



MALAYSIA AND SELANGOR MANGROVE POLICY MAPPING AND ANALYSIS

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Executive Summary

Purpose of the report

- This report presents an overview of a policy mapping activity which considers local, state, federal and international plans, laws, policies and directives that influence the conservation and management of mangroves in Malaysia.
- The key actors that play an important role in mangrove policy creation and delivery are also mapped.
- To reflect Malaysia's federal system of government, the state of Selangor in Peninsula Malaysia is used as a case study to show how mangrove policies and actors span these decision-making levels.
- The report identifies policy gaps and makes recommendations on how the policy landscape can be modified to support the sustainable management of mangroves within state and federal levels in Malaysia.

Method

- Relevant policy instruments and policy actors are identified through application of a Rapid Policy Network Mapping (RPNM) approach.
- This approach enables visualisation of the mangrove policy landscape through the creation of policy instrument and policy actor maps.
- The policy instrument map plots instruments by policy domain (international, regional, national, or local (state) scales), and policy category (cross-sectoral, forestry, fisheries, tourism, other environmental and non-environmental).
- The policy actor map plots actors by policy domain and policy role (Influencer, Owner/Decision-Maker, Influencer/Deliverer, Deliverer).
- A database of instruments and actors was also generated to record characteristics of both elements, which can become a resource for future policy assessments.

Results

- Forty-one policy instruments and forty-six policy actors are identified from this approach as influencing mangrove management to the state level.
- The highest policy instrument activity occurs at the national level and within a cross-sectoral context (i.e. biodiversity). Only five instruments are identified at the state level.
- No fisheries/aquaculture instruments are featured through this process.
- The highest number of policy actors operate at national level and are fairly equally distributed across the roles of Influencer, Owner/Decision-maker, and Influencer/Deliverer.

Policy gaps and key recommendations

- To recognise the importance of mangroves in providing multiple benefits to a range of parties across sectors, and to the environment, existing influential policies (i.e. National Forestry Policy, National Biodiversity Policy), as well as those in the process of review (i.e. National Climate Policy, National Wetland Policy), should be strengthened with regard to the explicit priority afforded mangroves, enabling:

- Appropriate resource allocations.
 - Potential economies of scale through harmonisation of policy priorities that deliver co-benefits.
 - Greater understanding of the role mangroves can play in nature-based solutions for major global and national environmental threats, including climate change pressures, biodiversity loss, greenhouse gas (GHG) emission reductions and achievement of nationally determined contributions (NDC) targets.
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- A National Mangrove Policy would offer a significant statement in federal recognition of the importance of this specific forest (wetland) habitat. Alternatively, the creation of a National Blue Carbon Policy could present a more coordinated and broader-looking directive for developing programmes and projects that address the environmental challenges listed above.
 - A more explicit connection is needed between forestry and fishery policies to reduce the chances of mangrove (and mangrove-dependent resource) management falling through cracks of responsibility.
 - State authorities could publish policy implementation plan updates more frequently to show more transparency on progress against targets.
 - Further mapping exercises should be developed that comprehensively capture emerging federal and state circumstances to update these policy maps to improve their accuracy and relevance.
 - To capture variation in policy interpretation and implementation across sub-state administration units i.e. local authorities, it is recommended that policy instruments of decisions made at this level are also mapped and analysed in order to improve consistency of application across the state.

Malaysia and Selangor Mangrove Policy Mapping and Analysis

Context

In common with many countries, there is currently no dedicated national policy for mangrove management in Malaysia. In the context of mangroves as a forest habitat, state authorities are constitutionally responsible for managing their land and natural resources, including mangroves as forests, in accordance with federal policy and legislation, while local authorities hold responsibilities for delivering resource objectives within states largely through spatial planning mechanisms i.e. from state structure plans to local plans.

While responsibilities for decisions and actions that impact on mangroves fall across various Ministries, Departments, State authorities etc, the key directive in Malaysia for effective forestry management is the National Forestry Policy. This policy was revised in 2021 after a period of 29 years. The key legislation to support implementation of the policy is currently the National Forestry Act 1984 (amended 1993), hence there is urgent need for this instrument to be updated.

Conceptually, the principles underpinning the National Forestry Policy apply to addressing sustainable forestry management challenges, which should include the complexities involved in coastal mangrove management. A focus on the Peninsula state of Selangor allows these challenges to be examined in practice, in relation to state agency involvement in mangrove management. This examination can usefully be applied to Malaysia's national policy and legal framework, and, specifically, the state of Selangor's implementation mechanisms.

Aims

1. To examine policies impacting mangrove management in Selangor, and assess the extent to which the National Forestry Policy drives sustainable mangrove management.
2. Provide an overview of the level of policy integration around mangrove management, with a spotlight on forestry, cross-sectoral policy, tourism, fisheries, and other environmental and non-environmental sectors.

Objectives

i/ Apply Rapid Policy Network Mapping to the policy development process impacting mangrove management in Selangor, including any instruments with a known or assumed connection with mangrove management, as well as the key policy actors identified within these instruments.

ii/ Visualise the policy landscape impacting mangrove management in Selangor through the production of policy 'maps'.

iii/ Identify gaps in policy instruments that could negatively impact the implementation of effective mangrove management in Selangor.

Methods

Relevant policy instruments and policy actors were identified through application of a Rapid Policy Network Mapping (RPNM) approach advocated by Bainbridge et al. (2011, 2014). A detailed protocol used to apply this approach to the context of mangrove management in Malaysia and Selangor is provided in Appendix I.

The aims of the RPNM exercise were to:

1. Review national, regional and state policy instruments and actors involved in mangrove management in Malaysia, with a focus on Selangor.
2. Provide a baseline map for further policy assessment using a SWOT analysis of existing policies and plans that influence mangrove management in Selangor.
3. Provide recommendations on mangrove-related policy and governance in Selangor.

The approach visualises the current policy landscape for mangrove management in Selangor to reflect the roles and responsibilities of agencies operating at international, national and state levels. The RPNM method also highlights the connections and conflicts between policy actors and instruments that can, or do, influence mangrove management generally, and specifically on the mangroves of Selangor. Importantly, gaps in policy instruments can be identified and allow recommendations to be made for policy development to increase opportunities for sustainable management of Selangor's mangroves.

Summary flow chart

The RPNM approach requires the adoption of a 'seed' instrument to start the policy instrument mapping process. The National Forestry Policy 2021 was selected as the seed instrument in this study because of its significance as a guiding document for forest management priorities for all Malaysian states, and because of its currency. A snowballing approach was applied where all instruments and actors that were perceived to be relevant to mangrove management, and were referenced within the document, were extracted for inclusion in a policy map template. This process was repeated for each instrument until no new (relevant) instruments or actors emerged.

Policy instruments included directives, legal instruments, reports, policy briefs, planning documents, and policy statements, where related to mangrove management. Instruments were obtained from desk top research, institutional libraries, and partner organisation representatives (for example, within the Forestry Departments).

The resultant policy templates provided concept maps for visually collating:

i/ policy instruments as a function of policy domain (international, regional, national, or local (state) scales), and policy category (cross-sectoral, forestry, fisheries, tourism, other environmental and non-environmental), and

ii/ policy actors as a function of policy domain and policy role in relation to the policy process, as follows, where roles should be considered along a continuum from policy setting to policy delivery:

- **Influencer:** An organisation, entity or individual which is legally, morally or practically required, invited or obliged to be involved in the official policy development process. It is assumed that Influencers can affect the outcome of the policy process using legitimate means based on their opinions and views.

- **Owner/Decision-Maker:** An organisation, entity or individual which has the authority to make a decision which can affect the policy creation, transposition and/or delivery as concerns intellectual or practical components or which owns all, or component parts, of the policy process within a specified boundary. The majority of these actors are accountable for the successful delivery of intellectual and/or practical objectives which may include reporting, data, legislation etc. Decisions may be made by Owner/Decision Maker's following consultation and/or negotiation however it is assumed they have the ultimate authority to decide outcomes.
- **Influencer/Deliverer:** An organisation, entity or individual which is legally, morally or practically required, invited or obliged to be involved in policy development process. They can affect the outcome of the policy process using legitimate channels based on their opinions and views and are also engaged in delivering an action, process, or report which facilitates the interpretation, transposition and/or implementation of the policy.
- **Deliverer:** An organisation, entity or individual which is legally, morally or practically required, invited or obliged to be involved in the official policy development process. They can affect the outcome of the policy process based on their delivery of actions, processes, or reporting which facilitate the interpretation, transposition, and/or implementation of the policy. They cannot, in principle, affect the outcome of the policy process based on their opinions and views.

Results and observations

Forty-one policy instruments (listed in Appendix II) were identified from the rapid policy network mapping process as being relevant to mangrove management at the state level, either having an influence on, or being specific to, the state of Selangor.

Table 1 shows the spread of instruments across policy domains and sectors. Sixty-two per cent of the instruments operate at the national level, mostly as *acts* set by the Parliament of Malaysia (Federal level), *policies* determined by the federal Ministries and ultimately the Cabinet, headed by The Prime Minister, and *plans* for implementing policies through relevant ministers, government authorities and officials. Five instruments refer to state level decision-making. In the context of this mapping activity, these all take the form of *plans*, although it should be noted that state legislative assemblies can also determine state laws which could, for example, influence land use decisions. Sub-state (local authority) level policy instruments, such as district plans, fall outside of the scope of this mapping activity, but are acknowledged as being potentially highly influential on implementation of state plans, including those impacting management of local mangrove forests. Similarly, sub-state level policy actors are not considered.

Table 1: Policy instrument distribution across policy domains and policy sectors

	International	National	State (Selangor)	Total
Cross-sectoral (i.e. biodiversity/MSP/ICZM)	10	12	4	26
Forestry		7	1	8
Fisheries & Aquaculture				0
Tourism (green)		1		1
Other environmental		3		3
Non-environmental		3		3
Total	10	26	5	41

Sixty-five per cent of the instruments relate to cross-sectoral environmental policy, which includes concepts such as biodiversity, climate change, spatial planning, and integrated coastal management. As one would expect, with the seed instrument being the National Forestry Policy, several mapped instruments primarily concerning forestry are apparent. No fisheries or aquaculture instruments are explicitly referenced from the documents sourced, while just one national tourism policy instrument appears. The 'Other environmental' policies relate mostly to water resource management. Non-environmental policies that could impact on some element of mangrove management include very influential broad-brush national instruments that one would expect to be referenced by every policy at some point i.e. Malaysia Plan, as well as crime-related instruments such as the Criminal Procedure Code.

These patterns can be better visualised on the two Rapid Policy Network Maps that have been generated from the above data using CMap software. These show:

- Mangrove management policy instruments (Fig. 1)
- Mangrove management policy actors (Fig. 2)

The figures here show low resolution exported images of the maps and hence are intended for illustrative purposes only. High resolution versions can be accessed via the online CMAPS by downloading the CmapTools software from <http://cmap.ihmc.us/> (accessed August 2023). Once installed, open 'Shared CMaps in Places', then 'IHMC Public Cmaps' and browse to the folder 'NexAMS'. Open to access the files 'NexAMS Instrument CMap 2' and 'NexAMS Actor CMap 2'.

Policy Instrument Map

The instrument map plots instruments by policy domain (columns) and policy category (rows), with the domains representing levels of authority that reflect the process of policy implementation i.e. moving from international directives to regional guidance to national laws and resolutions, to national plans and lastly to state (Selangor) decision-making and implementation. The map shows quite a complex policy landscape for mangrove management comprising 41 different instruments ranging from the international to local scales.

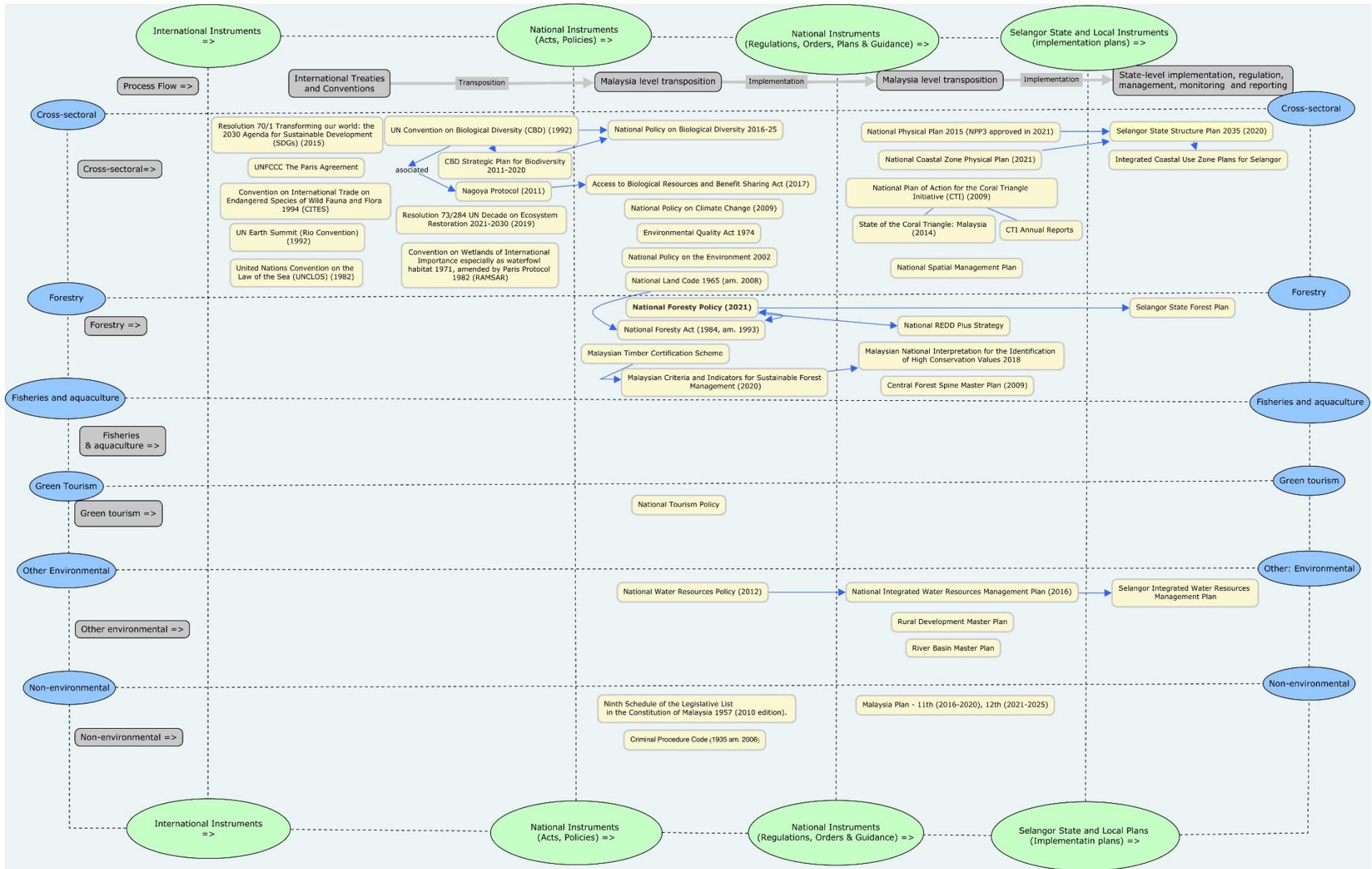
Ten important international instruments, mostly conventions, are acknowledged within other national and/or state policies as having a degree of influence on policy creation and function.

One important observation is that there are relatively similar proportions of international to national-level cross-sectoral policy instruments (25% and 30% of all instruments respectively), suggesting a significant response by the Federal Government to international policy drivers. As one might expect, several forestry instruments at national decision-making level exist, comprising a range of instrument types (acts, guidance, strategies and plans). Considering the evidenced importance of mangroves as breeding grounds for aquatic fauna and associated fisheries livelihoods (for example, Bimrah et al., 2022), it is notable that not one fisheries and aquaculture instrument appear in the policy map, highlighting an apparent gap in the relationship between forestry and fisheries policies at all decision-making levels. This doesn't mean that these two sectors aren't considered together within cross-sectoral policies. For example, the National Policy on Biodiversity considers coastal and marine habitats inclusively and draws out examples of where fisheries and forestry management coincide, such as the role of mangrove swamps as nursery grounds for fisheries.

In addition to the sectoral representation, this map clearly highlights thematic diversity within cross-sectoral (environment-related) policy, with tools developed to address issues such as biodiversity, climate change, integrated coastal management, natural resource management, and environmental protection.

The map shows that state-level instruments, in the form of plans determined by the state authority and delivered by state departments and local authorities, reflect the national prominence of cross-sectoral frameworks i.e. spatial planning.

Fig 1: Policy Instrument Map



The instrument map highlights that integrating broader sectoral policies and delivery mechanisms, including more explicit cross-referencing between forestry and (say) fisheries instruments will be an important aspect of future mangrove management strategies and plans, requiring consideration of how both horizontal *and* vertical integration can be enabled to ensure sustainable mangrove management with limited resources. By doing so, the tendency for some policies to push mangrove habitats to the background where they are overshadowed by a strong focus on mainstream forests may be mitigated. An example of this is the high profile of the Central Forest Spine, a key Government conservation initiative in Malaysia to protect biodiversity and ecosystem services by securing landscape connectivity between Peninsular Malaysia’s main terrestrial forest blocks, and influential within spatial planning instruments

Policy Actor Map

The policy actor map plots the breadth of actors involved in policy development of mangrove management at the national and state policy scales at a particular point in time (Apr 2021- Aug 2022). The range of actors involved in the policy development of mangrove management are charted, as cited by the key policy instruments identified through the RPNM approach. It should be noted that this method will not capture *all* actors engaged in mangrove management in Malaysia generally, and Selangor specifically. This is because some actors may operate outside of the remit or reach of the main policies at the current time. Also, one of the objectives of this study is to reveal gaps in the current policy landscape and one way of doing so is to recognise if relevant actors, or at least sectors within which such actors operate, are absent from the instruments that collectively form the mangrove management policy framework at national and state level.

A number of policy landscape observations can be made from an analysis of the actor map. In total, 46 different actors (listed in Appendix II) from across the policy domains are recognised as having some role to play in influencing or delivering mangrove management policy.

Table 2: Policy actor distribution across policy domains and policy roles

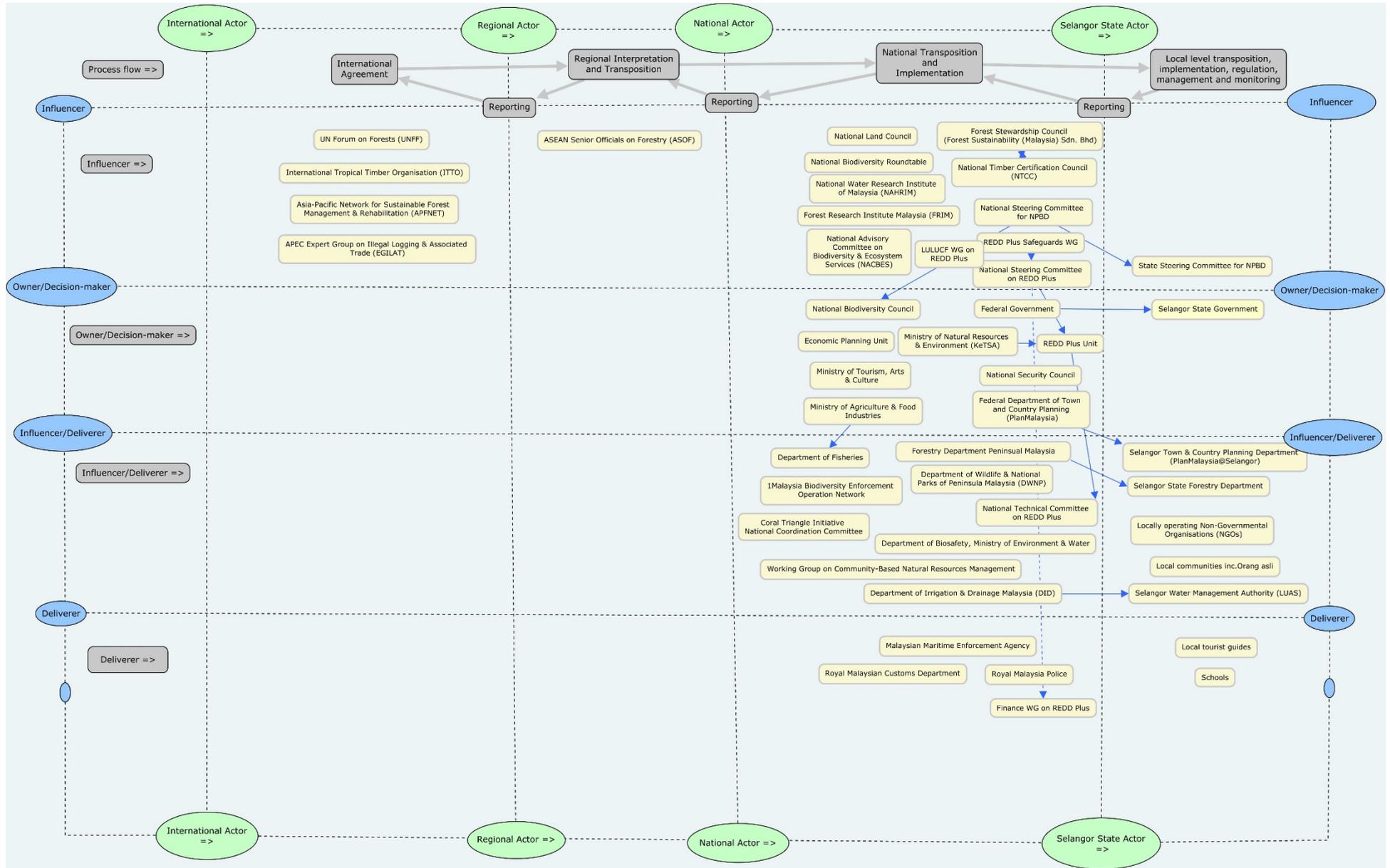
	International	National	State (Selangor)	Total
Influencer	4	11	1	16
Owner/Decision-maker	0	9	1	10
Influencer/Deliverer	0	9	5	14
Deliverer	0	4	2	6
Total	4	33	9	46

Operating at an international or regional scale, actors tend to hold an indirect influencer role on mangrove management policy via a focus on good practice guidance for sustainable forest management. For example, the International Tropical Timber Organization (ITTO) is an intergovernmental organization promoting the sustainable management and conservation of tropical forests and develops internationally agreed policy guidelines and norms to encourage sustainable forest management. These guidelines were used to inform strategic priorities for the revision of the National Forestry Policy in 2021.

The proportion of actors increases dramatically at the national level. While a number of actors can be seen to influence, own and/or implement policies, it is perhaps not surprising that the policy landscape, particularly in the owner and decision-maker categories, are dominated by federal ministries and agencies/units. Of note, though, are the frequency of multi-sectoral bodies which influence policy, such as the National Steering Committees for the National Policy on Biological Diversity and on REDD Plus, drawing on membership from NGO's and civil society as well as from a range of government departments. It is worth highlighting the role of the Coral Triangle Initiative National Coordination Committee and the corresponding CTI National Plan. Although the initiative is regional in scope, each member state is required to consider actions at a national level (although there is a strong focus on Sabah state responses), hence there are some actions, or at least commitments, which have the potential to influence mangrove management.

The map shows a high density of policy activity within the influencer/deliverer category. This largely reflects the federal and state government structure, where a number of actors, mostly ministries at national level and departments at state level, have dual responsibilities of decision-making *and* the subsequent determination of priorities and implementation of plans once the decisions have been made, as well as coordinating implementation with other sectors.

Fig 2: Policy Actor Concept Map



This can be evidenced through scrutiny of any number of policies where it is customary to list all agencies that are allocated a leading role as well as any actors that are expected to provide supporting roles to the lead agency.

The Peninsula Malaysia Forestry Department (for protected forests) and the Selangor State Forestry Department are probably the most critical actors for sustainable mangrove management from national to state domains. However, it should be emphasised that this is largely through these agencies' responsibilities for forestry management generally and that no policies are targeted specifically at mangroves. Coordination between these actors and the other influencer/deliverer actors are sometimes articulated in policy instruments; for example, the lead agency for monitoring the National REDD+ Strategy is the Ministry of Energy and Natural Resources (formerly the Ministry of Natural Resources and Environment at the time of publication), through its REDD+ Unit, while the policy document explicitly lays out the reliance on state departments to implement actions arising from the strategy.

While the state authority is the primary decision-maker on actions having the most impact on mangroves in Selangor (regarding land use, for example), the State Forestry Department is the key policy actor that determines the effectiveness of relevant policy implementation and the priority afforded mangrove protection and management compared with other state concerns i.e the central forest spine. Such decision-making between policy priorities is perhaps even more significant where mangroves occur on state land without protected forest reserve status rendering them much more vulnerable to other land use demands.

No actors identified through this mapping approach have a dedicated responsibility for delivery of mangrove management actions, or that might be expected to champion mangrove protection. However, there are a number of policies that reinforce the importance of mangroves for the provision of a range of ecosystem services, with corresponding objectives and actions for which coordinating and delivery partners can be held to account.

Key points and recommendations

The policy mapping templates presented in this report provide a flexible basis for the application of the rapid policy network mapping approach to policy challenges.

The instrument map reveals approximately five times the number of national to state policy instruments have been identified. While this pattern does reflect the actual policy landscape, it is also likely that relevant policies determined at the state level may have been more challenging for the researchers to identify and obtain, which, in turn, might reflect greater reluctance for state authorities to publish departmental policy delivery mechanisms.

Further to this, it should be noted that the scope of this mapping exercise, as the title suggests, covers policy only down to interpretation of such into delivery mechanisms. It does not review implementation plans, which could usefully be considered as a future priority. Similarly, the policy maps show policy domains to state level only. It is noted that further significant decision-making structures in Selangor continue to operate at district authority level, and certainly that implementation of state plans that impact on local mangroves forests and patches will be delivered by local authorities, often in collaboration with NGO's and/or local communities. To capture variation in policy interpretation and implementation across these sub-state administration units, it is recommended that policy

instruments of decisions made at this level are also mapped and analysed in order to improve consistency of application across the state.

It is recommended that a participatory and peer reviewed approach to further mapping exercises should be developed that comprehensively capture any emerging federal and state circumstances to update these maps to improve their accuracy and relevance.

The absence of policy instruments dedicated to mangrove management emphasises the reliance on the fate of mangroves being upheld from within broader-brush policies. This could perhaps be considered at odds with the widely recognised importance of this habitat to the benefit of multiple ecosystem services. While it is acknowledged that a mangrove policy per se is unlikely, there are a number of existing policies (I.e. National Forestry Policy, National Biodiversity Policy) and one or two that appear to be in a state of revision (I.e. National Climate Policy) or limbo (I.e. National Wetland Policy) that could be strengthened with regard to the explicit priority afforded mangroves (and, therefore, presumably, allocated additional resources).

At the very least, major policies could be better integrated through cross-referencing and collaborative implementation, to benefit mangroves. A stand-out example here is the need for a more explicit connection between forestry and fishery policies. With a greater understanding of the role mangroves can play in nature-based solutions for, for example, tackling climate change pressures, GHG emission reductions and achievement of NDC targets, reducing biodiversity loss and contributing toward national no net loss ambitions, a more joined-up approach between policy setting and delivery actors is essential. Returning to the policy maps, mechanisms will need to continue to support horizontal and vertical integration in order to maximise limited resources, while at the same time providing greater clarity and focus for implementing increasingly important policies.

If a mangrove-specific policy is unlikely, it may be more realistic to expect a national policy for blue carbon in order to present a coordinated and broader-looking directive for developing programmes and projects that address the environmental challenges listed above.

Some of the policies included in the instrument map are arguably in need of updating. Examples include the Forestry Act, which needs to be revised to enable effective implementation of the recently revised National Forestry Policy, and the National Wetland Policy, of which ownership is unclear. Other policies may be in the process of revision to reflect developments internationally and nationally (i.e. policy on climate change), while others may follow further international drivers and guidance, such as policies responding to guidance for supporting blue carbon projects and financing mechanisms. These policy maps may therefore prove useful as reference points for those responsible for updating the individual policies.

This study has mapped the policy context around mangrove management in Malaysia and Selangor and, by doing so, creates a publicly accessible platform that can be accessed for collaborative purposes in order to, for example, conduct a more detailed analysis of policy content, raise awareness of the policy landscape, and foster inter-agency cooperation.

Reflections on approach

By following the snowballing approach advocated by the RPNM process, some policy instruments known by the authors from personal experience and knowledge as potentially impacting mangroves, were not included in the mapping exercise. This could either be interpreted as a methodological limitation or an important outcome of the method in that it highlights a lack of connectedness between some policies. An example is the absence of the Fisheries Act from the instrument map. This act is not mentioned in any of the other policy instruments that snowball from the National Forestry Policy hence it does not feature. However, the authors are aware that this Act is a key legislative instrument for Marine Protected Area management, and that mangroves occur within many MPAs, hence it will have influence on their management. The absence of the Act from the policy map could therefore reflect the lack of connectivity between forestry and fisheries policies. Other examples of instruments that one might have expected to feature include the Town & Country Planning Act, the National Wetland Policy and the Status of Mangroves in Malaysia report authored by the Forest Research Institute of Malaysia (FRIM). It is suggested that any further analysis of key mangrove-relevant policy content includes these additional instruments. The RPNM approach might also fail to draw out private sector engagement in policy processes because of the emphasis on legislation and national policy instruments, hence the actor map in particular may under-represent this sector's role in policy determination and implementation.

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Appendix 1

Rapid Policy Network Mapping Protocol

Aims of the RPNM approach:

1. Review national, regional and local policy instruments and actors involved in mangrove management in Malaysia, with a focus on Selangor.
2. Provide a baseline map for further policy assessment using a SWOT analysis of existing policies and plans that influence mangrove management in Selangor.
3. Provide recommendations on mangrove-related policy and governance in Selangor.

Objectives of the RPNM approach:

1. Review current policy tools used to manage existing mangrove resources in Selangor and complete a policy landscape assessment in order to appreciate the roles and responsibilities of local, regional and national (and international) agencies in managing these resources, and the pressures they face.
2. Conduct Rapid Policy Network Mapping (RPNM) on existing policies that are related to the management of mangroves in Selangor.
3. Understand the links between policy actors and policy instruments that have greatest impact, positive or negative, on the mangroves of Selangor.
4. Highlight conflicts and synergies between policy instruments and key sectors (including non-environmental) that could impact on management of the mangroves of Selangor.
5. Identify gaps in policy instruments that could negatively impact the implementation of sustainable management of Selangor's mangroves.
6. Reveal variation in the engagement of policy instruments and actors by sector.

Hypotheses applied to the RPNM approach:

1. There is no coherent policy dedicated to the sustainable management of mangroves in Selangor.

2. There is conflict between Selangor's sustainable environmental and economic development goals.
3. The private sector is not meaningfully engaged with the benefits of sustainable mangrove management.
4. Selangor state, and federal, forestry departments are supportive of more integrated and sustainable mangrove management.

Overall outcome: This work will, in combination with an analysis of existing policies and plans that influence mangrove management, inform recommendations for policy development and/or change aimed at improving protection of Selangor's mangrove resources.

Approach: Conduct a Rapid Policy Network Mapping (RPNM) exercise in order to understand the relationships and dependencies in the development and implementation of the National Forestry Policy at a state level, specifically in relation to mangrove management in Selangor.

Rationale: The RPNM approach is a method of Policy Network Analysis (PNA) that has been adopted following a review by members of the project team of a peer-reviewed published paper by Bainbridge et. al (2011) which introduced RPNM to policy analysis work at The Scottish Association for Marine Science (SAMS). The method was subsequently taken up by other research groups and applied to several case studies (Bainbridge, 2014; O'Higgins, 2017; Celtic Seas Partnership, 2017) and employed by DEFRA. This method adopts an 'egocentric approach', where an 'ego' is a policy actor or instrument linked to other relevant policy actors and instruments in a policy community and where the 'centrality' of the instrument or actor is a function of its importance within that network.

An adapted version of the approach described in the paper was felt to be applicable to this project's objectives for the following reasons:

1. It supports management approaches where governance systems provide an incentive for stakeholders to align. There is some evidence that the national government is generally supportive of an integrated joined-up approach to forest management (or natural resources more broadly) but that agencies responsible for implementation could do with support on how a more cohesive approach could be adopted within, and between, their services and initiatives.
2. This method is particularly aimed at multi-sector situations. Existing policy-making and policy delivery institutions need to be able to accommodate and adapt to a new multi-sectoral approach (Bainbridge et al., 2011).
3. The future environmental status of Selangor is highly dependent on governance structures and policy networks.
4. Achieving an ecosystem-based management approach (EA) through the implementation of forestry policy and law requires a holistic approach, recognising interconnections between the natural environment and human activities and institutions.

5. It is necessary to show the relational networks between policy actors and policy instruments and show how a governance framework can facilitate a meaningful approach to engaging EA to the delivery of the national forestry policies and laws.
6. Public policies are often formed by the actions of NGO's and private sector market forces [the civil society].
7. PNA is a form of Social Network Analysis (SNA) that can provide an insight into the balance and patterns of responsibility, accountability, authority, resources, relationships and power within a policy process.
8. PNA is a robust analytical tool, although it is resource intensive. However, sufficient resources are available through NexAMS and ACCORD project funding.
9. The method allows non-specialists to quickly understand the policy context and create a useful working tool.
10. It provides a baseline assessment of the policy process.
11. It is an information rich method of connecting policy instruments and actors.
12. An interactive resource output is generated quickly and available to all stakeholders to provide a platform to support policy negotiations, further research, gap analysis, SWOT analysis and communication.
13. It will enable visualisation of social-economic, regulatory and legal structures as well as power relations between actors.

Analysis Boundaries: Due to time and capacity limitations, the mapping activity will concentrate on the sectors identified from previous research (NetComFish) as those having greatest responsibility for mangrove protection and management in Selangor i.e. forestry, coastal fisheries, and land management. However, attempts will be made to incorporate influences identified from other sectors such as aquaculture, tourism, and economic development . All relevant international, regional, national and local policy instruments will be included. While this analysis focuses on mangrove management, other key national environmental directives and policies that are expected to influence mangrove management decisions will also be considered. Examples might include national planning policies.

Methodological steps:

1. First, policy instruments and actors will be mapped from the National Forestry Policy (NFP) (the 'seed' instrument).
2. Subsequently a snowballing approach will be followed where all referenced instruments and actors, relevant to mangrove management, within each source instrument will be extracted until no new (relevant) instruments or actors emerge
3. Policy instruments might include, as examples, directives, legal instruments, reports, policy briefs, planning documents, organisation websites and policy statements, where related to mangrove management. Instruments will be obtained from desk top research, institutional libraries, and partner organisation representatives (for example, within the Forestry Departments).
4. Policy actor and instrument data will be collated in Microsoft Excel. Instrument data may include unique identifiers, policy domain, instrument title, instrument type, instrument group, date published. Actor data may include unique identifiers, actor name, actor sector, actor status, policy domain.
5. Two gridded mapping templates, one for the policy actor data and one for policy instrument data, will be generated as concept maps. The templates have been

developed using CmapTools software (Institute for Human and Machine Cognition, 2010) (<http://cmap.ihmc.us>.)

6. The templates will provide a matrix for visually collating policy actors and instruments as a function of the following categories, domains and definitions, linked to the policy process flow, and can be used to ensure consistency of reporting in accordance with this framework. The final instrument categories will be determined by Malaysia's and/or Selangor's policy implementation process.
 - a. Actors will be aggregated in the actor matrix in a manner that reflects their responsibility to deliver an output, influence policy development, or make decisions in relation to a specific component of the policy process.
 - b. Actors will be grouped according to their policy domain: international, national, regional or local scales.
 - c. A coding scheme will allow communities of policy actors from different policy domains to be recognised as a coherent group.
 - d. Policy instruments will be grouped by policy domain.
 - e. The stages of the policy within its lifecycle will be indicated: creation, interpretation, transposition and implementation.
7. Data analysis:
 - a. The templates will provide a means to generate network maps allowing process flows and relationships to be visualised.
 - b. For the mapping, relationships between actors will not be assumed and will only be recorded if explicitly recorded in a source.
 - c. Two Rapid Policy Network Maps will be generated: one for Forestry Policy Actors and one for Forestry Policy Instruments.
 - d. An analysis of the mapping information will reveal the strengths and weaknesses of the current policy community in Selangor in relation to the forestry policies and laws, and identify gaps in instruments and/or actors that are impacting on protection of mangroves.

Appendix II

List of policy instruments identified through application of the Rapid Policy Network Mapping approach

Instrument Name	Policy Instrument Category	Policy Instrument Domain
National Forestry Policy 2021	Forestry	National
Central Forest Spine Master Plan	Forestry	National
Resolution 70/1 Transforming our world: the 2030 Agenda for Sustainable Development (SDGs)	Cross-sectoral (i.e. ICZM)	International
Resolution 73/284 UN Decade on Ecosystem Restoration 2021-2030	Cross-sectoral (i.e. ICZM)	International

Ninth Schedule of the Legislative List in the Constitution of Malaysia 1957 (2010 edition).	Non-environmental	National
UN Earth Summit 1992 (Rio Convention)	Cross-sectoral (i.e. ICZM)	International
Malaysian Timber Certification Scheme	Forestry	National
National Forestry Act 1984 (amended 1993)	Forestry	National
UNFCCC Paris Agreement	Cross-sectoral (i.e. ICZM)	International
National Climate Change Policy	Cross-sectoral (i.e. ICZM)	National
UN Convention on Biological Diversity (CBD)	Cross-sectoral (i.e. ICZM)	International
National Biodiversity Policy 2016-25	Cross-sectoral (i.e. ICZM)	National
CITES	Cross-sectoral (i.e. ICZM)	International
Wetland Convention (RAMSAR)	Cross-sectoral (i.e. ICZM)	International
Nagoya Protocol	Cross-sectoral (i.e. ICZM)	International
Access to Biological Resources Act (draft)	Cross-sectoral (i.e. ICZM)	National
Malaysia Plan	Non-environmental	National
Selangor State Forest Management Plan	Forestry	State
Malaysian National Interpretation for the Identification of High Conservation Values	Forestry	National
Selangor State Structural Plan	Cross-sectoral (i.e. ICZM)	State
National Physical Plan	Cross-sectoral (i.e. ICZM)	National
National Land Code	Cross-sectoral (i.e. ICZM)	National
Criminal Procedure Code (Act 593)	Non-environmental	National
United Nations Convention on the Law of the Sea (UNCLOS)	Cross-sectoral (i.e. ICZM)	International

National Plan of Action for the Coral Triangle Initiative (CTI)	Other environmental	National
National Strategy for Plant Conservation	Forestry	National
National Water Resources Policy	Other environmental	National
Environmental Quality Act 1974	Cross-sectoral (i.e. ICZM)	National
National Coastal Zone Physical Plan	Cross-sectoral (i.e. ICZM)	National
ICUZP for Selangor	Cross-sectoral (i.e. ICZM)	State
National Environmental Policy	Cross-sectoral (i.e. ICZM)	National
Rural Development Master Plan	Cross-sectoral (i.e. ICZM)	National
River Basin Master Plan	Other environmental	National
Spatial Management Plan	Cross-sectoral (i.e. ICZM)	State
National Tourism Policy	Green Tourism	National
National REDD Plus Strategy	Forestry	National
CBD Strategic Plan for Biodiversity 2011-2020	Cross-sectoral (i.e. ICZM)	International
State of the Coral Triangle: Malaysia (2014) authored by ADB	Cross-sectoral (i.e. ICZM)	National
CTI Annual Reports	Cross-sectoral (i.e. ICZM)	National
National Integrated Water Resources Management Plan	Other environmental	National
Selangor Integrated Water Resources Management Plan	Other environmental	State

List of policy actors identified through application of the Rapid Policy Network Mapping approach

Actor Name	Policy Actor status	Policy Domain/Scale
Federal Government	Owner/Decision maker	National
Selangor State Government	Owner/Decision maker	State
National Land Council	Influencer	National

Forestry Department Peninsula Malaysia	Influencer/Deliverer	National
Forest Stewardship Council (Forest Sustainability (Malaysia) Sdn. Bhd)	Influencer	National
UN Forum on Forests (UNFF)	Influencer	International
International Tropical Timber Organisation (ITTO)	Influencer	International
National Timber Certification Council, NTCC	Influencer	National
ASEAN Senior Officials on Forestry (ASOF)	Influencer	Regional (SE Asia)
Asia-Pacific Network for Sustainable Forest Management & Rehabilitation	Influencer	International
Selangor State Forestry Department	Influencer/Deliverer	State
NGOs	Influencer/Deliverer	State
Expert Group on Illegal Logging & Associated Trade	Influencer	International
Tourist guides	Deliverer	State/Local
Local communities inc. Orang Asli	Influencer/Deliverer	Local
Schools	Deliverer	Local
Forest Research Institute Malaysia (FRIM)	Influencer	National
Department of Wildlife & National Parks of Peninsula Malaysia (DWNP)	Influencer/Deliverer	National
National Biodiversity Council (NBC)	Owner/Decision maker	National
National Steering Committee for NPBD (NSC)	Influencer	National
National Biodiversity Roundtable	Influencer	National
1Malaysia Biodiversity Enforcement Operation Network	Influencer/Deliverer	National
National Advisory Committee on Biodiversity & Ecosystem Services (NACBES)	Influencer	National
Department of Biosafety, Ministry of Environment & Water	Influencer/Deliverer	National
Working Group on Community-Based Natural Resources Management	Influencer/Deliverer	National
Ministry of Agriculture & Food Industries	Owner/Decision maker	National
Department of Fisheries	Influencer/Deliverer	National
Ministry of Tourism, Arts & Culture	Owner/Decision maker	National
Malaysian Maritime Enforcement	Deliverer	National

Agency		
Royal Malaysian Customs Department	Deliverer	National
Royal Malaysian Police	Deliverer	National
State Steering Committee for NPBD	Influencer	State
Ministry of Natural Resources & Environment (KeTSA)	Owner/Decision maker	National
REDD Plus Unit	Influencer/Deliverer	National
National Steering Committee (NSC) on REDD Plus	Influencer	National
National Technical Committee (NTC) on REDD Plus	Influencer/Deliverer	National
The Safeguards Working Group	Influencer	National
The LULUCF Working Group on REDD Plus	Influencer	National
Finance Working Group on REDD Plus	Deliverer	National
National Security Council	Owner/Decision maker	National
Department of Irrigation & Drainage Malaysia (DID)	Influencer/Deliverer	National
Selangor Water Management Authority (LUAS)	Influencer/Deliverer	State
National Water Research Institute of Malaysia (NAHRIM)	Influencer	National
Economic Planning Unit	Owner/Decision maker	National
Federal Department of Town and Country Planning (PlanMalaysia)	Owner/Decision maker	National
Selangor Town & Country Planning Department (PlanMalaysia@Selangor)	Influencer/Deliverer	State

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Nexus Action for Mangroves in Selangor (NexAMS) is a UK-Malaysia project funded by the Newton-Ungku Omar Fund Scheme aimed at advancing policy and business initiatives for improved, inclusive mangrove protection through sustainable use, and building public private-community partnerships, focusing on the state of Selangor. NexAMS comprises a team of researchers from Universiti Malaya, the University of Plymouth and Plymouth Marine Laboratory. For more information, visit: <https://nexams2020.wixsite.com/nexams2020>