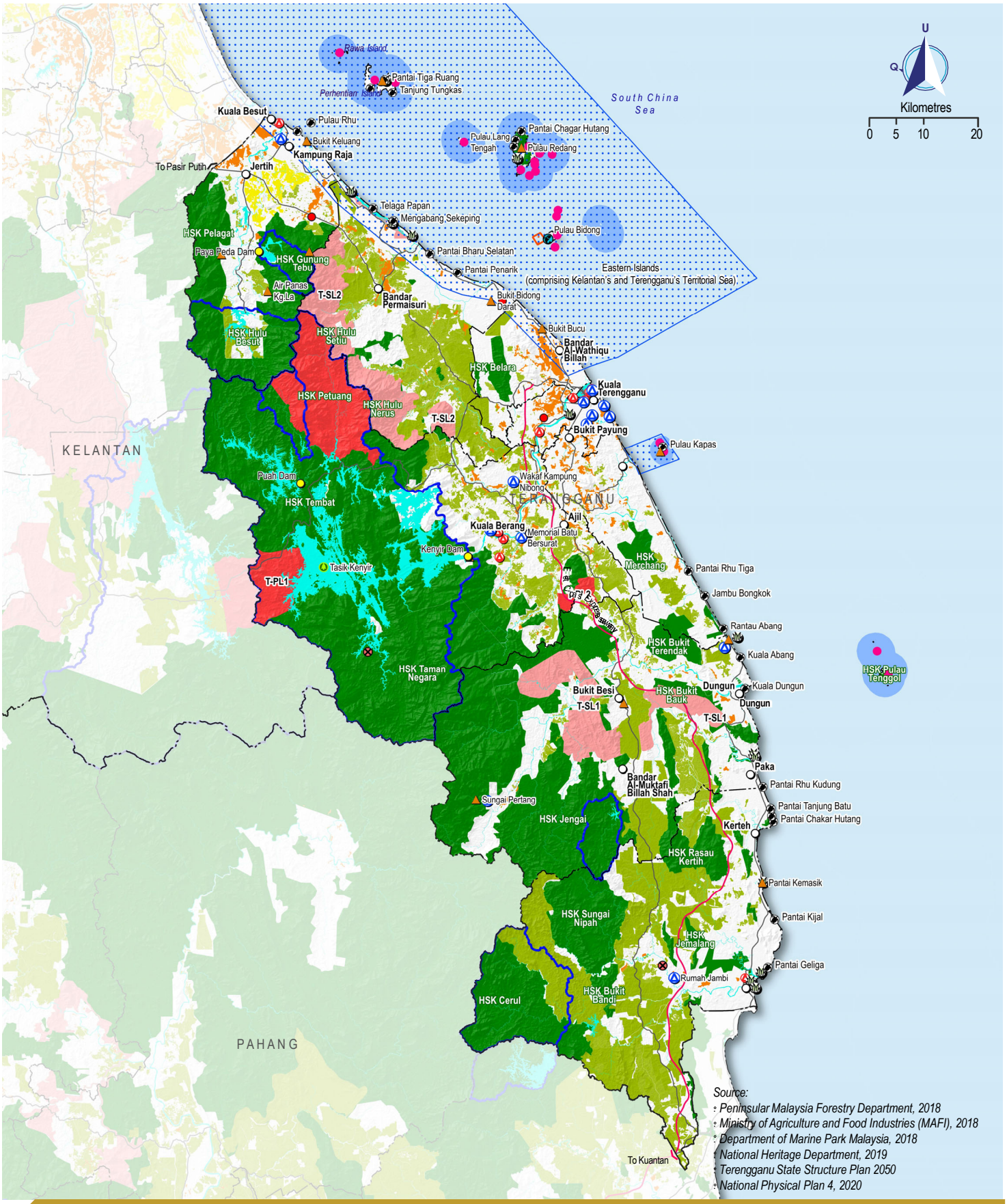
1. Emphasise the maintenance of existing forests to retain the State's potential to become a Carbon Neutral State as its forest cover is more than 50% of its total land area.
2. Preserve HSK Gunung Tebu, HSK Hulu Besut, HSK Hulu Setiu, HSK Petuang, HSK Hulu Nerus, HSK Belara, HSK Hulu Telemong, HSK Tembat, HSK Hulu Terengganu, HSK Mercang, HSK Jerangau, HSK Bukit Terendak, HSK Pasir Raja, HSK Jengai ,HSK Rasau Kertih, HSK Sungai Nipah HSK Cerul to protect the ecosystem and wildlife habitats.
3. Conserve the ecological corridors T-SL 2 HS Hulu Nerus - HS Hulu Setiu - Setiu Wetland to maintain the continuity of the forest landscape.
4. Gazette, protect and conserve marine protected areas and coastal areas of the Eastern Islands (including Terengganu Marine Parks - Setiu Wetlands - Kenyir Lake).
5. Maintain and protect the North Terengganu Integrated Agricultural Development Area (IADA) (KETARA) (4,876 hectares) paddy area.
6. Gazette natural sites of outstanding value and historical, artistic or scientific significance under the National Heritage Act (Act 645).
7. Gazette endangered habitats as protected areas (turtle landing sites, important bird areas and seaweed areas).
8. Protect the gazetted zone of Pulau Bidong waters (4 square kilometers) to ensure controlled development, conservation of natural assets and protection of underwater heritage.
9. Protect Permanent Food Production Park (TKPM) and Aquaculture Industrial Zone (ZIA) as sources for food security.

KD 2.3 Improve Sustainable Water Resource

1. Gazette the Sungai Kemaman, Sungai Kerteh, Sungai Paka Sungai Dungun, Sungai Merchang, Sungai Marang, Sungai Ibai, Sungai Terengganu, Sungai Setiu, Sungai Keluang Besar and Sungai Besut basin reserves.
2. Control the development and activities in water catchment areas (Paya Peda Dam, Puah Dam and Kenyir Dam).
3. Apply the concept of "Sponge City" for urban water management (focus on built-up areas).
4. Encourage the use of grey water and groundwater as alternative water supply sources.
5. Reduce the amount of non-revenue water (NRW) by increasing the efficiency of water supply system management.

KD 3.1 KD 3.3 KD 3.2 Implement Low-carbon City and Sustainable Alternative Energy Resource Approaches

1. Increase usage of smart technology, low-carbon mobility and green building practices in development.
2. Encourage the development of biogas and biomass energy generation in plantation, cattle ranching and landfill areas.
3. Increase the production and generation of renewable energy (RE) by strengthening solar energy generation.
4. Develop micro-hydro power plants for rural areas to support agricultural activities and daily life of the people.



Source:
- *Peninsular Malaysia Forestry Department, 2018*
- *Ministry of Agriculture and Food Industries (MAFI), 2018*
- *Department of Marine Park Malaysia, 2018*
- *National Heritage Department, 2019*
- *Terengganu State Structure Plan 2050*
- *National Physical Plan 4, 2020*

MAP 7-17 : TERENGGANU STATE RESOURCES MANAGEMENT

Natural Resources
- Forest Reserve
- CFS Ecological Link

Natural Heritage Resources
- Natural Heritage Site
- Turtle Landing Location
- Seaweed Areas
- Coral Reef Areas
- Proposed Marine Corridor Area
- Proposed Marine Protection Area
- Proposed Natural Heritage Geological Area
- Marine Park

Water Resources
- Dam Reservoir
- Water Body

Energy Resources
- River
- Dam Location (Hydro Powered and Mini Hydro)
- Oil Palm Plantation

Food Resources
- National Rice Bowl
- Paddy Field Outside National Rice Bowl
- Permanent Food Production Park
- Aquaculture Industrial Zone

Cultural Heritage Resources
- Archeological Heritage Site
- Building/ Monument/ Site Heritage
- Proposed Building/ Monument/ Site Heritage

Others
- Main Towns
- Highway
- Roads
- State Boundary
- District Boundary

TERENGGANU

NATURAL DISASTER RISK AREAS MANAGEMENT

The management of risk area includes identification of areas affected by natural disaster, as well as re-examination of the current framework for areas prone to natural disaster.

KD 1.5 Landslide Risk

1. Map and classify slope 'hotspot' areas according to the categories of stable (safe), showing signs of instability, and high risk.
2. Adopt the Guidelines for Development in Slope and Highland Areas (2009) as the basis for development control and for evaluation of the suitability of proposed development involving highlands and areas with slope in Terengganu.
3. Prohibit logging and land use change in highland area more than 1,000 metres above sea level.
4. Adopt community-based landslide management approach to encourage local community involvement in the management of slope and highland areas.

KD 1.5 Flood Risk

1. Expand the coverage of flood risk map to flood vulnerability areas in Terengganu (involving settlement areas along Terengganu coast in Kuala Besut, Jertih, Kampung Raja, Bandar Permaisuri, Bandar Al-Wathiqu Billah, Kuala Terengganu, Bukit Payung, Marang, Wakaf Tapai, Kuala Berang, Dungun, Paka, Kerteh, Chukai and Cheneh Baharu).
2. Translate the integrated land use management of flood risk area into SP, LP and SAP for the purpose of development control and planning approval evaluation.
3. Apply the concept of 'living with flood' to increase community preparedness towards flood risk.

KD 1.5 Tsunami and Earthquake Risk

1. Map tsunami risk area in detail by taking into account the aspects of vulnerability and hazard of tsunami-prone areas, especially on the coast of Terengganu.

KD 1.5 KD 2.2 Coastal Erosion Risk

1. Adopt the RFZPPN2 as the main reference in the planning and control of development in coastal erosion risk areas in Terengganu.
2. Implement the Terengganu State Coastal Vulnerability Index (CVI) for coastal erosion risk as a guide to development control in the coastal zones.
3. Regulate land reclamation activities in coastal areas.
4. Adapt Nature Based Solution (NBS) approach and green infrastructure for the protection of environmentally sensitive coastal areas.
5. Implement development control for coastal waters in Kuala Besut, Bandar Al-Wathiqu Billah, Kuala Terengganu, Dungun, Paka, Kerteh and Chukai.

KD 1.5 Sea Level Rise Risk

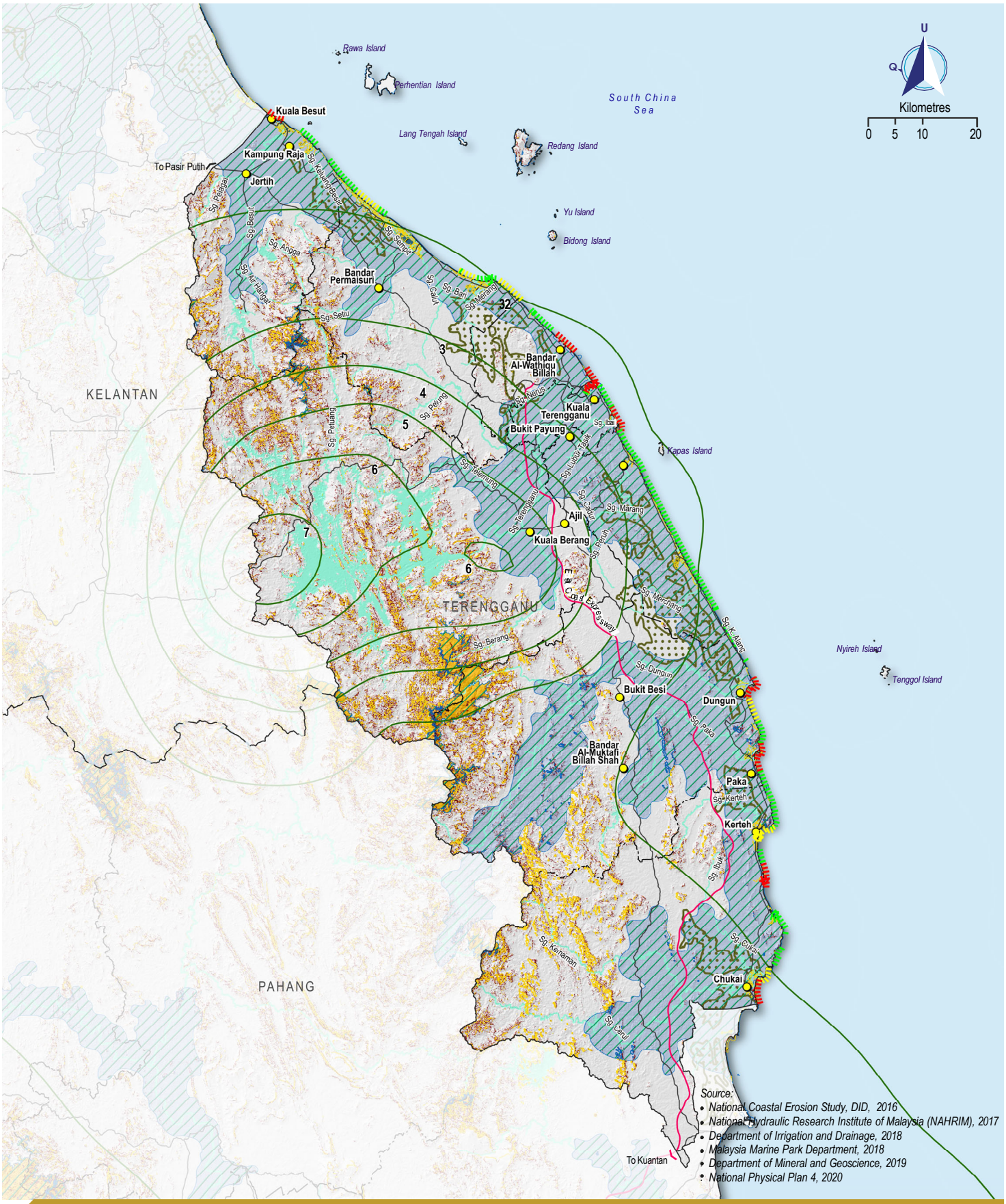
1. Adopt the RFZPPN2 as the main reference in the planning and control of coastal development in Terengganu.
2. Implement the Terengganu State Coastal Vulnerability Index (CVI) as a guide to development control in the coastal zones of Marang, Setiu and Besut.
3. Control development and land reclamation activities along the coastal waters of Terengganu.

KD 1.5 Drought Risk

1. Apply the concept of sponge-city development for urban water management (focus on built-up areas).
2. Expand the use of rainwater harvesting as an alternative water supply source during the dry season.
3. Explore and diversify alternative water sources such as riverside water reservoirs (TAPS) and groundwater to reduce dependence on rivers and dams.

KD 1.5 Forest and Peatland Fire Risk

1. Prepare peat soil fire risk map according to the categories of non-disaster risk zone and disaster risk zone.
2. Encourage community participation in peatland forest management.



Source:
- National Coastal Erosion Study, DID, 2016
- National Hydraulic Research Institute of Malaysia (NAHRIM), 2017
- Department of Irrigation and Drainage, 2018
- Malaysia Marine Park Department, 2018
- Department of Mineral and Geoscience, 2019
- National Physical Plan 4, 2020

MAP 7-18 : TERENGGANU STATE NATURAL DISASTER RISK AREA MANAGEMENT

Landslide Risk Area
- Landslide Risk (Slope >25°)
- Highlandi (> 1,000m)

Flood Risk
- Flood Risk

Earthquake and Tsunami Risk
- Fault Line

Coastal Erosion Risk
- Critical
- Significant
- Not Serious / Acceptable

Sea Level Rise Risk
- Projection Year 2030 (0.12m)
- Projection Year 2050 (0.24m)
- Projection Year 2100 (0.73m)

Forest and Peat Soil Fires
- Peat Soil

Disaster Risk Category
- High Risk Area
- Moderate Risk Area
- Low Risk Area

Others
- River/ Dam
- Main Towns
- Highway
- Roads
- State Boundary
- District Boundary

PAHANG SPATIAL GROWTH FRAMEWORK

Spatial Management is a framework in managing the availability of land, transport, growth areas, population settlement hierarchy and community involvement in creating a quality and liveable living environment. The intensification of development is emphasised through effective and holistic management to facilitate implementation of proposals for future land use development.

PD 2.1 PD 2.6 PD 2.4 PD 3.5 Sustainable and Competitive Economic Growth

1. Strengthen the Eastern Conurbation (Kuantan - Gambang - Pekan), the Jerantut - Bandar Tun Abdul Razak (Maran) - Temerloh - Mentakab Promoted Development Zone (PDZ), and the Bentong and Bandar Muadzam Shah Catalyst Centres.
2. Bandar Kuala Lipis, Raub, Bentong, Bera - Triang, Jerantut, Bandar Tun Abdul Razak (Maran), Mentakab, Maran, Pekan and Kuala Rompin have the potential to be upgraded into main towns.
3. Develop the Kuala Lipis, Raub and Kuala Rompin Agropolitan Centres as rural growth nodes.
4. Enhance the services, industry and tourism high value chain.
5. Enhance the role of the Temerloh Land Port as a logistics hub.
6. Enhance the role of the Kuantan Port (Level 2) as a regional port hub to handle all types of cargo.
7. The proposed Tanjung Agas Port, Pekan (Level 3) has the potential to support regional port hub.
8. The Kuantan Port has the potential as a cruise ship stopover to promote tourism activities.

PD 3.1 PD 3.4 PD 3.2 Integrated and Strategic Transport Network

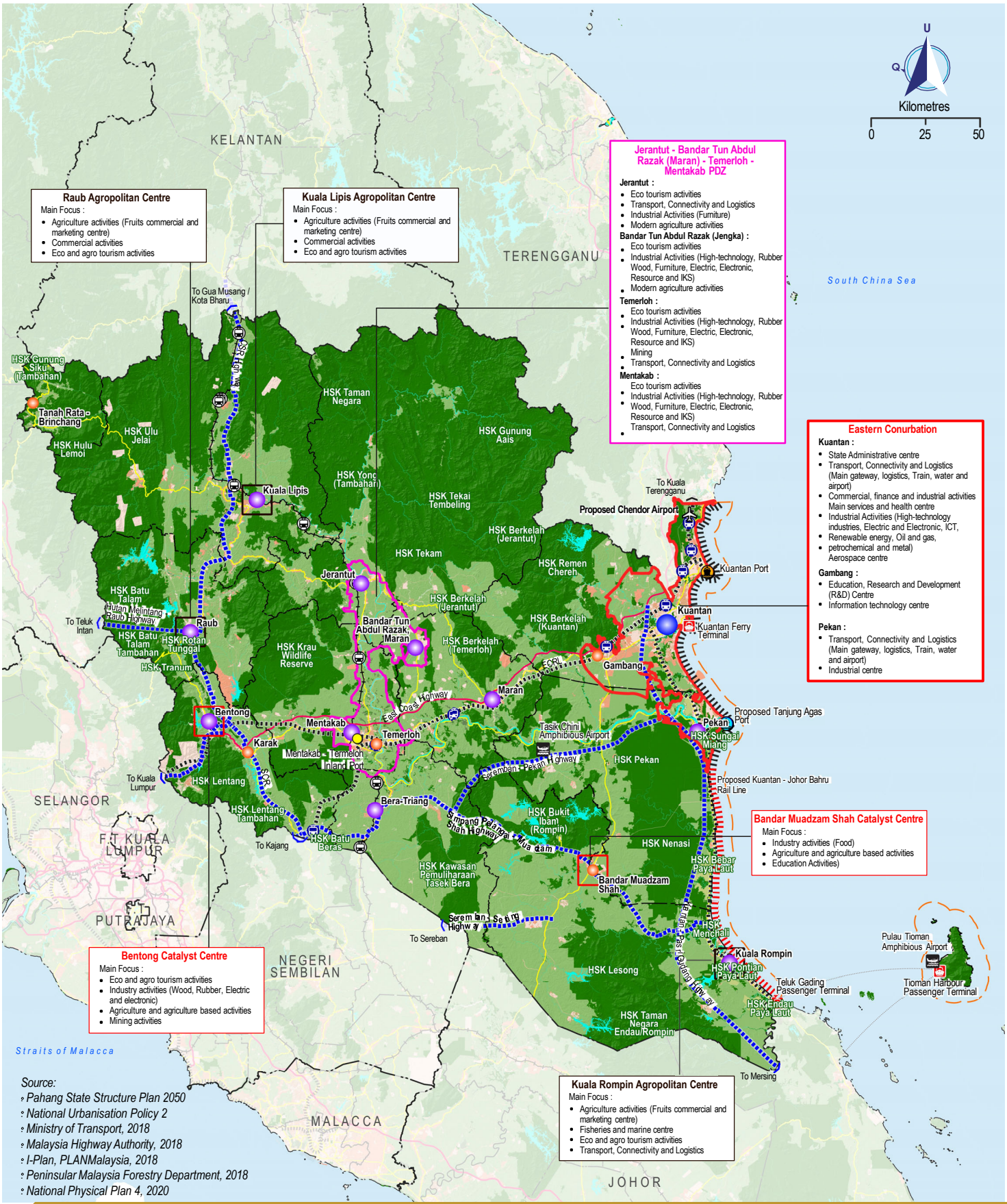
1. Strengthen the road network between the regions through the proposed connection from the Central Spine Road (CSR) in Simpang Pelangai, Pahang to Ulu Tiram, Johor via the Southern Central Road (SCR), the Kuantan - Pasir Gudang Highway extension, the Hutan Melintang - Raub Highway, the Simpang Pelangai - Muadzam Shah Highway and the Seremban - Pekan Highway.
2. Expand the high-speed rail network connecting Bandar Cherating - KotaSAS - Gambang - Maran - Temerloh - Port Klang, Selangor (ECRL 1) and the proposed Kuantan - Johor Bahru rail line via Bandar Kuala Rompin - Pekan - Kuantan (Proposed ECRL 2).
3. Strengthen the role of the Proposed Chendor Airport as a Regional Airport (Category 2).

KD 2.2 Coastal Area Development and Protection

1. Manage development and land reclamation activities in coastal areas.
2. Manage and protect marine habitats and ecological diversity in coastal zones in accordance with the RFZPPN2.

KI 1.1 KI 3.3 KI 2.1 KI 4.1 KI 3.2 Liveable Environment and Inclusive Communities

1. Provide adequate and affordable housing for the B40 and M40 target groups in urban areas.
2. Improve the quality of housing and neighbourhoods in rural areas through planned development.
3. Provide adequate and suitable facilities to nurture a smart society, which will become one of the building blocks of a developed and smart nation.
4. Promote green practices, healthy and safe lifestyles among communities and in residential surroundings.
5. Strengthen the role of the community in the planning and development process to ensure community needs are considered in the process.



MAP 7-19 : PAHANG STATE SPATIAL GROWTH FRAMEWORK

PAHANG RESOURCE MANAGEMENT

Resource management in NPP4 consists of five (5) main categories, namely natural, water, energy, food and heritage resources. These resources are national assets that provide important life support system. Good governance and appropriate laws are required to preserve and conserve the country's archeological assets and to ensure their benefits remain into the future.

KD 2.1 KD 2.6 KD 2.5 KD 2.7 Sustainable Management of Natural, Food and Heritage Resources

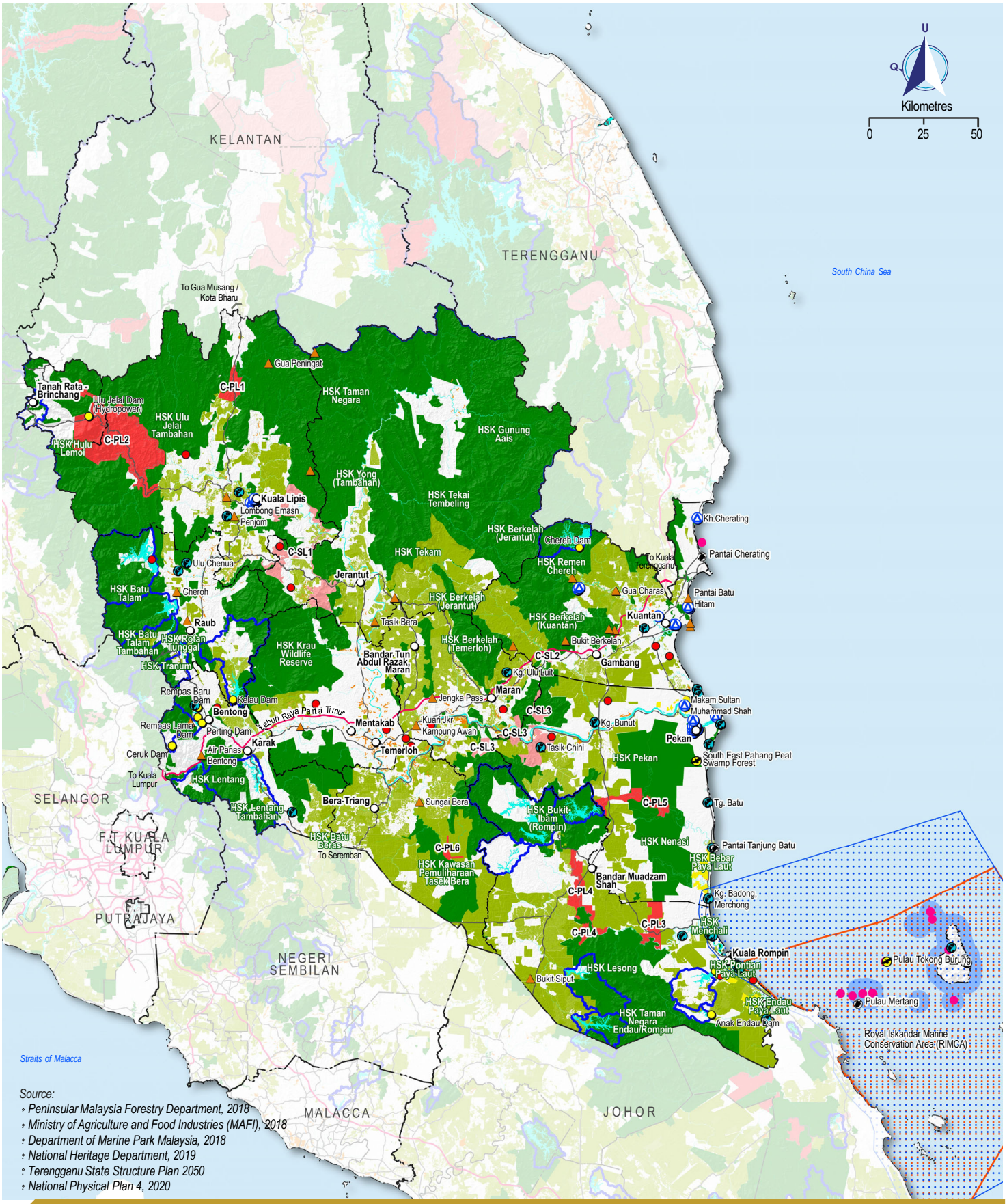
1. Emphasise the maintenance of existing forest to retain the State's potential to become a Carbon Neutral State as its forest cover is more than 50% of its total land area.
2. Preserve HSK Sungai Wi, HSK Sungai Yu, HSK Ulu Jelai, HSK Bukit Bujang, HSK Yong, HSK Tekai Tembeling, HSK Gunung Aais, HSK Tersang, HSK Batu Talam, HSK Som, HSK Tekam, HSK Berkelah (Kuantan), HSK Remen Chereh Tambahan, HSK Berkelah (Temerloh), HSK Krau, HSK Lakum, HSK Bukit Tinggi, HSK Lentang, HSK Kemasul, HSK Lepar, HSK Chini, HSK Chini Temerloh, HSK Bukit Ibam, HSK Pekan, HSK Nenasi, HSK Resak, HSK Lesong, HSK Endau State Park to protect the ecosystem and wildlife habitats.
3. Gazette, protect and conserve marine protected areas and coastal areas (including the Royal Iskandar Marine Conservation Area - RIMCA).
4. Conserve ecological corridors C-PL2 HS Ulu Jelai - HS Bukit Bujang - HS Hulu Lemoi, C-PL3 HS Lesong - HS Resak, C-PL4 HS Bukit Ibam - HS Sg. Manong - HS Sg. Lesong, C-PL6 RAMSAR Reserve Bera - HS Ibam, C-SL2 HS Lepar - HS Picnic and C-SL3 HS Chini - HS Lepar to maintain the continuity of the forest landscape.
5. Maintain and protect the Pekan Integrated Agricultural Development Area (IADA) (5,555 hectares) and Rompin Integrated Agricultural Development Area (IADA) (2,920 hectares) paddy areas.
6. Gazette natural sites of outstanding value and historical, artistic or scientific significance under the National Heritage Act (Act 645).
7. Gazette endangered habitats as protected areas (turtle landing sites, important bird areas and seaweed areas).
8. Protect the gazetted zone of Pulau Tioman waters (including Pulau Tioman and part of the archipelago in Johor covering an area of 7,048.60 square kilometres) to ensure controlled development, conservation of natural assets and protection of underwater heritage.
9. Protect Permanent Food Production Park (TKPM) and Aquaculture Industrial Zone (ZIA) as sources for food security.

KD 2.3 Improve Sustainable Water Resource

1. Gazette the Sungai Pontian, Sungai Rompin, Sungai Mercung, Sungai Bebar, Sungai Pahang, Sungai Penur, Sungai Kuantan, Sungai Baluk and Sungai Cherating basin reserves.
2. Control the development and activities in water catchment area (areas involved include Chereh Dam, Ulu Jelai Dam, Kelau Dam, Rempas Baru Dam, Rempas Lama Dam, Perting Dam, Ceruk Dam, Pontian Dam and Anak Endau Dam).
3. Apply the concept of "Sponge City" for urban water management (focus on built-up areas).
4. Encourage the use of grey water and groundwater as alternative water supply sources.
5. Reduce the rate of non-revenue water (NRW) by increasing the efficiency of water supply system management.

KD 3.1 KD 3.3 KD 3.2 Implement Low-carbon City and Sustainable Alternative Energy Resource Approaches

1. Increase usage of smart technology, low-carbon mobility and green building practices in development.
2. Encourage the development of biogas and biomass energy generation in plantation, cattle ranching and landfill areas.
3. Increase the production and generation of renewable energy (RE) by strengthening solar energy generation.
4. Develop micro-hydro power plants for rural areas to support agricultural activities and daily life of the people.



Source:

- *Peninsular Malaysia Forestry Department, 2018*
- *Ministry of Agriculture and Food Industries (MAFI), 2018*
- *Department of Marine Park Malaysia, 2018*
- *National Heritage Department, 2019*
- *Terengganu State Structure Plan 2050*
- *National Physical Plan 4, 2020*

MAP 7-20 : PAHANG STATE RESOURCES MANAGEMENT

Natural Resources
- Forest Reserve
- CFS Ecological Link

Natural Heritage Resources
- Turtle Landing Location
- Important Bird Areas
- Seaweed Areas
- Coral Reef Areas
- Proposed Marie Corridor Area
- Proposed Marine Protection Area
- Proposed Natural Heritage Geological Area
- Marine Park

Water Resources
- Dam Reservoir
- Water Body

Energy Resources
- River
- Dam Location (Hydro Powered and Mini Hydro)
- Oil Palm Plantation

Food Resources
- National Rice Bowl
- Paddy Field Outside National Rice Bowl
- Permanent Food Production Park
- Aquaculture Industrial Zone

Cultural Heritage Resources
- Archeological Heritage Site
- Proposed Building/ Monument/ Site Heritage

Others
- Main Towns
- Highway
- Roads
- State Boundary
- District Boundary

PAHANG NATURAL DISASTER RISK AREAS MANAGEMENT

The management of risk area includes identification of areas affected by natural disaster, as well as re-examination of the current framework for areas prone to natural disaster.

KD 1.5 Landslide Risk

1. Map and classify slope 'hotspot' areas according to the categories of stable (safe), showing signs of instability, and high risk.
2. Adopt the Guidelines for Development in Slope and Highland Areas (2009) as the basis for development control and for evaluation of the suitability of proposed development involving highlands and areas with slope in Pahang.
3. Prohibit logging and land use change in highland area more than 1,000 metres above sea level.
4. Adopt community-based landslide management approach to encourage local community involvement in the management of slope and highland areas.

KD 1.5 Flood Risk

1. Expand the coverage of flood risk map to flood vulnerability areas in Pahang (involving settlement areas in Kuantan, Pekan, Kuala Rompin, Kuala Lipis, Jerantut, Temerloh, Mentakab, Bera - Triang and part of Bandar Muadzam Shah).
2. Translate the integrated land use management of flood risk area into SP, LP and SAP for the purpose of development control and planning approval evaluation.
3. Apply the concept of 'living with flood' to increase community preparedness towards flood risk.

KD 1.5 Earthquake and Tsunami Risk

1. Map tsunami risk area in detail by taking into account the aspects of vulnerability and hazard of tsunami-prone areas, especially on the coast of Pahang.

KD 1.5 KD 2.2 Coastal Erosion Risk

1. Adopt the RFZPPN2 as the main reference in the planning and control of development in coastal erosion risk areas in Pahang.
2. Implement the Pahang State Coastal Vulnerability Index (CVI) for coastal erosion risk as a guide to development control in the coastal zones.
3. Regulate land reclamation activities in coastal areas.
4. Adapt Nature Based Solution (NBS) approach and green infrastructure for the protection of environmentally sensitive coastal areas.
5. Implement development control for coastal waters in Kuantan, Pekan and Kuala Rompin.

KD 1.5 Sea Level Rise Risk

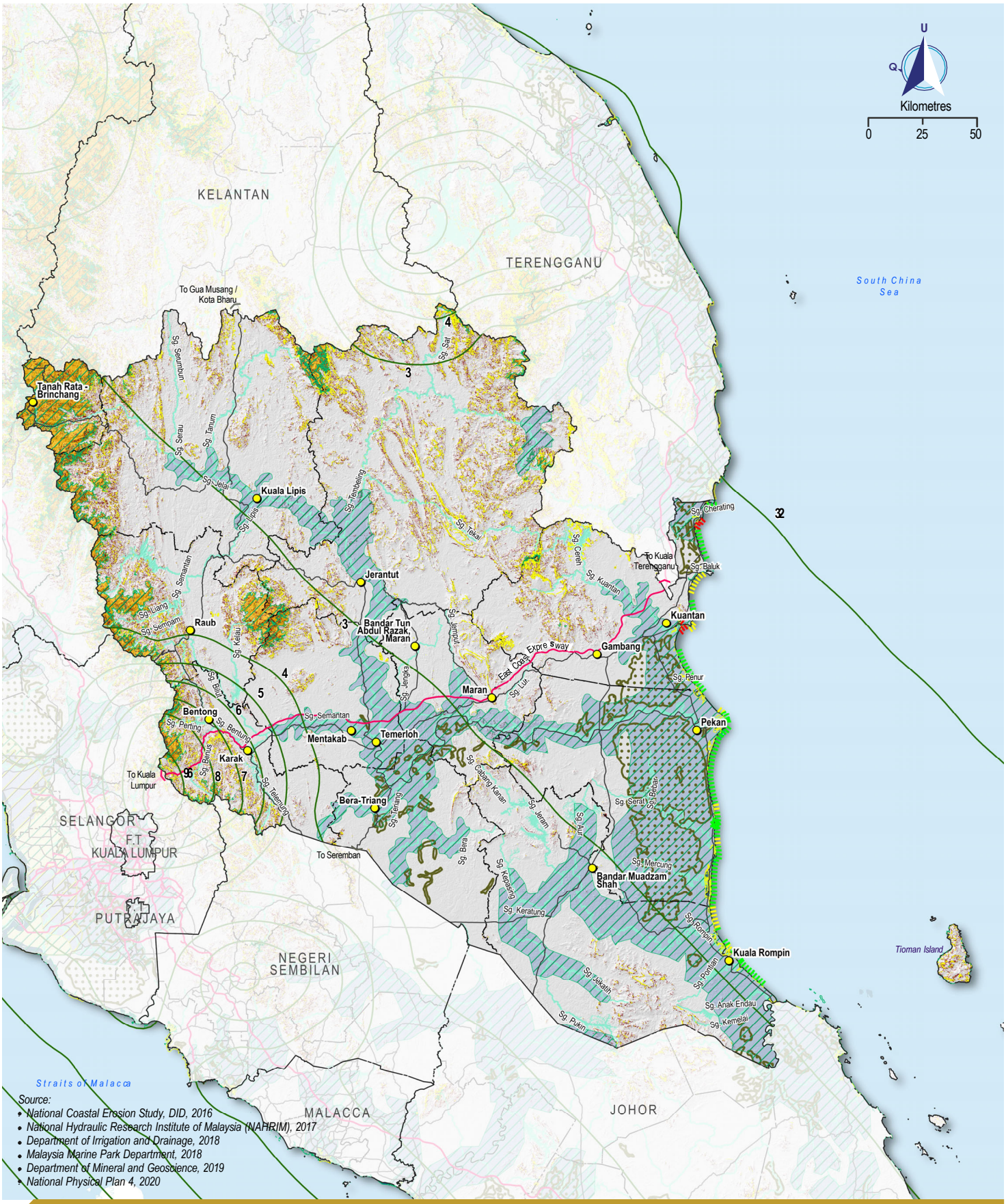
1. Adopt the RFZPPN2 as the main reference in the planning and control of coastal development in Pahang.
2. Implement the Pahang State Coastal Vulnerability Index (CVI) as a guide to development control in the coastal zone of Pekan, Pahang.
3. Control development and land reclamation activities along the coastal waters of Pahang.

KD 1.5 Drought Risk

1. Apply the concept of sponge-city development for urban water management (focus on built-up areas).
2. Expand the use of rainwater harvesting as an alternative water supply source during the dry season.
3. Explore and diversify alternative water sources such as riverside water reservoirs (TAPS) and groundwater to reduce dependence on rivers and dams.

KD 1.5 Forest and Peatland Fire Risk

1. Prepare peat soil fire risk map according to the categories of non-disaster risk zone and disaster risk zone.
2. Encourage community participation in peatland forest management.



Source:
- National Coastal Erosion Study, DID, 2016
- National Hydraulic Research Institute of Malaysia (NAHRIM), 2017
- Department of Irrigation and Drainage, 2018
- Malaysia Marine Park Department, 2018
- Department of Mineral and Geoscience, 2019
- National Physical Plan 4, 2020

MAP 7-21 : PAHANG STATE NATURAL DISASTER RISK AREA MANAGEMENT

Landslide Risk Area
- Landslide Risk (Slope >25°)
- Highland (> 1,000m)

Flood Risk
- Flood Risk

Earthquake and Tsunami Risk
- Fault Line

Coastal Erosion Risk
- Critical
- Significant
- Not Serious/ Acceptable

Sea Level Rise Risk
- Projection Year 2030 (0.12m)
- Projection Year 2050 (0.24m)
- Projection Year 2100 (0.73m)

Forest and Peat Soil Fires
- Peat Soil

Disaster Risk Category
- High Risk Area
- Moderate Risk Area
- Low Risk Area

Others
- River/ Dam
- Main Towns
- Highway
- Roads
- State Boundary
- District Boundary

SELANGOR SPATIAL GROWTH FRAMEWORK

Spatial Management is a framework in managing the availability of land, transport, growth areas, population settlement hierarchy and community involvement in creating a quality and liveable living environment. The intensification of development is emphasised through effective and holistic management to facilitate implementation of proposals for future land use development.

PD 2.1 PD 2.6 PD 2.4 PD 3.5 Sustainable and Competitive Economic Growth

1. Strengthen the National Conurbation, and the Sungai Besar and Kuala Selangor Catalyst Centres.
2. Develop the Sekinchan and Sabak Agropolitan Centres as rural growth nodes.
3. Enhance the services, industry and tourism high value chain.
4. Promote the KLIA as a World Class Airport City to become an air cargo hub.
5. Enhance the role of the Port Klang as a national and regional hub to handle all types of cargo.
6. The Carey Island Port has the potential to be developed as a logistics hub and as a port to support the manufacturing and production activities in the surrounding areas.
7. Enhance cruise ship services at the ASA Niaga International Ferry Terminal and the Boustead International Ferry Terminal to promote tourism activities.
8. Boost the tourism industry by leveraging on biodiversity assets with extensive branding and promotion.

PD 3.1 PD 3.4 PD 3.2 Integrated and Strategic Transport Network

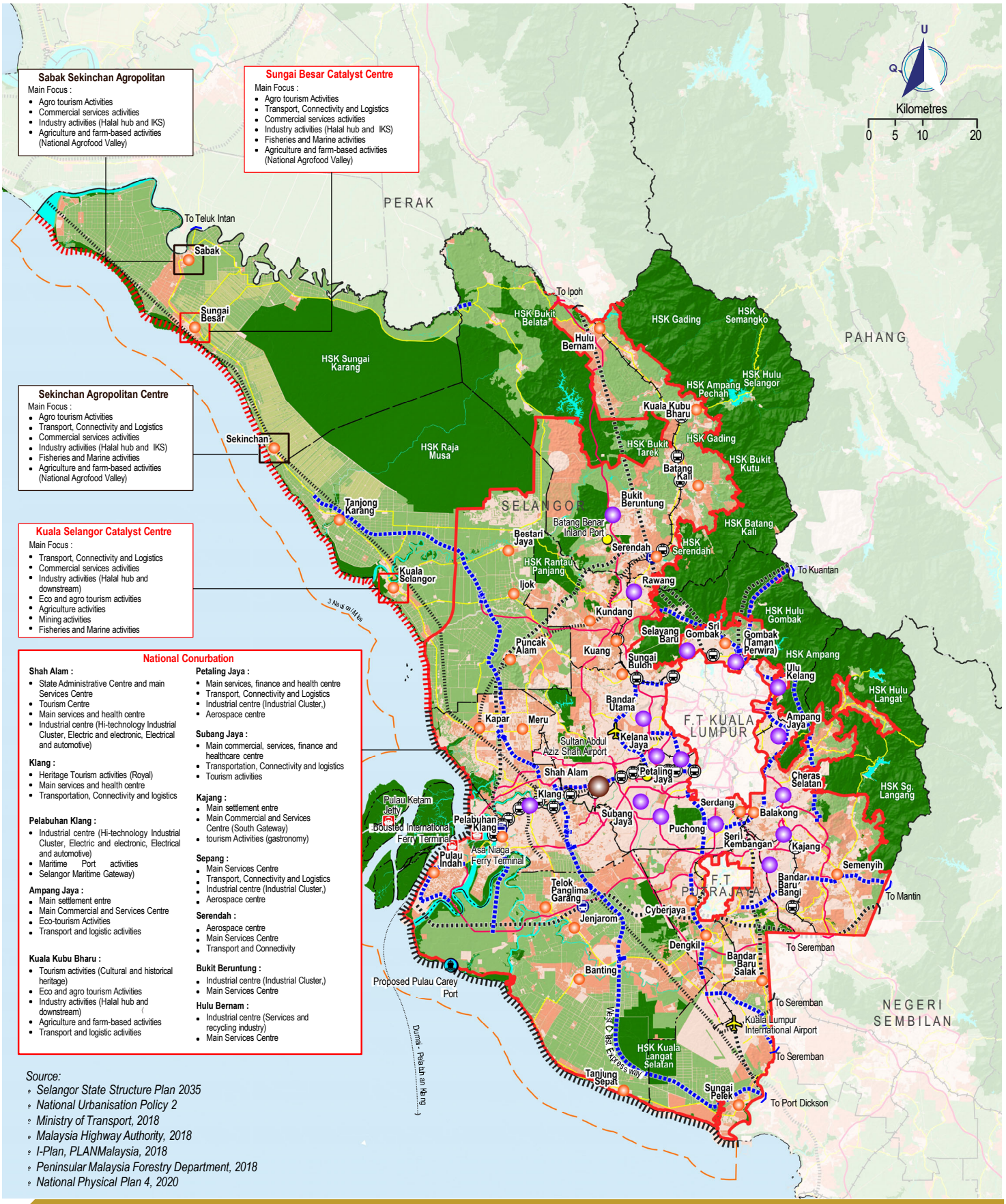
1. Strengthen the road network between regions through the proposed East Klang Valley Expressway (EKVE), the Putrajaya - Bangi Expressway (PBE), the KLIA - Senawang (SKLIA), the Putrajaya - KLIA (MAX II), the Northport - Westport Highway, the Serdang - Kinrara - Putrajaya Highway (SKIP), the Setiawangsa - Pantai Highway (SPE), the Sungai Besi - Ulu Kelang Highway (SUKE), the Damansara - Shah Alam Highway (DASH), the KLIA Ring Road, the Pulau Indah Ring Road and the Kuala Lumpur - Johor Bahru West Coast Expressway (WCE) extension.
2. Expand and integrate the existing rail network with new lines that connect Bagan Datuk - Shah Alam - KLIA, the Klang Valley Circle Line, the North Klang Valley and the South Klang Valley Line, and the Outer Klang Valley Line.
3. Expand the high-speed rail network connecting Bandar Tanjung Malim - Bandar Malaysia - Seremban (Proposed HSR) and Bandar Port Klang - Temerloh (Proposed ECRL).
4. Strengthen the role of the Sultan Abdul Aziz Shah Airport as a Regional Airport (Category 3) and the KLIA as the Main International Gateway (Category 1).
5. Upgrade public transport services with a modal split target for Shah Alam set at 50:50 between public transport and private vehicle usage.

KD 2.2 Coastal Area Development and Protection

1. Manage development and land reclamation activities in coastal areas.
2. Manage and protect marine habitats and ecological diversity in coastal zones in accordance with the RFZPPN2.

KI 1.1 KI 3.3 KI 2.1 KI 4.1 KI 3.2 Liveable Environment and Inclusive Communities

1. Provide adequate and affordable housing for the B40 and M40 target groups in urban areas.
2. Improve the quality of housing and neighbourhoods in rural areas through planned development.
3. Provide adequate and suitable facilities to nurture a smart society, which will become one of the building blocks of a developed and smart nation.
4. Promote green practices, healthy and safe lifestyles among communities and in residential surroundings.
5. Strengthen the role of the community in the planning and development process to ensure community needs are considered in the process.



MAP 7-22 : SELANGOR STATE SPATIAL GROWTH FRAMEWORK

Growth Area
- Conurbation
- Catalyst Centre
- Agropolitan Centre
- State City
- Main City
- Local Town

Land Use
- Current Built-up
- Proposed Built-up
- Forest
- Water Bodies
- Agriculture
- National Rice Bowl
- Outside National Rice Bowl

Coastal Development and Protection Area
- Coastal Development Zone
- Coastal Protection Zone

Land, Air and Water Transport
- Highway
- Road
- Proposed Highway
- Existing Rail Line
- Proposed High Speed Rail Line
- Proposed Inter City Rail Line
- Rail Station
- Proposed Rail Station
- Airport
- Port
- Proposed Port
- Passenger Terminal
- Inland Port

Others
- 3 Nautical Miles Boundary
- State Boundary
- District Boundary

SELANGOR RESOURCE MANAGEMENT

Resource management in NPP4 consists of five (5) main categories, namely natural, water, energy, food and heritage resources. These resources are national assets that provide important life support system. Good governance and appropriate laws are required to preserve and conserve the country's archeological assets and to ensure their benefits remain into the future.

KD 2.1 KD 2.6 KD 2.5 Sustainable Management of Natural, Food and Heritage Resources

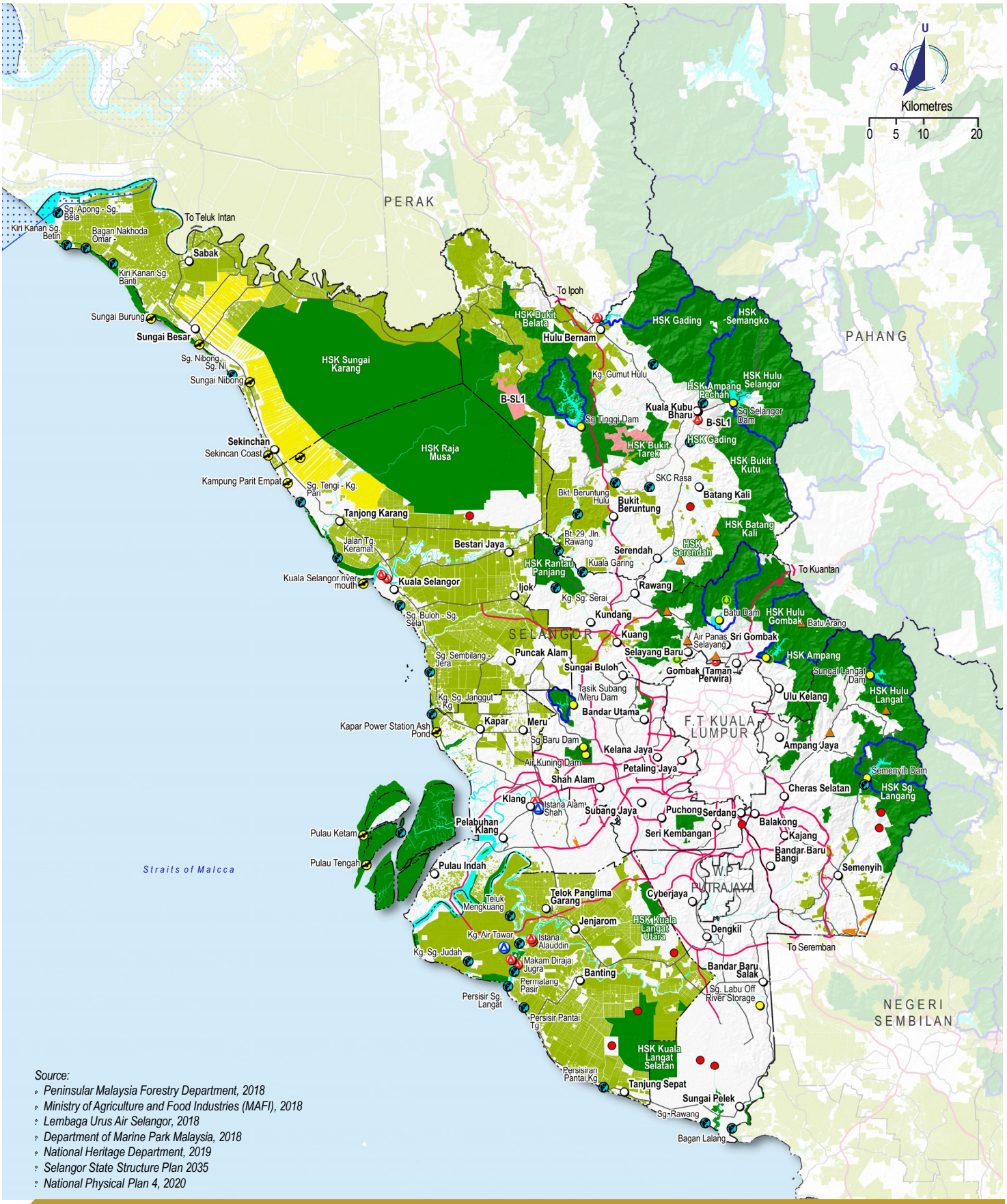
1. Preserve HSK Sungai Karang, HSK Sungai Dusun, HSK Bukit Belata, HSK Belata Tambahan 2, HSK Gading, HSK Semangko, HSK Hulu Selangor, HSK Bukit Tarek, HSK Rantau Panjang, HSK Bukit Lagong, HSK Bukit Cerakah, HSK Sungai Puteh Utara, HSK Sg. Jeloh, HSK Ayer Hitam, HSK Bukit Kutu, HSK Raja Musa, HSK Batang Kali, HSK Serendah, HSK Hulu Gombak, HSK Ampang, HSK Langat, HSK Sungai Langang, HSK Kuala Langat Utara HSK Kuala Langat Selatan to protect wildlife habitats and to ensure continuity of the forest landscape.
2. Conserve ecological corridor B-SL1 HS Raja Musa - HS Bukit Tarek - HS Bukit Gading to maintain the continuity of the forest landscape.
3. Maintain and protect the Northwest Selangor Integrated Agricultural Development Area (IADA) (19,087 hectares) paddy area.
4. Adopt smart farming and use the latest technology to increase agricultural yield.
5. Protect Permanent Food Production Park (TKPM) and Aquaculture Industrial Zone (ZIA) as sources for food security.
6. Maintain and preserve key agricultural areas (KPU) in Selangor.
7. Maintain Northwest Selangor IADA paddy area as a source of staple food for the country and increase the rice self-sufficiency level.
8. Gazette endangered habitats as protected areas (important bird areas).
9. Gazette natural heritage sites of outstanding value and historical, artistic or scientific significance under the National Heritage Act (Act 645).

KD 2.3 Improve Sustainable Water Resource

1. Gazette the Sungai Bernam, Sungai Tengi, Sungai Selangor, Sungai Buloh, Sungai Klang, Sungai Langat and Sungai Sepang basin reserves.
2. Control the development and activities in water catchment areas (Sg. Selangor Dam, Sg. Tinggi Dam, Batu Dam, Subang Lake Dam, Klang Gates Dam, Langat Dam and Semenyih Dam.
3. Apply the concept of "Sponge City" for urban water management (focus on built-up areas).
4. Encourage the use of grey water and groundwater as alternative water supply sources.
5. Reduce the rate of non-revenue water (NRW) by increasing the efficiency of water supply system management.

KD 3.1 KD 3.3 KD 3.2 Implement Low-carbon City and Sustainable Alternative Energy Resource Approaches

1. Increase usage of smart technology, low-carbon mobility and green building practices in development.
2. Encourage the development of biogas and biomass energy generation in plantation, cattle ranching and landfill areas.
3. Increase the production and generation of renewable energy (RE) by strengthening solar energy generation.
4. Develop micro-hydro power plants for rural areas to support agricultural activities and daily life of the people.



Source:

- *Peninsular Malaysia Forestry Department, 2018*
- *Ministry of Agriculture and Food Industries (MAFI), 2018*
- *Lembaga Urus Air Selangor, 2018*
- *Department of Marine Park Malaysia, 2018*
- *National Heritage Department, 2019*
- *Selangor State Structure Plan 2035*
- *National Physical Plan 4, 2020*

MAP 7-23 : SELANGOR STATE RESOURCE MANAGEMENT

Natural Resources
- Forest Reserve
- CFS Eccological Link

Natural Heritage Resources
- Natural Heritage Site
- Important Bird Areas
- Proposed Natural Heritage Geological Area

Water Resources
- Dam Reservoir
- Water Body

Energy Resources
- River
- Dam Location (Hydro Powered and Mini Hydro)
- Oil Palm Plantation

Food Resources
- National Rice Bowl
- Paddy Field Outside National Rice Bowl
- Permanent Food Production Park
- Aquaculture Industrial Zone

Cultural Heritage Resouces
- Bulding/ Monument/ Site Heritage
- Proposed Building/ Monument/ Site Heritage

Others
- Main Towns
- Highway
- Roads
- State Boundary
- District Boundary

SELANGOR NATURAL DISASTER RISK AREAS MANAGEMENT

The management of risk area includes identification of areas affected by natural disaster, as well as re-examination of the current framework for areas prone to natural disaster.

KD 1.5 Landslide Risk

1. Map and classify slope 'hotspot' areas according to the categories of stable (safe), showing signs of instability, and high risk.
2. Adopt the Guidelines for Development in Slope and Highland Areas (2009) as the basis for development control and for evaluation of the suitability of proposed development involving highlands and areas with slope in Selangor.
3. Prohibit logging and land use change in highland area more than 1,000 metres above sea level.
4. Adopt community-based landslide management approach to encourage local community involvement in the management of slope and highland areas.

KD 1.5 Flood Risk

1. Expand the coverage of flood risk map to flood vulnerability areas in Selangor (involving settlement areas in Sungai Besar, Tanjong Karang, Kuala Selangor, Bestari Jaya, Ijok, Klang, Port Klang, Pulau Indah, Hulu Langat, Telok Panglima Garang , Jenjarom, Banting and Dengkil.
2. Translate the integrated land use management of flood risk area into SP, LP and SAP for the purpose of development control and planning approval evaluation.
3. Apply the concept of 'living with flood' to increase community preparedness towards flood risk.

KD 1.5 Earthquake and Tsunami Risk

1. Map tsunami risk area in detail by taking into account the aspects of vulnerability and hazard of tsunami-prone areas, especially on the coast of Selangor.
2. Some areas in the state of Selangor may be exposed to tsunami and the possibility of radiation (as these areas are within 1,500 kilometer from the Anak Krakatua volcano and tsunami along the Andaman sea).

KD 1.5 KD 2.2 Coastal Erosion Risk

1. Adopt the RFZPPN2 as the main reference in the planning and control of development in coastal erosion risk areas in Selangor.
2. Implement the Selangor State Coastal Vulnerability Index (CVI) for coastal erosion risk as a guide to development control in the coastal zones.
3. Regulate land reclamation activities in coastal areas.
4. Adapt Nature Based Solution (NBS) approach and green infrastructure for the protection of environmentally sensitive coastal areas.
5. Implement development control for coastal waters in Tanjung Karang and Kuala Selangor - Kapar.

KD 1.5 Sea Level Rise Risk

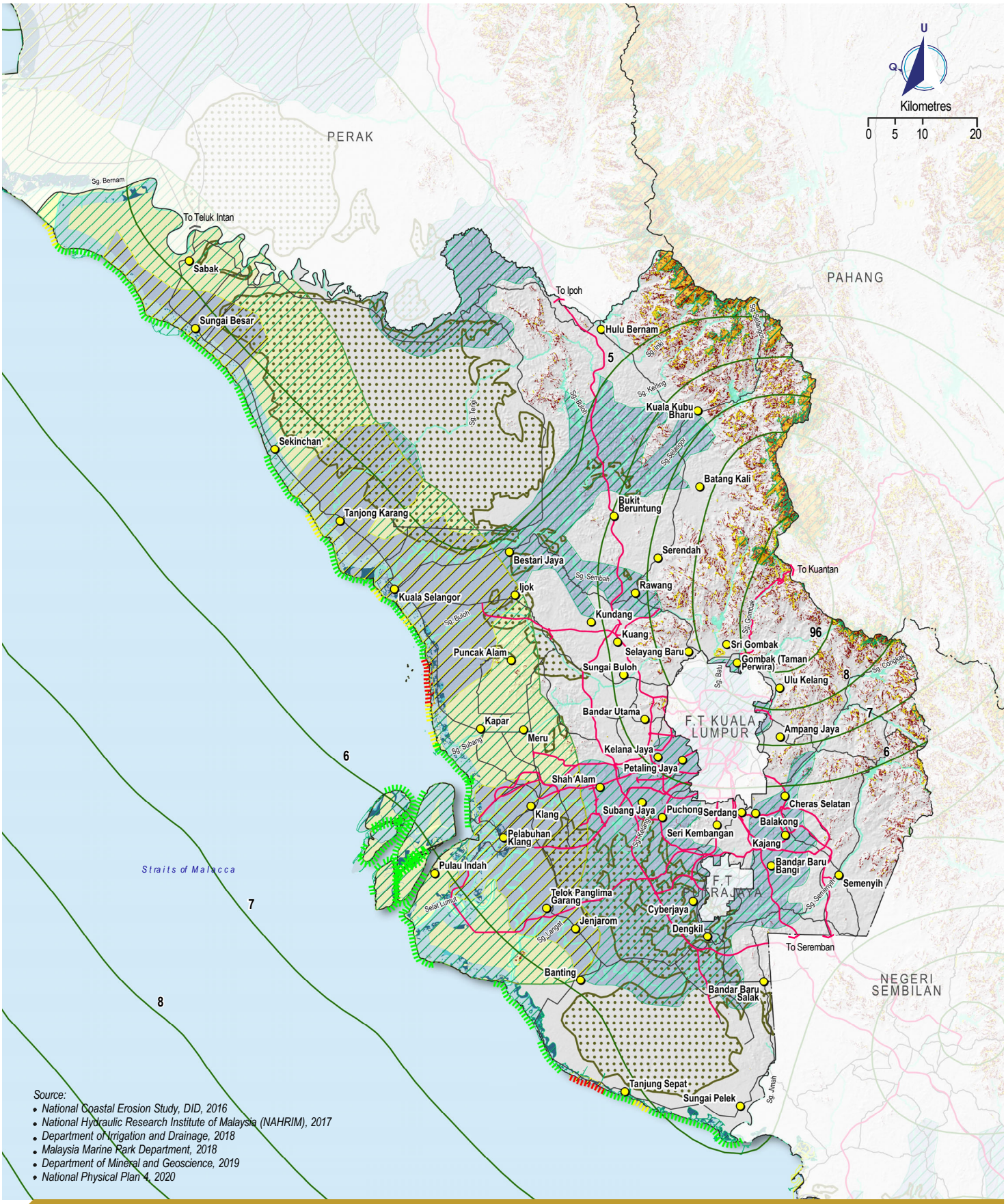
1. Adopt the RFZPPN2 as the main reference in the planning and control of coastal development in Selangor.
2. Implement the Selangor State Coastal Vulnerability Index (CVI) as a guide to development control in the coastal zones of Selangor.
3. Control development and land reclamation activities along the coastal waters of Selangor.

KD 1.5 Drought Risk

1. Apply the concept of sponge-city development for urban water management (focus on built-up areas).
2. Expand the use of rainwater harvesting as an alternative water supply source during the dry season.
3. Explore and diversify alternative water sources such as riverside water reservoirs (TAPS) and groundwater to reduce dependence on river.

KD 1.5 Forest and Peatland Fire Risk

1. Prepare peat soil fire risk map according to the categories of non-disaster risk zone and disaster risk zone.
2. Encourage community participation in peatland forest management.



Source:

- *National Coastal Erosion Study, DID, 2016*
- *National Hydraulic Research Institute of Malaysia (NAHRIM), 2017*
- *Department of Irrigation and Drainage, 2018*
- *Malaysia Marine Park Department, 2018*
- *Department of Mineral and Geoscience, 2019*
- *National Physical Plan 4, 2020*

MAP 7-24 : SELANGOR STATE NATURAL DISASTER RISK AREA MANAGEMENT

Landslide Risk Areas
- Landslide Risk (Slope >25°)
- Highland (> 1,000m)

Flood Risk
- Flood Risk

Earthquake and Tsunami Risk
- Fault Line
- Tsunami Risk

Coastal Erosion Risk
- Critical
- Significant
- Not Serious/ Acceptable

Se Level Rise Risk
- Projection Year 2030 (0.12m)
- Projection Year 2050 (0.24m)
- Projection Year 2100 (0.73m)

Forest and Peat Soil Fires
- Peat Soil

Disaster Risk Category
- High Risk Area
- Moderate Risk Area
- Low Risk Area

Others
- River/ Dam
- Main Towns
- Highway
- Roads
- State Boundary
- District Boundary

F.T.K.L & F.T.P

SPATIAL GROWTH FRAMEWORK

Spatial Management is a framework in managing the availability of land, transport, growth areas, population settlement hierarchy and community involvement in creating a quality and liveable living environment. The intensification of development is emphasised through effective and holistic management to facilitate implementation of proposals for future land use development.

PD 2.1 PD 2.4 PD 3.5 Sustainable and Competitive Economic Growth

1. Strengthen the National Conurbation to enhance development within the Federal Territory of Kuala Lumpur and the Federal Territory of Putrajaya.
2. Strengthen the international competitiveness of Kuala Lumpur and Putrajaya as global cities.
3. Enhance the services, industry and tourism high value chain.
4. Encourage the development of TOD in transit areas to create efficient and maximum land use.
5. Increase economic diversification through innovation and adoption of high technology.
6. Promote integrated planning and development through urban renewal to improve the quality and regeneration of old city areas.

PD 3.1 PD 3.2 Integrated and Strategic Transport Network

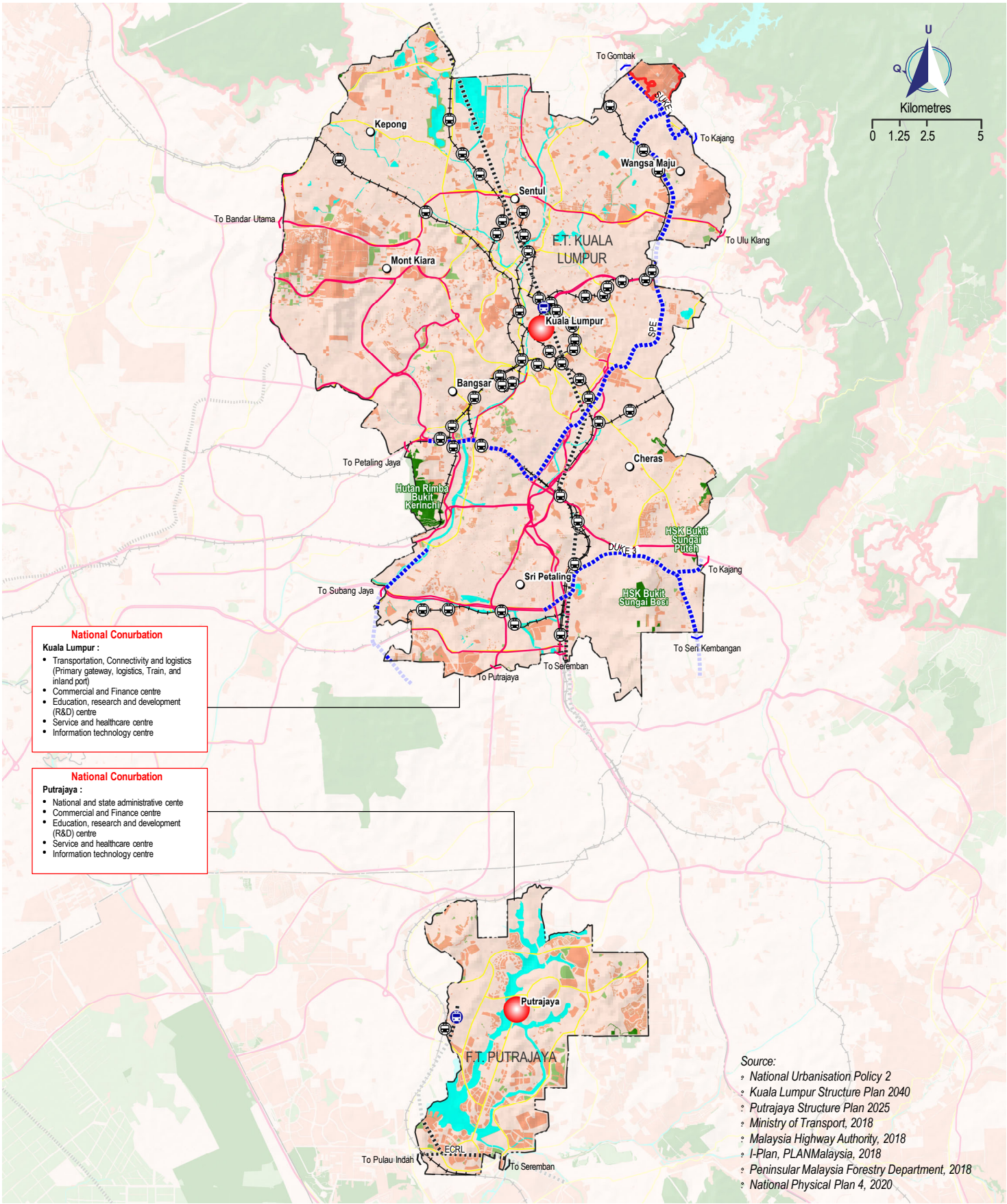
1. Strengthen the road network between the regions through the proposed Putrajaya and Kuala Lumpur North Dispersal Expressway (KL NODE).
2. Expand and integrate the existing rail network with new lines that connect the Federal Territories with various parts of the Klang Valley.
3. Expand the high-speed rail network connecting Kuala Lumpur - Kangar (HSR 2).
4. Expand the urban transport network through the development of high-innovation transport services.
5. Upgrade public transport services with a modal split target of 60:40 between public transport and private vehicle usage.

KD 2.2 Coastal Area Development and Protection

1. Manage development and land reclamation activities in coastal areas.
2. Manage and protect marine habitats and ecological diversity in coastal zones in accordance with the RFZPPN2.

KI 1.1 KI 2.1 KI 3.2 KI 3.3 KI 4.1 Liveable Environment and Inclusive Communities

1. Provide adequate and affordable housing for the B40 and M40 target groups in urban areas.
2. Improve the quality of housing and neighbourhoods through planned development.
3. Provide adequate and suitable facilities to nurture a smart society, which will become one of the building blocks of a developed and smart nation.
4. Promote green practices, healthy and safe lifestyles among communities and in residential surroundings.
5. Strengthen the role of the community in the planning and development process to ensure community needs are considered in the process.



MAP 7-25 : F.T. KUALA LUMPUR AND F.T. PUTRAJAYA SPATIAL GROWTH FRAMEWORK

Growth Area
- Global City
- Other Towns (Not Included in DPN 2)

Land Use
- Current Built-up
- Proposed Built-up
- Forest
- Water Bodies
- Agriculture

Land Transport
- Highway
- Road
- Proposed Highway
- Existing Rail Line
- Proposed High Speed Rail Line
- Rail Station
- Proposed Rail Station

Others
- 3 Nautical Miles Boundary
- State Boundary
- District Boundary

F.T.K.L & F.T.P

RESOURCE MANAGEMENT

Resource management in NPP4 consists of five (5) main categories, namely natural, water, energy, food and heritage resources. These resources are national assets that provide important life support system. Good governance and appropriate laws are required to preserve and conserve the country's archeological assets and to ensure their benefits remain into the future.

KD 2.1 KD 2.6 KD 2.5 Sustainable Management of Natural, Food and Heritage Resources

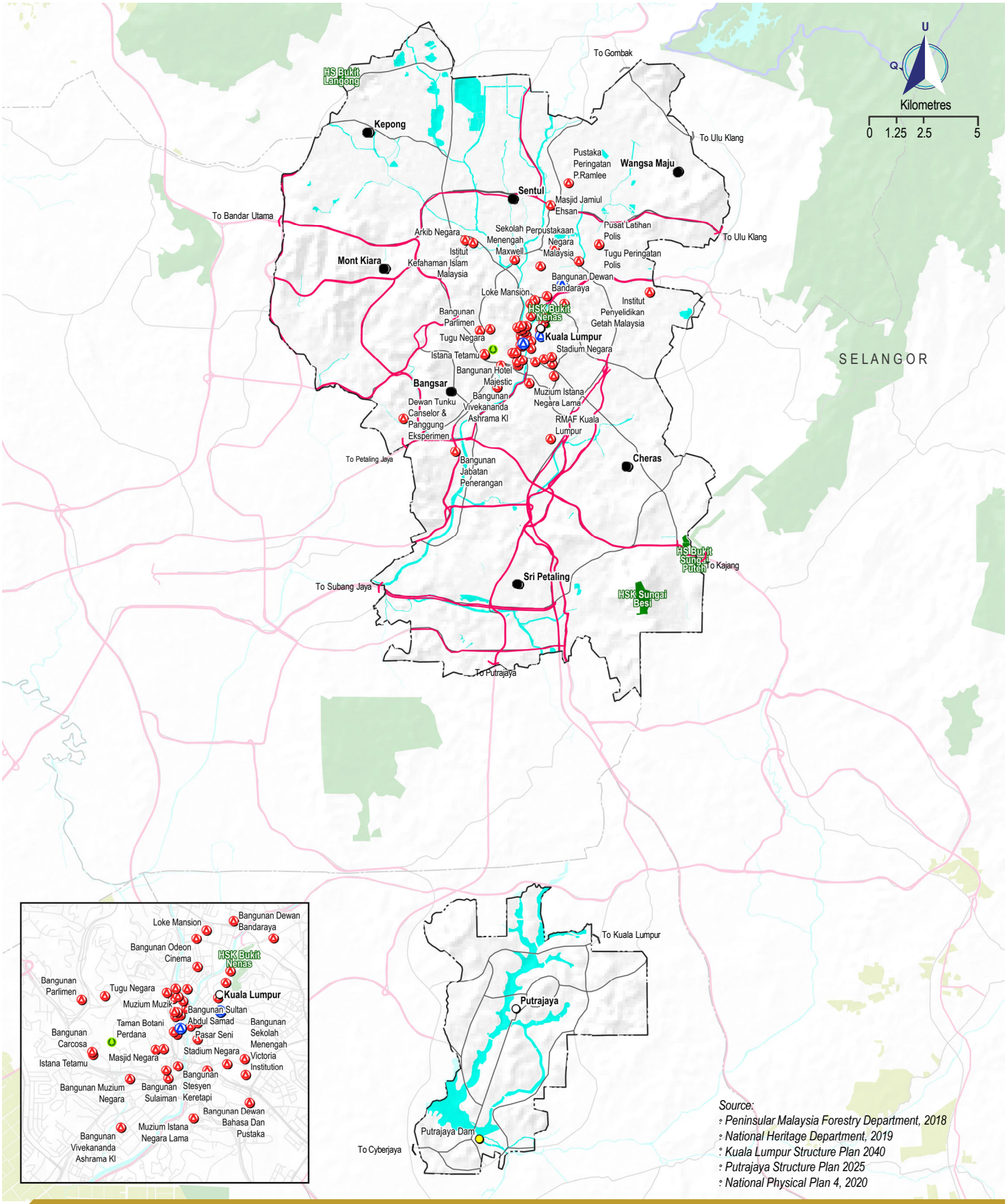
1. Conserve Sungai Besi Forest Reserve, Bukit Nanas Forest Reserve, Bukit Sungei Puteh Forest Reserve and Bukit Lagong Forest Reserve to protect biodiversity and to ensure the continuity of the forest landscape.
2. Adopt smart farming and use the latest technology to increase agricultural yield.
3. Gazette natural heritage sites of outstanding value and historical, artistic or scientific significance under the National Heritage Act (Act 645).

KD 2.3 Improve Sustainable Water Resource

1. Apply the concept of "Sponge City" for urban water management (focus on built-up areas).
2. Control the development and activities in water catchment area (Putrajaya Dam).
3. Encourage the use of grey water and groundwater as alternative water supply sources.
4. Reduce the rate of non-revenue water (NRW) by increasing the efficiency of water supply system management.

KD 3.1 KD 3.3 KD 3.2 Implement Low-carbon City and Sustainable Alternative Energy Resource Approaches

1. Increase usage of smart technology, low-carbon mobility and green building practice in development.
2. Encourage the development of biogas and biomass energy generation in landfill areas.
3. Increase the production and generation of renewable energy (RE) by strengthening solar energy generation.



MAP 7-26 : F.T.KUALA LUMPUR AND F.T.PUTRAJAYA RESOURCE MANAGEMENT

Natural Resources
- Forest Reserve

Natural Heritage Resources
- Natural Heritage Site

Water Resource
- Water Body

Energy Resource
- River
- Dam Location

Cultural Heritage Resource
- Building/ Monument/ Site Heritage
- Monumnet/ Site Heritage

Others
- Main Towns
- Other Town (not included in DPN2)
- Highway
- Roads
- State Boundary
- District Boundary

F.T.K.L & F.T.P

NATURAL DISASTER RISK AREAS MANAGEMENT

The management of risk area includes identification of areas affected by natural disaster, as well as re-examination of the current framework for areas prone to natural disaster. The involvement of stakeholders in risk area management is important to ensure that the management measures proposed are implemented and complied with the established safety regulations and control.

KD 1.5 Landslide Risk

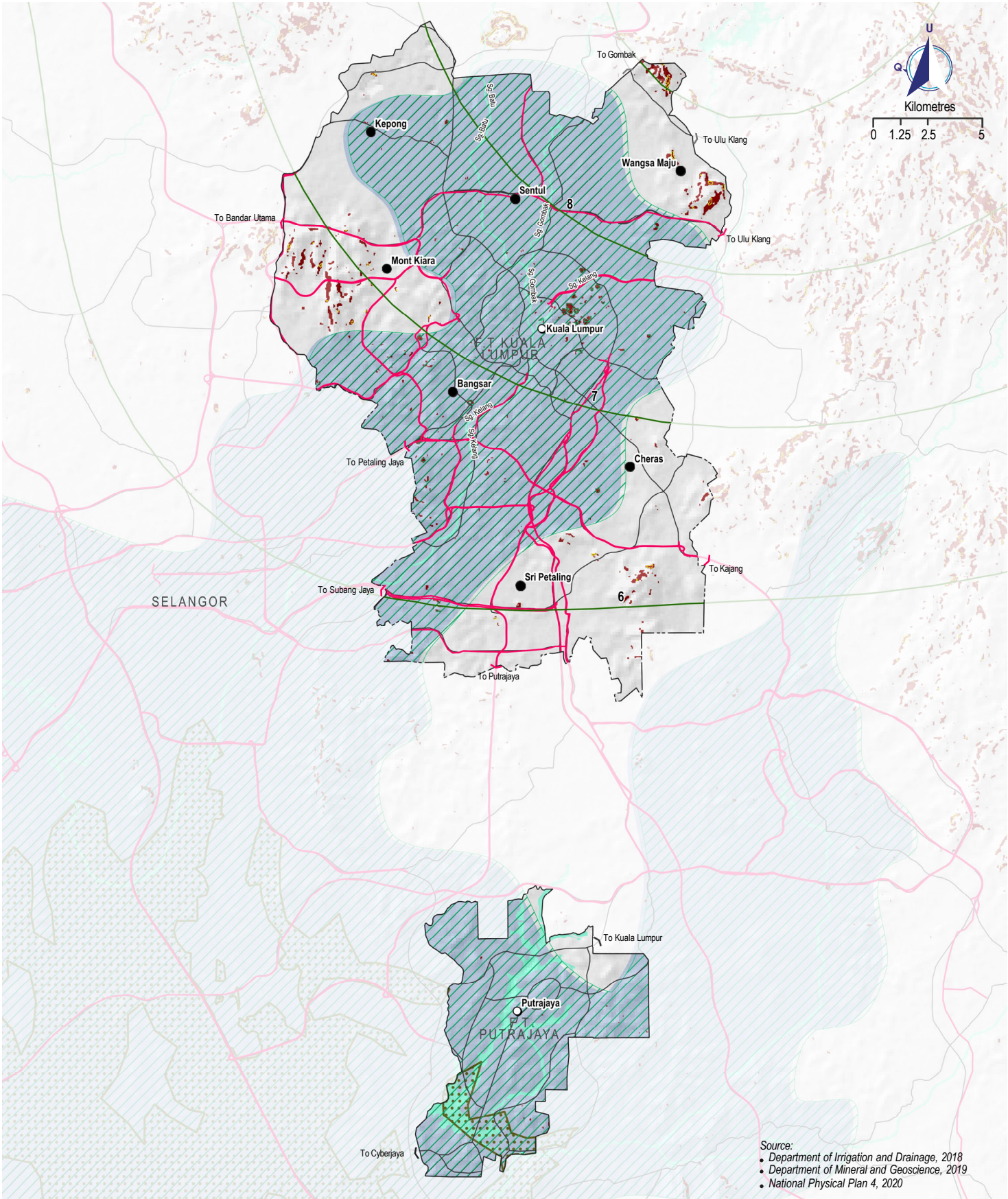
1. Map and classify slope 'hotspot' areas according to the categories of stable (safe), showing signs of instability, and high risk.
2. Prohibit land use change at areas more than 320 metres above sea level, involving Sungai Besi Forest Reserve, Bukit Nanas Forest Reserve, Bukit Sungei Puteh Forest Reserve and Bukit Lagong Forest Reserve.
3. Adopt community-based landslide management approach to encourage local community involvement in the management of slope and highland areas.

KD 1.5 Flood Risk

1. Translate the integrated land use management of flood risk area into SP, LP and SAP for the purpose of development control and planning approval evaluation.
2. Apply the concept of 'living with flood' to increase community preparedness towards flood risk.

KD 1.5 Drought Risk

1. Apply the concept of sponge-city development for urban water management (focus on built-up areas).
2. Expand the use of rainwater harvesting as an alternative water supply source during the dry season.
3. Explore and diversify alternative water sources such as riverside water reservoirs (TAPS) and groundwater to reduce dependence on rivers and dams.



Source:
- *Department of Irrigation and Drainage, 2018*
- *Department of Mineral and Geoscience, 2019*
- *National Physical Plan 4, 2020*

MAP 7-27 : F.T.KUALA LUMPUR AND F.T.PUTRAJAYA NATURAL DISASTER RISK AREA MANAGEMENT

Landslide Risk Areas
- Landslide Risk (Slope >25°)

Flood Risk
- Flood Risk

Earthquake and Tsunami Risk
- Fault Line

Forest and Peat Soil Fires
- Peat Soil

Disaster Risk Category
- Low Risk Area

Others
- River/ Dam
- Main Towns
- Other Towns (Not include in DPN 2)
- Highway
- Roads
- State Boundary

NEGERI SEMBILAN

SPATIAL GROWTH FRAMEWORK

Spatial Management is a framework in managing the availability of land, transport, growth areas, population settlement hierarchy and community involvement in creating a quality and liveable living environment. The intensification of development is emphasised through effective and holistic management to facilitate implementation of proposals for future land use development.

PD 2.1 PD 3.5 PD 2.6 Sustainable and Competitive Economic Growth

1. Strengthen the National Conurbation area [covering the Malaysia Vision Valley area (MVV Seremban District and Port Dickson District)], and the Tampin, Gemas and Seri Jempol Catalyst Centres.
2. Bandar Port Dickson has the potential to be upgraded into a main town.
3. Develop the Rembau, Kuala Pilah, Seri Jempol and Gemas Agropolitan Centres as rural growth nodes.
4. The Seri Jempol and Gemas Agropolitan Centres also have the potential to be upgraded as Catalyst Centres.
5. Enhance the role of the Nilai Land Port as a logistics hub.
6. Strengthen ferry services and improve infrastructure for cruise ship services at the Port Dickson passenger jetty terminal to promote tourism activities.

PD 3.1 PD 3.2 Integrated and Strategic Transport Network

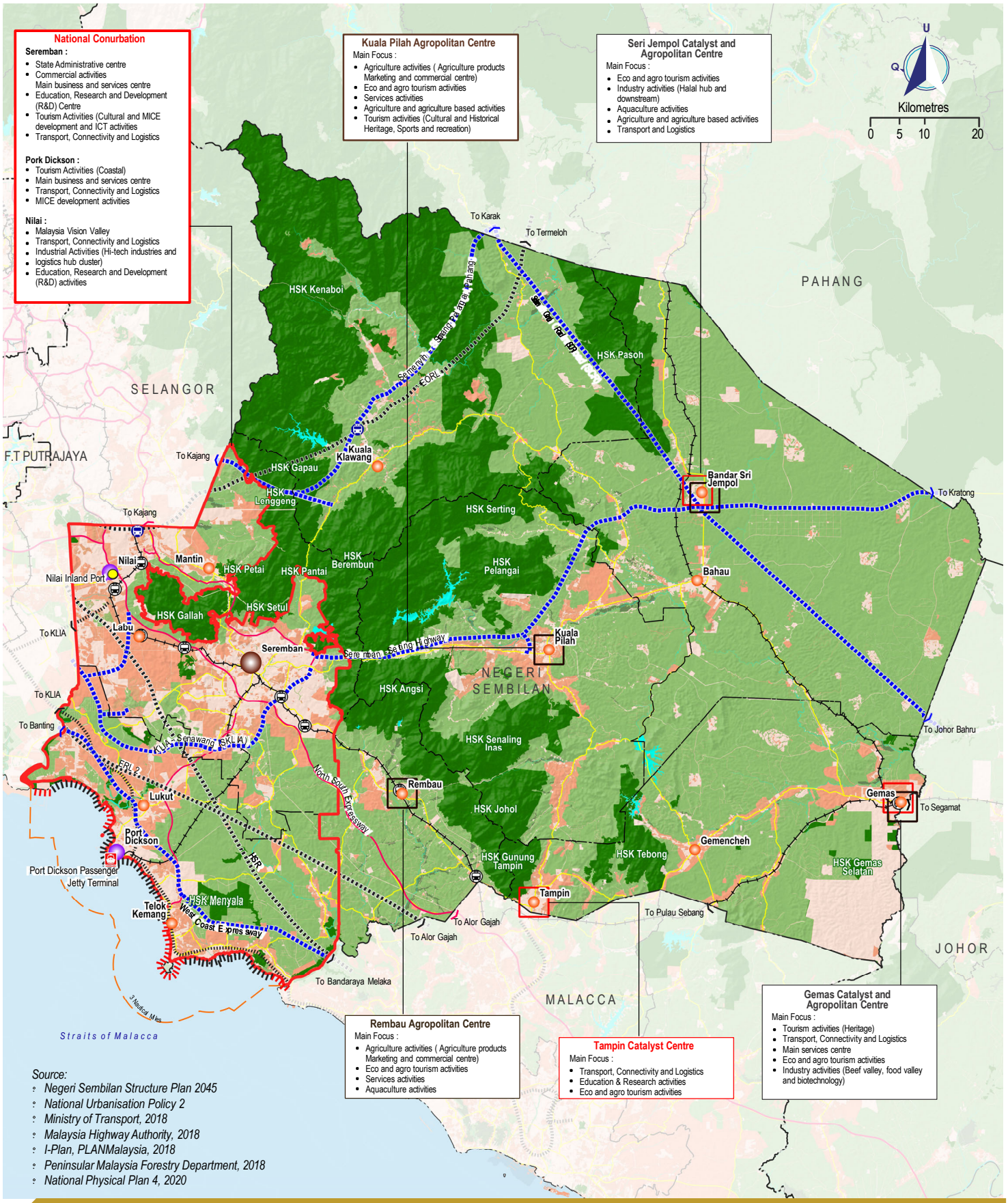
1. Strengthen the road network between the regions through the proposed Semenyih - Simpang Pelangai, Pahang, the KLIA - Senawang (SKLIA), the Seremban - Serting Highway, the Kuala Lumpur - Johor Bahru West Coast Expressway Extension (WCE) and the Southern Central Road (SCR) through Simpang Pelangai - Segamat.
2. Expand and integrate the existing rail network with new lines connecting KLIA, Selangor - Port Dickson and Nilai - KLIA, Selangor.
3. Expand the high-speed rail network connecting Bandar Seremban - Nilai - Melaka (proposed HSR) and Bandar Nilai - Klawang (proposed ECRL).

KD 2.2 Coastal Area Development and Protection

1. Manage development and land reclamation activities in coastal areas.
2. Manage and protect marine habitats and ecological diversity in coastal zones in accordance with the RFZPPN2.

KI 1.1 KI 3.3 KI 2.1 KI 4.1 KI 3.2 Liveable Environment and Inclusive Communities

1. Provide adequate and affordable housing for the B40 and M40 target groups in urban areas.
2. Improve the quality of housing and neighbourhoods in rural areas through planned development.
3. Provide adequate and suitable facilities to nurture a smart society, which will become one of the building blocks of a developed and smart nation.
4. Promote green practices, healthy and safe lifestyles among communities and in residential surroundings.
5. Strengthen the role of the community in the planning and development process to ensure community needs are considered in the process.



MAP 7-28 : NEGERI SEMBILAN STATE SPATIAL GROWTH FRAMEWORK

Growth Area
- Conurbation
- Catalyst Centre
- Agropolitan Centre
- State City
- Main City
- Local Town

Land Use
- Current Built-up
- Proposed Built-up
- Forest
- Water Bodies
- Agriculture
- Outside National Rice Bowl

Coastal Development and Protection Area
- Coastal Development Zone
- Coastal Protection Zone

Land and Water Transport
- Highway
- Road
- Proposed Highway
- Existing Rail Line
- Proposed High Speed Rail Line
- Proposed Inter City Rail Line
- Rail Station
- Proposed Rail Station
- Passenger Terminal
- Inland Port

Others
- 3 Nautical Miles Boundary
- State Boundary
- District Boundary

NEGERI SEMBILAN — RESOURCE MANAGEMENT

Resource management in NPP4 consists of five (5) main categories, namely natural, water, energy, food and heritage resources. These resources are national assets that provide important life support system. Good governance and appropriate laws are required to preserve and conserve the country's archeological assets and to ensure their benefits remain into the future.

KD 2.1 KD 2.6 KD 2.5 Sustainable Management of Natural, Food and Heritage Resources

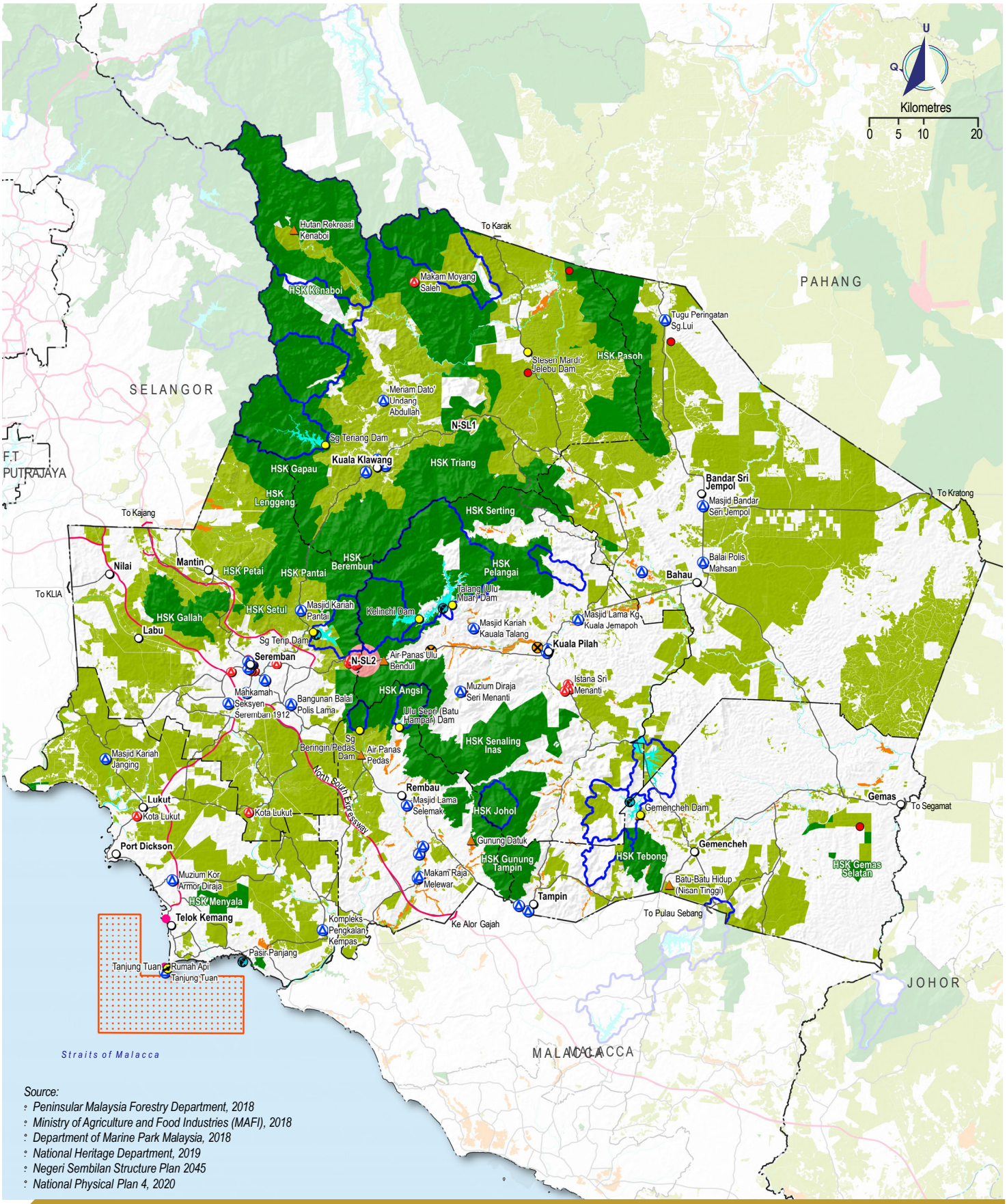
1. Preserve HSK Kenaboi, HSK Pasoh, HSK Gapau, HSK Teriang, HSK Serting, HSK Pelangai, HSK Berembun, HSK Pantai, HSK Setul, HSK Petai, HSK Gallah, HSK Lenggeng, HSK Angsi, HSK Senaling Inas, HSK Johol, HSK Gunung Tampin ,HSK Tebong, HSK Gemas Selatan, and HSK Menyala to ensure the continuity of the forest landscape.
2. Protect Permanent Food Production Park (TKPM) and Aquaculture Industrial Zone (ZIA) as sources of food security.
3. Maintain and preserve key agricultural areas (KPU) in Negeri Sembilan.
4. Adopt smart farming and use the latest technology to increase agricultural yield.
5. Protect endangered habitats (important bird areas).
6. Protect the gazetted zone of Tanjung Tuan waters (covering Teluk Kemang and Pasir Panjang Port Dickson with an area of 141.4 square kilometres) to ensure controlled development, conservation of natural assets and protection of underwater heritage.
7. Gazette natural heritage sites of outstanding value and historical, artistic or scientific significance under the National Heritage Act (Act 645).

KD 2.3 Improve Sustainable Water Resource

1. Gazette the Sungai Lukut Besar and Sungai Linggi basin reserves.
2. Control the development and activities in water catchment areas [Sg. Teriang Dam, Sg. Terip Dam, Talang Dam (Ulu Muar), Kelinchi Dam, Sg. Beringin/Pedas Dam, Ulu Sepri Dam (Batu Hampar) and Gemencheh Dam].
3. Apply the concept of "Sponge City" for urban water management (focus on built-up areas).
4. Encourage the use of grey water and groundwater as alternative water supply sources.
5. Reduce the rate of non-revenue water (NRW) by increasing the efficiency of water supply system management.

KD 3.1 KD 3.3 KD 3.2 Implement Low-carbon City and Sustainable Alternative Energy Resource Approaches

1. Increase usage of smart technology, low-carbon mobility and green building practices in development.
2. Encourage the development of biogas and biomass energy generation in plantation, cattle ranching and landfill areas.
3. Increase the production and generation of renewable energy (RE) by strengthening solar energy generation.
4. Develop micro-hydro power plants for rural areas to support agricultural activities and daily life of the people.



Source:

- *Peninsular Malaysia Forestry Department, 2018*
- *Ministry of Agriculture and Food Industries (MAFI), 2018*
- *Department of Marine Park Malaysia, 2018*
- *National Heritage Department, 2019*
- *Negeri Sembilan Structure Plan 2045*
- *National Physical Plan 4, 2020*

MAP 7-29 : NEGERI SEMBILAN STATE RESOURCE MANAGEMENT

Natural Resources
- Forest Reserve
- CFS Ecological Link

Natural Heritage Resources
- Important Bird Areas
- Gazetted Waters Zone
- Proposed Natural Heritage Geological Area

Water Resources
- Dam Reservoir
- Water Body

Energy Resourcees
- River
- Dam Location (Hydro Powered and Mini Hydro)
- Oil Palm Plantation

Food Resources
- Paddy Field Outside National Rice Bowl
- Permanent Food Production Park
- Aquaculture Industrial Zone

Cultural Heritage Resources
- Archeological Heritage Site
- Building/ Monument/ Site Heritage
- Proposed Building/ Monument/ Site Heritage

Others
- Main Towns
- Highway
- Roads
- State Boundary
- District Boundary

NEGERI SEMBILAN

NATURAL DISASTER RISK AREAS MANAGEMENT

The management of risk area includes identification of areas affected by natural disaster as a result of climate change. The identification of areas at risk in Negeri Sembilan due to flood, sea level rise, landslide, coastal erosion, earthquake and tsunami is to ensure sufficient attention is given to natural disaster risk management in the planning and development of the areas.

KD 1.5 Landslide Risk

1. Map and classify slope 'hotspot' areas according to the categories of stable (safe), showing signs of instability, and high risk.
2. Adopt the Guidelines for Development in Slope and Highland Areas (2009) as the basis for development control and for evaluation of the suitability of proposed development involving highlands and areas with slope in Negeri Sembilan.
3. Prohibit logging and land use change in highland areas more than 1,000 metres above sea level.
4. Adopt community-based landslide management approach to encourage local community involvement in the management of slope and highland areas.

KD 1.5 Flood Risk

1. Expand the coverage of flood risk map to flood vulnerability areas in Negeri Sembilan (involving settlement areas in Seremban, Port Dickson, Jelebu and Tampin).
2. Translate the integrated land use management of flood risk area into SP, LP and SAP for the purpose of development control and planning approval evaluation.
3. Apply the concept of 'living with flood' to increase community preparedness towards flood risk.

KD 1.5 Earthquake and Tsunami Risk

1. Map tsunami risk area in detail by taking into account the aspects of vulnerability and hazard of tsunami-prone areas, especially on the coast of Negeri Sembilan.

KD 1.5 KD 2.2 Coastal Erosion Risk

1. Adopt the RFZPPN2 as the main reference in the planning and control of development in coastal erosion risk areas in Negeri Sembilan.
2. Implement the Negeri Sembilan Coastal Vulnerability Index (CVI) for coastal erosion risk as a guide to development control in the coastal zones.
3. Regulate land reclamation activities in coastal areas.
4. Adapt Nature Based Solution (NBS) approach and green infrastructure for the protection of environmentally sensitive coastal areas.
5. Implement development control for coastal waters in Teluk Kemang and Port Dickson.

KD 1.5 Sea Level Rise Risk

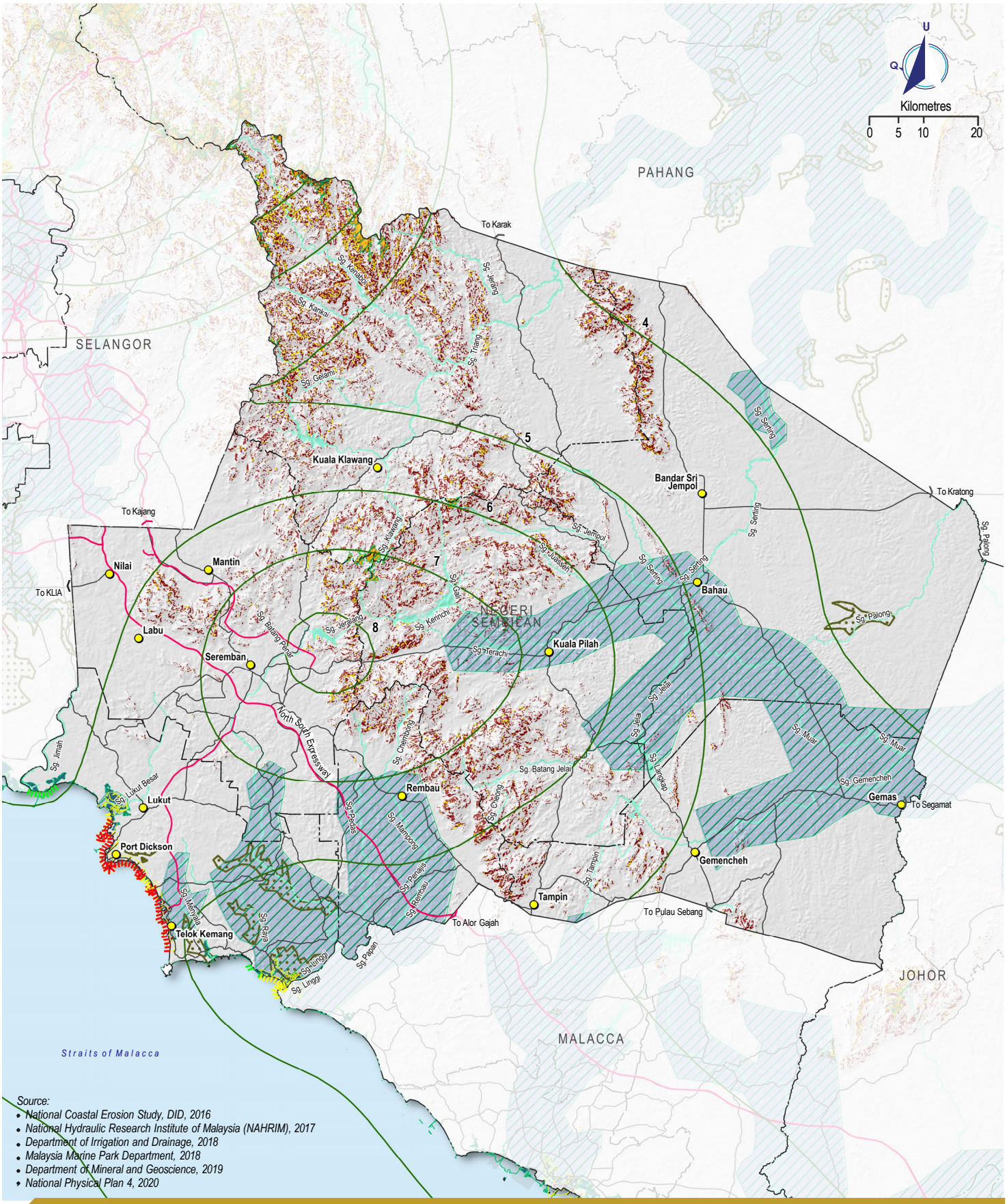
1. Adopt the RFZPPN2 as the main reference in the planning and control of coastal development in Negeri Sembilan.
2. Implement the Negeri Sembilan Coastal Vulnerability Index (CVI) as a guide to development control in the coastal zones of the state.
3. Control development and land reclamation activities along the coastal waters of Negeri Sembilan.

KD 1.5 Drought Risk

1. Apply the concept of sponge-city development for urban water management (focus on built-up areas).
2. Expand the use of rainwater harvesting as an alternative water supply source during the dry season.
3. Explore and diversify alternative water sources such as riverside water reservoirs (TAPS) and groundwater to reduce dependence on rivers and dams.

KD 1.5 Forest and Peatland Fire Risk

1. Prepare peat soil fire risk map according to the categories of non-disaster risk zone and disaster risk zone.
2. Encourage community participation in peatland forest management.



Source:
- *National Coastal Erosion Study, DID, 2016*
- *National Hydraulic Research Institute of Malaysia (NAHRIM), 2017*
- *Department of Irrigation and Drainage, 2018*
- *Malaysia Marine Park Department, 2018*
- *Department of Mineral and Geoscience, 2019*
- *National Physical Plan 4, 2020*

MAP 7-30 : NEGERI SEMBILAN STATE NATURAL DISASTER RISK AREA MANAGEMENT

Landslide Risk Areas
- Landslide Risk (Slope >25°)
- Highland (> 1,000m)

Flood Risk
- Flood Risk

Earthquake and Tsunami Risk
- Fault Line

Coastal Erosion Risk
- Critical
- Significant
- Not Serious/ Acceptable

Sea Level Rise Risk
- Projection Year 2030 (0.12m)
- Projection Year 2050 (0.24m)
- Projection Year 2100 (0.73m)

Forest and Peat Soil Fires
- Peat Soil

Disaster Risk Category
- High Risk Area
- Moderate Risk Area
- Low Risk Area

Others
- River/ Dam
- Main Towns
- Highway
- Roads
- State Boundary
- District Boundary

MALACCA

SPATIAL GROWTH FRAMEWORK

Spatial Management is a framework in managing the availability of land, transport, growth areas, population settlement hierarchy and community involvement in creating a quality and liveable living environment. The intensification of development is emphasised through effective and holistic management to facilitate implementation of proposals for future land use development.

PD 2.1 PD 3.5 PD 2.4 Sustainable and Competitive Economic Growth

1. Strengthen the Historic City of Melaka Promoted Development Zone (PDZ), and the Kuala Linggi, Pulau Sebang and Sungai Rambai Catalyst Centres.
2. Bandar Melaka has the potential to be upgraded into a regional city.
3. Enhance the services, industry and tourism high value chain.
4. Strengthen health tourism by making Melaka a major health tourism destination in the region.
5. Enhance the role of the Tanjung Beruas Port to support the manufacturing and production activities in the surrounding areas.
6. Enhance cruise ship services at the Melaka International Ferry Terminal to promote tourism activities.
7. The Kuala Linggi Port has the potential to be developed into a logistics hub and as a port to support the manufacturing and production activities in the surrounding areas.
8. Boost development in the Melaka Waterfront Economic Zone (MWEZ) through the empowerment of the Straits of Melaka maritime routes for new economic growth.

PD 3.1 PD 3.4 PD 3.2 Integrated and Strategic Transport Network

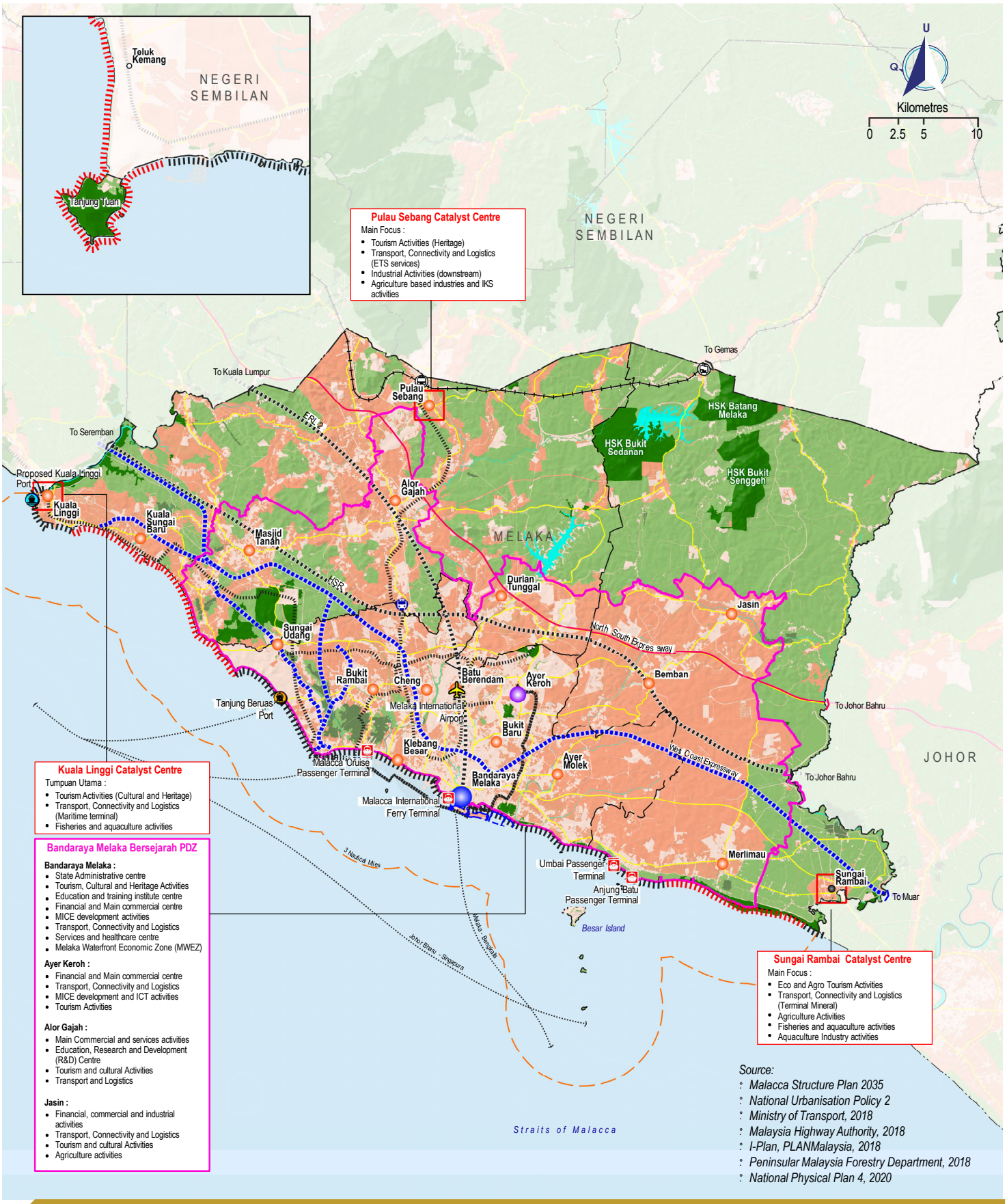
1. Strengthen the road network between the regions through the proposed Kuala Lumpur - Johor Bahru West Coast Highway (WCE) Extension, the Jalan Pesisir Pantai, the Jalan Kuala Linggi - Masjid Tanah (Phase 2), the Kuala Sungai Baru - Jalan Londang (Malacca State Route M157) and the Jalan Sungai Udang - Bukit Rambai.
2. Expand and integrate the existing rail network with new lines that connect Port Dickson - Bandaraya Melaka, Pulau Sebang - Bandaraya Melaka and the Proposed ERL 2 (KLIA - Melaka).
3. Expand the high-speed rail network connecting Bandar Melaka - Pagoh (Proposed HSR).
4. Strengthen the role of the Melaka International Airport as a Regional Airport (Category 3).

KD 2.2 Coastal Area Development and Protection

1. Manage development and land reclamation activities in coastal areas.
2. Manage and protect marine habitats and ecological diversity in coastal zones in accordance with the RFZPPN2.

KI 1.1 KI 3.3 KI 2.1 KI 4.1 KI 3.2 Liveable Environment and Inclusive Communities

1. Provide adequate and affordable housing for the B40 and M40 target groups in urban areas.
2. Improve the quality of housing and neighbourhoods in rural areas through planned development.
3. Provide adequate and suitable facilities to nurture a smart society, which will become one of the building blocks of a developed and smart nation.
4. Promote green practices, healthy and safe lifestyles among communities and in residential surroundings.
5. Strengthen the role of the community in the planning and development process to ensure community needs are considered in the process.



MAP 7-31 : MALACCA STATE SPATIAL GROWTH FRAMEWORK

Growth Area
- Promoted Development Zone
- Catalyst Centre
- Regional City
- Main City
- Local Town
- Town

Land Use
- Current Built-up
- Proposed Built-up
- Forest
- Water Bodies
- Agriculture
- Outside National Rice Bowl

Coastal Development and Protection Area
- Coastal Development Zone
- Coastal Protection Zone

Land, Air and Water Transport
- Highway
- Road
- Proposed Highway
- Existing Rail Line
- Proposed High Speed Rail Line
- Proposed Inter City Rail Line
- Water Route
- Rail Station
- Proposed Rail Station
- Airport
- Port
- Proposed Port
- Passenger Terminal

Others
- Reclaimed Area
- 3 Nautical Miles Boundary
- State Boundary
- District Boundary

MALACCA

RESOURCE MANAGEMENT

Resource management in NPP4 consists of five (5) main categories, namely natural, water, energy, food and heritage resources. These resources are national assets that provide important life support system. Good governance and appropriate laws are required to preserve and conserve the country's archeological assets and to ensure their benefits remain into the future.

KD 2.1 KD 2.6 KD 2.5 Sustainable Management of Natural, Food and Heritage Resources

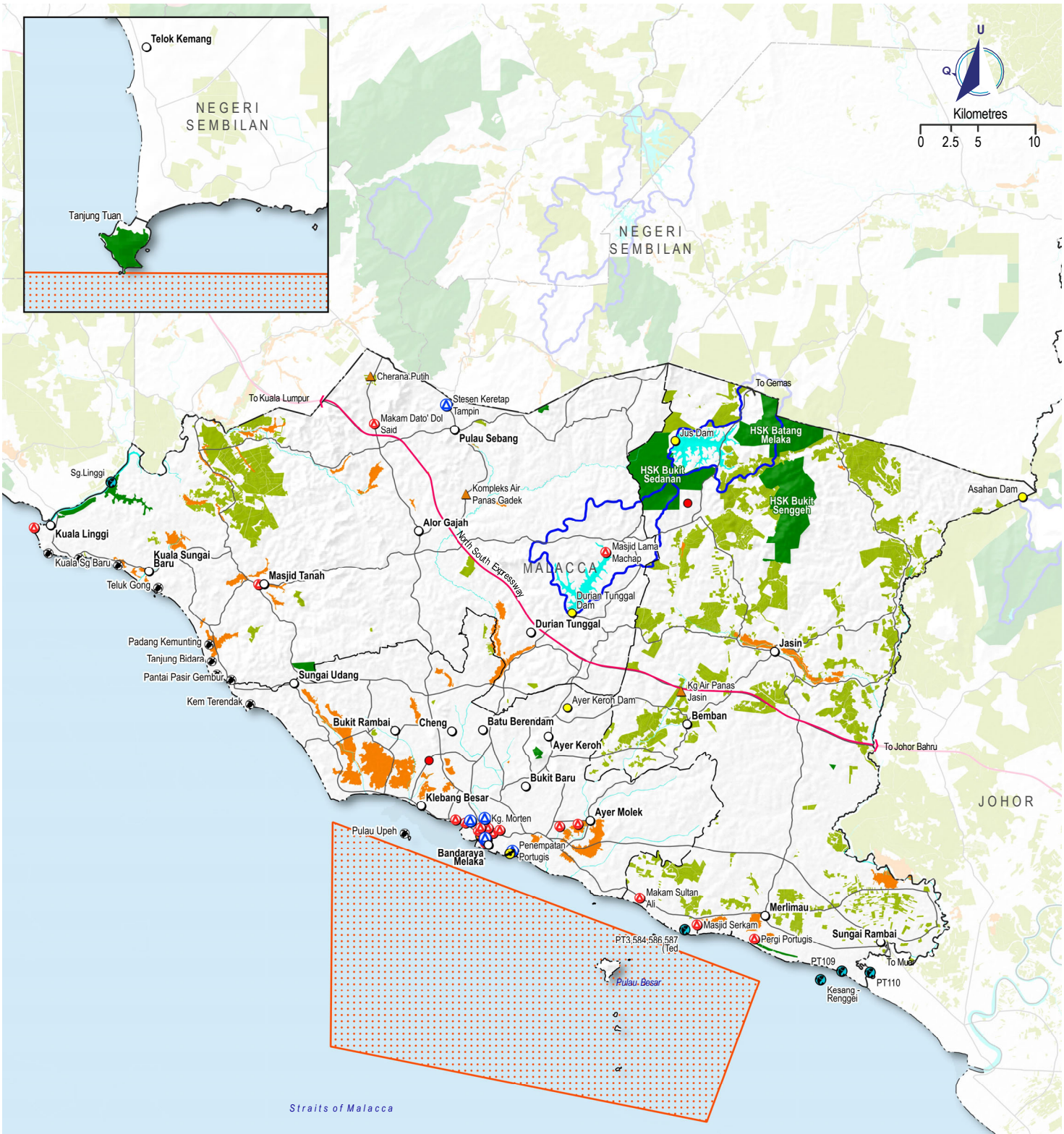
1. Preserve HSK Kuala Linggi, HSK Bukit Sedanan, HSK Batang Melaka and HSK Bukit Senggeh to protect wildlife habitats and to ensure continuity of the forest landscape.
2. Protect Permanent Food Production Park (TKPM) and Aquaculture Industrial Zone (ZIA) as sources for food security.
3. Adopt smart farming and use the latest technology to increase agricultural yield.
4. Gazette natural sites of outstanding universal value and historical, artistic or scientific significance under the National Heritage Act (Act 645).
5. Protect the gazetted zone of Pulau Upeh waters (covering the waters of Bandar Melaka with an area of 364.47 square kilometers) to ensure controlled development, conservation of natural assets and protection of underwater heritage.

KD 2.3 Improve Sustainable Water Resource

1. Gazette the Sungai Baru, Sungai Melaka, Sungai Duyong and Sungai Kesang basin reserves.
2. Control the development and activities in water catchment areas (Jus Dam, Durian Tunggal Dam, Ayer Keroh Dam and Asahan Dam).
3. Apply the concept of "Sponge City" for urban water management (focus on built-up areas).
4. Encourage the use of grey water and groundwater as alternative water supply sources.
5. Reduce the rate of non-revenue water (NRW) by increasing the efficiency of water supply system management.

KD 3.1 KD 3.3 KD 3.2 Implement Low-carbon City and Sustainable Alternative Energy Resource Approaches

1. Increase usage of smart technology, low-carbon mobility and green building practices in development.
2. Encourage the development of biogas and biomass energy generation in cattle ranching and landfill areas.
3. Develop micro-hydro power plants for rural area to support agricultural activities and daily life of the people.



Source:

- *Peninsular Malaysia Forestry Department, 2018*
- *Ministry of Agriculture and Food Industries (MAFI), 2018*
- *Department of Marine Park Malaysia, 2018*
- *National Heritage Department, 2019*
- *Malacca State Structure Plan 2035*
- *National Physical Plan 4, 2020*

MAP 7-32 : MELAKA STATE RESOURCES MANAGEMENT

Natural Resources
- Forest Reserve

Natural Heritage Resources
- Turtle Landing Area
- Important Bird Areas
- Gazetted Waters Zone
- Proposed Natural Heritage Geological Area

Water Resources
- Dam Reservoir
- Water Body

Energy Resources
- River
- Dam Location (Hydro Powered and Mini Hydro)
- Oil Plam Plantation

Food Resources
- Paddy Field Outside National Rice Bowl
- Permanent Food Production Park
- Aquaculture Industrial Zone

Cultural Heritage Resources
- Archeological Heritage Site
- Building/ Monument/ Site Heritage
- Proposed Building/ Monument/ Site Heritage

Others
- Main Towns
- Highway
- Roads
- State Boundary
- District Boundary

MALACCA NATURAL DISASTER RISK AREAS MANAGEMENT

The management of risk area includes identification of areas affected by natural disaster, as well as re-examination of the current framework for areas prone to natural disaster. The involvement of stakeholders in risk area management is important to ensure the management measures proposed are implemented and complied with the established safety regulations and control.

KD 1.5 Landslide Risk

1. Map and classify slope 'hotspot' areas according to the categories of stable (safe), showing signs of instability, and high risk.
2. Adopt the Guidelines for Development in Slope and Highland Areas (2009) as the basis for development control and for evaluation of the suitability of proposed development involving highlands and areas with slope in Melaka.
3. Adopt community-based landslide management approach to encourage local community involvement in the management of slope and highland areas.

KD 1.5 Flood Risk

1. Expand the coverage of flood risk map to flood vulnerability areas in Melaka (involving settlement areas in Kuala Linggi, Alor Gajah, Durian Tunggal, Paya Rumput, Cheng, Malim Jaya, Batu Berendam, Bukit Baru, Melaka City and Jasin) .
2. Translate the integrated land use management of flood risk area into SP, LP and SAP for the purpose of development control and planning approval evaluation.
3. Apply the concept of 'living with flood' to increase community preparedness towards flood risk.

KD 1.5 Earthquake and Tsunami Risk

1. Map tsunami risk area in detail by taking into account the aspects of vulnerability and hazard of tsunami-prone areas, especially on the coast of Melaka.

KD 1.5 KD 2.2 Coastal Erosion Risk

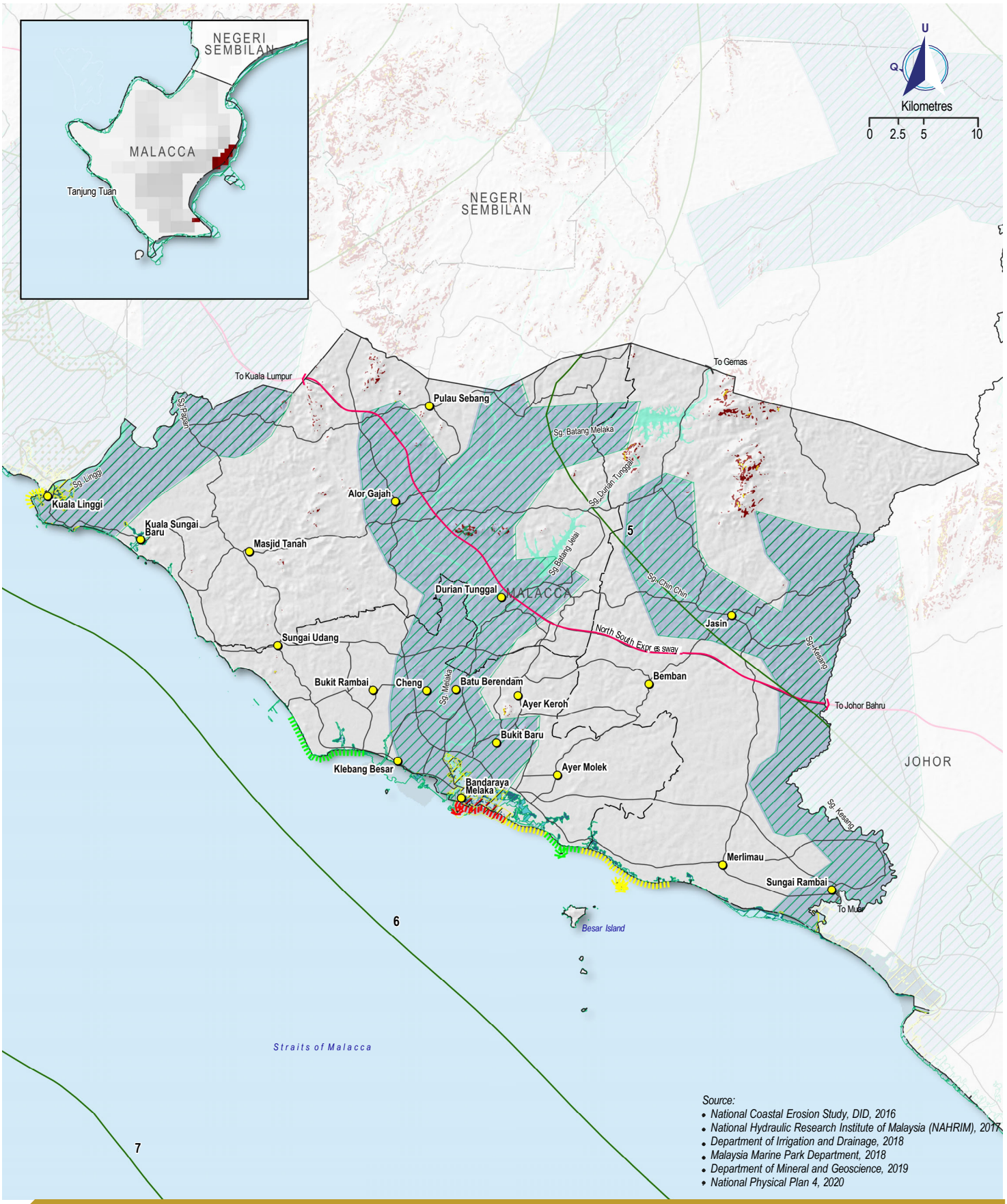
1. Adopt the RFZPPN2 as the main reference in the planning and control of development in coastal erosion risk areas in Melaka.
2. Implement the Melaka State Coastal Vulnerability Index (CVI) for coastal erosion risk as a guide to development control in the coastal zones.
3. Regulate land reclamation activities in coastal areas.
4. Adapt Nature Based Solution (NBS) approach and green infrastructure for the protection of environmentally sensitive coastal areas.
5. Implement development control for coastal waters in Melaka City.

KD 1.5 Sea Level Rise Risk

1. Adopt the RFZPPN2 as the main reference in the planning and control of coastal development in Melaka.
2. Implement the Melaka State Coastal Vulnerability Index (CVI) as a guide to development control in the coastal zones of Melaka.
3. Control development and land reclamation activities along the coastal waters of Melaka.

KD 1.5 Drought Risk

1. Apply the concept of sponge-city development for urban water management (focus on built-up areas).
2. Expand the use of rainwater harvesting as an alternative water supply source during the dry season.
3. Explore and diversify alternative water sources such as riverside water reservoirs (TAPS) and groundwater to reduce dependence on river.



Source:
- *National Coastal Erosion Study, DID, 2016*
- *National Hydraulic Research Institute of Malaysia (NAHRIM), 2017*
- *Department of Irrigation and Drainage, 2018*
- *Malaysia Marine Park Department, 2018*
- *Department of Mineral and Geoscience, 2019*
- *National Physical Plan 4, 2020*

MAP 7-33 : MELAKA STATE NAATURAL DISASTER RISK AREA MANAGEMENT

Landslide Risk Areas
- Landslide Risk (Slope >25°)

Flood Risk
- Flood Risk

Earthquake and Tsunami Risk
- Fault Line

Coastal Erosion Risk
- Critical
- Significant
- Not Serious / Acceptable

Sea Level Rise Risk
- Projection Year 2030 (0.12m)
- Projection Year 2050 (0.24m)
- Projection Year 2100 (0.73m)

Forest and Peat Soil Fires
- Peat Soil

Disaster Risk Category
- High Risk Area
- Moderate Risk Area
- Low Risk Area

Others
- River/ Dam
- Main Towns
- Highway
- Roads
- State Boundary
- District Boundary

JOHOR

SPATIAL GROWTH FRAMEWORK

Spatial Management is a framework in managing the availability of land, transport, growth areas, settlement hierarchy and community involvement in creating a quality and liveable living environment. The intensification of development is emphasised through effective and holistic management to facilitate implementation of proposals for future land use development.

PD 2.1 PD 2.6 PD 2.4 PD 3.5 Sustainable and Competitive Economic Growth

1. Strengthen the Southern Conurbation, the Tangkak - Bandar Maharani Bandar Diraja - Pagoh Promoted Development Zone (PDZ), the Bandar Penggaram - Kluang PDZ, and the Segamat and Mersing Catalyst Centres.
2. Bandar Johor Bahru - Iskandar Puteri has the potential to be upgraded into a global city.
3. Develop the Labis, Tenggaroh and Rengit Agropolitan Centres as rural growth nodes.
4. Enhance the services, industry and tourism high value chain.
5. Enhance the role of the Ports of Tanjung Pelepas, Pasir Gudang, Tanjung Langsat and Pengerang as national, inter-regional and regional hubs to handle all types of cargo and to support the manufacturing and production activities in the surrounding areas.
6. Enhance the economic activities, especially involving the Pagoh Special Economic Zone (PSEZ), to support and complement each other.
7. Encourage the establishment of agro-based industry through the proposed redevelopment of the West Johor Integrated Agricultural Area.
8. Enhance the services of six (6) regional passenger terminals (Pulau Kukup International Ferry Terminal, Puteri Harbor International Ferry Terminal, Johor Bahru International Ferry Terminal, Tanjung Belungkor Ferry Terminal, Pasir Gudang Ferry Terminal and Sungai Melayu Ferry Terminal) to promote tourism activities.
9. Boost the tourism industry by leveraging on biodiversity assets through extensive branding and promotion.
10. Strengthen the proposed Astronomical Centre in Pontian District by making it as a moon sighting site.

PD 3.1 PD 3.4 PD 3.2 Integrated and Strategic Transport Network

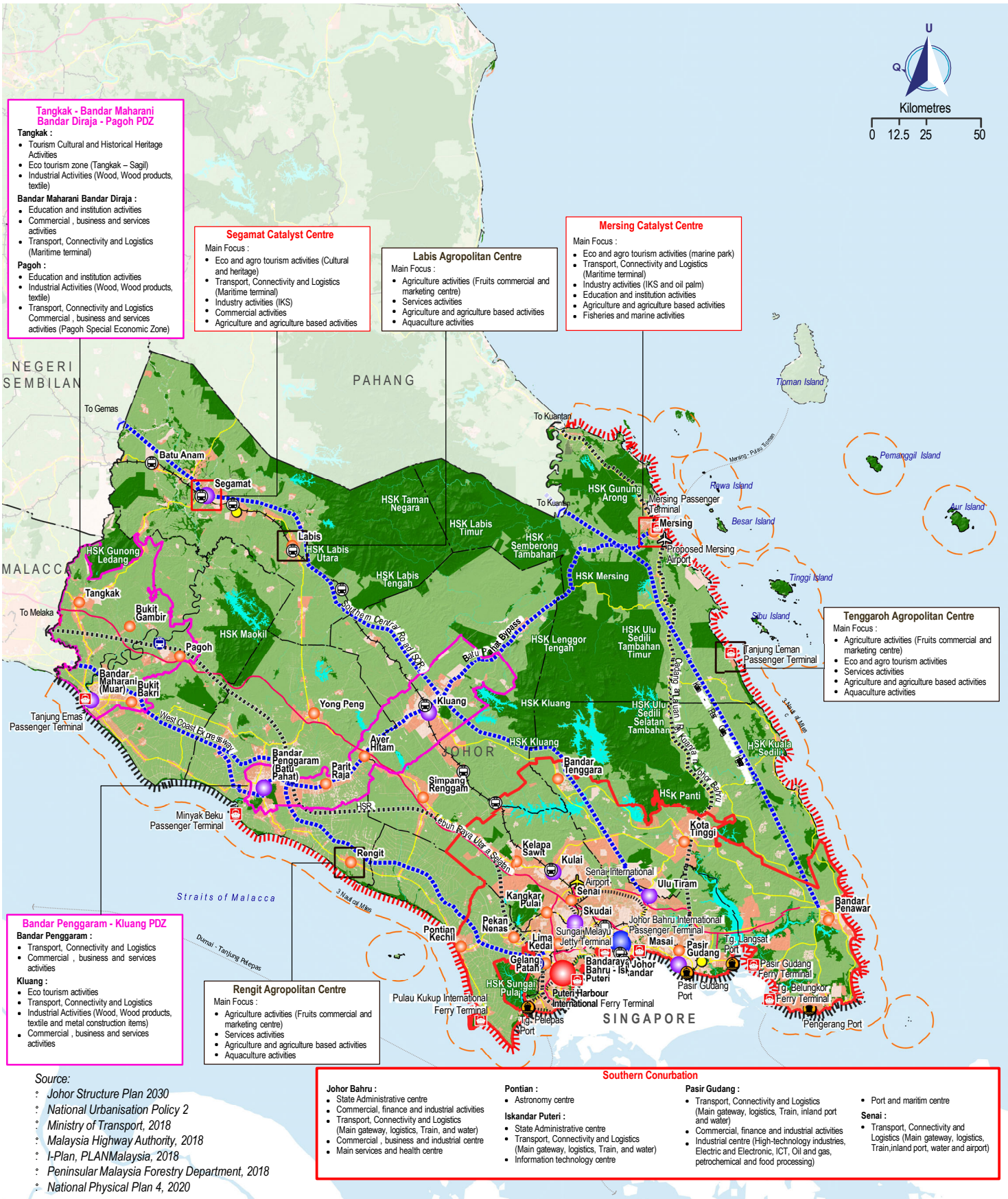
1. Strengthen the road network between the regions through the proposed Kuala Lumpur - Johor Bahru West Coast Highway (WCE) extension, the Southern Central Road (SCR) connecting Segamat - Ulu Tiram, the Batu Pahat Bypass and the Kuantan - Pasir Gudang Highway extension (LPT 4) .
2. Expand and integrate the existing rail network with new lines that connect the Johor Bahru - Singapore Rapid Transit System (RTS), the Iskandar Malaysia BRT Line (Tebrau, Skudai & Iskandar Puteri) and the Iskandar Puteri BRT connection to Singapore (MRT Tuas Station).
3. Expand the high-speed rail network connecting Bandar Muar - Iskandar Puteri - Singapore (HSR 2) and Bandar Mersing - Kota Tinggi - Pasir Gudang - Singapore (ECRL 2).
4. Strengthen the role of the Senai International Airport as a Regional Airport (Category 2).
5. Upgrade public transport services with a modal split target for Johor Bahru set at 50:50 between public transport and private vehicle usage.

KD 2.2 Coastal Area Development and Protection

1. Manage development and land reclamation activities in coastal areas.
2. Manage and protect marine habitats and ecological diversity in coastal zones in accordance with the RFZPPN2.

KI 1.1 KI 3.3 KI 2.1 KI 4.1 KI 3.2 Liveable Environment and Inclusive Communities

1. Provide adequate and affordable housing for the B40 and M40 target groups in urban areas.
2. Improve the quality of housing and neighbourhoods in rural areas through planned development.
3. Provide adequate and suitable facilities to nurture a smart society, which will become one of the building blocks of a developed and smart nation.
4. Promote green practices, healthy and safe lifestyles among communities and in residential surroundings.
5. Strengthen the role of the community in the planning and development process to ensure community needs are considered in the process.


Tangkak - Bandar Maharani
Bandar Diraja - Pagoh PDZ
Tangkak :
Tourism Cultural and Historical Heritage Activities
Eco tourism zone (Tangkak – Sagil)
Industrial Activities (Wood, Wood products, textile)
Bandar Maharani Bandar Diraja :
Education and institution activities
Commercial , business and services activities
Transport, Connectivity and Logistics (Maritime terminal)
Pagoh :
Education and institution activities
Industrial Activities (Wood, Wood products, textile)
Transport, Connectivity and Logistics Commercial , business and services activities (Pagoh Special Economic Zone)
Segamat Catalyst Centre
Main Focus :
Eco and agro tourism activities (Cultural and heritage)
Transport, Connectivity and Logistics (Maritime terminal)
Industry activities (IKS)
Commercial activities
Agriculture and agriculture based activities
Labis Agropolitan Centre
Main Focus :
Agriculture activities (Fruits commercial and marketing centre)
Services activities
Agriculture and agriculture based activities
Aquaculture activities
Mersing Catalyst Centre
Main Focus :
Eco and agro tourism activities (marine park)
Transport, Connectivity and Logistics (Maritime terminal)
Industry activities (IKS and oil palm)
Education and institution activities
Agriculture and agriculture based activities
Fisheries and marine activities
Tenggaroh Agropolitan Centre
Main Focus :
Agriculture activities (Fruits commercial and marketing centre)
Eco and agro tourism activities
Services activities
Agriculture and agriculture based activities
Aquaculture activities
Bandar Penggaram - Kluang PDZ
Bandar Penggaram :
Transport, Connectivity and Logistics
Commercial , business and services activities
Kluang :
Eco tourism activities
Transport, Connectivity and Logistics
Industrial Activities (Wood, Wood products, textile and metal construction items)
Commercial , business and services activities
Rengit Agropolitan Centre
Main Focus :
Agriculture activities (Fruits commercial and marketing centre)
Services activities
Agriculture and agriculture based activities
Aquaculture activities
Southern Conurbation
Johor Bahru :
State Administrative centre
Commercial, finance and industrial activities
Transport, Connectivity and Logistics (Main gateway, logistics, Train, and water)
Commercial , business and industrial centre
Main services and health centre
Pontian :
Astronomy centre
Iskandar Puteri :
State Administrative centre
Transport, Connectivity and Logistics (Main gateway, logistics, Train, and water)
Information technology centre
Pasir Gudang :
Transport, Connectivity and Logistics (Main gateway, logistics, Train, inland port and water)
Commercial, finance and industrial activities
Industrial centre (High-technology industries, Electric and Electronic, ICT, Oil and gas, petrochemical and food processing)
Port and maritim centre
Senai :
Transport, Connectivity and Logistics (Main gateway, logistics, Train,inland port, water and airport)
Source:
Johor Structure Plan 2030
National Urbanisation Policy 2
Ministry of Transport, 2018
Malaysia Highway Authority, 2018
I-Plan, PLANMalaysia, 2018
Peninsular Malaysia Forestry Department, 2018
National Physical Plan 4, 2020
Kilometres
0 12.5 25 50
NEGERI SEMBILAN
PAHANG
MALACCA
JOHOR
SINGAPORE
Straits of Malacca
To Gemas
To Kuantan
To Melaka
Batu Anam
Segamat
Labis
HSK Taman Negara
HSK Labis Timur
HSK Labis Utara
HSK Labis Tengah
HSK Gunong Ledang
HSK Gunung Arong
HSK Semberong Tambahan
HSK Mersing
Mersing Passenger Terminal
Mersing
Proposed Mersing Airport
Tioman Island
Pemanggil Island
Rawa Island
Besar Island
Aur Island
Tinggi Island
Sibu Island
Tanjung Leman Passenger Terminal
Tangkak
Bukit Gambir
Pagoh
HSK Maokil
Bandar Maharani (Muar)
Bukit Bakri
Tanjung Emas Passenger Terminal
West Coast Expressway
Yong Peng
Kluang
Batu Pahat Bypass
Southern Central Road (SCR)
HSK Lenggor Tengah
HSK Ulu Sedili Tambahan Timur
HSK Kluang
HSK Ulu Sedili Selatan Tambahan
Jalan Kluang - Mersing
Jalan Kluang - Kota Tinggi
HSK Kuala Sedili
Ayer Hitam
Bandar Penggaram (Batu Pahat)
Parit Raja
Simpang Renggam
Bandar Tenggara
HSK Panti
Kota Tinggi
Minyak Beku Passenger Terminal
HSR
Rengit
Kelapa Sawit
Kulai
Senai International Airport
Senai
Ulu Tiram
Kangkar Pulai
Skudai
Johor Bahru International Passenger Terminal
Pekan Nenas
Pontian Kechil
Lima Kedai
Sungai Melayu Jetty Terminal
Masai
Pasir Gudang
Tg. Langsat Port
Bandar Penawar
Gelang Patah
Bandaraya Johor Bahru - Iskandar Puteri
HSK Sungai Pulai
Puteri Harbour International Ferry Terminal
Pasir Gudang Port
Pasir Gudang Ferry Terminal
Tg. Belungkor Ferry Terminal
Pengerang Port
Pulau Kukup International Ferry Terminal
Tg. Pelepas Port
Lebuh Raya Utara Selatan
Dumai - Tanjung Pelepas
3 Nautical Miles
MAP 7-34 : JOHOR STATE SPATIAL GROWTH FRAMEWORK
Growth Area
Conurbation
Promoted Development Zone
Catalyst Centre
Agropolitan Centre
Global City
Regional City
Main City
Local Town
Land Use
Current Built-up
Proposed Built-up
Forest
Water Bodies
Agriculture
Outside National Rice Bowl
Coastal Development and Protection Area
Coastal Development Zone
Coastal Protection Zone
Land, Air and Water Transport
Highway
Road
Proposed Highway
Existing Rail Line
Proposed High Speed Rail Line
Water Route
Rail Station
Proposed Rail Station
Airport
Proposed Airport
Port
Inland Port
Passenger Terminal
Others
Reclaimed Area
3 Nautical Miles Boundary
State Boundary
District Boundary

JOHOR

RESOURCE MANAGEMENT

Resource management in NPP4 consists of five (5) main categories, namely natural, water, energy, food and heritage resources. These resources are national assets that provide important life support system. Good governance and appropriate laws are required to preserve and conserve the country's archeological assets and to ensure their benefits remain into the future.

KD 2.1 KD 2.6 KD 2.5 Sustainable Management of Natural, Food and Heritage Resources

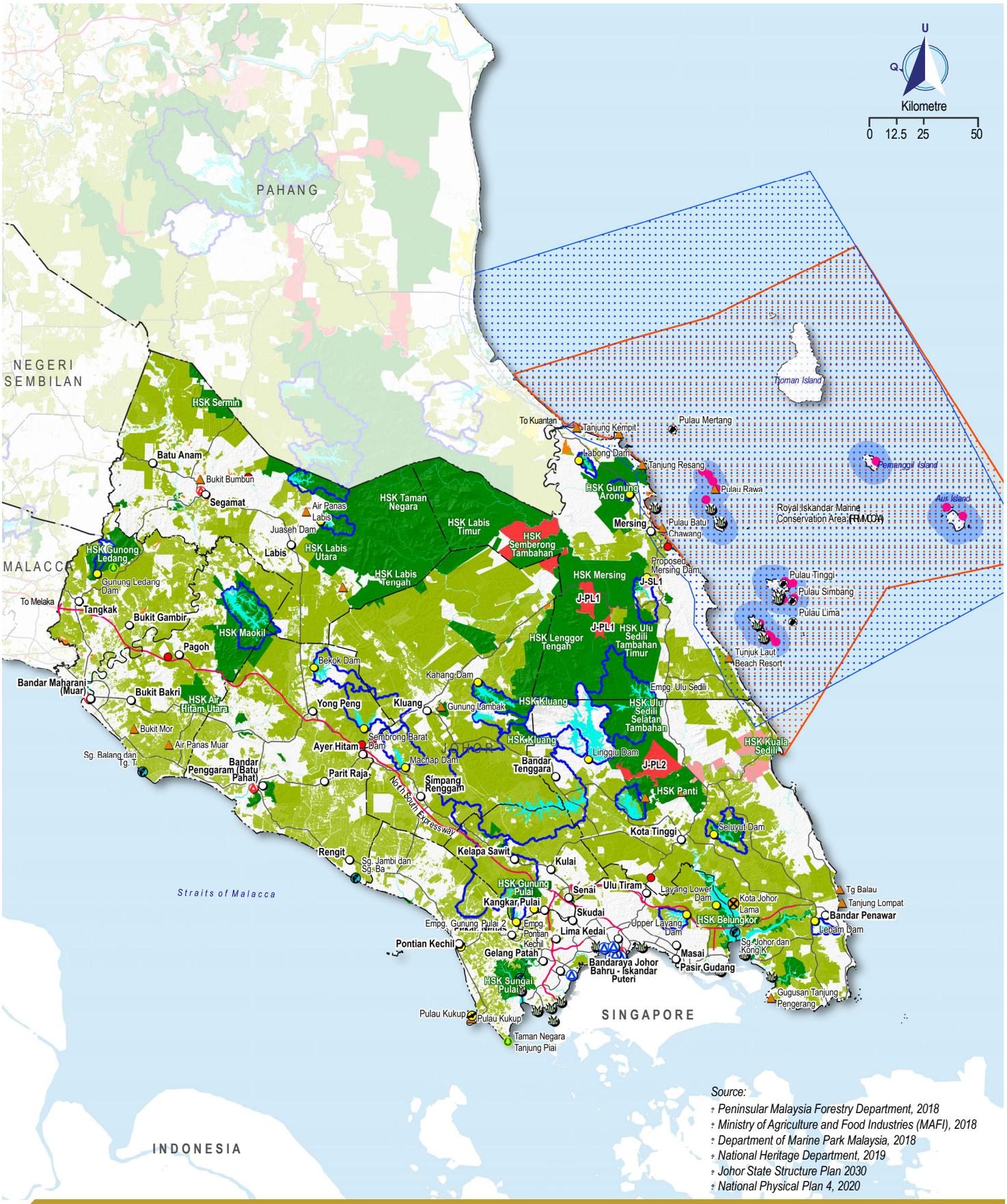
1. Preserve HSK Gunung Ledang, HSK Sermin, HSK Maokil, HSK Air Hitam Utara, HSK Labis Utara, HSK Labis Tengah, HSK Labis Timur, HSK Semberong Tambahan, HSK Gunung Arong, HSK Mersing, HSK Lenggor Tengah, HSK Sedili Timur, HSK Ulu Sedili South, HSK Panti, HSK Gunong Pulai, HSK Sungai Pulai HSK Belungkor to protect wildlife habitats and to ensure the continuity of the forest landscape.
2. Conserve ecological corridors J-PL2 HS Panti - HS Ulu Sedili and J-SL2 HS Panti - HS Kuala Sedili to maintain the continuity of the forest landscape.
3. Gazette, protect and conserve marine protected areas and coastal areas (including the Royal Iskandar Marine Conservation Area (RIMCA).
4. Maintain and preserve key agricultural areas (KPU) in the State of Johor.
5. Protect Permanent Food Production Park (TKPM) and Aquaculture Industrial Zone (ZIA) as sources for food security.
6. Adopt smart farming and use the latest technology to increase agricultural yield.
7. Gazette endangered habitats as protected areas (turtle landing sites, important bird areas and seaweed areas).
8. Protect the gazetted zone of Pulau Tioman waters (covering Pulau Tioman and part of the archipelago in Johor covering an area of 7,048.60 square kilometers) to ensure controlled development, conservation of natural assets and protection of underwater heritage.
9. Gazette natural heritage sites of outstanding value and historical, artistic or scientific significance under the National Heritage Act (Act 645).

KD 2.3 Improve Sustainable Water Resource

1. Gazette Sungai Muar, Sungai Sarang Buaya, Sungai Batu Pahat, Parit Botak, Sungai Benut, Sungai Sanglang, Sungai Ayer Baloi, Sungai Pontian Besar, Sungai Pulai, Sungai Skudai, Sungai Tebrau, Sungai Johor, Sungai Lebam, Sungai Santi, Sungai Sedili Kechil, Sungai Sedili Besar, Sungai Jemaluang, Sungai Mersing and Sungai Endau basin reserves.
2. Control the development and activities in water catchment areas (Gunung Ledang Dam, Juaseh Dam, Labong Dam, Bekok Dam, Sembrong Dam, Machap Dam, Congok Dam, Kahang Dam, Ulu Sedili Dam, Lingiu Dam, Seluyut Dam, Lebam Dam, Lower Layang Dam, Upper Layang Dam, Gunung Pulai 2 Dam and Pontian Kechil Dam).
3. Apply the concept of "Sponge City" for urban water management (focus on built-up areas).
4. Encourage the use of grey water and groundwater as alternative water supply sources.
5. Reduce the rate of non-revenue water (NRW) by increasing the efficiency of water supply system management.

KD 3.1 KD 3.3 KD 3.2 Implement Low-carbon City and Sustainable Alternative Energy Resource Approaches

1. Increase usage of smart technology, low-carbon mobility and green building practices in development.
2. Encourage the development of biogas and biomass energy generation in plantation, cattle ranching and landfill areas.
3. Increase the production and generation of renewable energy (RE) by strengthening solar energy generation.
4. Develop micro-hydro power plants for rural areas to support agricultural activities and daily life of the people.



Source:

- *Peninsular Malaysia Forestry Department, 2018*
- *Ministry of Agriculture and Food Industries (MAFI), 2018*
- *Department of Marine Park Malaysia, 2018*
- *National Heritage Department, 2019*
- *Johor State Structure Plan 2030*
- *National Physical Plan 4, 2020*

MAP 7-35 : JOHOR STATE RESOURCE MANAGEMENT

Natural Resources
- Forest Reserve
- CFS Ecological Link

Natural Heritage Resource
- Natural Heritage Site
- Turtle Landing Location
- Important Bird Areas
- Seaweed Areas
- Coral Reef Area
- Gazetted Waters Zone
- Proposed Marine Protection Area
- Proposed Natural Heritage Geological Area
- Marine Park

Water Resources
- Dam Reservoir
- Water Body

Energy Area
- River
- Dam Location (Hydro Powered and Mini Hydro)
- Oil Palm Plantation

Food Resources
- Paddy Field Outside National Rice Bowl
- Permanent Food Production Park
- Aquaculture Industrial Zone

Cultural Heritage Resources
- Archeological Heritage Site
- Building/ Monument/ Site Heritage
- Proposed Building/ Monument/ Site Heritage

Others
- Main Towns
- Highway
- Roads
- State Boundary
- District Boundary

JOHOR NATURAL DISASTER RISK AREAS MANAGEMENT

The management of risk area includes identification of areas affected by natural disaster, as well as re-examination of the current framework for areas prone to natural disaster. The involvement of stakeholders in risk area management is important to ensure the management measures proposed are implemented and complied with the established safety regulations and control.

KD 1.5 Landslide Risk

1. Map and classify slope 'hotspot' areas according to the categories of stable (safe), showing signs of instability, and high risk.
2. Adopt the Guidelines for Development in Slope and Highland Areas (2009) as the basis for development control and for evaluation of the suitability of proposed development involving highlands and areas with slope in Johor.
3. Prohibit logging and land use change in highland areas more than 1,000 metres above sea level.
4. Adopt community-based landslide management approach to encourage local community involvement in the management of slope and highland areas.

KD 1.5 Flood Risk

1. Expand the coverage of flood risk map to flood vulnerability areas in the State of Johor [involving settlement areas in Batu Anam, Segamat, Tangkak, Bandar Maharani (Muar), Pagoh, Yong Peng, Bandar Penggaram (Batu Pahat), Ayer Hitam, Mersing, Bandar Tenggara, Kelapa Sawit, Kota Tinggi, Senai, Pekan Nenas and Skudai].
2. Translate the integrated land use management of flood risk area into SP, LP and SAP for the purpose of development control and planning approval evaluation.
3. Apply the concept of 'living with flood' to increase community preparedness towards flood risk.

KD 1.5 Earthquake and Tsunami Risk

1. Map tsunami risk area in detail by taking into account the aspects of vulnerability and hazard of tsunami-prone areas, especially on the coast of Johor.

KD 1.5 KD 2.2 Coastal Erosion Risk

1. Adopt the RFZPPN2 as the main reference in the planning and control of development in coastal erosion risk areas in Johor.
2. Implement the Johor State Coastal Vulnerability Index (CVI) for coastal erosion risk as a guide to development control in the coastal zones.
3. Regulate land reclamation activities in coastal areas.
4. Adapt Nature Based Solution (NBS) approach and green infrastructure for the protection of environmentally sensitive coastal areas.
5. Implement development control for coastal waters in Mersing and parts of western Johor waters.

KD 1.5 Sea Level Rise Risk

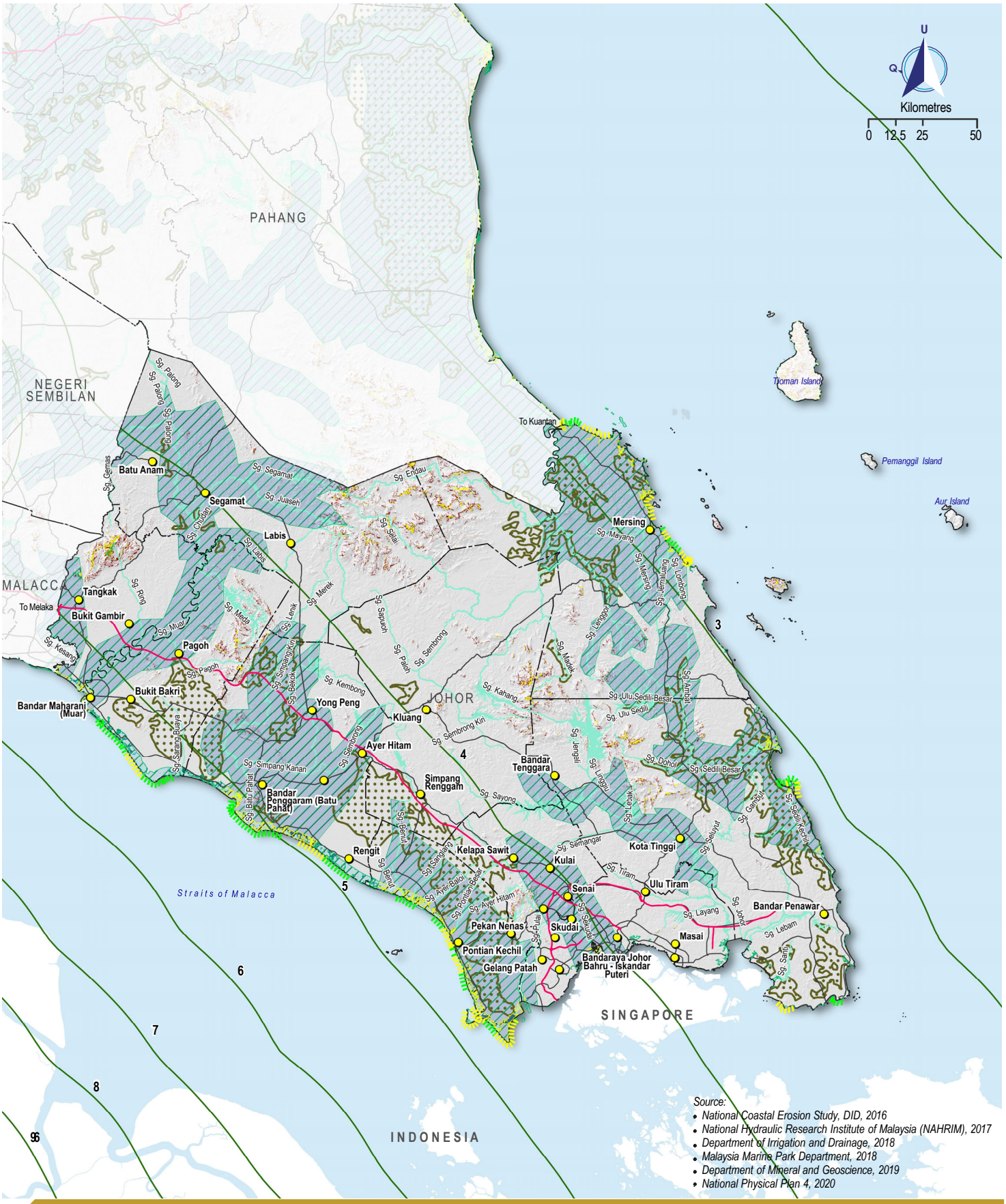
1. Adopt the RFZPPN2 as the main reference in the planning and control of coastal development in Johor.
2. Implement the Johor State Coastal Vulnerability Index (CVI) as a guide to development control in the coastal zones of Johor.
3. Control development and land reclamation activities along the coastal waters of Johor.

KD 1.5 Drought Risk

1. Apply the concept of sponge-city development for urban water management (focus on built-up areas).
2. Expand the use of rainwater harvesting as an alternative water supply source during the dry season.
3. Explore and diversify alternative water sources such as riverside water reservoirs (TAPS) and groundwater to reduce dependence on river.

KD 1.5 Forest and Peatland Fire Risk

1. Prepare peat soil fire risk map according to the categories of non-disaster risk zone and disaster risk zone.
2. Encourage community participation in peatland forest management.



Source:
- National Coastal Erosion Study, DID, 2016
- National Hydraulic Research Institute of Malaysia (NAHRIM), 2017
- Department of Irrigation and Drainage, 2018
- Malaysia Marine Park Department, 2018
- Department of Mineral and Geoscience, 2019
- National Physical Plan 4, 2020

MAP 7-36 : JOHOR STATE NATURAL DISASTER RISK AREA MANAGEMENT

Landslide Risk Areas
- Landslide Risk (Slope >25°)

Flood Risk
- Flood Risk

Earthquake and Tsunami Risk
- Fault Line

Coastal Erosion Risk
- Significant
- Not Serious/ Acceptable

Sea Level Rise Risk
- Projection Year 2030 (0.12m)
- Projection Year 2050 (0.24m)
- Projection Year 2100 (0.73m)

Forest and Peat Doil Fires
- Peat Soil

Disaster Risk Catergory
- High Risk Area
- Low Risk Area

Others
- River/ Dam
- Main Towns
- Highway
- Roads
- State Boundary
- District Boundary

F.T. LABUAN SPATIAL GROWTH FRAMEWORK

Spatial Management is a framework in managing the availability of land, transport, growth areas, settlement hierarchy and community involvement in creating a quality and liveable living environment. The intensification of development is emphasised through effective and holistic management to facilitate implementation of proposals for future land use development.

PD 2.1 PD 3.5 Sustainable and Competitive Economic Growth

1. Strengthen the Labuan Promoted Development Zone (PDZ) which covers the entire island of F.T. Labuan.
2. Upgrade the Labuan Port into a regional port.
3. Enhance the Labuan International Ferry Terminal services to promote tourism activities.
4. Enhance industry high value chain activities, especially the oil and gas industry as well as tourism activities.
5. Strengthen the role of the Labuan International Business and Financial Centre (IBFC) by increasing funding for research and development (R&D) as well as by encouraging the transfer of knowledge and technology involving the educational institutions.

PD 3.1 PD 3.4 Integrated and Strategic Transport Network

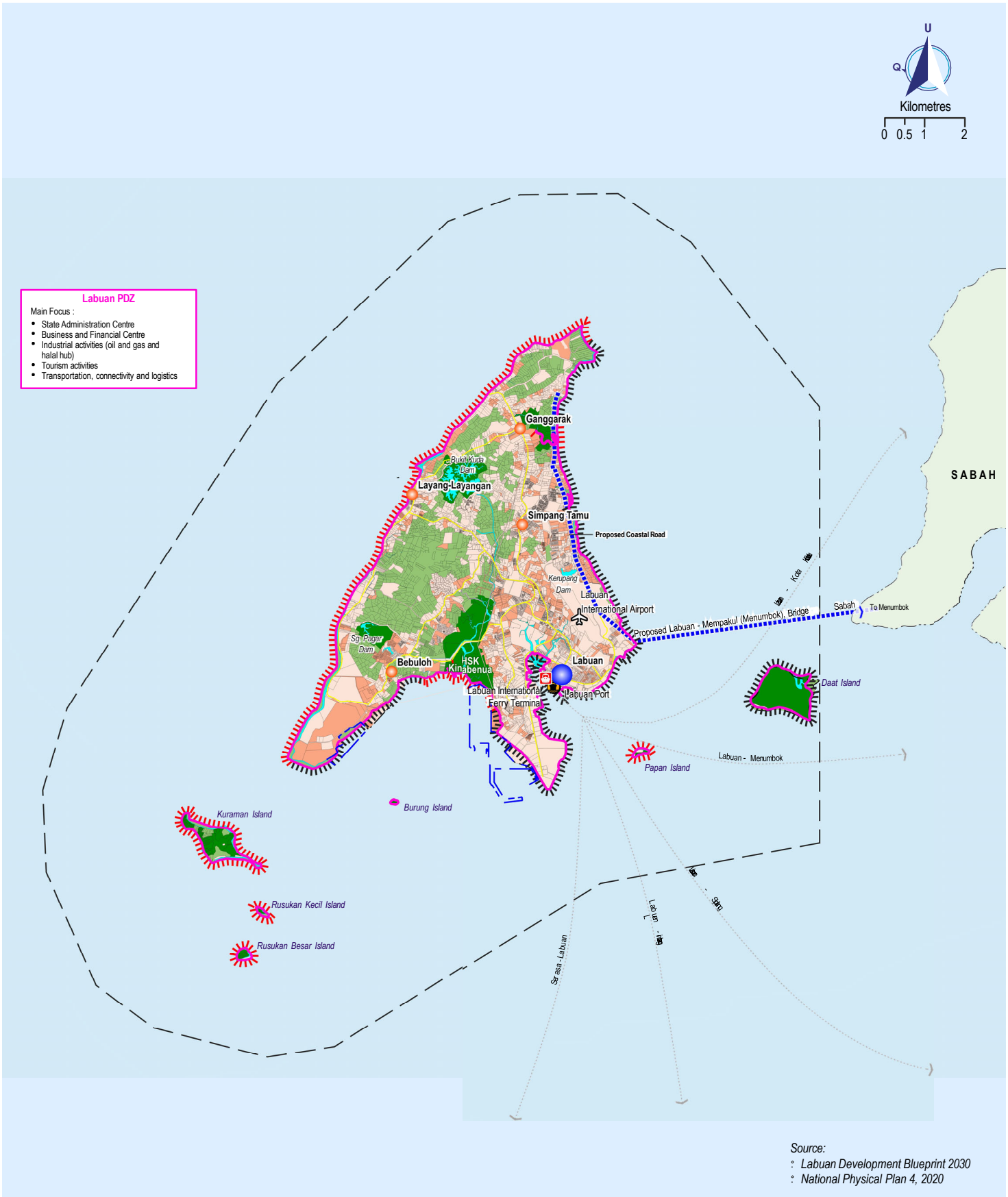
1. Strengthen the road network between the regions through the proposed Labuan Coastal Road (Ganggarak - Tanjung Aru) and the Labuan - Mempakul (Menumbok) bridge, Sabah.
2. Strengthen the role of the Labuan Airport as a Domestic Airport (Category 3).

KD 2.2 Coastal Area Development and Protection

1. Manage development and land reclamation activities in coastal areas.
2. Manage and protect marine habitats and ecological diversity in coastal zones in accordance with the RFZPPN2.

KI 1.1 KI 3.3 KI 2.1 KI 4.1 KI 3.2 Liveable Environment and Inclusive Communities

1. Provide adequate and affordable housing for the B40 and M40 target groups in urban areas.
2. Improve the quality of housing and neighbourhoods in rural areas through planned development.
3. Provide adequate and suitable facilities to nurture a smart society, which will become one of the building blocks of a developed and smart nation.
4. Promote green practices, healthy and safe lifestyles among communities and in residential surroundings.
5. Strengthen the role of the community in the planning and development process to ensure community needs are considered in the process.



Source:
- *Labuan Development Blueprint 2030*
- *National Physical Plan 4, 2020*

MAP 7-37 : F.T LABUAN SPATIAL GROWTH FRAMEWORK

Growth Area
- Promoted Development Zone
- Regional City
- Local Town

Land Use
- Current Built-up
- Proposed Built-up
- Forest
- Water Bodies
- Agriculture

Coastal Development and Protection Area
- Coastal Development Zone
- Coastal Protection Zone

Land, Air and Water Transport
- Road
- Proposed Road
- Water Route
- Port
- Airport
- Passenger Terminal

Others
- Reclaimed Area
- Federal Territory of Labuan Boundary

F.T. LABUAN RESOURCE MANAGEMENT

Resource management in NPP4 consists of five (5) main categories, namely natural, water, energy, food and heritage resources. These resources are national assets that provide important life support system. Good governance and appropriate laws are required to preserve and conserve the country's archeological assets and to ensure their benefits remain into the future.

KD 2.1 KD 2.6 KD 2.5 KD 2.7 Sustainable Management of Natural, Food and Heritage Resources

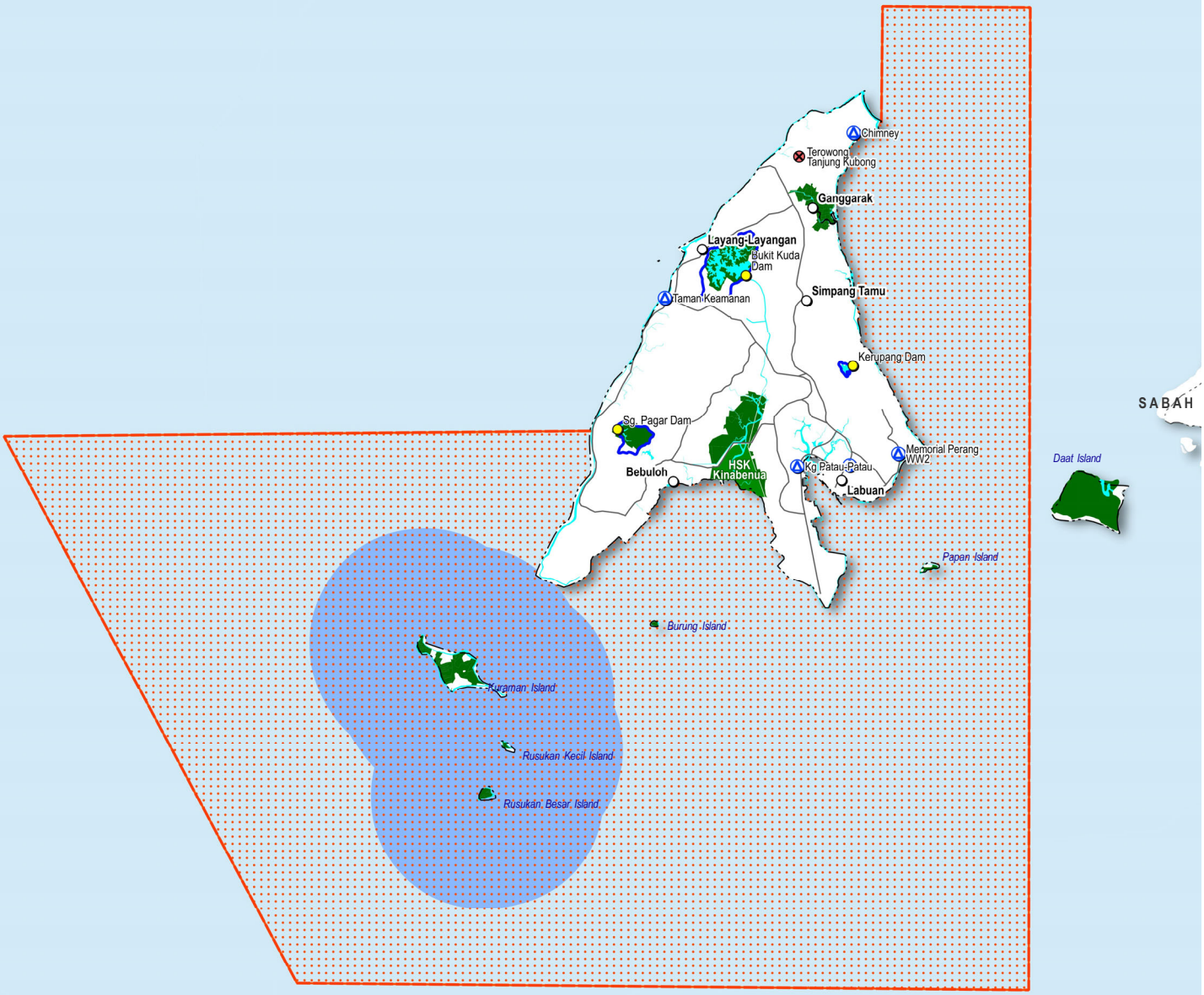
1. Conserve HSK Kinabenua to protect wildlife habitats and forest landscape.
2. Gazette natural sites of outstanding value and historical, artistic or scientific significance under the National Heritage Act (Act 645). Among them are Chimney, Tanjung Kubong Tunnel, Peace Site, World War 2 War Memorial, Masjid Jamek An-Nur and Kg. Patau-Patau.
3. Protect the gazetted coastal zone of F.T. Labuan (526.24 square kilometres) to ensure controlled development, conservation of natural assets and protection of underwater heritage.

KD 2.3 Improving Sustainable Water Resource

1. Gazette the Sungai Lada, Sungai Kinabenua, Sungai Batu, Sungai Gerisik, Teluk Victoria, Sungai Kerupang, Sungai Gangarak and Sungai Batu Manikar basin reserves.
2. Control the development and activities in water catchment areas (Bukit Kuda Dam, Kerupang Dam and Sg. Pagar Dam).
3. Apply the concept of "Sponge City" for urban water management (focus on built-up areas).
4. Encourage the use of grey water and groundwater as alternative water supply sources.
5. Reduce the rate of non-revenue water (NRW) by increasing the efficiency of water supply system management.

KD 3.1 KD 3.3 KD 3.2 Implement Low-carbon City and Sustainable Alternative Energy Resource Approaches

1. Increase usage of smart technology, low-carbon mobility and green building practices in development.
2. Encourage the development of biogas and biomass energy generation in plantation, cattle ranching and landfill areas.
3. Increase the production and generation of renewable energy (RE) by strengthening solar energy generation.
4. Develop micro-hydro power plants for rural areas to support agricultural activities and daily life of the people.



Source:
- *Department of Marine Park Malaysia 2018*
- *National Heritage Department, 2019*
- *Labuan Development Blueprint 2019*
- *National Physical Plan 4, 2020*

PELAN 7-38 : F.T.LABUAN RESOURCE MANAGEMENT

Natural Resources
- Forest Reserve

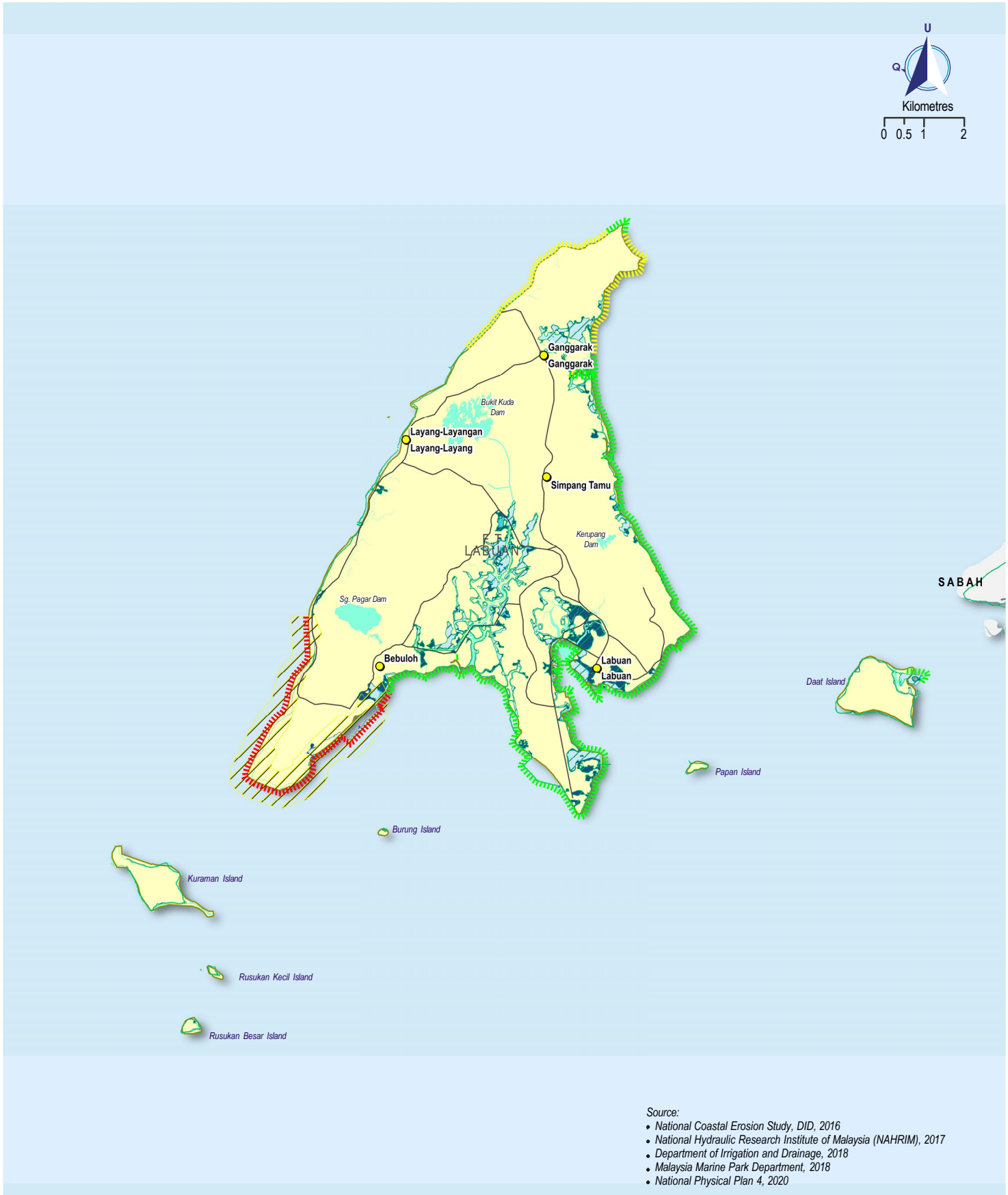
Natural Heritage Resources
- Coral Reef Area
- Gazetted Waters Zone
- Marine Park

Water Resources
- Dam Reservoir
- Water Body

Energy Resources
- River
- Dam Location (Hydro Powered and Mini Hydro)

Cultural Heritage Resources
- Archeological Heritage Site
- Building/ Monument/ Site Heritage
- Proposed Bulding/ Monument/ Site Heritage

Others
- Main Towns
- Roads



Source:

- *National Coastal Erosion Study, DID, 2016*
- *National Hydraulic Research Institute of Malaysia (NAHRIM), 2017*
- *Department of Irrigation and Drainage, 2018*
- *Malaysia Marine Park Department, 2018*
- *National Physical Plan 4, 2020*

MAP 7-39 : F.T.LABUAN NATURAL DISASTER RISK AREA MANGEMENT

Tsunami Risk
- Tsunami Risk

Coastal Erosion Risk
- Critical
- Significant
- Not Serious/ Acceptable

Sea Level Rise Risk
- Projection Year 2030 (0.12m)
- Projection Year 2050 (0.24m)
- Projection Year 2100 (0.73m)

Disaster Risk Category
- Moderate Risk Area

Others
- River/ Dam
- Main Towns
- Roads

F.T. LABUAN — NATURAL DISASTER RISK AREAS MANAGEMENT

The management of risk area includes identification of areas affected by natural disaster, as well as re-examination of the current framework for areas prone to natural disaster. The involvement of stakeholders in risk area management is important to ensure the management measures proposed are implemented and complied with the established safety regulations and control.

KD 1.5 Tsunami Risk

1. Map tsunami risk area in detail by taking into account the aspects of vulnerability and hazard of tsunami-prone areas, especially on the coast of F.T. Labuan.

KD 1.5 KD 2.2 Coastal Erosion Risk

1. Adopt the RFZPPN2 as the main reference in the planning and control of development in coastal erosion risk areas in F.T. Labuan.
2. Implement the F.T. Labuan Coastal Vulnerability Index for coastal erosion risk as a guide to development control in the coastal zones.
3. Regulate land reclamation activities in coastal areas.
4. Adapt Nature Based Solution (NBS) approach and green infrastructure for the protection of environmentally sensitive coastal areas.
5. Implement development control for coastal waters in Bebuloh and Ganggarak.

KD 1.5 Sea Level Rise Risk

1. Adopt the RFZPPN2 and the Integrated Coastal Management Plan (ISMP) as the main reference in the planning and control of coastal development.
2. Implement the F.T. Labuan Coastal Vulnerability Index as a guide to development control in coastal zones of F.T. Labuan.
3. Control development and land reclamation activities along the coastal waters of F.T. Labuan

KD 1.5 Drought Risk

1. Apply the concept of sponge-city development for urban water management (focus on built-up areas).
2. Expand the use of rainwater harvesting as an alternative water supply source during the dry season.
3. Explore and diversify alternative water sources such as riverside water reservoirs (TAPS) and groundwater to reduce dependence on river.

KD 1.5 Forest and Peatland Fire Risk

1. Prepare peat soil fire risk map according to the categories of non-disaster risk zone and disaster risk zone.
2. Encourage community participation in peatland forest management.