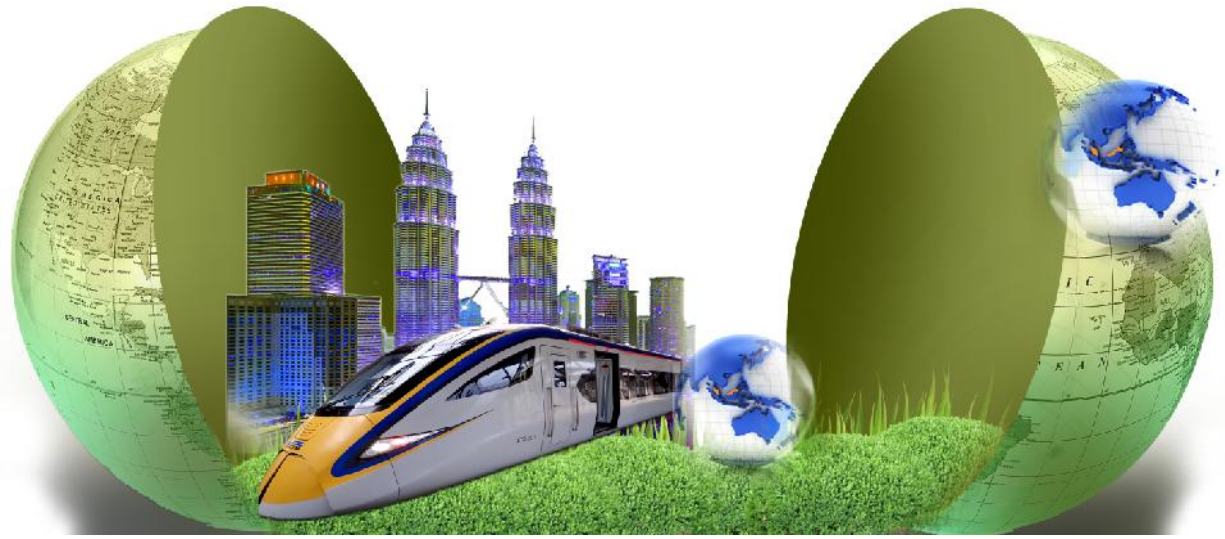
# Roadmap for System of Environmental-Economic Accounting 2016-2020

# MALAYSIA



United Nations Statistics Division

Jabatan Perangkaan Malaysia

UNIVERSITI PUTRA MALAYSIA

# Roadmap for System of Environmental-Economic Accounting 2016-2020

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# FOREWORD

There is a growing need to develop and combine statistics and indicators beyond Gross Domestic Product that are more inclusive of environmental and social aspects in order to cover the full realm of sustainable development. This is in line with the Eleventh Malaysia Plan 2016-2020 under Chapter 6-Pursuing Green Growth for Sustainability and Resilience that emphasized green growth as a fundamental shift to see the role of natural resources and the environment in its socio-economic development, protecting both development gains and biodiversity at the same time.

The Roadmap SEEA for Malaysia 2016-2020 is a dynamic document that outlined policies/programmes/initiatives related to environment in Malaysia, governance structure, data requirements, proposed accounts and implementation strategies as well as critical success factors for SEEA implementation. This Roadmap identified four potential SEEA accounts that could be developed in Malaysia namely energy, water, air emission (for energy use) and land accounts (agriculture).

The System of Environmental-Economic Accounting (SEEA) is a new mechanism in preparing official statistics to measure the sustainability of national economic development. It can facilitate more timely production of indicators in analysing the effectiveness of relevant policies for natural resources in relation to land, water, forest, energy and marine resources. The integration of environmental statistics into economy, would improve countries' abilities to manage their economies and resources.

DOSM would like to take this opportunity to extend our appreciation to the United Nations Statistics Division for its relentless efforts and support especially on capacity building and the technical assistance rendered in the development of SEEA Malaysia. We would also wish to record our appreciation to Dr. Mohd Yusof Saari and his team for their commitment and dedication upon the completing the pilot SEEA Water Account as well as the Roadmap. Our sincere gratitude are also extended to all ministries and agencies for their invaluable contribution and unwavering support in making the formulation of the Roadmap a success.

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**December 2017**

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# Contents

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- This Roadmap for Advancing Environmental-Economic Accounting (RM-SEEA) assesses the potential areas for Malaysia to develop and strengthening the System of Environmental Economic Accounting (SEEA). It reflects the combined work of the United Nations Statistics Division (UNSD) and the Department of Statistics Malaysia (DOSM).

- The assessment was conducted under the leadership of DOSM headed by Datuk Dr. Abdul Rahman Hasan, the former Chief Statistician; Dr. Mohd. Uzir Mahidin, Chief Statistician; Deputy Chief Statistician (Programme of Social/Demographic) and in close collaboration with Ms. Zarinah Mahari, Director of the Agricultural and Environment Statistics Division as SEEA Project Director and the TWG-SEEA team:

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- Appreciation goes to all the officers from various national agencies directly and indirectly involved in the discussions during the focus-group meeting and engagement sessions. The agencies involved are:
  1. Ministry of Finance
  2. Economic Planning Unit
  3. Ministry of Natural Resources and Environment
  4. Ministry of Agriculture and Agro-based Industry
  5. Ministry of Energy, Green Technology and Water

6. Ministry of Plantation Industries and Commodities
7. Ministry of Rural and Regional Development Malaysia
8. Ministry of Urban Wellbeing, Housing and Local Development
9. Ministry of International Trade and Industry
10. Ministry of Science, Technology and Innovation
11. Energy Commission
12. National Water Service Commission
13. Department of Minerals and Geosciences Malaysia
14. Department of Agriculture
15. Department of Survey and Mapping Malaysia
16. Department of Marine Park Malaysia
17. Department of Wildlife and National Parks Peninsular Malaysia
18. Department of National Solid Waste Management
19. Federal Department of Town and Country Planning Peninsular Malaysia
20. Forestry Department Peninsular Malaysia
21. Department of Environment
22. Sewerage Service Department
23. Department of Veterinary Services
24. Department of Fisheries Malaysia
25. Department of Irrigation and Drainage
26. National Hydraulic Research Institute Malaysia
27. Indah Water Konsortium
28. Malaysian Agricultural Research and Development Institute
29. Forest Research Institute Malaysia
30. Institute of Labour Market Information and Analysis
31. United Nations Development Programme

# 1 Executive Summary

**Background:**

1.1. The purpose of this document is to link the current Malaysia environmental-economic accounting initiatives and policy requirements with the System of Environmental-Economic Accounting (SEEA) and other international statistical frameworks. This document is commonly termed as a "National Plan" for Advancing Environmental-Economic Accounting (NP-AEEA) by the United Nations Statistics Division (UNSD). Assessment indicates that the use of "National Plan" terminology should be replaced with the word "Roadmap" for Advancing Environmental-Economic Accounting (RM-SEEA).

1.2. This RM-SEEA provides the foundation for initiating statistical development towards improving decisions related to sustainable development and green economy. This document is prepared based on the ***Malaysia - Country Assessment Report*** that has identified policy priorities and institutional and statistical capacity for Malaysia to engage in such development.

1.3. The contents of RM-SEEA are largely extracted from the focus-group meetings and stakeholder engagements, as well as reviewing the most recent national policy documents (such as, the Eleventh Malaysia Plan and the National Climate Change Policy). Results from the focus-group meetings and stakeholder engagements are analyzed using quantitative and qualitative approaches.

1.4. This project is a collaboration work between the Department of Statistics Malaysia (DOSM) and various agencies, which include, the Ministry of Finance (MOF), Economic Planning Unit (EPU), Ministry of Energy, Green Technology and Water (KeTTHA), Ministry of Natural Resources and Environment (NRE), Ministry of Agriculture and Agro-based Industry (MOA) and other agencies. It positions the work within internationally accepted best practices for statistical development.

1.5. This document will serve as a basis for engaging stakeholders and developing focussed proposals for support. It does so by:

(a) establishing the rationale for an integrated statistical system for sustainable development information;
(b) summarizing priorities and opportunities in Malaysia for further improvement of the National Statistical System with a focus on SEEA;
(c) using an Investment Logic Framework (ILF), it identifies the enabling factors (preconditions for engaging in activities), activities, outputs, impacts and long-term outcomes of engaging in these activities; and by
(d) outlining the foundational activities needed to implement environmental-economic accounting ready for use in fully developed and costed funding proposals.

1.6. The System of Environmental Economic Accounting Central Framework (SEEA CF) has been recommended as an international statistical standard. The SEEA CF manual is intended to focus the efforts of the National Statistics Office (NSO), the National Statistical System and other

stakeholders, including international agencies, to develop a cost-effective, ongoing and effective statistical systems and related institutional mechanisms to address Malaysia's sustainable development policy objectives.

**Proposed SEEA module:**

1.7. Feedbacks from various stakeholders and gap analysis indicate that Energy, Water and Land are the major focused policy priorities in Malaysia. This is further supported by the targets set by the main environmental related policy/plan/programme documents in Malaysia, is summarized below:

- 42 targets relate to Energy
- 23 targets relate to Water
- 22 targets relate to Land
- 62 targets involve multiple areas

1.8. In addition to the policy priorities, these three areas are also doable and feasible to be developed because resource materials such as technical knowledge and methodologies are well documented. Energy is the top policy priorities in Malaysia, followed by Water and Land.

1.9. Based on the engagements, assessment missions and workshops with agencies, three priority accounts identified namely SEEA-Energy, SEEA-Water and SEEA-Land (specific focus on agriculture, forestry and fishery). In this RM-SEEA, Malaysia has agreed to develop SEEA-Water for the first phase because of the following reasons:

- First, under the strategic planning approach, development of SEEA-Water should be the main aim for Malaysia for the next few years because SEEA-Energy is currently developed by DOSM.
- Second, the current water shortage associated with climate change, water quality and inefficient water management demands for proper data management that links economic activities and environments. For SEEA-Water, assessment also indicates that policy targets demand for the focus on the development of supply and use accounts, asset accounts, emission accounts and extended accounts that linked other variables (such as population and labor) for policy analysis.
- Third, methodologies and resources for the development of SEEA-Water are well documented as many countries had already compiled the water account. The benchmarking countries provide guidance and direction for the development of SEEA-Water in Malaysia.
- Fourth, assessment indicates that aggregated data for the compilation of water account are mostly and readily available.

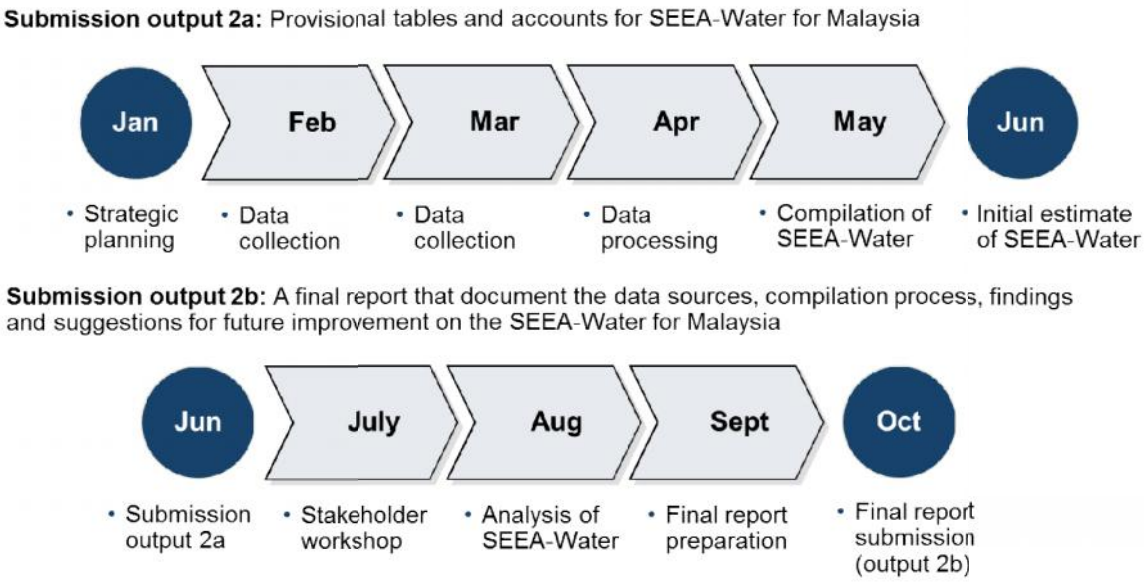
**Implementation strategies:**

1.10. This RM-SEEA recommend the following phases in developing SEEA account in Malaysia:

- **Phase 1: Setting and formalizing the governance structure and establish the foundation for SEEA-Water account development.** There are 3-level governance structures consisting of a Steering Committee, Technical Committee and Technical Working Committee that are responsible for issuing directive on guidelines, monitor SEEA development and capacity building according to the stated Term of Reference (TOR).

- **Phase 2: Development of SEEA-Water**. Development SEEA-Water mainly takes place in 2017. Selected tables and accounts for SEEA-Water in Malaysia will be developed based on the details activities below (Figure 1). The figure indicates the proposed working plans for 2017. In 2017 working plans, pilot accounts for SEEA-Water will be developed for 2010 reference year. It is suggested to develop a standard account such as supply and use table on yearly basis while integration with the economic account, i.e. input-output table is constructed for every 5 years, depending on the availability of the input-output table.

**Figure 1: Development of SEEA-Water in 2017**




- **Phase 3: Other SEEA potential accounts** – Knowledge gained from the establishment of SEEA-Water will be used for future development of other accounts. The Steering and Technical Committees will remain, the Technical Working Committee will vary depending on account to be establish.

**SEEA governance structures:**

1.11. For the success of SEEA development in Malaysia, planning and coordination of the implementation of the RM-SEEA would be most effective with a 3-level structures consisting of a Steering Committee, Technical Committee and Technical Working Committee.

1.12. For the first level, the Steering Committee as agreed in the Planning and Development of Environmental Statistic Committee meeting, will give guidelines and endorse the implementations of SEEA-Water. The Steering Committee is proposed to be chaired by the EPU with DOSM and EPU as the secretariat and the permanent members should include; the Ministry of Finance (MOF), Ministry of Energy, Green Technology and Water (KeTTHA), Ministry of Agriculture and Agro-based Industry (MOA), Ministry of Plantation Industries and Commodities (MPIC) and Ministry of Natural Resources and Environment (NRE).

1.13. The second level is the Technical Committee. The main function of the Technical Committee is to provide technical coordination for the development of SEEA-Water. In addition, it also approves working plans of the Working Groups; provide internal resources to the Working groups; and coordinate technical work with related national and international initiatives. This Technical Committee is proposed to be chaired by DOSM. DOSM and EPU as the secretariat, while the members include relevant agencies under the KeTTHA, NRE, MOA and MPIC.

1.14. The third level is the Technical Working Committee. The main function of the Technical Working Committee is to lead the development of SEEA-Water accounts. This involves the development and establishment of specific methodologies for the data estimation, and prioritization of indicators and linking the accounts to policy priorities. The Ministry of Natural Resources and Environment (NRE) and DOSM is proposed to be the co-chair and secretariat for the Technical Working Committee. Members will include various agencies related to water.

**Conclusion:**

1.15. The SEEA-water approach can make a major contribution to the sustainable planning and development in Malaysia. There is a significant need for an integrated database that provides useful and comprehensive policy analysis. Such a database would also support the national and international initiatives and commitments, which include the Eleventh Malaysia Plan and the Sustainable Development Goals (SDGs).

# 2 Introduction

2.1. There is little doubt that at global, national and local scales, humanity is pushing against a web of environmental boundaries. This message has been growing clearer and clearer through multiple scientific, social and economic studies ((MA 2005), (Rockström, Steffen et al. 2009), (TEEB 2010), (Cardinale, Duffy et al. 2012)). At the broadest level, the risks associated with breaching environmental boundaries are at the centre of concerns about sustainable development and, given the inter-connected nature of our economies and societies, environmental concerns are relevant to all people in all countries. It is unsurprising that the demands from governments, international agencies and the general public for a response have been growing stronger and stronger (see for example, Rio +20, post-2015 development agenda).

2.2. Commitments and policy initiatives of Malaysia towards environment at national and international levels are well documented (Refer 3.2.1). In addition, Research and Development (R&D) activities towards environment by various agencies and researchers in Malaysia are not only large in quantity but also growing recently. Among the areas that have been studied include valuation of natural resources (see Kamri, 2013; Abdullah et al., 2015), solid waste management (Pek and Jamal, 2011), environmental impact of economic activities (Harrigan, 2000; Bohari, 2015), evaluation of river water quality (Lee et al., 2017).

2.3. Institutionally, efforts to promote sustainability through environmental research are supported by both international and local Non-government Organizations (NGOs). For example, Economy and Environment Program for Southeast Asia (EEPSEA) funded a project "Economic costs of haze to the Malaysian economy" in Philippines that carried out by the local Malaysian researcher. In supporting the development of environmental economics field in Malaysia, the Malaysian Environmental Economics Associations (MEEA) has been established on January 20, 2016. The MEEA establishment to promote and develop environmental economics discipline and related fields from academic institutions, government agencies, research institutions, NGOs and interested stakeholders that aims to promote environmental economics through capacity building, research, professional services and networking. Among the research projects that carried out the MEEA members are:

- Forest Pricing Policy in Malaysia, 2003
- Responses of Timber Concessionaires to Selected Policy Instruments: The Case of Peninsular Malaysia, 2003
- Economic Impacts of Artificial Reefs: The Case of Fisher Households in Peninsular Malaysia, 2014
- Economic Valuation of Health Impacts of Haze Pollution in Malaysia, 2015
- The Economic Value of the June 2013 Haze Impacts on Peninsular Malaysia, 2016

2.4. However, all the above mentioned studies are designed for a specific purpose and they do not integrate in an economy-wide framework. One of the attempts of this project is to use all of the available information and integrate them in a consistent and comprehensive statistical database.

2.5. One barrier in working towards the appropriate responses is the lack of well accepted, broadly based and globally integrated information on the nature of humanity's connection to the environment – our dependence on its services and our impact on its condition and future capacity to generate these services and hence sustain future human wellbeing. We have much integrated information concerning national and global economic activity where, via the standard economic accounts and Gross Domestic Product (GDP), we have a strong understanding of our combined economic performance and history. On the social side, while the information is more diverse, we have relatively standardized approaches to assessing changes in population, education and health, among many other variables and a reasonably common understanding of the links between economic and social activity.

2.6. However, on the environmental dimension, our information set is far more disparate and a common understanding of the relevant issues is undeveloped. While we have much scientifically based data it is often discipline specific; based on observations in specific areas; not scalable to national or global level; measured using different methods and definitions; and most often, not presented in reference to economic or human activity. Given these characteristics, it is not surprising that public and academic discourse on environmental matters has been fractured and lacking momentum. The development of integrated environmental information is clearly needed.

2.7. Both the System of Environmental-Economic Accounting (SEEA) Central Framework and SEEA Experimental Ecosystem Accounting use the accounting concepts, structures, rules and principles of the System of National Accounts (SNA). The SEEA Central Framework starts from the perspective of the economy and its economic units and incorporates relevant environmental information concerning natural inputs, residual flows and associated environmental assets. In contrast, SEEA Experimental Ecosystem Accounting starts from the perspective of ecosystems and links ecosystems to economic and other human activity. Together, the approaches provide the potential to describe in a complete manner the relationship between the environment, and economic and other human activity.

2.8. SEEA Experimental Ecosystem Accounting is a synthesis of the current knowledge in this area and can provide a starting point for the development of ecosystem accounting at national or sub-national levels. While the SEEA Experimental Ecosystem Accounting does not give precise instructions on how to compile ecosystem accounts, it represents a strong and clear convergence across the disciplines of ecology, economics and statistics on many core aspects related to the measurement of ecosystems and thus there is a strong base on which further research and development can build.

2.9. This report is set out in three parts, firstly a global and country rationale for undertaking environmental-economic accounting is provided with an outline of the building blocks and methodologies needed for its implementation. This provides the context and rationale for the RM-SEEA, the high level needs of Malaysia based on the assessment report and finally a summary of the key outcomes that could be achieved for Malaysia by implementing the RM-SEEA.

2.10. Secondly, a brief overview of the building blocks and methods needed to implement the RM-SEEA is presented. The aim of this section is to provide generic guidance on a standardised approach based on current frameworks, system, methods and guidance and training material.

2.11. Thirdly, the details of a national program of work are outlined following an investment logic framework (ILF). The focus on the ILF is to identify what work is required in order to achieve the objectives and translate them into outcomes for the country. This section is specifically tailored to the needs of Malaysia using the building blocks and methods outlined in part two. The use of an ILF provides detail on the work program participation requirements (institutional needs), enabling factors (resources, systems, processes), the work program (a series of actions described as work phases over time), outputs (a clear set of deliverables), impacts (what will change substantively) and finally the outcomes which are linked to the objectives of the country.

2.12. The advantage of providing the three-part approach to developing an RM-SEEA is to identify commonalities across countries to target international research and enable better coordination and collaboration in sharing best practices between countries. The activities and priorities for each country's RM-SEEA identified in part three will be used in the future to focus resources, research and training efforts.

# 3 Environmental-Economic Accounting Rationale

3.1. There are a number of global and national drivers which provide the rationale for the development of an environmental-economic accounts program of work.

## 3.1 Global Perspective

3.2. Seizing the opportunities and facing the new challenges requires greater efficiency and integration of the functions of national statistical systems through modernizing the institutional environment and the statistical production processes. The traditional way of organizing and managing the statistical system is not appropriate for making the transition to a modern integrated national statistical system that can meet the requirements in terms of producing and reporting data for the post-2015 development agenda and providing information for decision-making.

3.3. In 2013 the Report of the High-Level Panel of Eminent Persons on the Post-2015 Development Agenda, A New Global Partnership: Eradicate Poverty and Transform Economies through Sustainable Development called for a data revolution for sustainable development, with a new international initiative to improve the quality of statistics and information available to citizens. The report states, 'We should actively take advantage of new technology, crowd sourcing, and improved connectivity to empower people with information on the progress towards the targets'.

3.4. The report also noted better data and statistics will help governments track progress and make sure their decisions are evidence-based; they can also strengthen accountability. The Panel further proposed that, in future – at latest by 2030 – all large businesses should be reporting on their environmental and social impacts, and governments should adopt the UN's System of Environmental-Economic Accounting with help provided to those who need help to do this.

3.5. In 2013 the Guidelines on Integrated Economic Statistics was published highlighting the need to move from the traditional silo approach to a more integrated approach to the production of statistics matched by the reform of the institutional arrangements, including access and use of administrative sources for statistical purposes. It recognised the significance of an integrated approach for increasing the consistency and coherence of economic statistics in order to enhance the quality and analytical value of the information the statistics contain for short-term, annual and benchmark economic statistics and macroeconomic statistics. The guidelines present the integration framework of economic statistics based on current best practices for the entire spectrum of statistical agencies, including countries with centralized and decentralized statistical systems and countries at different stages of economic and statistical development.

3.6. Integrated economic statistics are a set of economic statistics that depict a consistent and coherent picture of economic activities for policy, business and other analytical uses. In addition, a number of recent emerging initiatives on the measurement of sustainability, social progress and well-being have raised the need for integrated and coherent official statistics to shed light on those complex issues, and therefore pose challenges to statistical offices to produce integrated economic, environmental and socio-demographic statistics.

3.7. In 2014 the report 'A world that counts – mobilising the data revolution for sustainable development[1]' published by the IEAG[2] calls for a better coordination of statistical programmes developed by international organisations. The recent "Synthesis Report" published by the UN Secretary General has picked up the IEAG recommendation of considering the "statistical capacity building" dimension as an important part of the new investments for development. Moreover: *"all countries are encouraged to adopt their own national sustainable development financing strategies".*

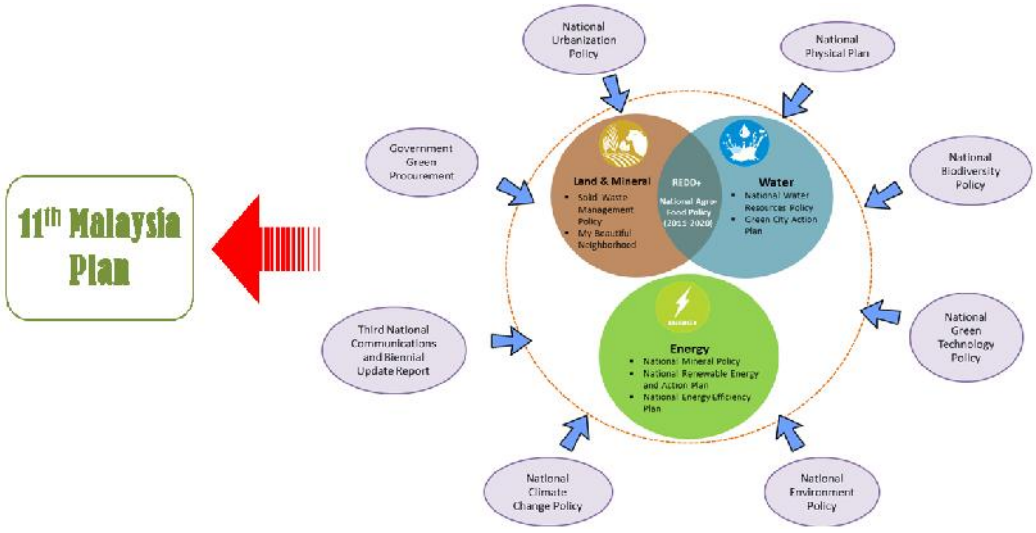
## 3.2 Country Perspective

### 3.2.1 The Policy Setting

3.8. Commitments and policy initiatives of Malaysia towards environment at national and international are well documented. It ranges from the general direction setting in the Eleventh Malaysia Plan (2016-2020) to specific targets on environmental commitments. Efforts towards economic-environmental sustainability are also supported by the existing laws and regulations.

3.9. This RM-SEEA reviews a number of main policy/plan/programme documents related to the environment in Malaysia. They are summarized in **Figure 2** below.

**Figure 2**. **Summary of main environmental related policy/plan/programme in Malaysia**




[1] http://www.undatarevolution.org/.
[2] Independent Expert Advisory Group on a Data Revolution for Sustainable Development.

These policy/plan/programme documents are briefly explained below.

3.10. Analysis shows that there are 149 targets, (see Appendix 6) whereby numerous targets are matched by three selected areas:

- 42 targets relate to Energy
- 23 targets relate to Water
- 22 targets relate to Land
- 62 targets involve multiple areas

**Eleventh Malaysia Plan (2016-2020)**. Climate change is considered as one of major threats for economic and social development gains. The unstable use of lands, loss of biodiversity, illegal deforestation, and over-exploitation of natural resources will weaken the provision of ecosystem services. Policy initiatives in the Eleventh Malaysia Plan are formulated to shift the method of development from conventional to a greener method (Green Growth) that will ensure the socio-economic development is pursued in a more sustainable manner. Malaysia targets to be a high-income nation by 2020 with regard to low carbon, resource efficient, and socially-inclusive aspects. Environmental areas are identified in the Eleventh Malaysia Plan include, conserving natural resources for present and future generations, adopting the sustainable consumption and production concept, strengthening the enabling environment for green growth, and strengthening resilience against climate change and natural disasters.

**Second National Physical Plan (NPP II, 2010-2020)**. This is a long-term strategic framework for national spatial planning including measures requires shaping the direction and pattern of biodiversity conservation and development, including land-use planning. The main objectives of NPP II are to tackle climate change; conserve natural and biological resources; establishing carbon sinks, sustainable forest and water management.

**National Policy on Biological Diversity**. The policy aims to transform Malaysia into a leading nation in research, conservation, and utilization of tropical biological diversity by the year 2020. It also stated that Malaysia's biological diversity is conserved and ensure that the components are utilized in a sustainable manner for continued progress and socio-economic development of the nation. The main objectives of the policy are; to optimize economic benefits from sustainable utilization of biological diversity; to maintain and improve environmental stability for proper function of ecological systems; to enhance scientific knowledge and educational, social, cultural, and aesthetic values of biological diversity, to ensure long-term food security for the nation; and focuses on biosafety in the development and application of biotechnology.

**National Policy on the Environment.** This policy was approved by the Cabinet on October 2002. It was formed to continue the economic, social and cultural progress of Malaysia and enhancement of the quality of life of its people, through environmentally sound and sustainable development. There are eight key principles of the policy: Stewardship of the Environment, Conservation of Nature's Vitality and Diversity, Continuous Improvement in the Quality of the Environment, Sustainable Use of Nature Resources, Integrated Decision-making, Role of Private Sector, Commitment and Accountability, and Active Participation in the International Community. The policy aims to integrate environmental considerations into development activities and in all decision-making processes, to foster long-term economic growth and

human development and to protect and enhance the environment. It complements and enhances the environmental dimension of other existing national policies, such as those on forestry and industry and take cognizance of international concerns.

**National Mineral Policy 2**. The objectives of the National Mineral Policy 2 are: to ensure the sustainable development and optimum utilisation of mineral resources; to promote environmental stewardship that will ensure the nation's mineral resources are developed in an environmentally sound, responsible and sustainable manner; to enhance the nation's mineral sector competitiveness and advancement in the global arena; to ensure the use of local minerals and promote the further development of mineral-based products; and to encourage the recovery, recycling and reuse of metals and minerals. NMP2 is supported by nine (9) major thrust: the expansion of the Mineral Sector; Conducive Business Climate; Environmental Stewardship; Research and Development (R&D) Enhancement; Human Resources Development; Establishment of Integrated Mineral Information; Community Involvement and Social Responsibility; Promotion, Marketing and Branding; Publicity and Public Relations.

**National Agro-food Policy (2011-2020)**. The development of world economy and globalization process has turn the economic surrounding to be more competitive and dynamic. This at the same time creates opportunities and challenges towards the nation's food supply and consumption. Examples of the identified challenges are improving the competitiveness, meet the needs of skilled and semi-skilled workers, ensuring adequate food supply, sustainable industrial development, and attract private investment. Therefore, the policy was introduced which focuses on improving the efficiency of the agro-food industry along the value chain for the industry to be more productive, competitive, and knowledge-intensive. This approach consist of 8 main ideas: The ideas are food security (adequacy, availability, safety, and affordability); high-valued agriculture development; development of sustainable agriculture; cluster dynamic agriculture (maximize revenue generation); private sector investment is the catalyst for the transformation of modern agriculture; human capital and informative smart agriculture; modernization of agriculture (through research and development (R&D), innovation, and technology); and advantages of agriculture support services.

**National Water Resources Policy (NWRP)**. The state of Malaysia's natural resources has been a concern since the 1970's. The country reacted by formulating a policy that ensure the use of these precious natural resources, guided by the principles of sustained yield management. The ultimate aim of the Third Malaysia Plan was to enable both federal and state governments work in close cooperation to ensure that all human activities are in balance with the environment. The priority then was to address concerns relating to the factors that threaten the stability of hydrological regimes. In 2011, water and water resources still remain as one of important issues. The Tenth Malaysia Plan (2011-2015) highlighted the need to have a NWRP. NWRP will adopt measures to ensure the sustainability of water resources to achieve water security. The policy requires forging of partnerships between all levels of government and stakeholders to ensure that water resources are made a national priority

**Solid Waste Management Policy**. This is related to an approach for the development of a solid waste system management that is comprehensive, cost-effective, sustainable, integrated, and socially acceptable with conscious preservation of the environment. The policy also hopes to implement solid waste management referring the waste management hierarchy that prioritize waste production through the Reuse, Reduce, and Recycle (3R), intermediate treatment, and

final disposal. The policy's objectives are to have a cost-effective and integrated solid waste management that include transportation and collection, intermediate treatment and disposal; to reduce solid waste of domestic, commercial, institution community, industrial, and construction through 3R; cost-effective and efficient services through privatization, efficient regulation, and uniform standards; selection of technology proven to be environmentally friendly; ensuring conservation of environment and public health; and establishing institutional and legal framework for solid waste management.

**National Policy on Climate Change**. This policy was approved by the Cabinet on November of 2009. It was formed to ensure climate-resilient development to fulfil national aspirations for sustainability. The objectives are to mainstream the climate change through wise management of resources and enhance environmental conservation resulting in strengthened economic competitiveness and improved quality of life; to integrate responses into national policies, plans, and programmes to strengthen the resilience of development from arising and potential impact of climate change,; and to strengthen the institution and implementation capacity to better harness opportunities to reduce negative impacts of climate change.

**National Renewable Energy Policy and Action Plan**. This policy document is developed to enhance the use of renewable energy resources which contributes to sustainable socioeconomic development and national electricity supply security. Five objectives of the policy are determined which include: to increase renewable energy contribution in the national power generation mix, to ensure reasonable renewable energy generation cost, to conserve the environment for future generation, to facilitate the growth of the renewable energy industry, and to enhance awareness on the role and importance of renewable energy.

**Green Technology Policy**. The National Green Policy was launched by the Prime Minister of Malaysia in 2009. Green Technology shall be a driver to accelerate the national economy and promote sustainable development. The objectives of the policy are: to minimize growth of energy consumption while enhancing economic development; to facilitate the growth of GT industry and enhance its contribution to national economy; to increase national capability and capacity for innovation in GT development and enhance Malaysia's competitiveness in global arena; to ensure sustainable development and conserve environment for future generations; to enhance public education and awareness on GT and encourage its widespread use. The four pillars of green energy policy constitutes: (i) Energy – seek to attain energy independence and promote efficient utilization, (ii) Environment – conserve and minimize impact on environment, (iii) Economy – enhance national economic development through the use of green technology, and (iv) Social – improve the quality of life for all.

**Government Green Procurement (GGP)** is the acquisition of products, services and work in the public sector that takes into account environmental criteria and standards to conserve the natural environment and resources, which minimises and reduces the negative impacts of human activities. The project is meant to improve the efficiency of government procurement and to transform the Malaysian economy into Green Economy. It also meant for conservation of energy & natural resources and promote the usage of renewable resources. It has a role as the catalyst for socioeconomic development that represents 12% - 15% Gross Domestic Product (GDP). The identified benefits from the project are improving the environmental performance of

businesses, healthier working conditions, and support local innovations and economy. By 2020, it is targeted that at least 20% of government procurement will be green.

**Green City Action Plan**. This is an approach to make city resident able to live and at the same time concerning the economic competitiveness, environment, and equity. The Green City approach promotes city's paradigm shift where the city pursues environmental planning and integrated urban development. The environmental planning focuses on managing water, land, and air efficiently to maintain long-term sustainability of natural resources.

**REDD+**. This is an approach to stop deforestation and climate change. Malaysia is blessed with complex ecosystem and lush tropical rainforests. It is also considered as one of the world's mega-diverse countries. Since 1970's, Malaysia has experienced loss in forest area which resulted in forest fragmentation. REDD+ movement helps the country by ensuring at least 50% of national land mass is forested and intact, ensures water supply for both domestic and industrial use, forestry determine the extent of national level of mitigation actions to be taken, ensure soil fertility for crop production, and community adaptation to climate change.

**My Beautiful Neighbourhood (MyBN**) programme involves repairing, painting and beautifying low-cost housing areas and nearby public facilities (children's play area, side-walks in residential areas, car parks). The programme is delivered at minimum cost by rapidly mobilising resources across federal, state, local governments and resident association to low-cost housing neighbourhoods.

**Green Technology Financing Scheme (GTFS)**. Green technology is one of the important features of Malaysia's target towards green growth. To pursue green growth, the Government has strengthened enabling environment, particularly in terms of policy and regulatory framework, human capital, green technology investment and financial instruments. The Green Technology Financing Scheme (GTFS) was introduced in 2010 to accelerate the growth of green technology by providing easier access to funding from financial institutions for companies venturing into green businesses. In addition, the Scheme also aims to generate new markets and drive job creation. Targeting both producers as well as users of green technology, the Scheme offers a rebate of 2% per annum on interest or profit rates charged by financial institutions, while also providing a Government guarantee of up to 60% on the financed amount. The targeted sectors for this scheme are energy, building, water and waste management, and transport. Funding is provided for any project that complies with the participating financial institutions' requirements and meets the green technology criteria i.e. it minimises the degradation of the environment, it is safe for use and promotes a healthy and improved environment for all forms of life, it conserves energy and natural resources, it promotes the use of renewable resources and it emits zero or low greenhouse gas (GHG).

**Third National Communications (TNC) and Biennial Update Report (BUR).** TNC and BUR project is to assist Malaysia in the preparation for submission of its first BUR and the TNC to the United Nations Framework Convention on Climate Change (UNFCCC). The project is funded through contributions from the Global Environment Facility (GEF), the United Nations Development Programme (UNDP) and the Malaysia Government. The Ministry of Natural Resources and Environment (NRE) in its capacity as the UNFCCC National Focal Point of Malaysia acts as the Executing Agency to coordinate and implement the project activities.

3.11. In general, policy initiatives and programmes related to environmental sustainability are well documented in Malaysia. The major programme recently embarked are monitoring and mitigating climate change under the wings of KeTTHA and NRE. In addition, energy consumption and emission, land-use change, sustainable consumption of water and sustainable agricultural production are among important areas to be considered by policy makers.

3.12. Assessing environmental impacts created by intensive economic development and human activities calls for an integrated data system. The data system that integrates economic and environment in one single accounting framework is provided in SEEA and its extensions. Malaysia needs to be serious in developing SEEA so that environmental policy initiatives and programs can be monitored and assessed properly.

3.13. Assessment also indicates that SEEA framework is highly relevant for supporting indicators proposed by the Malaysian government in Sustainable Development Goals (SDGs). Integration of SDG indicator framework requires methodological consistency across themes and levels of monitoring. This methodological consistency should be supported by statistical framework such as the SEEA. United Nations Statistical Commission (UNSC) has proposed 241 SDGs indicators. SDGs will be mapped with the three potential accounts which are SEEA-Energy, SEEA-Water and SEEA-Land (See Appendix 7 and 8).

### 3.2.2 Limitation

3.14. It is important to note that the document prepared here is based on engagements with federal agencies in Peninsular Malaysia. Due to time and financial constraints, further engagements at the state governments as well as Sabah and Sarawak governments is not possible at this moment. DOSM needs to consider further engagements with them for the development of future SEEA accounts.

## 3.3 Malaysia Environmental-Economic accounting needs assessment

3.15. Malaysia is a country where the SEEA approach could make a major contribution to the sustainable planning and development. There is a significant need for an integrated database that provides useful and comprehensive policy analysis. Such a database would also support some international and national initiatives and commitments such as Paris Agreement, Sustainable Development Goals and Eleventh Malaysia Plan.

3.16. While environmental policies are broad, this report needs to identify the most important SEEA module to be developed in Malaysia. SEEA-energy is highly relevant for policy decisions in Malaysia, given major efforts undertaken by the country to address climate change issue. To address the climate change issue, efforts are focused towards the reduction in the GHG emissions that caused by the consumption of energy. For example, the Eleventh Malaysia Plan (2016-2020) sets a target to reduce GHG emission intensity of GDP to 45% compared 2005 level. Moreover, involvement Malaysia in the Paris Agreement indicates that the country is serious in the efforts to reduce GHG emissions.

3.17 The development of energy module would have to be closely aligned with recent policy priorities. The Department of Statistics Malaysia (DOSM) has constructed the SEEA-energy which contains supply and use tables in physical units. To make it more policy relevant, the SEEA-energy must be extended to include emission account. The emission account could focus on bringing together carbon data from different sectors and agencies, as well as supporting data quality assurance and reporting. DOSM is currently working closely with the Ministry of Natural Resources and Environment (NRE), the United Nations Statistics Division (UNSD) and other relevant agencies to expand the SEEA-Energy to account for air emissions.

3.18. Based on the engagements, assessment missions and workshops with agencies, three priority accounts identified which are SEEA-Energy, SEEA-Water and SEEA-Land (specific focus on agriculture, forestry and fishery). In this RM-SEEA, Malaysia has agreed to develop SEEA-Water for the first phase because of the following reasons:

- First, under the strategic planning approach, development of SEEA-Water should be the main aim for Malaysia for the next few years because SEEA-Energy is currently developed by DOSM.
- Second, the current water shortage associated with climate change, water quality and inefficient water management demands for proper data management that links economic activities and environments. For SEEA-Water, assessment also indicates that policy targets demand for the focus on the development of supply and use accounts, asset accounts, emission accounts and extended accounts that linked other variables (such as population and labor) for policy analysis.
- Third, methodologies and resources for the development of SEEA-Water are well documented as many countries had already compiled the water account. The benchmarking countries provide guidance and direction for the development of SEEA-Water in Malaysia.
- Fourth, assessment indicates that aggregated data for the compilation of water account are mostly and readily available.

3.19. This Assessment report clearly indicates high level awareness among agencies on the need for environmental-economic accounting. Policy priorities of all agencies have a common interest and adapting the policy priorities into SEEA can be supported by the availability of data. Budget limitation and lack of understanding and technical knowledge on SEEA are the most important constraints facing by all agencies.

3.20. This Assessment report identifies several needs for strengthening the development of environmental-economic accounting. These needs must be carefully addressed to ensure continuity and sustainability of SEEA in Malaysia. They are briefly summarized below.

- **The need for an integrated environmental-economic accounting** to address national policy priorities and economic sustainability. For example, the commitment of Malaysia to reduce carbon emissions from activities demands for an integrated data system that links both environment and economic in a single framework. Policy concern on the food production also would require specific attention on managing the supply and use of water resources and land-use.

- **The need for enhancing capacity building** in environment-economic accounting within DOSM and between relevant agencies such as Economic Planning Unit (EPU), Ministry of Finance (MOF), Ministry of Natural Resources and Environment (NRE) and Ministry of Energy, Green Technology and Water (KeTTHA). There is a need to provide intensive capacity building in the forms of training and knowledge transfer covering the basic understanding of SEEA, data requirement and estimation techniques, and application of SEEA for policy analysis.
- **The need for strengthening inter- and intra-agencies coordination**. In terms of data sharing and data management among agencies as well as within agencies, it is limited. Lacking coordination will jeopardize the continuity and sustainability of SEEA. Adoption of National Blue Ocean Strategy (NBOS) approach will further strengthen agency coordination.
- **The need for promoting public-private cooperation** in the form of trust funds in supporting the development of environment-economic accounting. The established SEEA account is beneficial to both the government and public sectors. Financial constraint has been identified as one of the barrier to SEEA development. To overcome this, for example, the government and private sectors may jointly raise fund to support SEEA activities.
- **The need for identifying well-trained SEEA personnel** to be placed at appropriate position in respective agencies to promote continuity and sustainability of SEEA. Continuous in-house training by skilled SEEA personnel will create a pool of SEEA knowledgeable staff to undertake SEEA accounts.
- **The need for compiling aggregated key environmental statistics**. Commonly, the top-down approach is used to estimate detailed SEEA accounts. According to this approach, the aggregate environmental statistics at national level are used to detail the estimates at disaggregated level. Unavailability of aggregate environmental statistics would make the estimation difficult because no "control" values are available.

3.21. To address these needs, the RM-SEEA proposes to work towards developing a comprehensive environmental-economic accounting system by improving inter- and intra-agencies cooperation, capacity building and public-private funding scheme. These strategies can be addressed simultaneously within the concept of NBOS (for overview the concept of NBOS, see **Appendix 2**).

3.22. To support the development of environmental-economic accounting for improved monitoring of sustainable development in Malaysia, a phased approach is proposed.

3.23. The first phase is considered as short-term planning that covers for the periods of 10 months and aims to complete the compilation of provisional tables and accounts for SEEA-Water. Several action plans are prepared in this phase to further strengthening the development of SEEA in Malaysia which include setting and formalizing the governance structure, enhancing capacity building, establishing data sharing and management, and promoting inter- and intra-agencies cooperation.

3.24. The second phase is considered as medium-term planning (2-3 years) that aims to ensure the continuity and sustainability of SEEA-Water in Malaysia. Some of the action plans in the first phase such as governance structure and inter- and intra-agencies coordination are still important to be considered. In the second phase, setting and formalizing public-private thrust funds, and establishing and strengthening NBOS concept are the key successes. However, these proposed action plans may take longer than expected to be effective, depending on the resources and implementation strategies.

# 4 RM-SEEA – High Level Outcomes

4.1. It is important to link proposed activities with their ultimate outcomes. This section summarises the key outcomes that could be achieved for Malaysia by adopting and implementing the RM-SEEA. In section 'RM-SEEA – Investment Logic Framework' a program of activities is detailed showing the timelines and steps needed to achieve the outcomes:

- An integrated environmental-economic accounting that responds to the requirements of information on sustainable development.
- Increased training and capacity building in environmental-economic accounting.
- Enhanced institutional coordination within Malaysia and between national and state governments for the advancement of SEEA.
- Enhanced public-private cooperation by establishing trust funds that support data development needed for environmental-economic accounting.
- Identifying skilled personnel (such as well-trained in SEEA) to be placed at appropriate positions in respective agencies, ensuring continuity and sustainability of environmental-economic accounting.
- Key aggregate macro-environmental statistics such as stock of groundwater and total waste-water, and environmental indicators such as water footprint and material footprint.

# 5 Program of work building blocks

5.1. This section and the following section on Methodologies provide a brief overview of the building blocks and methods needed to implement the RM-SEEA. The aim of this section is to provide generic guidance on a standardised approach based on current frameworks, systems, methods and guidance and training material.

5.2. The integrated approach to environmental-economic statistics is supported by three main building blocks: (1) the SEEA CF and SEEA EEA as the conceptual frameworks, (2) supporting institutional arrangements and (3) an integrated statistical production process[3]. The building blocks are interlinked and mutually reinforcing structures for setting up integrated statistical systems.

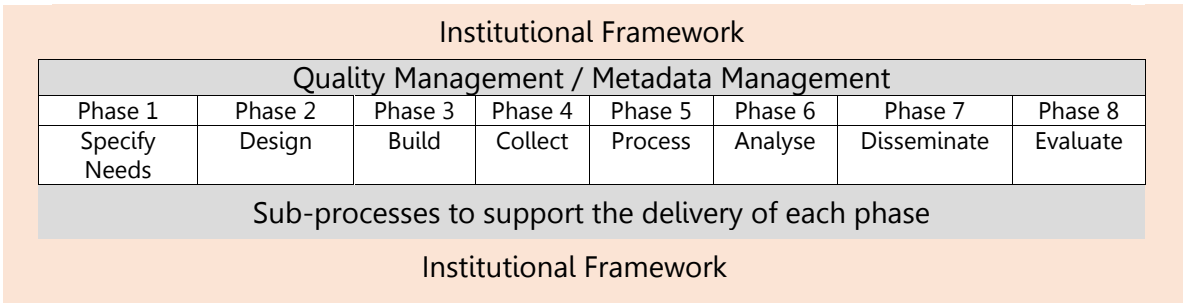
5.3. An important aspect of the building blocks is their link to needs assessment and high-level outcomes sections above. The building blocks are combined with the RM-SEEA – Investment Logic Framework section below. The building block or high-level outcomes of the RM-SEEA are:

1) Mainstream the environmental-economic accounting
2) Rationalise and integrate institutional arrangements
3) Integrate the data, tools and statistical production process
4) Ecosystem Accounting Experimentation[4]

5.4. Blocks 1-3 are the core and required to achieve the overall aim and Block 4 captures the aim of continuous improvement including research and development, testing and experimentation to build on SEEA EEA. The building blocks are combined with the Generic Statistical Business Process Model (GSBPM[5]) shown in Figure 3 below. The GSBPM describe and defines the set of business processes needed to produce official statistics. It provides a standard framework and harmonised terminology to help statistical organisations to modernise their statistical production processes, as well as to share methods and components. The GSBPM can also be used for integrating data and metadata standards, as a template for process documentation, for harmonizing statistical computing infrastructures, and to provide a framework for process quality assessment and improvement.

[3] The building block approach presented here is an application of the process presented in the Guidelines on Integrated Economic Statistics (IES) ( http://unstats.un.org/unsd/nationalaccount/docs/IES-Guidelines-e.pdf).
[4] Experimentation has been added as an additional building block in support of SEEA EEA and the experimental nature of work needed.
[5] http://www1.unece.org/stat/platform/display/GSBPM/GSBPM+v5.0

**Figure 3. Generic Statistical Business Process Model (GSBPM).**




5.5. The GSBPM should be applied and interpreted flexibly and used to provide guidance. It is not a rigid framework in which all steps must be followed in a strict order; instead it identifies the possible steps in the statistical business process, and the inter-dependencies between them.

5.6. Although the presentation of the GSBPM follows the logical sequence of steps in most statistical business processes, the elements of the model may occur in different orders in different circumstances. Also, some sub processes will be revisited a number of times forming iterative loops, particularly within the Process and Analyse phases.

5.7. GSBPM should therefore be seen more as a matrix, through which there are many possible paths. In this way the GSBPM aims to be sufficiently generic to be widely applicable, and to encourage a standard view of the statistical business process, without becoming either too restrictive or too abstract and theoretical.

5.8. The building blocks are expanded on below followed by a discussion of methodologies to support their implementation.

## 5.1 Mainstream the environmental-economic accounting

5.9. The fundamental objective of this building block is to communicate with and engage national and international partners for the implementation of environmental-economic accounts. The foundations of the GSBPM are quality management and metadata management frameworks of which the SEEA is one.

5.10. This building block aims to mainstream the environmental-economic accounting frameworks, and structure it in stages of advancements, that can be implemented and monitored. The framework builds on SNA principles but is extended based on ecological foundations, and under the umbrella of SEEA-CF and SEEA-EEA. Novel concepts and ideas need to be mainstreamed for the purposes of experimentation and familiarisation across government agencies and academia. It is an umbrella block of work that both guides the development of the others and is necessary for their success.

5.11. Building and publishing environmental-economic accounts relies on a number of related processes, all geared towards the advancement of organizational design (institutions), technical (data collection and processing), scientific discovery (generating new data) and ultimately an improved understanding of ecosystem values (as services and assets).

5.12. These processes combine available knowledge from many disciplines and agencies including national statistics and accounting, management of land, water, ecosystems and biodiversity and studies of key ecological processes to name a few. All these require clear communication tailored to their needs so mainstreaming, adaptation and application of the available knowledge can occur.

## 5.2 Rationalise and integrate institutional arrangements

5.13. The "One-UN" process recommends that countries move towards one integrated National Statistical System. That is, all agencies should work within the same quality guidelines and seek opportunities for reducing duplication of effort by improving coordination in statistical production.

5.14. Clearly for any new system, process or framework that impacts so many agencies to be adopted by government requires very careful assessment of current institutional arrangements and possible impacts on those arrangements. The GSBPM recognises this as a condition to achieving adoption, funding, monitoring and enforcement of any new system. Further, it can be applied to all stages in the process and, at each stage, institutions and agencies will understand clearly their roles and responsibilities.

5.15. There are many agencies involved in the collection and publication of data. In many instances, the need has arisen from within individual agencies to meet their reporting and policy requirements. For instance, an environmental agency may focus on the measurement of important residuals released by industries whereas an agricultural agency will focus on the consequences of residuals for economic reasons. Both approaches are valid in their own right, but the aim of environmental-economic accounting is to build an integrated set of information to support decision making and trade-offs. Further, the movement towards a more integrated and streamlined processes for the collection and publication of data provides opportunities for lowering the overall cost and increasing its use and efficacy.

5.16. This does not imply having fewer agencies, but it does require a rationalising of the standards used for data collection and strengthening the National Statistical System to share data in real time where appropriate. It is important to recognise that individual agencies have the greatest strength in understanding specific subject areas, but are not necessarily expert in statistical production systems – this is the role of national statistic offices.

## 5.3 Integrate the data, tools and statistical production process

5.17. Environmental-economic accounting is a transdisciplinary activity. That is, the concepts and tools require a common language between disciplines. Integrating existing concepts and tools that have been developed for specific purposes will require adaptation to a common framework, provided by the SEEA.

5.18. This building block links to GSBPM Phases 3, 4, 5 and 6 and addresses the main challenges of data gaps, scientific credibility, comparability and data uncertainties that can be bridged by building on the existing data systems, methods and tools. Building environmental-economic accounts provides new challenges for both economic and ecological data collection and collation. There is a need to harmonise concepts and rationalise the principles of both disciplines to maintain the integrity of both areas. In many instances there will be a need to adjust to a shared conceptual framework to facilitate an integrated outcome.

5.19. Many of the tools and infrastructure required already exist however they operate on different platforms and standards making integration costly in both timeliness and resources. In the medium to long term the aim is to leverage current systems that offer the flexibility needed to support future demands for integration. Key to achieving this will be the review and assessment of current systems and approaches following by the development of a strategic investment plan.

This integration will also identify opportunities for further research and experimentation.

## 5.4 Ecosystem Accounting Experimentation

5.20. There is much uncertainty in the science and its application in *ecosystem accounting* within the broad umbrella of environmental-economic accounting. A cost effective approach to determining the best pathway is to experiment on a number of fronts at the same time whilst keeping in mind the long term aim of full integration and publication at the national level. Testing the SEEA-EEA is part of a global experiment to develop effective ecosystem accounts. In this respect, the experience of all countries will contribute to this experiment.

5.21. Experimentation also serves as important vehicle for achieving the mainstreaming of ecosystem accounting. During the experimentation phase agencies less familiar with ecosystem accounting can be involved and grow to understand how demands for data are changing and how the accounts can be tailored to their policy needs.

# 6 Methodologies

6.1. This section on methodology relies heavily on the current and new material being produced that will support the ongoing production of environmental-economic accounts. This section provides a brief overview of some of the methodological approaches and options that may be considered when formulating a program of work to that delivers on (achieves) the building blocks and the longer term aim of country.

6.2. The advantage of having common methodological frameworks is to enable coordinated progress towards advancing environmental-economic accounting.

## 6.1 Institutional framework

6.3. The Institutional framework should facilitate exchange of knowledge, expertise and even experts between the partners. The creation of the integrated systems of statistics should be the shared responsibility of the top management of all agencies involved. When agreement on the more detailed programme, the roadmap and the specific roles and responsibilities has been reached, then periodic high level meetings may be very fruitful to discuss progress, solve bottlenecks, strengthen commitment and ensure the outputs satisfy the needs of the stakeholders.

6.4. Designing, developing and implementing an integrated system of statistics is a large programme and requires extra provisions for a good programme management. For the programme and all the sub-programmes, programme boards and programme managers are needed. The programme boards are chaired by the senior manager of the domain involved. If the (sub-) programme goes beyond the borders of organizational units, it is preferable to have a senior manager as chair.

6.5. The programme boards and the programme managers may be supported by a small bureau in operational and administrative tasks. The programme boards consist of the chair, the programme managers and directly involved management. All members should seek to have a mandate to make decisions within the scope of the (sub-) programme. Elements that may be adapted to conditions in Malaysia include:

- High level commitment, and engagement of partners; common coordination; data collection/sharing implications
- Advisory committees (IES[6], p. 39)
- Legislation mandates to coordinate, produce, supply inputs etc.
- Inter-institutional commitments for production of integrated statistics – MoU (IES, p.41)
- Inter-departmental commitments – service-level agreements (IES, p.42)
- Programme governance structure development

[6] The Guidelines on Integrated Economic Statistics http://unstats.un.org/unsd/nationalaccount/docs/IES-Guidelines-e.pdf. See above.

## 6.2 Roles and responsibilities for environmental-economic accounting

6.6. If agencies outside the national statistical institutes are involved in the compilation and dissemination of official statistics, then for the creation of integrated system of statistics, it is necessary to create strategic partnerships. The first step is to engage with the top management of relevant agencies in discussing the necessity and mutual gains of such system. The next step is agreement on the possible new roles and responsibilities of relevant agencies in SEEA development, subjected to approval by top management of respective agencies.

6.7. When general agreement on the scope of the integrated systems of statistics has been reached, a detailed design of the whole chain of all processes, inputs, intermediary products, outputs and all interdependencies can be made. The process will be iterative, in that pilot accounts will be built and the design will be revised based on experience of the pilot. Initial design and testing will require attention to:

- Working groups
- Advocacy
- Workshops – policy, awareness-building, etc.
- Demonstrations
- Feasibility
- Proof of concept – experimentation, structural change,
- Training sessions
- Customised communications plans

## 6.3 Environmental-Economic accounts production process

6.8. A part of the GSBPM design phases 3-4 is to understand the mechanics on delivering on a new system. This includes (but is not limited to):

"Build" and "collect" phases:

- Data collection (or generation – through sampling, inventories/surveys, detailed process-modelling, remote-sensing applications, course-process modelling);
- data harmonization (processing, quality control, imputation);
- accounting inputs;
- accounting outputs estimation
- accounts validation

6.9. The program of work is an opportunity to adapt these elements to the needs of each country for all the phases of GSBPM.

## 6.4 Research, development and experimentation

6.10. An important step is to carry out extensive experimentation to test whether methods and concepts are appropriate for the nature of the data available. The SEEA-EEA provides a core measurement framework, but has not yet developed to the point where all methodological issues have been resolved and universal compilation guidelines can be provided. Issues that require further experimentation include:

- Accounting classifications[7], with standardised item definitions and measurement methods
- Country specific classification of ecosystem assets
- Units for ecosystem accounting
- Environmental indicators and aggregates
- Upscaling and downscaling
- Valuation
- Validation data and specific quality criteria need to be developed to formally track progress

6.11. These methodological issues will be addressed in collaboration with an international community of practice on ecosystem accounting. This can be enhanced by considering the pilot accounts as experiments, in which concepts, classifications and methods are tested and improved in successive iterations. Different options, for example, for classifications or data sources could be applied in parallel and evaluated.

### 6.4.1 Accounting architecture

6.12. It is very important to check the timely availability of the micro-data form the primary and secondary sources and the time available for the processing. A part of the experimentation should be a check of the design with the business architecture and the software architecture to get an expert view on the consequences for the IT-environment (GIS capacity, running time, storage etc.). If the experimentation shows bottlenecks, one must make sure that they can be solved (for acceptable costs) before the next phase can start. Based upon the (adapted) design, the experimentation, the estimated costs and benefits a decision must be made whether the programme is feasible and acceptable for all involved partners.

### 6.4.2 Information and decision support tools and architecture

6.13. Outside of traditional statistical systems there are many systems in place for the collection and collation of data for decision making. These include geographical information systems, biophysical models, agency data based, business and land registers and taxation registers.

[7] Accounting classification enables the translations between existing classifications.

6.14. Many of these are amenable to producing data that can be used for environmental-economic accounting but may require further work or adaptation. This area of experimentation is very important because there are significant opportunities to leverage of current system and save resources.

6.15. It is important that experimentation has clear links with policy and decision making in order to demonstrate the benefits of change. Examples may include:

- The specification of ecosystem assets and services used in payments for ecosystem services programs[8]
- Land offset programs for environmental purposes[9]
- Land use change programs for carbon sequestration[10]
- Trade-offs between optional uses of land in land use planning
- Setting priorities for conservation areas

### 6.4.3 Moving from experimentation to (national) production

6.16. In some instances there has been informal experimentation in data collection, analysis and dissemination to meet some policy need. Under the GSBPM it can be assumed that Phases 1 and 7 are being undertaken but are not linked to Quality Management / Metadata Management – for instance many countries currently produce environmental reports on an ad hoc basis. Adopting the GSBPM approach requires formalising the other phases

6.17. At the national level there are many agencies with national data coverage. However it is often incomplete or inconsistent in its application due to a lack of resources and a clear medium to long term program of work. Often these are opportunities that can be described as the "low hanging fruit" (low cost and easy to take forward in the current national policy context). These include very well established local applications of data collection; collation and reporting that can be easily rolled out at the national level. Alternatively, they may be existing national approaches that need strategic investment to bring them up to an acceptable and consistent standard. It is important that the experimentation in ecosystem accounting is informed by national needs and vice versa. Often experiments can save money and time if conducted appropriately to inform the needs for a national approach.

[8] http://www.depi.vic.gov.au/environment-and-wildlife/environmental-action/innovative-market-approaches/ecomarkets
[9] http://www.trustfornature.org.au/
[10] http://www.un-redd.org/aboutredd/tabid/102614/default.aspx

# 7 RM-SEEA – Investment Logic Framework (ILF)

7.1. The ILF provides a structured approach to analysing the suite of optional activities that may be undertaken to achieve the desired outcomes (See Figure 4 below). The ILF should not be seen as a series of steps to be followed consecutively but as a key elements that are essential to the effective delivery of outcomes.

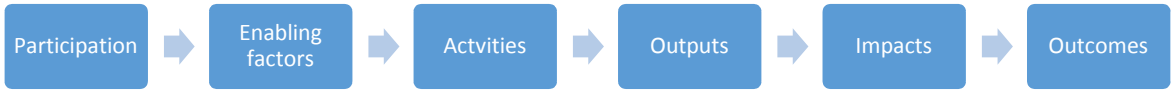



**Figure 4. Investment Logic Framework**

**Participation & Enabling Factors** – it is important to identify those that need to participate and start engagement early. Participation is central to the mainstreaming of environmental-economic accounting and achieving buy-in and engagement. Often an assessment of participation and enabling factors occur together. Enabling factors generally require some type of change which participants have to undertake and or adopt before statistical development activities commence. It may also require the allocation of resources in order to achieve an enabling factor so it is important for participants to be very clear from the outset what their involvement may mean.

**Activities & Outputs** – the program of work is made up of series of activities that lead to a number of outputs. Activities are elements of work and outputs are visible products of that work. In order for one output to be achieved may require several activities. It is important to ensure that each activity can be linked to an output to ensure the relevance and timing of activities and finally outputs can then be linked to impacts and outcomes.

**Impacts & Outcomes** - Impact evaluation measures the difference between what happened with the programme and what would have happened without it. It answers the question, "How much (if any) of the change observed occurred because of the programme or activities?" Outcome evaluation measures the programme results or outcomes. These can be both short and long-term outcomes.

## 7.1 Participation & enabling factors

### 7.1.1 Coordination with development partners in Malaysia

Several government institutions in Malaysia are involved in managing the environment.

1. Ministry of Finance
2. Economic Planning Unit
3. Ministry of Natural Resources and Environment
4. Ministry of Agriculture and Agro-based Industry
5. Ministry of Energy, Green Technology and Water
6. Ministry of Plantation Industries and Commodities
7. Ministry of Rural and Regional Development Malaysia

8. Ministry of Urban Wellbeing, Housing and Local Development
9. Ministry of International Trade and Industry
10. Ministry of Science, Technology and Innovation
11. Energy Commission
12. National Water Service Commission
13. Department of Minerals and Geosciences Malaysia
14. Department of Agriculture
15. Department of Survey and Mapping Malaysia
16. Department of Marine Park Malaysia
17. Department of Wildlife and National Parks Peninsular Malaysia
18. Department of National Solid Waste Management
19. Federal Department of Town and Country Planning Peninsular Malaysia
20. Forestry Department Peninsular Malaysia
21. Department of Environment
22. Sewerage Service Department
23. Department of Veterinary Services
24. Department of Fisheries Malaysia
25. National Hydraulic Research Institute Malaysia
26. Department of Irrigation and Drainage
27. Indah Water Konsortium
28. Malaysian Agricultural Research and Development Institute
29. Forest Research Institute Malaysia
30. State governments

7.2. DOSM sits within the Prime Minister's department. It operates under the Statistical Act (1965, revised 1989). DOSM is a relatively large organisation with over 3,000 permanent staff and has a reasonable degree of internal flexibility to manage its work programme. In governance of the national statistical system, the Main User Committee (MUC) is the platform in establishing highly prioritised statistics in Malaysia for additional work programs, particularly in conducting new surveys and development of new statistics. The MUC is chaired by Director General of Economic Planning Unit (EPU) and DOSM acts as secretariat. The members of MUC consist of Ministry of Finance, Bank Negara Malaysia (central bank) and key stakeholders.

7.3. Operations and exchanges between government agencies are common and do not rely on legal documents and MOUs. However, it is generally necessary to have well established means of communicating and exchanging through steering committees, technical working groups and similar, more formal arrangements.

7.4. There is a wide range of information that is needed to support SEEA implementation and a large data is likely to be sourced from other agencies. It is suggested during the discussion that DOSM be the sources of technical SEEA experts and provides the data template for other agencies. Then, using the data that are compiled by relevant agencies, the steering committee finalizes the SEEA accounts.

7.5. In this institutional arrangement, DOSM no longer serves the "traditional" function but rather acts as coordinator while the environmental statistics are collected and maintained by the relevant agencies (for example, the Ministry of Natural Resources and Environment (NRE) may be the potential host for the water account). In this context, SEEA may also be a catalyst to strengthen connections between DOSM and other agencies as part of the broader strengthening of the role of DOSM within the national statistical system.

7.6. The success of this institutional arrangement depends on the level of inter- and intra-agencies cooperation and coordination. In terms of data sharing and data management among agencies as well as within agencies, it is limited. Lacking coordination will jeopardize the continuity and sustainability of SEEA. Adoption of NBOS approach will further strengthen agency coordination.

## 7.2 Enabling factors

7.7. Technical knowledge, data availability and institutional support are the major factors contributing to the SEEA success. The knowledge base for environmental-economic accounting exists in Malaysia. This has grown through DOSM initiatives to construct SEEA-energy. This section examines the progress on environmental-economic accounting and the data available to enable the development and on-going production of environmental-economic accounts and the related data sources needed for them.

7.8. DOSM has compiled SEEA-Energy by completing the supply and use accounts at broad economic sectors. This initial effort to compile SEEA is an excellent initiative for the development of pilot SEEA in Malaysia. However, there is a need to further expand the energy account for emissions released by the consumption of energy and thus could support the national policy priorities on reducing climate change. Inclusion of emission account in the SEEA-energy is doable and feasible because it will be supported by the availability of data and strong commitment from various agencies.

7.9. In term of data, assessment shows that most of aggregated data are available for the following indicators:

- Energy (such as energy consumption, GHG emissions, energy stocks[11])
- Water (such as water use and supply, waste-water, water stocks[12])
- Land-use (such as land cover, land-use by activities, forest areas)
- Waste (such as solid waste, scheduled waste)
- Others (such as fish stocks, water consumption by animals)

[11] For example: assessment and reassessment of existing reserves; and assessment of the importance of the production of energy from renewable sources for total energy production (SEEA central framework, pg. 283)
[12] Water resources (SEEA central framework, pg. 286)

7.10. In general, economy wide data seems available for almost all these areas but there are some consistent data gaps. For example, there are limited data available that record water consumption by industries and households from ground water and surface; data are managed and stored at three different agencies (i.e. NRE is responsible for water resources including ground water, KeTTHA is responsible managing water supply and MOA deals with agricultural irrigation management); data on land ownership and land-use by type of activities are limited; and there is no consistent and common methodologies used for estimation of some data.

7.11. While these data gaps are real and serious for some areas, there also seems the potential to consider alternative means of filling the gaps that may help to ensure that basic accounts can be finalised even if at a high level of industry aggregation. For example, particularly for the measurement of wastewater, it may be beneficial to consider collecting of information from those businesses or agencies that specialise in dealing with wastewater, rather than trying to collect industry level information based on economy wide surveys. Similarly, the estimation of carbon released by the industries can be derived from the standard widely accepted methodologies.

7.12. Assessment indicates that there is a strong institutional support in developing SEEA in Malaysia. Some agencies such as the Ministry of Natural Resources and Environment, Ministry of Agriculture and Agro-based Industry, Ministry of Energy, Green Technology and Water and Department of Environment strongly agree on the relevancy of SEEA for monitoring and analyzing policies. In addition, there is a growing research interest in economic-environmental nexus at local universities. The technical and methodological experts on the environmental input-output analysis at universities further strengthening the capacity building.

### 7.2.1 Planning and coordination

7.13. Planning and coordination of the implementation of the SEEA in Malaysia (including SEEA-Energy, SEEA-Water and SEEA-Land) would be most effective with a 3-level structures consisting of a Steering Committee, Technical Committee and Technical Working Committee.

**Figure 5: Agreed general governance structure for SEEA**


7.14. For the first level, the Steering Committee as agreed in the Planning and Development of Environmental Statistic Committee meeting, will give guidelines and endorse the implementations of SEEA account. The Steering Committee is proposed to be chaired by the EPU with DOSM and EPU as the secretariat and the permanent members should include; the Ministry of Finance (MOF), Ministry of Energy, Green Technology and Water (KeTTHA), Ministry of Agriculture and Agro-based Industry (MOA), Ministry of Plantation Industries and Commodities (MPIC) and Ministry of Natural Resources and Environment (NRE).

7.15. The second level is the Technical Committee. The main function of the Technical Committee is to provide technical coordination for the development of SEEA account. In addition, it also approves working plans of the Technical Working Committee; provide internal resources to the Technical Working Committee; and coordinate technical work with related national and international initiatives. This Technical Committee is proposed to be chaired by DOSM and DOSM and EPU as the secretariat, while the members include relevant agencies under the KeTTHA, NRE, Ministry of Agriculture (MOA) and MPIC.

7.16. The third level is the Technical Working Committee. The main function of the Technical Working Committee is to lead the development of SEEA accounts. This involves the development and establishment of specific methodologies for the data estimation, and prioritization of indicators and linking the accounts to policy priorities.

### 7.2.2 Governance structure for SEEA-Water

7.17. It is important to note that water resource administration is a shared responsibility among various agencies, the Federal and State Governments. The Federal agencies are responsible for planning, research and development of water resources, while the State governments are responsible for water supply, infrastructure development including financing, operation and maintenance.

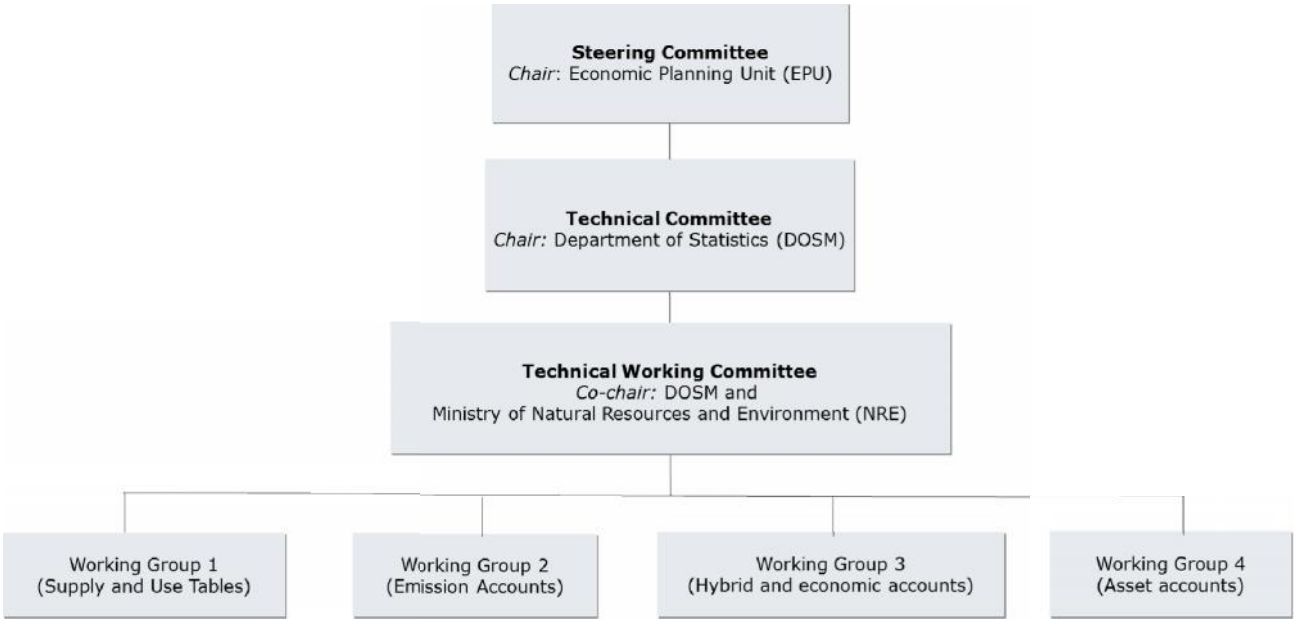
7.18. However, in view of the need for a more holistic approach in water resources planning and development, the Malaysian Government has introduced the Water Services Industry Act (WSIA) 2006 to regulate the water industry. The National Water Services Industry Commission (SPAN) was also established and employs WSIA as a regulatory tool to regulate the national water services industry in terms of licensing, supervision and monitoring. The idea of consolidation is to centralize the water assets and put the onus of developing the water infrastructure on the Federal Government, who will then lease them back to the asset operators who can then focus on providing clean and reliable water supply under a more regulated landscape[13].

7.19. Malaysia has established National Water Resources Policy (NWRP) as the main policy document for water resources. This policy recognises the steps taken by the government to deal with aspects related to the conservation, management and provision of adequate and safe water for the people and the environment. It also leverages on the already established National Water Resources Council (NWRC), which serves as a platform to help bring together the federal and state governments to identify means and measures to address issues and capitalise on opportunities related to water resources[14].

7.20. After several discussions with numerous key stakeholders, the general governance structure for SEEA-Water is agreed upon.

[13] Mohamad, J., Mustafa, F.-B., & Wan-Sobri, W. M. a. (2010). Water governance in Peninsular Malaysia: Strategies for reform. The Sixteenth Annual International Sustainable Development Research Conference, 30 May-1 June 2010.
[14] Sources: National Water Resources Policy

**Figure 6. Agreed governance structure for SEEA-Water**




7.21. For the development of SEEA-Water, the members of Steering and Technical committee can be adopted by the existing general Steering and Technical committee as Figure 5.

7.22. The Steering Committee would need to meet at least two times per year.

7.23. The Term of References (TOR) for the Steering Committee may include:

- Give guidelines and direction of environmental statistics based on national policy priorities,
- Endorse the planning of environmental statistics by DOSM based on:
  i. Manual United Nations Statistics Division (UNSD)
  ii. Accepted project from other international agencies
- Give guidelines and advise to Technical Committee,
- Ensure the planning of budget for development of environmental statistics,
- Endorse the members of committee and the Term of References (TOR)

7.24. The main function of Technical Committee is to review and provide input regarding the improvement of the Roadmap development plan relating to new environmental statistics and production report or publication of these statistics and provide guidance to the Technical Working Committee including concepts, definitions, classification and methodology of estimation and preparation of environmental statistics. In addition to that, it also report on progress and preparation of environmental statistics to the Steering Committee and monitoring technical matters based on the latest manual.

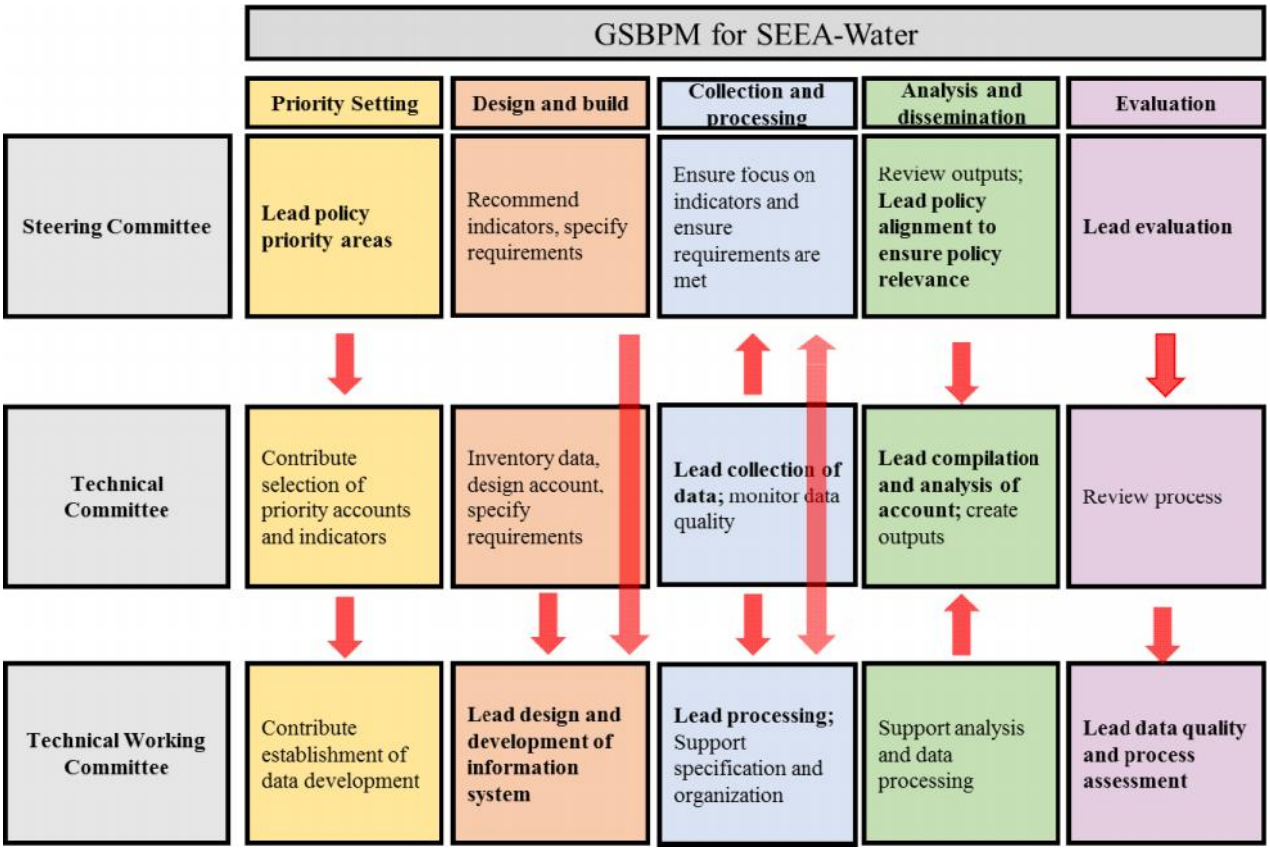
7.25. This Technical Committee is chaired by DOSM while the members include relevant agencies under the Ministry of Agriculture (MOA); Ministry of Urban Wellbeing, Housing and Local Government; NRE; KeTTHA and MPIC. (See details at Appendix 3)

7.26. The principles of developing statistical production processes suggest that duplication of effort can be minimized by organizing work into centres of specialization (such as establishment of National Data Action Council). Rather than creating subject-matter groups that each undertake similar functions, Working Groups should be organized into centres of subject-matter and functional specialization. The Working groups are categorised according to the types of accounts; supply and use tables, emission accounts, hybrid and economic accounts; and the asset accounts are based on the suitability of agencies' function in Malaysia. Ideally, the Working Groups will meet at least once in 3 months.

7.27. The main function of Working Groups is to lead the development of SEEA-Water accounts. This involves the development and establishment of specific methodologies for the data estimation, and prioritization of indicators and linking the accounts to policy priorities. Ministry of Natural Resources and Environment (NRE) is proposed to be chaired with DOSM. Members will included various agencies related to water. (See Appendix 3)

**Figure 7** shows one possible activity flow for collaboration between the Steering Committee, Technical Committee and Working Group to implement the RM-SEEA.

**Figure 7: A possible activity flow for the Integrated System of Natural Resource and Environment Accounts**




7.28. The composition of each Technical Committee will need to reflect the particular account being developed, but in general would need to contain representatives from the physical sciences, ecology, economics, accounting and statistics. The group of statisticians can be viewed more generally as ensuring on-going production of data by government. The main government agencies responsible for the collection, management and distribution of data relevant to the account would need to be represented.

7.29. Each of the Technical Committee would need to meet four times per year. The focus of the work is the production of pilot accounts, with a view to establishing the technical processes for the regular production and use of accounts within government.

7.30. This will be accomplished initially by inventorying available data, assessing its quality, identifying gaps, and integrating the data into a common spatial infrastructure. Priority data gaps could then be filled based on the most feasible approach (e.g., new data collection, adaptation of existing data, adaptation of global datasets).

7.31. As part of the planning and coordination phase a detailed project plan would be produced by each of the Working Groups for each of the priority environmental-economic accounts plus the group on accounting aggregates and valuation.

## 7.3 Activities and Outputs

### 7.3.1 Building priority accounts based on policy needs

7.32. The need for a range of water accounts was identified after a review of the major policy documents and discussions with a range of stakeholders. The link between policies, accounts and agencies is summarized in Appendix 4.

7.33. The priorities identified for the development of SEEA-Water are:

- **Supply and use accounts.** Describe water flows within the economy and between the environment and the economy. It follows water from its initial abstraction from the environment by the economy and its supply and use within the economy to its final discharge back into the environment.
- **Asset accounts.** Describe the stocks of water resources at the beginning and the end of an accounting period and the changes in stocks that have occurred during that period. It can be used for the management of shared water as they facilitate the formulation and monitoring of policies for the allocation of water among countries with connected water resources.
- **Emission accounts.** Describe the flows of pollutants added to wastewater as a result of production and consumption, and flowing into water resources directly or indirectly through the sewage network. It measure the pressure on the environment caused by human activities by presenting information on activities responsible for emissions, the types and amount of pollutants added to wastewater as well as the destination of the emissions, such as water resources and the sea.
- **Hybrid and economic accounts**. Describes in monetary terms the supply and use of water-related products, identifies the costs associated with the production of these products, the income generated by them, the investments in hydraulic infrastructure and the cost of maintaining it

7.34. Based on the assessment done with agencies on the data availability, Malaysia will focus the priorities to develop the supply and use (SUT) accounts for water.

7.35. SEEA Water account would be progressively produced and refined from early 2017. Following the pilot production of each of the priority accounts, the aim is to improve each of them again in two more consecutive years (i.e. in 2018 and 2019 or 2019 and 2020) and well as to produce a publication integrating all of the pilot environmental accounts and aggregate macro-economic statistics.

7.36. Ensuring the use of the accounts in government and other decision-making process will be addressed in a number of ways. Until the production of the first pilot accounts, the primary method will be engagement with policy-makers at different levels via the Steering Committee

and Technical Working Groups. It is important that these first pilot accounts are seen as a proof of concept that addresses the specific needs of one or more stakeholders. After the pilot accounts are produced, discussions on the possible applications of the accounts, including any additions or refinements, will be held directly with key government agencies.

### 7.3.2 Capacity building

7.37. Both human resources and infrastructure will need to built-up to develop, implement and regularly produce and use environmental-economic accounts in Malaysia. A key part of the capacity building will be learning-by-doing via the production of pilot accounts and aggregate macro-economic statistics.

7.38. In this, the building of both human resource and infrastructure would occur in the first 1-2 years, with the pilot accounts produced in 2-3 years.

### 7.3.3 Human resource capacity

7.39. Development of SEEA demands for well-trained officers in the fields of economics and environment, and requires highly committed persons. Officers assigned to develop SEEA should have acquired sufficient knowledge and satisfactory level of understanding in the following fields:

- System of national accounts
- SEEA manuals
- Input-output table and analysis
- Environmental economics and analysis

7.40. Capacity building is another critical part of the development of environmental-economic accounts in Malaysia. Therefore, there will be continuous trainings on environmental-economic accounts as well as specifics training on each of sub-accounts and the primary data sources used in the accounts. The following are tentative for SEEA training programmes. These proposed training programs are general and apply for all SEEA modules.

- Workshop on general structure of SEEA account
- Workshop on data estimation and compilation of SEEA account
- Workshop on applications of SEEA account

7.41. Inter-agency capacity building activities are important to be developed and further strengthening the current cooperation. The inter-agency capacity building can be formed and fitted into the existing or specific programs. The following programs are highly relevant to be considered:

- Participation of statisticians and officers in relevant international meetings and conferences (such as the planned regional workshops on environmental-economic accounting);
- Development of knowledge sharing platform through distance or on-line learning;

- Placement of relevant statisticians and officers in countries or international agencies that had established environmental-economic accounting programmes; and
- Development of extension program for statisticians and officers to upgrade skills in research and development (R&D). This can be established based on project-basis arrangement, i.e. the specific statisticians and officers awarded with master or PhD degrees from local universities in relevant fields once the project is completed.
- Development of specific course or module on system of environmental-economic accounting and integrated in the undergraduate and post-graduate program syllabus in local universities.

### 7.3.4 Infrastructure

7.42. Ensuring that the account developers have the necessary information technology and data to support the development of accounts is also important. This need is already being addressed in a number of current projects, for example, the use of Geographical Information System (GIS) and remote-sensing for estimation of land-use.

7.43. A specific need of DOSM is to augment their expertise and information technology needed to integrate the spatially referenced environmental information of other agencies with their social and economic information. A geographic information system with sufficiently trained operators and managers is essential to conducting much of this work.

7.44. The cost implications for SEEA development also must be included in the planning process. Based on our observations and DOSM past experiences, the 12 month period of working plan for SEEA are estimated at RM120, 000. The cost breakdowns are:

- Staffing (2 additional contract officers with monthly RM 2,500) – RM 60,000
- Workshops (three times in a year) – RM 30,000
- Domestic travel expenses (data collection, meetings, workshops etc) – RM 20,000
- Other expenses (e.g. printing, papers etc) – RM 10,000

Take note that during the implementation periods the actual costs may differ, depending on (i) the scope of the specific SEEA module, (ii) data availability and (iii) other factors that directly and indirectly affect cost valuation such as inflation rates, fuel prices and wage rates.

### 7.3.5 Development of key aggregates

7.45. In addition to the priority accounts, the macro-environmental accounting aggregates such as carbon footprint per capita could be derived from a suite of integrated accounts. The continuity production of key macro-environmental aggregates would be dependent on the development of supporting environmental-economic accounting.

## 7.4 Impacts & Final outcomes

**Link impacts to policies to activities**

7.46. Whereas activities and outputs are tangible and generally observable, the impacts and outcomes are more difficult to observe. However, the impacts are important because they are the changes you expect as a result of the activities.

The following points are a high-level assessment of the impacts linked to the activities.

**Table 1 Linking activities to impacts**

| Activities | Impacts |
|---|---|
| **Building priority accounts based on policy needs** | Providing ministries and their agencies with empirical evidence of changes resulting from sustainable development policies<br><br>Improved knowledge on environmental-economic linkages and well-being<br><br>Better policies, decisions on trade-offs between development and conservation<br><br>Foundations to build integrated indicators on sustainable development |
| **Capacity building**<br><br>Human resources<br><br>Infrastructure | The ongoing capability to integrate environmental-economic information into government decision making<br><br>Training for agency and academic staff to support the ongoing implementation of environmental-economic accounts<br><br>A civil service and civil society that is informed about environment and development<br><br>The ongoing cost effective production of environmental-economic accounts that meet the needs of policy in a timely manner<br><br>Improved statistical collaboration between sectors & agencies |
| **Development of key aggregates** | Provide ministries and their agencies with empirical evidence linking government policies to sustainable development goals |

7.47. The outputs are expected to contribute to the needs for a more integrated National Statistical System and a more engaged and better-coordinated body of stakeholders. The contribution of the project to the sustainability of Malaysia development initiatives depends on many factors, including unforeseen circumstances and events beyond the control of the RM-SEEA. It has been the experience of the international statistical community that a robust and flexible National Statistical System is an important tool in adapting to future uncertainties and future data needs.

# 8 Constraints and Challenges

## 8.1 Constraints

8.1 Constraints are identified based on the information obtained from the SEEA Diagnostic Tools. There are several significant constraints observed in developing the SEEA accounts in Malaysia. The constraints are identified below with the percentage scores for each constraint.

1. Availability of data (25%)
2. Lack of manpower (20%)
3. Lack of financial resources (20%)
4. Quality of data (15%)
5. Lack of inter-institutional coordination (10%)
6. Others (10%)

8.2 The main stumbling block at this point is the availability of data to support the SEEA accounts. The aggregated environmental statistics such as total land-use, GHG emissions and water stocks are mostly available. The only issue is how these aggregated environmental statistics are detailed to support the SEEA format, particularly when dealing with the consumption of natural resources and emission by industries and households. Lack of data can be solved by imputation and estimation using well-recognized methodologies but the knowledge and understanding on SEEA must be first established among respective agencies. The level of understanding on SEEA can be elevated by attending training courses.

8.3 There are two main issues raised by the agencies regarding the manpower, (i) shortage of manpower to maintain the compilation of reliable environmental statistics and (ii) high staff turnover resulting in knowledge and expertise gaps. The first issue can be addressed by working under the NBOS initiatives. DOSM may consider to register SEEA development project in Malaysia as one of the programme under NBOS initiatives. The second issue is more challenging because it involves human resource planning and management of the Public Service Department that is beyond the control of all agencies.

8.4 Compiling and maintaining reliable environmental statistics may require additional staffs. Under the current condition, hiring additional staffs are unlikely to be materialized due to budget constraint. In the short-run, this budget constraint can be addressed by establishing inter-agency coordination. In the long-run, this issue can be addressed by establishing the so-called public-private trust funds. Under this trust fund, public and private jointly contributed to the development of SEEA, which in turn benefit both parties.

8.5 The quality and reliability issues of some environmental statistics have also been raised. There are cases where different estimation methodologies are employed by various agencies for similar sets of data. This is not a serious issue because a common methodology that is well accepted internationally and scientifically can be established by having series of discussions.

8.6 Inter-agency coordination is another main constraint that needs to be quickly addressed. The major constraint for inter-agency coordination is to get cooperation from agencies, including the states of Sabah and Sarawak. The pre-requisite for NBOS initiative is a strong inter-agency coordination and failure to address this would result in difficulties in developing the SEEA accounts. Inter-agency coordination is not only established for data sharing purposes but also for strengthening technical expertise in Malaysia. Other than suggesting the act and regulation for data sharing, higher rank government officers need to be involved so that SEEA development in Malaysia can be executed with great ease. Among the suggestion to be considered is DOSM needs to get Parliament order to produce environmental statistics in Malaysia.

## 8.2 Challenges

8.7 While good potential exists, there are likely to be important challenges to overcome in developing the SEEA accounts and compiling them on a regular basis. These challenges need to be addressed to avoid SEEA implementation becoming an ad-hoc, one-off exercise rather than an ongoing work programme.

The major challenges are listed below.

1. Co-ordinating the inflow of data from various agencies in the development of multiple SEEA modules. To be successful, all agencies must have full commitment in data sharing for the sake of national interest.
2. Gaining access to relevant administrative datasets and maintaining an understanding of these datasets in particular in the states of Sabah and Sarawak.
3. Determining the methodologies to fill data gaps, particularly those related to obtaining economy-wide coverage of various stocks and flows.
4. Gaining support from the private sectors to be involved directly and indirectly in supporting the establishment of a public-private trust fund.
5. Maintaining the appropriate internal and external networks of SEEA users and producers to support the long-term implementation of SEEA.
6. Maintaining trained staffs in agencies that are working specifically on compiling and estimating SEEA accounts.
7. Overlapping functions between agencies and overlapping jurisdictions between federal and state agencies.
8. Convincing the policy makers on the relevance of SEEA for development planning in Malaysia.

# 9 Conclusions and Next Step

9.1 There is a significant need for an integrated database that provides useful and comprehensive policy analysis. The SEEA is a multipurpose system and is relevant in a number of ways for policy development and evaluation as well as decision-making. Such a database would also support international and national initiatives and commitments such as Paris Agreement, Sustainable Development Goals (SDGs) and Eleventh Malaysia Plan.

9.2 This Roadmap for Advancing Environmental-Economic Accounting (RM-SEEA) identifies "key" success factors that needed to ensure the sustainability and continuity of SEEA development in Malaysia. These key success factors are briefly summarized below and must be carefully addressed.

- **The need for an integrated environmental-economic accounting** to address national policy priorities and economic sustainability. For example, the commitment of Malaysia to reduce carbon emissions from activities demands for an integrated data system that links both environment and economic in a single framework. Policy concern on the food production also would require specific attention on managing the supply and use of water resources and land-use.

- **The need for enhancing capacity building** in environment-economic accounting within DOSM and between relevant agencies such as Economic Planning Unit (EPU), Ministry of Finance (MOF), Ministry of Natural Resources and Environment (NRE) and Ministry of Energy, Green Technology and Water (KeTTHA). There is a need to provide intensive capacity building in the forms of training and knowledge transfer covering the basic understanding of SEEA, data requirement and estimation techniques, and application of SEEA for policy analysis.

- **The need for strengthening inter- and intra-agencies coordination**. In terms of data sharing and data management among agencies as well as within agencies, it is limited. Lacking coordination will jeopardize the continuity and sustainability of SEEA. Adoption of National Blue Ocean Strategy (NBOS) approach will further strengthen agency coordination.

- **The need for promoting public-private cooperation** in the form of trust funds in supporting the development of environment-economic accounting. The established SEEA account is beneficial to both the government and public sectors. Financial constraint has been identified as one of the barrier to SEEA development. To overcome this, for example, the government and private sectors may jointly raise fund to support SEEA activities.

- **The need for identifying well-trained SEEA personnel** to be placed at appropriate position in respective agencies to promote continuity and sustainability of SEEA. Continuous in-house training by skilled SEEA personnel will create a pool of SEEA knowledgeable staff to undertake SEEA accounts.

- **The need for compiling aggregated key environmental statistics**. Commonly, the top-down approach is used to estimate detailed SEEA accounts. According to this approach, the aggregate environmental statistics at national level are used to detail the estimates at disaggregated level. Unavailability of aggregate environmental statistics would make the estimation difficult because no "control" values are available.

9.3 To the success in implementing SEEA in Malaysia, strong commitment and cooperation between agencies is the key factor. Development of SEEA demands for support from various agencies because data are compiled by different agencies. Experienced and institutional setting of Denmark can be good example for Malaysia to be copied.

9.4 There are four strategies that are lessons learned from the experiences of Statistics Denmark:

- Statistics Denmark has established proper coordination between three divisions namely Business Dynamics, Government Finance and National Accounts. Business Dynamics is responsible for the Environmental Goods and Services Centre, the Government Finance focuses on the account related to taxes and subsidies and National Accounts compiles the main accounts for SEEA.
- The steering committee known as the "Green National Accounts" was established to further strengthening the inter-division coordination.
- Website and portal are utilized and designed to increase the communication effectiveness and updated the information for a better statistical development.
- Establishment of official agreements with relevant agencies on data supply and regulation.

9.5 Compilation of SEEA in Malaysia is considered as a new statistical development program. It is common at this stage for any new development program, awareness programs must be planned properly. There are three aspects about SEEA awareness need to be addressed.

- **Level of knowledge**. Reading materials and expert references for the country specific must be ready before SEEA can be constructed. United Nations may need to consider to develop manual guidelines for a specific region because each country has different structure of natural resources and preferences, and some countries may have common structures. The current SEEA manuals are more "general" and some data samples may not applicable for some countries like Malaysia. In addition to the manuals, other reading materials such as scientific journal articles, working papers and reports are also required as complement materials. DOSM and other relevant agencies may have limited access to these complement materials and thus establishment of data sharing platform is vital.

- **Agency engagement**. To ensure the success of SEEA implementation in Malaysia, all the agencies need to be involved in the processes. Direct involvement of agencies can be divided into three phases. First, organizing a workshop with agencies as the preliminary discussion of the planning for a specific SEEA account. Second, providing the technical

assistance that could help them to learn SEEA applications. Third, providing training for the specific officers from the several agencies to enhance competencies.

- **Communication engagement**. Information provided in SEEA is useful for policy makers and researchers that deal with environmental-economic nexus. Thus, communication strategies should be properly developed to create "market" for SEEA. There are several effective communication options that can be considered:
    - Press release and conference
    - Promotion of SEEA database by including aggregated main tables via official online portal
    - Participation in roadshow and exhibition
    - Workshop for specific SEEA applications to all agencies either as supplier data or user
    - Knowledge transfer program to relevant stakeholders aiming at enhancing the SEEA applications for policy analysis

9.6. To support the development of environmental-economic accounting, two-phase approach is proposed:

- **First phase** is considered as short-term planning that covers for the periods of 10 months and aims to complete the compilation of provisional tables and accounts for SEEA-Water. Several action plans are prepared in this phase to further strengthening the development of SEEA in Malaysia which include setting and formalizing the governance structure, enhancing capacity building, establishing data sharing and management, and promoting inter- and intra-agencies cooperation.

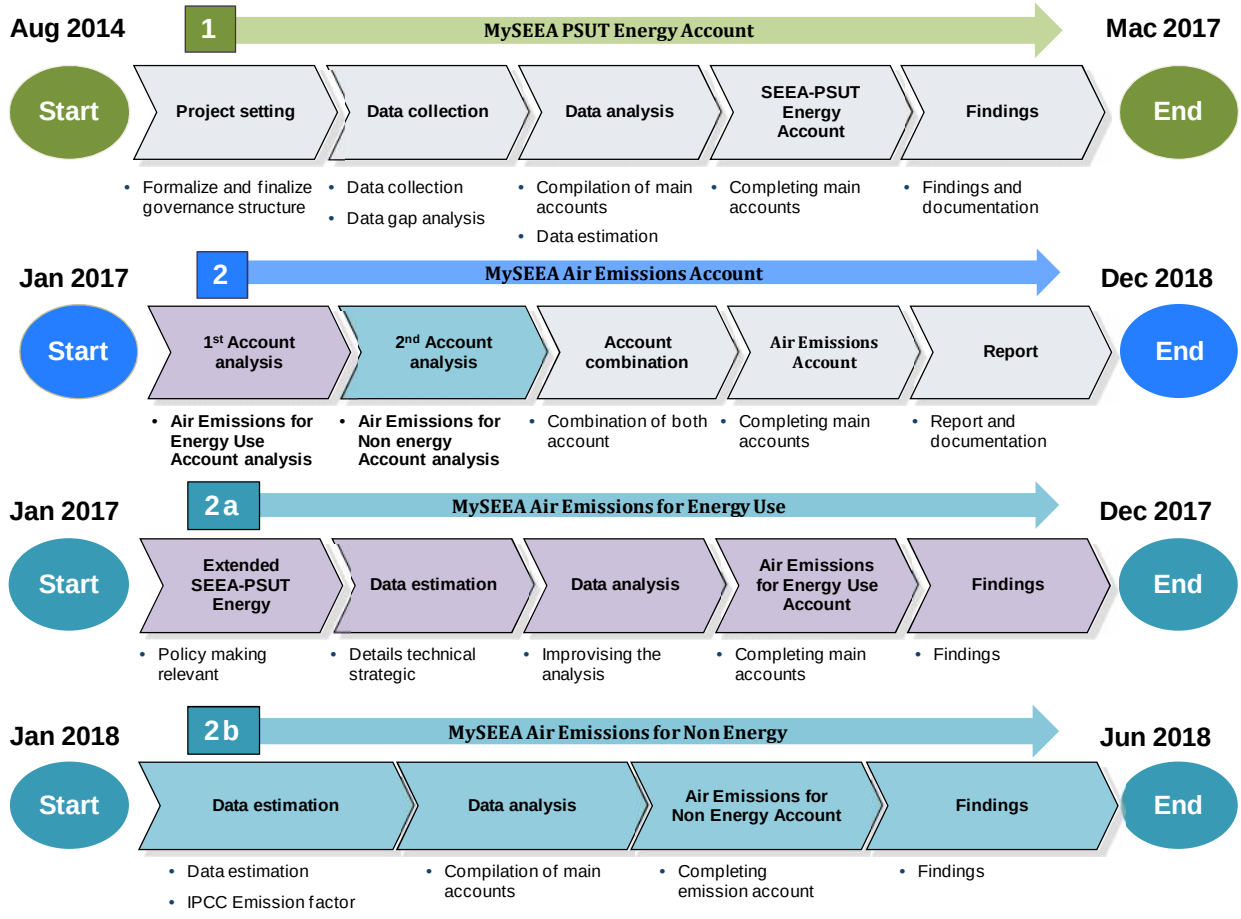
- **Second phase** is considered as medium-term planning for the periods 2018-2020 that aims to ensure the continuity and sustainability of SEEA in Malaysia (see figure below). The figure indicates the proposed working plans for the periods 2018-2020. The detailed and specific plans may be different, depending on the current and future policy priorities, governance structure and resources.

9.7 In term of institutional arrangement, some of the action plans in the first phase such as governance structure and inter- and intra-agencies coordination are still important to be considered. In the second phase, setting and formalizing public-private cooperation, and establishing and strengthening NBOS concept are also important to be considered. However, these proposed action plans may take longer than expected to be effective, depending on the resources availability and implementation strategies.

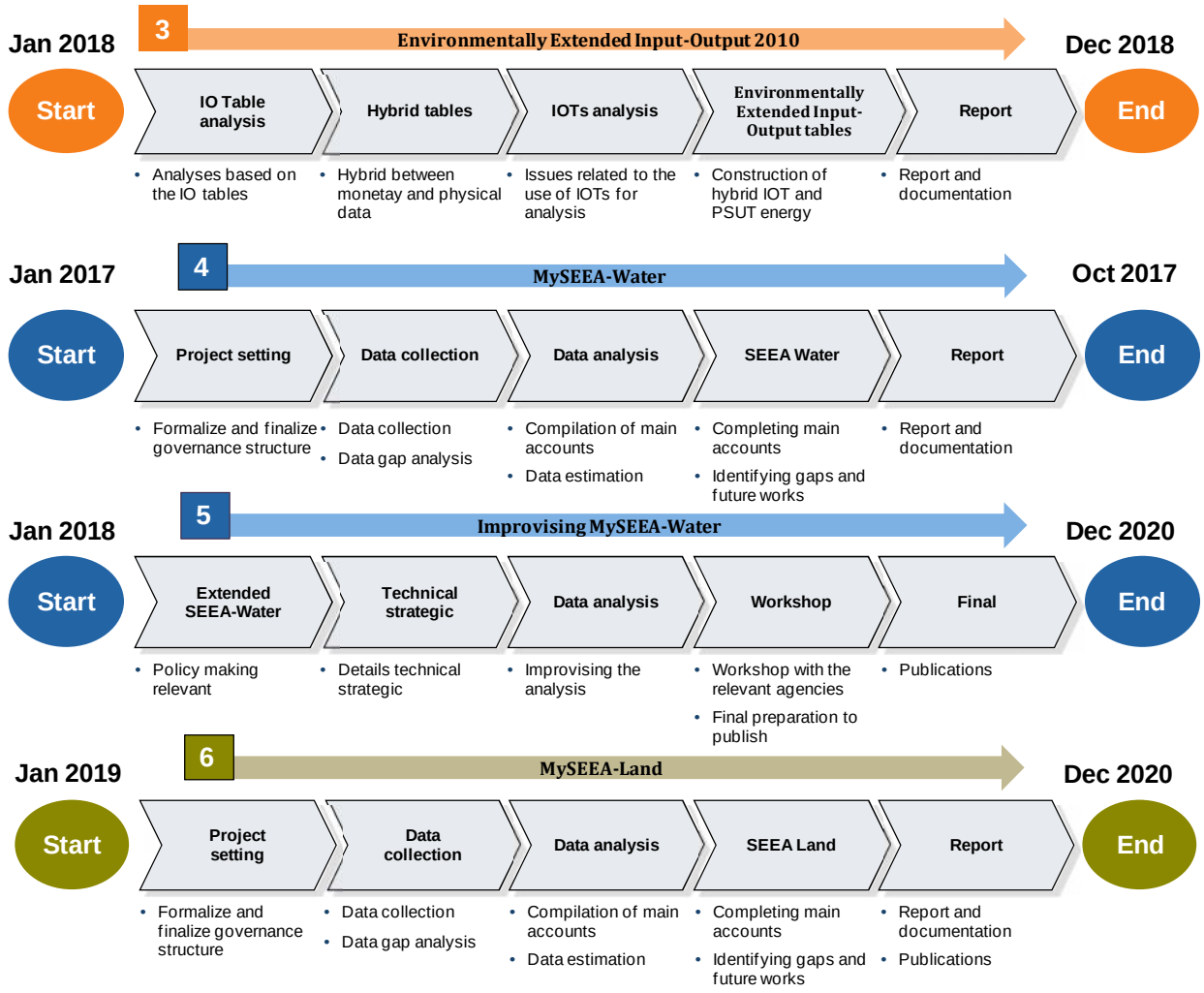
9.8 In terms of the development of SEEA, two main activities are suggested for the periods 2018-2020. First, working plans for the improvement and expansion of SEEA-Water should continue for the periods 2018-2020. This activity is to ensure that not only the continuity of the pilot project for SEEA-Water but also to strengthening the technical capacity within the DOSM and between agencies. Second, the third pilot project for SEEA-Land is highly recommended because the assessment clearly indicates data availability and technical resources (e.g. benchmarking countries and country reports) are available.

9.9 It is strongly suggested to focus the development of land-use for agricultural sector as a starting effort for SEEA-Land. Policy priorities on food production and market assess support the need for the development of land-use account. SEEA-Ecosystem and SEEA Agriculture, Fisheries and Forestry documents published by the United Nations could be as the international guidelines. The potential host agency for SEEA-Land could be the Ministry of Agriculture and Agro-Based Industry (MOA) or the Ministry of Wellbeing Housing and Local Government since the Town Planning Department is the custodian for land data in Malaysia (see Assessment Mission Report). Reference year 2015 for the development of SEEA-Land database is proposed. The main activities involve for both SEEA modules (i.e. SEEA-Water and SEEA-Land) are similar that involve project setting, data collection, data analysis, completion the accounts and report.

## Proposed medium-term working plans for advancing SEEA in Malaysia



## Proposed medium-term working plans for advancing SEEA in Malaysia Contd.



## 10 Malaysia- RM-SEEA – Investment Logic Framework for SEEA-Water

| Participation | Enabling Factors | Activities | Outputs | Impacts | Outcomes |
|---|---|---|---|---|---|
| **Steering Group:**<br>EPU, MOF, NRE, KeTTHA, DOSM, MOA, KPKT, KKLW and MPIC<br><br>**Technical Group:**<br>EPU, DOSM, MITI, DID, NAHRIM, DOE, DFPM, DOF, SPAN, DWS, IWK, SSW, MPOB, Academicians<br><br>**Working Group:** Several agencies (Refer Appendix 3) | **Governance Structure for SEEA-Water**<br>• Steering Committee<br>• Technical Committee<br>• Working Group<br><br>**Policies and Priorities:**<br>• RMK-11<br>• Paris Agreement<br>• National Agro-food policy<br>• National Water Resources Policy<br>• National Policy on Climate Change<br>• Green City Action Plan<br>• NPP-2<br><br>**Activities and Initiatives:**<br>• Government Green Procurement<br>• REDD+<br>• Green City Action Plan<br><br>**Other Factors:**<br>• Priority<br>• Data Accessibility<br>• Data Availability<br>• Market access | **Building priority accounts** (SEEA-Water)**:**<br>• Data inventory, exchange and quality assessments<br>• Data integration<br>• Application of common concepts, classification, and standards<br>• Transformation of data into accounting structure<br><br>**Capacity building:**<br>Human resources<br>• Training workshops<br>• Awareness programs<br>Workshops/programs should involve private sectors<br><br>Infrastructure<br>• Design of common data infrastructure<br>• Determination of common statistical standards and processes<br><br>**Project Management**<br>• Planning and evaluation | **Pilot accounts** for: SEEA-Water<br><br>**Publication** of Environmental-Economic Accounts in the forms of reports and journal articles<br><br>**Additional or improved indicators** for policy priorities<br><br>**Publicly-available environmental-economic information**<br><br>**Graduate students** (Master and Ph.D) in the field of environmental-economic accounting<br><br>**Policy documents or reports** on environmental-economic indicators that highly relevant for private sectors in strategizing market access | **Environment-economic accounts mainstreamed into planning and decision making**<br><br>**Sustainable statistical infrastructure with integrated data**<br><br>**Integrated indicators on sustainable development**<br><br>**A civil service and civil society that is informed about environment and development**<br><br>**Improved knowledge on sustainability and well-being**<br><br>**Improved statistical collaboration among government agencies and public-private cooperation**<br><br>**Better policies, decisions on trade-offs between development and environment** | **A set of integrated environmental-economic accounting information**<br><br>**Enhanced institutional coordination within Malaysia**<br><br>**Increased technical and capacity building**<br><br>**Enhanced public-private cooperation in supporting statistical development**<br><br>**Key aggregate macro-environmental statistics and indicators**<br><br>**Improved the scientific knowledge by proposing new indicators or concepts** |

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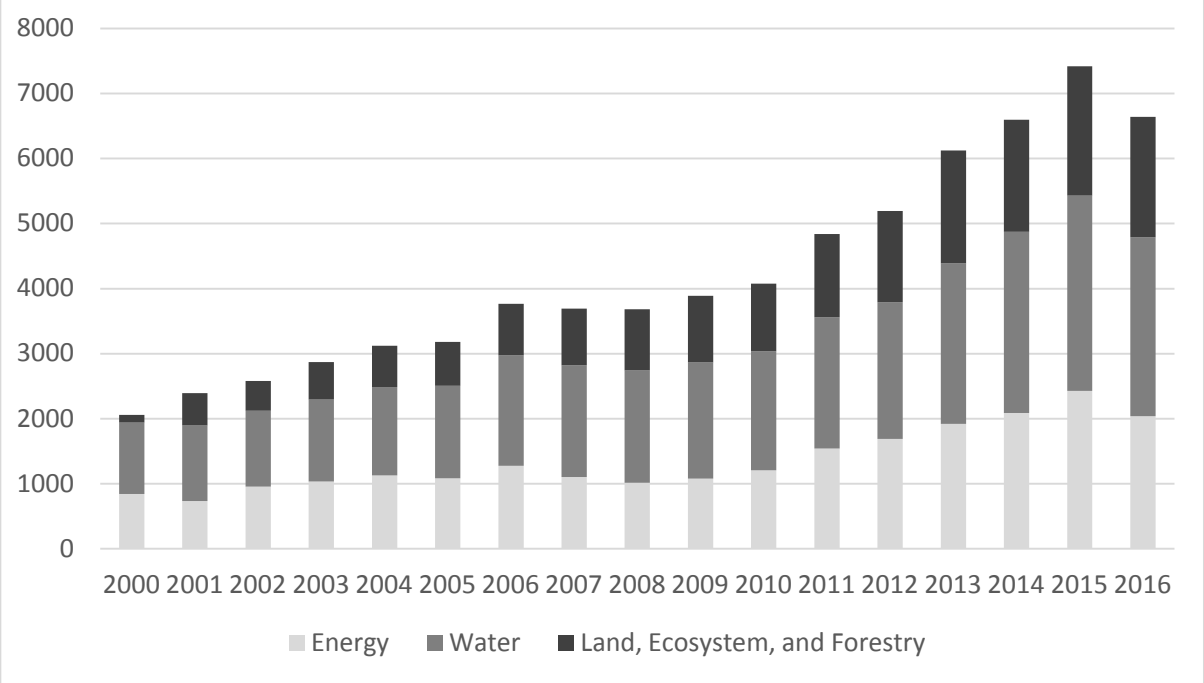
# Appendix 1. International and national trends in environmental research

11.1. Findings from this assessment also is linked to the current research in environmental studies. This is important to measure the consistency between the priority policies and the proposed SEEA accounts and the current research in environmental studies. To address this objective, the consultant team reviews the number of environmental researches published in Sciencedirect.com and grouped them according to the themes. The literature review indicates that assessment results for the case of Malaysia are consistent with the international and national studies. Water, energy, and land, ecosystem and forestry are the three core areas mostly studied. This literature review gives two main implications.

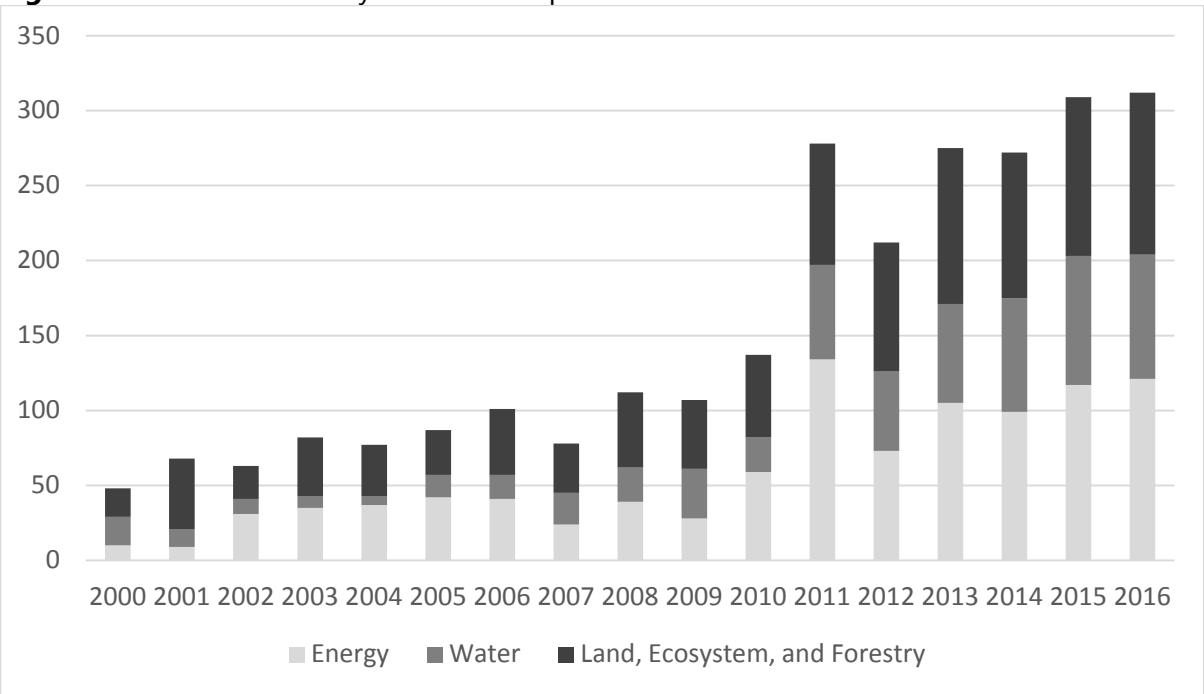
- First, there is a growing number of researches that studies the areas of water, energy, and land, ecosystem and forestry. This supports our proposal in this RM-SEEA to concentrate on the SEEA-Water.
- Second, prioritizing the SEEA into these three core areas are supported by the resource materials (such as methodologies and data estimation) that are highly useful in the process of compilation of specific individual SEEA accounts.

**Figure A1**. Number of international research publications in environmental studies




Source: www.sciencedirect.com

**Figure A2**. Number of Malaysian research publications in environmental studies




Source: www.sciencedirect.com

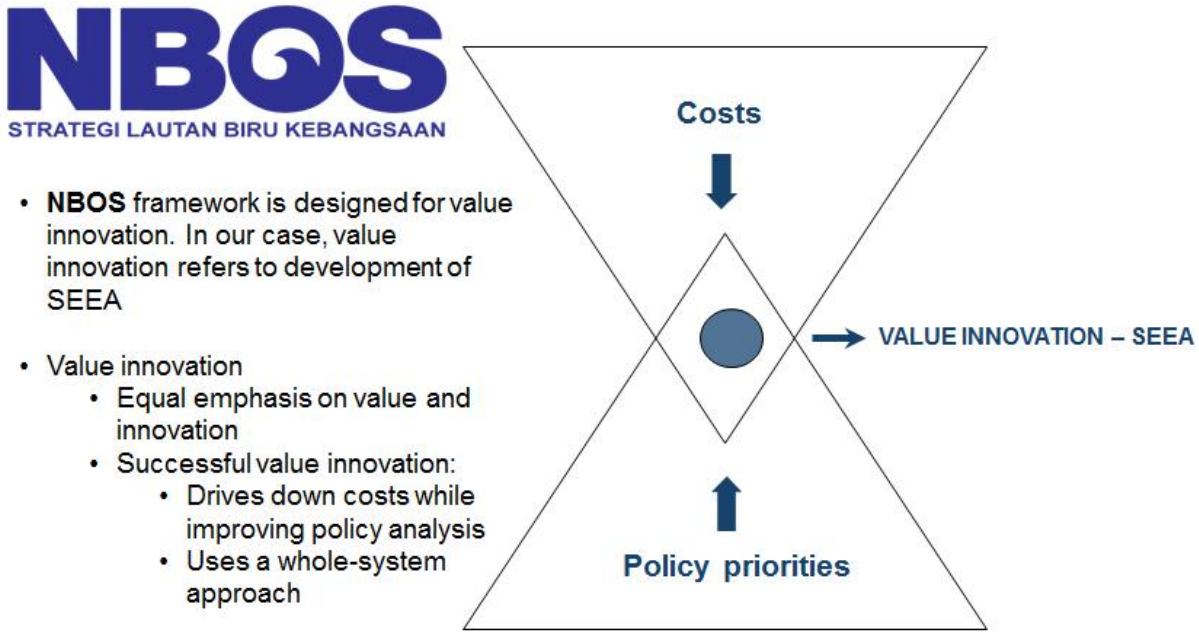
# Appendix 2. NBOS-SEEA Framework

12.1. National Blue Ocean Strategy (NBOS) is formulated and executed through the NBOS Summit, a unique and dynamic national strategy platform which brings together ministries, agencies, all levels of government and the private sector on a voluntary basis to develop initiatives that are high impact, low cost and rapidly executed. The Summit, which was launched in 2009, breaks down bureaucratic silos through fair process and is driven by the creativity of ideas, while participants receive full credit and recognition. To date, more than 90 NBOS initiatives have been successfully implemented to address a wide range of economic and social issues.

12.2. NBOS serves as the basis for the Malaysian National Development Strategy (MyNDS) which will guide the 11th Malaysia Plan from 2016 until 2020. MyNDS focuses on rapidly delivering high impact on both the capital and people economies at low cost to the government. The capital economy is about GDP growth, big businesses, large investment projects and financial markets, while the people economy is concerned with what matters most to the people, including jobs, small businesses, the cost of living, family well-being and social inclusion.

12.3. Under MyNDS, strategy formulation is being driven by creativity and innovation, and strategy execution follows the principles of fair process. By reconstructing the conventional boundaries that exist across public and private organizations, the government is creatively unlocking and multiplying national resources. Costs are lowered by breaking down silos across ministries and agencies to unlock underutilized resources, while higher value is delivered to people by creatively deploying those resources to hot spots. This enables the simultaneous pursuit of high income and greater public well-being while keeping taxes low. Figure A1 below summarizes the framework of NBOS-SEEA framework.

**Figure A1.** NBOS-SEEA framework



Lowering the costs for the development of SEEA can be achieved through the following potential strategies

- Set-up a public-private thrust fund that specifically used to support for the development of SEEA activities
- Establishing a centre of excellent at public university that supports technical experts and research in SEEA. For example, establishing a so-called SEEA unit at Institute of Agricultural and Food Policy Studies, UPM may be considered.

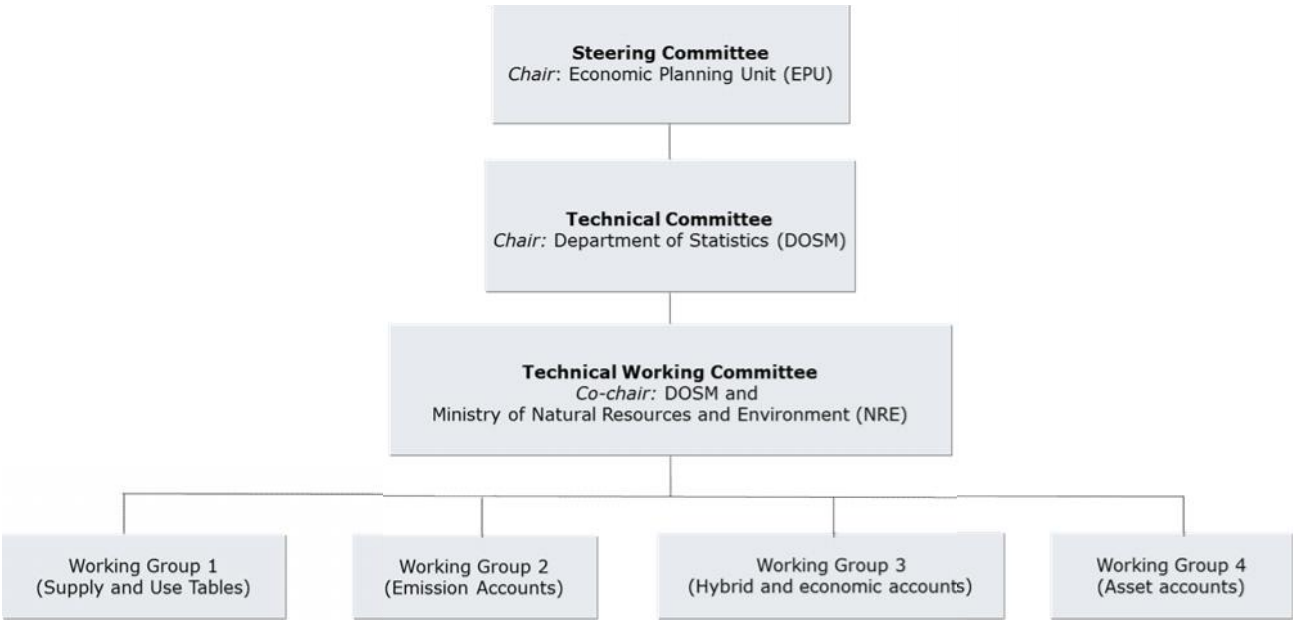
Improving the policy analysis using SEEA can be achieved through the following strategies

- Establishing proper governance structure for the development of SEEA. It must involves all related agencies and be led by the most influential agency.
- DOSM is strongly suggested to participate in the NBOS activities because currently they are not one of the NBOS participating agencies.

12.4. This NBOS-SEEA framework has "unofficially" been put into practice by DOSM and its strategic partners such as Energy Commission on the development of SEEA-Energy since 2014. In this collaborative works, DOSM is able to complete Supply and Use tables for SEEA-Energy. Inclusion of NBOS-SEEA as one of the NBOS initiatives would be a better setting because potential to get additional funding and institutional support is high.

# Appendix 3. Proposed SEEA-Water governance structure

The following is a suggested governance structure for the development of SEEA-Water in Malaysia.




**Steering Committee**:

*Chair*: Economic Planning Unit (EPU)

*Members*:

1. EPU;
2. Ministry of Finance (MOF);
3. Ministry of Natural Resources and Environment (NRE);
4. Ministry of Energy, Green Technology and Water (KeTTHA);
5. Ministry of Agriculture and Agro-Based (MOA);
6. Ministry of Urban Wellbeing, Housing and Local Government (KPKT);
7. Ministry of Rural and Regional Development (KKLW);
8. Ministry of Plantation Industries and Commodities (MPIC);
9. Department of Statistics (DOSM)

*Secretariat*: EPU and Department of Statistics Malaysia (DOSM)

The Steering Committee will meet at least two times per year.

The Term of Reference (TOR) for the Steering Committee are:

- Give guidelines and direction of environmental statistics based on national policy priorities,
- Endorse the planning of environmental statistics by DOSM based on:
  i. Manual United Nations Statistics Division (UNSD)
  ii. Accepted project from other international agencies

- Give guidelines and advise to Technical Committee,
- Ensure the planning of budget for development of environmental statistics,
- Endorse the members of committee and the Term of References (TOR)

**Technical Committee**:

*Chair:* Department of Statistics Malaysia (DOSM)

*Members:*

1. EPU;
2. DOSM;
3. Ministry of International Trade and Industry (MITI);
4. Department of Irrigation and Drainage (DID);
5. National Hydraulic Research Institute of Malaysia (NAHRIM);
6. Department of Environment (DOE);
7. Department Forestry Peninsular Malaysia (DFPM);
8. Department of Fisheries (DOF);
9. National Water Commission (SPAN);
10. Department of Water Supply (DWS);
11. Indah Water Konsortium (IWK);
12. Sewerage Service Department (SSW);
13. Malaysian Palm Oil Board (MPOB);
14. Academicians

*Secretariat*: Economic Planning Unit (EPU) and Department of Statistics Malaysia (DOSM)

Technical Committee will meet at least quarterly (four times per year).

The Term of Reference (TOR) for the Technical Committee are:

- Review and provide input regarding the improvement of the Roadmap development plan relating to new environmental statistics and production reports of these statistics,
- Review and provide guidance to the Technical Working Committee including concepts, definitions, classifications and methodology of estimation and preparation of environmental statistics,
- Monitor the implementation of the compilation environmental statistics,
- Report on progress and preparation of environmental statistics to the Steering Committee,
- Lifting the reports / publications of environmental statistics to the Steering Committee,
- Provide advice on preparation of the new environmental statistics,
- Monitoring technical matters based on the latest manual,
- Provide guidance related capacity building,
- Report on progress to the Steering Committee.

## Technical Working Committee (Working Groups):

The Working groups are categorised based on the types of accounts; supply and use tables, emission accounts, hybrid and economic accounts; and asset accounts. The Working Groups need to meet more frequently and the ideal approach is at least once in 2 months.

The Term of Reference (TOR) for the Working Groups are:

- Lead coordination and development of SEEA-water accounts,
- Develop and establish specific methodologies for data estimation,
- Lead the development macro-environmental aggregates and indicators,
- Lead the work on prioritizing indicators and linking accounts to policy priorities,
- Report to the Technical Committee.

### Working Group 1 (Supply and Use Tables)

The physical supply and use table describe water flows within the economy and the environment such as the distribution of water and water abstraction by industries and households. The list of potential agencies under Working Group 1 as below:

*Chair*: Ministry of Natural Resources and Environment (NRE)

*Members:*

1. Ministry of International Trade and Industry (MITI);
2. Department of Irrigation and Drainage (DID);
3. Department of Environment (DOE);
4. National Water Commission (SPAN);
5. Department of Water Supply (DWS);
6. Indah Water Konsortium (IWK);
7. Sewerage Service Department (SSW);
8. Department of Agriculture (DOA);
9. Department of Fisheries (DOF);
10. Department Forestry Peninsular Malaysia (DFPM);
11. Malaysian Meteorological Department (MetMalaysia);
12. Mineral and Geoscience Department Malaysia (MGD);
13. National Hydraulic Research Institute of Malaysia (NAHRIM);
14. Academy of Sciences Malaysia (ASM);
15. Kemubu Agricultural Development Authority (KADA);
16. Muda Agriculture Development Authority (MADA);
17. State governments;
18. Academicians

**Working Group 2 (Emission Accounts)**

Emission accounts provide information by industry, households and government on the amount of pollutants added to wastewater, which is discharged into the environment, with or without treatment, or discharge into a sewage network. The list of potential agencies under Working Group 2 as below:

*Chair*: Ministry of Natural Resources and Environment (NRE)

*Members:*

1. Ministry of International Trade and Industry (MITI);
2. Department of Environment (DOE);
3. National Water Commission (SPAN);
4. Sewerage Service Department (SSW);
5. Department of Agriculture (DOA);
6. Indah Water Konsortium (IWK);
7. National Hydraulic Research Institute of Malaysia (NAHRIM);
8. Academy of Sciences Malaysia (ASM);
9. Academicians

**Working Group 3 (Hybrid and Economic Accounts)**

Hybrid and economic accounts describes in physical and monetary information on the use and supply of water-related products, identifies the costs associated with the production of these products, the income generated by them, the investments in hydraulic infrastructure and the cost of maintaining it. These accounts are presented together with other economic transactions related to water, namely, taxes, subsidies and water rights. The list of potential agencies under Working Group 3 as below:

*Chair*: Ministry of Natural Resources and Environment (NRE)

*Members:*

1. Ministry of Health (MOH);
2. Ministry of Finance (MOF);
3. Economic Planning Unit (EPU);
4. Department of Environment (DOE);
5. National Water Commission (SPAN);
6. Indah Water Konsortium (IWK);
7. Sewerage Service Department (SSW);
8. National Hydraulic Research Institute of Malaysia (NAHRIM);
9. Academicians

**Working Group 4 (Asset Accounts)**

Asset accounts measure stocks at the beginning and the end of the accounting period and record the changes in stocks that occur during the period. Two types of assets are related to water: produced assets, which are used for the abstraction, mobilization and treatment of water; and water resources. The list of potential agencies under Working Group 4 as below:

*Chair*: Ministry of Natural Resources and Environment (NRE)

*Members:*

1. Department of Irrigation and Drainage (DID);
2. National Water Commission (SPAN);
3. Department of Water Supply (DWS);
4. Department of Fisheries (DOF);
5. Department Forestry Peninsular Malaysia (DFPM);
6. Malaysian Meteorological Department (MetMalaysia);
7. Mineral and Geoscience Department Malaysia (MGD);
8. National Hydraulic Research Institute of Malaysia (NAHRIM);
9. Academy of Sciences Malaysia (ASM);
10. State governments;
11. Academicians

# Appendix 4. Overview of policies and accounts relevant to SEEA-Water in Malaysia

| Types of accounts | Agencies | Policies/Programs | Targets/Goals |
|---|---|---|---|
| Supply and use accounts, asset accounts | Ministry of Natural Resources and Environment (NRE) | National Climate Change Policy | Mainstreaming climate change through wise management of resources and enhanced environmental conservation resulting in strengthened economic competitiveness and improved quality of life; |
| | | | Integration of responses into national policies, plans and programmes to strengthen the resilience of development from arising and potential impacts of climate change; and |
| | | | Strengthening of institutional and implementation capacity to better harness opportunities to reduce negative impacts of climate change. |
| Supply and use accounts | Ministry of Energy, Green Technology and Water (KeTTHA) | National Green Technology Policy | To facilitate the growth of GT industry & enhance its contribution to national economy |
| | | | To increase national capability and capacity for innovation in GT development & enhance Malaysia's competitiveness in global arena |
| | | | To ensure sustainable development & conserve environment for future generations |
| | | | To enhance public education & awareness on GT and encourage its widespread use |
| Supply and use accounts, asset accounts, emission accounts, extended SEEA | Malacca State, Malaysia | Green City Action Plan | Protect and enhance the quality of surface and groundwater bodies in Melaka |
| | | | Put Melaka on the path to become a "zero-waste" state and reduce waste-related GHG emissions |
| | | | Measure of dissolved oxygen, water temperature, pH level, levels of E.coli, nitrates, electrical conductivity, and transparency for each water body - According to Water Quality Index |
| | | | Protect all existing wetlands |
| | | | Restore 20% of degraded wetlands |
| | | | Increase to 20% of portable water supply |
| | | | Increase coverage of centralized wastewater collection by 10% |
| | | | Reduce number of STP that don't comply with environmental regulations by 20% |
| | | | Volume of industrial wastewater that does not meet industrial waste-water discharge requirements reduce by 20% |

| | | | |
|---|---|---|---|
| | | | Average number of households and individuals exposed to annual floods (loss of shelter, livelihoods) reduced by 50% |
| | | | Average economic impacts related to flooding reduce 50% |
| | | | Per capita waste output reduced by 20% |
| | | | Percentage of population with regular solid waste collection increase to 50% |
| | | | Percentage of city's solid waste that is recycled (by type) increase by 100% |
| | | | Total GHG emissions related to solid waste reduced by 40% |
| | | | Percentage of labor force in green waste management activities increase by 100% |
| Supply and use accounts, asset accounts, extended SEEA | Economic Planning Unit | Eleventh Malaysia Plan | People protected through flood mitigation projects - 2 million |
| | | | Terrestrial and inland water areas gazetted as protected areas - 17% |
| Supply and use accounts, asset accounts, emission accounts, extended SEEA | Federal Department of Town and Country Planning, Ministry of Housing and Local Government | Second National Physical Plan 2 | To optimise utilisation of land and natural resources for sustainable development and biodiversity conservation. |
| | | | To enhance spatial and environmental quality, diversity and safety for a high quality of life and liveability. |
| | | | NPP 22 - Environmentally Sensitive Areas shall be integrated in the planning and management of land use and natural resources. |
| | | | NPP 26 - All surface and ground water resources shall be safeguarded and managed sustainably. |
| | | | NPP 27 - The spatial planning framework shall incorporate mitigation and adaptation measures against the impacts of climate change. |
| | | | NPP 35 - Appropriate water supply infrastructure including source works, treatment plants and transmission and distribution networks shall be provided to all settlements. |
| | | | NPP 36 - Appropriate sewerage facilities shall be provided for all areas, with adequate collection, treatment and disposal of sewage and sludge. |
| | | | NPP 37 - All settlements shall be serviced by an integrated network of solid waste disposal and/or recovery facilities. |
| | | | NPP 38 - Drainage infrastructure shall be provided in all settlements to eliminate the incidence of major |

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|---|---|---|---|
| | | | floods, minor floods and pollution. |
| Supply and use accounts, asset accounts, ecosystem accounts | Ministry of Natural Resources and Environment (NRE) | National Policy Biodiversity | Target 6: By 2025, at least 20% of terrestrial areas and inland water, and 10% of coastal and marine areas, are conserved through a representative system of protected areas and other effective area-based conservation measures. |
| Supply and use accounts, asset accounts, extended SEEA | Ministry of Natural Resources and Environment (NRE) | National Water Resources Policy | P1: Water Resources Security |
| | | | P2: Water Resources Sustainability |
| | | | P3: Collaborative Governance |
| | | | Target 1: Develop a comprehensive water resources information system. |
| | | | Target 2: Strengthen database framework. |
| | | | Target 3: Standardise multiple scientific processes and methods related to evaluation and analysis of state, status and condition of water resources. |
| | | | Target 4: Set national standards to determine thresholds for water resources to protect their availability and integrity of waterbodies. |
| | | | Target 5: Reduce vulnerability of water resources to impacts and threats as well as strengthen adaptability to ecosystems and physical changes. |
| | | | Target 6: Develop water resources conservation plans for strategic, sensitive and critical water resources areas and bodies. |
| | | | Target 7: Optimise options for alternative, conjunctive or contiguous use of different water resources types to reduce stress on existing sources. |
| | | | Target 8: Adopt a national disaster risk reduction, preparedness and response plan for water resources to introduce measures for preparedness and response, as well as reduction of risks and threats of disasters from and to water resources. |
| | | | Target 9: Adopt national criteria for water resources characterisation and standards. |
| | | | Target 10: Determine priority for water resources use, particularly in times of crisis or threat. |
| | | | Target 11: Protect condition and state of water resources, catchment and bodies. |
| | | | Target 12: Adopt economic measures to value water resources. |
| | | | Target 13: Adopt measures to determine optimum water quality and yield. |

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|---|---|---|---|
| | | | Target 14: Adopt measures to implement water demand management nationwide. |
| | | | Target 15: Establishment of mechanisms for formal and informal consultation on matters related to water resources. |
| | | | Target 16: Develop framework for stakeholder collaboration in water resources governance. |
| | | | Target 17: Build capacity of key water resources stakeholders. |
| | | | Target 18: Improve understanding and awareness of the importance of water resources security and sustainability. |
| Supply and use accounts, asset accounts, emission accounts, extended SEEA | Ministry of Science, Technology and the Environment, Malaysia | National Environment Policy | Exercise respect and care for the environment in accordance with the highest moral and ethical standards. |
| | | | Conserve natural ecosystems to ensure integrity of biodiversity and life support systems. |
| | | | Ensure continuous improvement in the productivity and quality of the environment while pursuing economic growth and human development objectives. |
| | | | Manage natural resource utilization to sustain the resource base and prevent degradation of the environment. |
| | | | Integrate environmental dimensions in the planning and implementation of the policies, objectives and mandates of all sectors to protect the environment. |
| | | | Strengthen the role of the private sector in environmental protection and management. |
| | | | Ensure the highest commitment to environmental protection and accountability by all decision-makers in the public and private sectors, resource users, non-governmental organisations and the general public, in formulating, planning and implementing their activities. |
| | | | Participate actively and effectively in regional and global efforts towards environmental conversation and enhancement. |
| | | | Education and Awareness |
| | | | Effective management of natural resources and the environment |
| | | | Integrated development planning and implementation |
| | | | Prevention and control of pollution and environmental degradation |
| | | | Strengthening administrative and institutional |

| | | | |
|---|---|---|---|
| | | | mechanisms |
| | | | Proactive approach to regional and global environmental issues |
| | | | Formulation and implementation of Action Plans |
| Supply and use accounts, asset accounts, emission accounts, extended SEEA | Federal Department of Town and Country Planning, Ministry of Housing and Local Government | National Urbanization Policy | To develop a planned, quality, progressive and sustainable city; |
| | | | To develop and strengthen a competitive urban economy; |
| | | | To create a conducive environment in order to encourage social development; |
| | | | To eradicate urban poverty; |
| | | | To strengthen the planning, implementation and monitoring system; |
| | | | To strengthen urban management and administrative institutions |
| Supply and use accounts, asset accounts, emission accounts, extended SEEA | Ministry of Housing and Local Government Malaysia | My Beautiful Neighbourhood (MyBN) | To create a condusive environment for the public housing |
| | | | To create a safe, clean and beauty environment for the neighbourhood |
| | | | To strengthen the planning, implementation and monitoring system; |
| | | | To strengthen neighborhood residents to love the environment |
| Supply and use accounts | Ministry of Natural Resources and Environment (NRE) | REDD+ Malaysia | Ensures water supply for both domestic and industrial use. |
| | | | Community adaptation to climate change. |
| Supply and use accounts, emission accounts, extended SEEA | Ministry of Natural Resources and Environment (NRE) | Third National Communications (TNC) and Biennial Update Report (BUR) | Assist Malaysia in meeting reporting requirements under Article 12 of the United Nations Framework Convention on Climate Change (UNFCCC) and at the same time strengthen the country's capacities for the implementation of climate change reporting activities in a continuous manner |
| | | | Support Malaysia's Biennial Update Reporting |
| | | | Strengthen the technical and institutional capacities of Malaysian institutions to implement the Convention |
| | | | Assist the government to integrating climate change issues into sectoral and national development priorities in a more efficient way |

# Appendix 5. Eleventh Malaysia Plan Targets (2016-2020)

| Sectors | Target in 2016 – 2020 |
|---|---|
| **Economy** | |
| Average GDP growth (%) | 5 – 6 |
| Labour productivity (RM) | 92,300 |
| Gross national income (GNI) per capita (RM) | 54,100 |
| Average monthly household income (RM) | 10,540 |
| Compensation of employees (% of value added) | 40 |
| Average real private consumption growth (%) | 6.4 |
| Average growth of real public consumption (%) | 3.7 |
| Average private investment in current prices (RM) | 291 billion |
| Average public investment in current prices (RM) | 131 billion |
| Federal Government debt to GDP (%) | < 45 |
| Trade balance (RM) | 57.3 billion |
| Average growth of gross exports (%) | 4.6 |
| Average growth of real private investment (%) | 9.4 |
| Average growth of real public investment (%) | 2.7 |
| Fiscal position | Balanced budget by 2020 |
| **The people (*rakyat*)** | |
| Gini coefficient | 0.385 |
| Mean monthly household income (RM) | 5,270 |
| Median monthly household income (RM) | 5,701 |
| Participation of women in the workforce (%) | 59 |
| Realised investment in five regional economic corridors (RM) | 236 billion |
| Paved road (km) | 3,000 |
| Job opportunities created | 470,000 |
| Additional houses will be supplied with electricity | 36,800 |
| Realised investment (RM) | 236 billion |
| **Population wellbeing** | |
| Malaysian Wellbeing Index (MWI) increase per annum (%) | 1.7 |
| Doctor to population ratio | 1:400 |
| Houses to repaired for the poor | 47,000 |
| Houses to be developed for low and middle-income households | 606,000 |
| Percent of population feeling safe (%) | 60 |
| Annual reduction of crime index (%) | 5 |
| Optimised police / emergency response time (minutes) | 8 |
| Road fatalities index per 10,000 registered vehicles | 2.0 |
| Minimum percentage of Malaysian who embrace sports culture (%) | 50 |

| **Human capital development** | |
|---|---|
| Labour productivity per annum (%) | 3.7 |
| Intake of SPM leavers to TVET programmes | 225,000 |
| Number of employees that will benefit from expansion of the HRDF Act | 2.8 million |
| Students' enrolment from preschool to upper secondary school (%) | 100 |
| Number of universities in top 100 of the QS World University Ranking | 2 |
| **Green growth for sustainability and resilience** | |
| Reduction of greenhouse gas emission intensity of GDP (%) | 40 |
| Household recycling rate (%) | 22 |
| People protected through flood mitigation projects | 2 million |
| Installed capacity for renewable energy (MW) | 2,080 |
| Government procurement to be green (%) | > 20 |
| Terrestrial and inland water areas gazetted as protected areas (%) | 17 |
| Coastal and marine areas gazetted as protected areas (%) | 10 |
| **Infrastructure** | |
| Population served by clean water (%) | 99 |
| Generation capacity (MW) | 7,626 |
| Areas nationwide with access to Digital Terrestrial Television (DTT) | 46 |
| Household areas covered by broadband (%) | 95 |
| Paved rural roads constructed (km) | 3,000 |
| Malaysian Aviation Commission | As newly established regulator |
| Sewerage connected services coverage, especially in main cities (%) | 80 |
| Non-revenue water (%) | 25 |
| Growth of transport and storage subsector (%) | 8.5 |
| World Bank Logistics Performance Index | Top 10 |
| Additional refining capacity (BPD) | 300,000 |

# Appendix 6. Mapping between policies targets and SEEA

The following table aligns the policy targets with SEEA. Some targets can be achieved by developing an individual SEEA module while some demand for the development of multiple SEEA modules.

| Policy Documents | Periods/Year | Themes | Targets | Link to SEEA |
|---|---|---|---|---|
| National Water Resources Policy | 2012 | Managing water resources | Target 1: Develop a comprehensive water resources information system. | SEEA-Water |
| | | | Target 2: Strengthen database framework. | SEEA-Water |
| | | | Target 3: Standardise multiple scientific processes and methods related to evaluation and analysis of state, status and condition of water resources. | SEEA-Water |
| | | | Target 4: Set national standards to determine thresholds for water resources to protect their availability and integrity of waterbodies. | SEEA-Water |
| | | | Target 5: Reduce vulnerability of water resources to impacts and threats as well as strengthen adaptability to ecosystems and physical changes. | SEEA-Water |
| | | | Target 6: Develop water resources conservation plans for strategic, sensitive and critical water resources areas and bodies. | SEEA-Water |
| | | | Target 7: Optimise options for alternative, conjunctive or contiguous use of different water resources types to reduce stress on existing sources. | SEEA-Water |
| | | | Target 8: Adopt a national disaster risk reduction, preparedness and response plan for water resources to introduce measures for preparedness and response, as well as reduction of risks and threats of disasters from and to water resources. | SEEA-Water |

| Policy Documents | Periods/Year | Themes | Targets | Link to SEEA |
|---|---|---|---|---|
| National Water Resources Policy | 2012 | Managing water resources | Target 9: Adopt national criteria for water resources characterisation and standards. | SEEA-Water |
| | | | Target 10: Determine priority for water resources use, particularly in times of crisis or threat. | SEEA-Water |
| | | | Target 11: Protect condition and state of water resources, catchment and bodies. | SEEA-Water |
| | | | Target 12: Adopt economic measures to value water resources. | SEEA-Water |
| | | | Target 13: Adopt measures to determine optimum water quality and yield. | SEEA-Water |
| | | | Target 14: Adopt measures to implement water demand management nationwide. | SEEA-Water |
| | | | Target 15: Establishment of mechanisms for formal and informal consultation on matters related to water resources. | SEEA-Water |
| | | | Target 16: Develop framework for stakeholder collaboration in water resources governance. | SEEA-Water |
| | | | Target 17: Build capacity of key water resources stakeholders. | SEEA-Water |
| | | | Target 18: Improve understanding and awareness of the importance of water resources security and sustainability. | SEEA-Water |

| Policy Documents | Periods/Year | Themes | Targets | Link to SEEA |
|---|---|---|---|---|
| National Agro-food Policy | 2011-2020 | Agro-food | Development food commodities that leads to the achievement of food security and to improve the processing and export of high-value agricultural income | SEEA-Water, SEEA-Land |
| | | | Contribution to value added to the agricultural sector increased to RM29.8 billion or 51.1% in 2020 | SEEA-Water, SEEA-Land |
| | | | the export value of RM76.5 billion in 2020 | SEEA-Water, SEEA-Land |
| | | | Food production increase to 14.8 million tonnes in 2020 | SEEA-Water, SEEA-Land |
| | | Paddy | Intensity of cultivation increase to 157% by 2020 or average frequency of cultivation increase to 1.57 times a year by 2020 | SEEA-Water, SEEA-Land |
| | | Fisheries | Landing of deep sea fisheries would be increased from 381 thousand tonnes to 620 thousand tonnes in 2020 | SEEA-Water, SEEA-Land |
| | | Livestock | Meat production increase to 2.1 million tonnes in 2020, with growth of 2.7% per annum | SEEA-Water, SEEA-Land |
| | | | Egg production increase to 773 thousand tonnes with a growth of 3.6% per annum by 2020 | SEEA-Water, SEEA-Land |
| | | | Contribution to the value added of the agricultural sector increased to RM29.8 billion or 51.1% in 2020 | SEEA-Water, SEEA-Land |

| Policy Documents | Periods/Year | Themes | Targets | Link to SEEA |
|---|---|---|---|---|
| National Agro-food Policy | 2011-2020 | Vegetables, Fruits and Coconuts | Vegetable production increase from to 1.7 million tonnes with a growth rate of 9.8% per annum by 2020 | SEEA-Water, SEEA-Land |
| | | | Exports of vegetables increase to 710 thousand tonnes in 2020, representing an annual growth rate of 5.0% | SEEA-Water, SEEA-Land |
| | | | Fruit production increase to 2.6 million tonnes by 2020 with an annual growth rate of 3.8% | SEEA-Water, SEEA-Land |
| | | | Coconut production increase to 1.2 million tonnes (1.2 billion pieces) in 2020 with a growth of 8.7%. The increase in production will be achieved through an increase in productivity of 4.8 tonnes per hectare to 15.1 tonnes per hectare | SEEA-Water, SEEA-Land |
| | | Aquaculture | Aquaculture production increase to 790 thousand tonnes the equivalent of 41% of the total demand for fish in 2020. | SEEA-Water, SEEA-Land |
| | | | Wet seaweed production increase to 900 thousand tonnes in 2020 of 19.7% per annum | SEEA-Water, SEEA-Land |
| | | Agro-based Industry | IAT-based food product exports increase to RM53.8 billion in 2020, an increase of 11.8% per annum | SEEA-Water, SEEA-Land |
| | | Agro-tourism | Increase to 6 million tourists in 2020. | SEEA-Water, SEEA-Land |
| | | Contribution to GDP | Contributed RM49.1 billion in GDP by 2020 | SEEA-Water, SEEA-Land |

| Policy Documents | Periods/Year | Themes | Targets | Link to SEEA |
|---|---|---|---|---|
| National Mineral Policy | 2009 | Non-renewable resources | To ensure the sustainable development and optimum utilisation of mineral resources. | SEEA-Energy |
| | | | To promote environmental stewardship that will ensure the nation's mineral resources are developed in an environmentally sound, responsible and sustainable manner. | SEEA-Energy |
| | | | To enhance the nation's mineral sector competitiveness and advancement in the global arena. | SEEA-Energy |
| | | | To ensure the use of local minerals and promote the further development of mineral-based products. | SEEA-Energy |
| | | | To encourage the recovery, recycling and reuse of metals and minerals. | SEEA-Energy |
| National Climate Change Policy | 2009 | Climate change | Mainstreaming climate change through wise management of resources and enhanced environmental conservation resulting in strengthened economic competitiveness and improved quality of life; | SEEA-Energy, SEEA-Water, SEEA-Land |
| | | | Integration of responses into national policies, plans and programmes to strengthen the resilience of development from arising and potential impacts of climate change; and | SEEA-Energy, SEEA-Water, SEEA-Land |
| | | | Strengthening of institutional and implementation capacity to better harness opportunities to reduce negative impacts of climate change. | SEEA-Energy, SEEA-Water, SEEA-Land |

| Policy Documents | Periods/ Year | Themes | Targets | Link to SEEA |
|---|---|---|---|---|
| National Renewable Energy Policy and Action Plan | 2009 | Renewable energy | To increase RE contribution in the national power generation mix; | SEEA-Energy |
| | | | To facilitate the growth of the RE industry; | SEEA-Energy |
| | | | To ensure reasonable RE generation costs; | SEEA-Energy |
| | | | To conserve the environment for future generation; and | SEEA-Energy |
| | | | To enhance awareness on the role and importance of RE. | SEEA Energy |
| | | SMART Target | **Electricity Capacity Mix**: By 2030, total capacity from RE is targeted to reach 3,484 MW or 13% of total peak electricity demand capacity by 2030 | SEEA-Energy |
| | | | **Electricity (Energy) Mix:** By 2030, total electricity mix from RE is targeted to reach 16.5 TWh/year or 10% of total electricity generated. | SEEA-Energy |
| | | | In terms of greenhouse gas emissions, it is calculated that, by 2030, an accumulated 208 TWh of electricity from renewable energy resources would be generated, avoiding 131 million tonnes of $CO_2$ from the power generation sector. | SEEA-Energy |
| National Green Technology Policy | 2009 | Green technology | To minimize growth of energy consumption while enhancing economic development | SEEA-Energy |
| | | | To facilitate the growth of GT industry & enhance its contribution to national economy | SEEA-Energy, SEEA-Water, SEEA-Land |
| | | | To increase national capability and capacity for innovation in GT development & enhance Malaysia's competitiveness in global arena | SEEA-Energy, SEEA-Water, SEEA-Land |
| | | | To ensure sustainable development & conserve environment for future generations | SEEA-Energy, SEEA-Water, SEEA-Land |

| Policy Documents | Periods/ Year | Themes | Targets | Link to SEEA |
|---|---|---|---|---|
| Government Green Procurement Action Plan | 2013-2014 | Greenhouse gas emissions | 40 per cent reduction in per capita greenhouse gas (GHG) emissions by 2020, based on 2005 levels. | SEEA-Energy |
| National Energy Efficiency Action Plan | 2014 | Energy efficiency | The target of Malaysia Energy Efficiency Action Plan is to save electricity and reduce electricity demand growth. | SEEA-Energy |
| | | | To save 50,594 GWh of electricity over the plan period against a business-as-usual (BAU) scenario. | SEEA-Energy |
| | | | Electricity demand growth reduction at the end of the plan is 6.0%. | SEEA-Energy |
| | | | Total capacity saving of 2,268 MW | SEEA-Energy |
| | | | The total reduction of greenhouse gas emission over the plan is projected to be 40 million tonnes CO2 equivalent | SEEA-Energy |
| | | | Total reduction of 96 million tonnes of $CO_2$ equivalent will be achieved over the lifetime of the energy-efficient technologies adopted and adapted from the plan implementation. | SEEA-Energy |
| | | | Monetary saving benefit of RM 14,627 million(value of total electricity saved) | SEEA-Energy |
| | | | Every RM 1 spent on the Malaysia Energy Efficiency Action Plan's programmes will result in RM 1.40 | SEEA-Energy |

| Policy Documents | Periods/ Year | Themes | Targets | Link to SEEA |
|---|---|---|---|---|
| Green City Action Plan | 2014 - 2020 | Renewable energy | Total electrical use per capita (KWh/year) reduced by 20% | SEEA-Energy |
| | | | Percentage of electricity used obtained from renewable energy (RE) sources 20% | SEEA-Energy |
| | | | Average number and length of electrical interruptions per customer per year reduce to zero | SEEA-Energy |
| | | | Number of employees in the renewable energy industries increase by 20% | SEEA-Energy |
| | | Transportation | Km of public transit system per 10,000 people increased by 50% | SEEA-Energy |
| | | | Ridership in public transit per 10,000 people increase by 100% | SEEA-Energy |
| | | | Vehicle kilometer traveled per capita reduce by 20% | SEEA-Energy |
| | | | Transportation injuries/fatalities per 10,000 people reduce by 0% | SEEA-Energy |
| | | | Km of 'safe' bicycle paths per 10,000 people increase by 50% | SEEA-Energy |
| | | | Km of 'safe' pedestrian paths per 10,000 people increase by 50% | SEEA-Energy |
| | | | Total GHG emissions from the transportation sector reduce by 40% | SEEA-Energy |
| | | | 50% Total number of vehicles in the public fleet that are electric, biodiesel or hybrid | SEEA-Energy |

| Policy Documents | Periods/ Year | Themes | Targets | Link to SEEA |
|---|---|---|---|---|
| Green City Action Plan | 2014 - 2020 | Waste | Per capita waste output reduced by 20% | SEEA-Water, SEEA-Land, SEEA-Energy |
| | | | Percentage of population with regular solid waste collection increase to 50% | SEEA-Water, SEEA-Land, SEEA-Energy |
| | | | Percentage of city's solid waste that is recycled (by type) increase by 100% | SEEA-Water, SEEA-Land, SEEA-Energy |
| | | | Total GHG emissions related to solid waste reduced by 40% | SEEA-Water, SEEA-Land, SEEA-Energy |
| | | Forest | Proportion of natural areas (forested, wetlands, etc.) in Melaka minimum of 20% | SEEA-Land |
| | | | Proportion of ecologically sensitive natural areas that are protected increase by 20% | SEEA-Land |
| | | | Quality of connectivity between natural areas (extent of fragmentation) increase by 201% | SEEA-Land |
| | | | Length of formal walking trails for passive recreation in natural areas increase by 20% | SEEA-Land |
| | | | Difference between average air temperature in paved settings compared to average air temperature in green areas at the outskirts of the urban area reduce by 2 dgree | SEEA-Energy |

| Policy Documents | Periods/ Year | Themes | Targets | Link to SEEA |
|---|---|---|---|---|
| Eleventh Malaysia Plan | 2016-2020 | Green growth for sustainability and resilience | Reduction of greenhouse gas emission intensity of GDP - 40% | SEEA-Energy |
| | | | Household recycling rate - 22% | SEEA-Land, SEEA-Water |
| | | | Installed capacity for renewable energy - 2,080 MW | SEEA-Energy |
| | | | Government procurement to be green > 20% | SEEA-Energy |
| | | | Terrestrial and inland water areas gazetted as protected areas - 17% | SEEA-Land, SEEA-Water |
| Second National Physical Plan 2 | 2010-2020 | Spatial development | To rationalise and consolidate the national spatial planning framework supported by key strategic infrastructure for economic efficiency and global competitiveness. | SEEA-Land |
| | | | To optimise utilisation of land and natural resources for sustainable development and biodiversity conservation. | SEEA-Water, SEEA-Land |
| | | | To promote more balanced regional development for national economic integration and social unity. | SEEA-Land |
| | | | To enhance spatial and environmental quality, diversity and safety for a high quality of life and liveability. | SEEA-Land |

| Policy Documents | Periods/ Year | Sectors/Goals | Targets | Link to SEEA |
|---|---|---|---|---|
| Second National Physical Plan 2 | 2010-2020 | Spatial development | To facilitate efficient integrated inter-state connectivity and public common users' space provision for social interaction and sustainable communities in line with the 1Malaysia concept. | SEEA-Land |
| | | Managing natural resources | NPP 1 - The NPP shall serve as the national spatial planning framework in order to achieve an integrated and sustainable land use planning, coordinated with other sectoral policies. | SEEA-Land |
| | | | NPP 6 - Prime Agricultural Areas (PAA) shall be conserved only for agriculture purposes and urban development shall be restricted. | SEEA-Land |
| | | | NPP 16 - High priority shall be given to achieve energy efficient 'compact cities'. | SEEA-Energy |
| | | | NPP 21 - A designated central authority shall be responsible for publishing on a regular basis, information pertaining to land use development. | SEEA-Land |
| | | | NPP 22 - Environmentally Sensitive Areas shall be integrated in the planning and management of land use and natural resources. | SEEA-Land, SEEA-Water |
| | | | NPP 23 - A Central Forest Spine shall be established to form the backbone of the Environmentally Sensitive Area network. | SEEA-Land |
| | | | NPP 25 - Land development in the highlands shall be strictly controlled to safeguard human safety and maintain environmental quality and biodiversity. | SEEA-Land |
| | | | NPP 26 - All surface and ground water resources shall be safeguarded and managed sustainably. | SEEA-Water |

| Policy Documents | Periods/ Year | Themes | Targets | Link to SEEA |
|---|---|---|---|---|
| Second National Physical Plan 2 | 2010-2020 | Managing natural resources | NPP 27 - The spatial planning framework shall incorporate mitigation and adaptation measures against the impacts of climate change. | SEEA-Water, SEEA-Land, SEEA-Energy |
| | | | NPP 35 - Appropriate water supply infrastructure including source works, treatment plants and transmission and distribution networks shall be provided to all settlements. | SEEA-Water |
| | | | NPP 36 - Appropriate sewerage facilities shall be provided for all areas, with adequate collection, treatment and disposal of sewage and sludge. | SEEA-Water |
| | | | NPP 37 - All settlements shall be serviced by an integrated network of solid waste disposal and/or recovery facilities. | SEEA-Water, SEEA-Land |
| | | | NPP 38 - Drainage infrastructure shall be provided in all settlements to eliminate the incidence of major floods, minor floods and pollution. | SEEA-Water |
| | | | NPP 39 - As strategic assets, electricity generation plants, transmission and distribution mains shall be located strategically to provide a reliable and efficient supply of electricity to consumers. | SEEA-Energy |
| | | | NPP 40 - Natural gas processing plants, transmission and distribution pipe networks shall be located to provide a reliable and efficient supply of natural gas to consumers. | SEEA-Energy |

| Policy Documents | Periods/ Year | Themes | Targets | Link to SEEA |
|---|---|---|---|---|
| National Policy Biodiversity | 2015-2025 | Managing biodiversity | Target 4: By 2025, our production forests, agriculture production and fisheries are managed and harvested sustainably. | SEEA-Land |
| | | | Target 6: By 2025, at least 20% of terrestrial areas and inland water, and 10% of coastal and marine areas, are conserved through a representative system of protected areas and other effective area-based conservation measures. | SEEA-Water |
| | | | Target 7: By 2025, vulnerable ecosystems and habitats, particularly limestone hills, forests on ultrabasic soils, wetlands, coral reefs and sea grass beds, are adequately protected and restored. | SEEA-Land |

| Policy Documents | Periods/ Year | Themes | Targets | Link to SEEA |
|---|---|---|---|---|
| National Environment Policy | 2002 | Managing the environment | Exercise respect and care for the environment in accordance with the highest moral and ethical standards. | SSEEA-Water, SEEA-Energy |
| | | | Conserve natural ecosystems to ensure integrity of biodiversity and life support systems. | SEEA-Water, SEEA-Energy |
| | | | Ensure continuous improvement in the productivity and quality of the environment while pursuing economic growth and human development objectives. | SEEA-Water, SEEA-Energy |
| | | | Manage natural resource utilization to sustain the resource base and prevent degradation of the environment. | SEEA-Water, SEEA-Energy |
| | | | Integrate environmental dimensions in the planning and implementation of the policies, objectives and mandates of all sectors to protect the environment. | SEEA-Water, SEEA-Energy |
| | | | Strengthen the role of the private sector in environmental protection and management. | SEEA-Water, SEEA-Energy |
| | | | Ensure the highest commitment to environmental protection and accountability by all decision-makers in the public and private sectors, resource users, non-governmental organisations and the general public, in formulating, planning and implementing their activities. | SEEA-Water, SEEA-Energy |

| Policy Documents | Periods/Year | Sectors/Goals | Targets | Link to SEEA |
|---|---|---|---|---|
| Strategic Solid Waste Management | 2005-2020 | Waste management | Reduce waste through the effective management of resources at the levels of raw materials utilisation, production, distribution, marketing and consumption | SEEA-Energy, SEEA-Land |
| | | | Re-use products and materials | SEEA-Land, SEEA-Energy |
| | | | Recover reusable elements of the waste such as paper, plastic, glass and metals through source separation and separate waste collection, and materials recovery at materials recovery facilities | SEEA-Land |
| | | | Intermediate treatment of the waste in order to reduce the waste amount, and further recover the value of the waste through composting or waste to energy | SEEA-Energy, SEEA-Land |
| | | | The disposal by sanitary landfill of the residual waste | SEEA-Land, SEEA-Water |
| | | Improving services | Extend collection service (75% to 90%) by 2020 | SEEA-Land |
| | | | Reduction and recovery (3-4% to 17%) by 2020 | SEEA-Land |
| | | | Closure of dump sites (112 sites to 100%) by 2020 | SEEA-Land, SEEA-Water |
| | | | Source separation in the urban areas (None to 100%) by 2020 | SEEA-Land |

| Policy Documents | Periods/Year | Sectors/Goals | Targets | Link to SEEA |
|---|---|---|---|---|
| National Urbanization Policy | 2020 | Objectives | To develop a planned, quality, progressive and sustainable city; | SEEA Land, SEEA Water |
| | | | To develop and strengthen a competitive urban economy; | SEEA Land, SEEA Water |
| | | | To create a conducive environment in order to encourage social development; | SEEA Land, SEEA Water |
| | | | To eradicate urban poverty; | SEEA Land, SEEA Water |
| | | | To strengthen the planning, implementation and monitoring system; | SEEA Land, SEEA Water |
| | | | To strengthen urban management and administrative institutions | SEEA Land, SEEA Water |
| My Beautiful Neighbourhood (MyBN) | 2002-2020 | Objectives | To create a condusive environment for the public housing | SEEA Land, SEEA Water |
| | | | To create a safe, clean and beauty environment for the neighbourhood | SEEA Land, SEEA Water |
| | | | To strengthen the planning, implementation and monitoring system; | SEEA Land, SEEA Water |
| | | | To strengthen neighborhood residents to love the environment | SEEA Land, SEEA Water |
| REDD+ Malaysia | 2010-2020 | Targets | Forestry determines the level and extent of national level mitigation actions to be taken. | SEEA Land |
| | | | Ensures at least 50% of national land mass is forested and intact. | SEEA Land |
| | | | Ensures water supply for both domestic and industrial use. | SEEA Water |
| | | | Ensures soil fertility for crop production. | SEEA Land |
| | | | Community adaptation to climate change. | SEEA Land, SEEA Water |

| Policy Documents | Periods/Year | Sectors/Goals | Targets | Link to SEEA |
|---|---|---|---|---|
| Third National Communications (TNC) and Biennial Update Report (BUR) | 2010-2017 | Objectives | Assist Malaysia in meeting reporting requirements under Article 12 of the United Nations Framework Convention on Climate Change (UNFCCC) and at the same time strengthen the country's capacities for the implementation of climate change reporting activities in a continuous manner | SEEA Energy, SEEA Land, SEEA Water |
| | | | Support Malaysia's Biennial Update Reporting | SEEA Energy, SEEA Land, SEEA Water |
| | | | Strengthen the technical and institutional capacities of Malaysian institutions to implement the Convention | SEEA Energy, SEEA Land, SEEA Water |
| | | | Assist the government to integrating climate change issues into sectorial and national development priorities in a more efficient way | SEEA Energy, SEEA Land, SEEA Water |

# Appendix 7. Alignment between SDGs and SEEA

The following table maps the proposed Sustainable Development Goals (SDGs) with the SEEA accounts.

| Sustainable Development Goals | Descriptions | Indicators informed by SEEA |
|---|---|---|
| Goal 1: No poverty | End poverty in all its forms everywhere | 0/12 |
| Goal 2: Zero hunger | End hunger, achieve food security and improved nutrition and promote sustainable agriculture | 1/14 |
| Goal 3: Good health and well-being | Ensure healthy lives and promote well-being for all at all ages | 0/26 |
| Goal 4: Quality education | Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all | 0/11 |
| Goal 5: Gender equality | Achieve gender equality and empower all women and girls | 0/14 |
| Goal 6: Clean water and sanitation | Ensure availability and sustainable management of water and sanitation for all | 10/11 |
| Goal 7: Affordable and clean energy | Ensure access to affordable, reliable, sustainable and modern energy for all | 4/6 |
| Goal 8: Decent work and economic growth | Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all | 0/17 |
| Goal 9: Industry, innovation and infrastructure | Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation | 1/12 |
| Goal 10: Reduced inequalities | Reduce inequality within and among countries | 0/11 |
| Goal 11: Sustainable cities and communities | Make cities and human settlements inclusive, safe, resilient and sustainable | 5/15 |
| Goal 12: Responsible consumption and production | Ensure sustainable consumption and production patterns | 3/13 |
| Goal 13: Climate change | Take urgent action to combat climate change and its impacts | 0/7 |
| Goal 14: Life below water | Conserve and sustainably use the oceans, seas and marine resources for sustainable development | 0/10 |
| Goal 15: Life on land | Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reserve land degradation and halt biodiversity loss | 8/14 |
| Goal 16: Peace, justice and strong institutions | Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels | 0/23 |
| Goal 17: Partnerships for the goals | Strengthen the means of implementation and revitalize the global partnership for sustainable development | 0/25 |
| Total indicators informed by SEEA | | 32/241 |

# Appendix 8. Mapping between SDGs and SEEA

The following table further details Appendix 7 by providing specific links between Sustainable Development Goals (SDGs) and SEEA. Some indicators can be achieved through development of a specific SEEA module (such as SEEA-Water while some indicators can be derived from the SEEA central framework.

| **GOAL 2** | **ZERO HUNGER** | **POTENTIAL SDGs-SEEA LINKAGES** |
|---|---|---|
| Target 2.4 | By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality. | |
| Indicator 2.4.1 | Proportion of agricultural area under productive and sustainable agriculture | Can be obtained by constructing SEEA-Land |

| GOAL 6 | CLEAN WATER AND SANITATION | POTENTIAL SDGs-SEEA LINKAGES |
|---|---|---|
| Target 6.1 | By 2030, achieve universal and equitable access to safe and affordable drinking water for all | |
| Indicator 6.1.1 | Proportion of population using safely managed drinking water services | Can be derived from SEEA-Water and integrating it with the demographic satellite accounts |
| Target 6.2 | By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations. | |
| Indicator 6.2.1 | Proportion of population using safely managed sanitation services, including a hand-washing facility with soap and water | Can be derived from SEEA-Water and integrating it with the demographic satellite accounts |
| Target 6.3 | By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and increasing recycling and safe reuse by [x] per cent globally. | |
| Indicator 6.3.1 | Proportion of wastewater safely treated | Can be derived from SEEA-Water and integrating it with the demographic satellite accounts |
| Indicator 6.3.2 | Proportion of bodies of water with good ambient water quality | |
| Target 6.4 | By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity. | |
| Indicator 6.4.1 | Change in water-use efficiency over time | Can be derived from SEEA-Water by calculating water intensity per sector/consumption |
| Indicator 6.4.2 | Level of water stress: freshwater withdrawal as a proportion of available freshwater resources | Can be obtained by constructing SEEA-Water |
| Target 6.5 | By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate | |
| Indicator 6.5.1 | Degree of integrated water resources management implementation (0-100) | Can be obtained by constructing SEEA-Water |
| Indicator 6.5.2 | Proportion of transboundary basin area with an operational arrangement for water cooperation | |
| Target 6.6 | By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes. | |
| Indicator 6.6.1 | Change in the extent of water-related ecosystems over time | Can be obtained by integrating SEEA-Water and SEEA-Experimental Ecosystem Accounting |
| Target 6.a | By 2030, expand international cooperation and capacity-building support to developing countries in water- and sanitation-related activities and programs, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies | |
| Indicator 6.a.1 | Amount of water- and sanitation-related official development assistance that is part of a government-coordinated spending plan | Can be obtained by constructing SEEA-Water |

| GOAL 7 | AFFORDABLE AND CLEAN ENERGY | POTENTIAL SDGs-SEEA LINKAGES |
|---|---|---|
| Target 7.1 | By 2030, ensure universal access to affordable, reliable and modern energy services | |
| Indicator 7.1.1 | Proportion of population with access to electricity | Direct data may be obtained from official statistics. This indicator is more accurate and integrated if it is derived from SEEA. |
| Indicator 7.1.2 | Proportion of population with primary reliance on clean fuels and technology | |
| Target 7.2 | By 2030, increase substantially the share of renewable energy in the global energy mix | |
| Indicator 7.2.1 | Renewable energy share in the total final energy consumption | Direct data may be obtained from official statistics. This indicator is more accurate and integrated if it is derived from SEEA. |
| Target 7.3 | By 2030, double the global rate of improvement in energy efficiency | |
| Indicator 7.3.1 | Energy intensity measured in terms of primary energy and GDP | Direct data may be obtained from official statistics. This indicator is more accurate and integrated if it is derived from SEEA. |
| **GOAL 9** | **INDUSTRY, INNOVATION AND INFRASTRUCTURE** | **POTENTIAL SDGs-SEEA LINKAGES** |
| Target 9.4 | By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities | |
| Indicator 9.4.1 | CO2 emission per unit of value added | Can be derived from SEEA-Energy |
| **GOAL 11** | **SUSTAINABLE CITIES AND COMMUNITIES** | **POTENTIAL SDGs-SEEA LINKAGES** |
| Target 11.1 | By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums | |
| Indicator 11.1.1 | Proportion of urban population living in slums, informal settlements or inadequate housing | Can be derived from SEEA-Land Use. It must be integrated with demographic satellite accounts |
| Target 11.3 | By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries | |
| Indicator 11.3.1 | Ratio of land consumption rate to population growth rate | Can be derived from SEEA-Land Use. It must be integrated with demographic satellite accounts |
| Target 11.6: | By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management | |
| Indicator 11.6.1 | Proportion of urban solid waste regularly collected and with adequate final discharge out of total urban solid waste generated, by cities | Can be derived from SEEA-Land Use |
| Indicator 11.6.2 | Annual mean levels of fine particulate matter (e.g. PM2.5 and PM10) in cities (population weighted) | Can be derived from SEEA-Energy |
| Target 11.a | Support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning | |
| Indicator 11.a.1 | Proportion of population living in cities that implement urban and regional development plans integrating population projections and resource needs, by size of city | Can be derived from SEEA-Land Use. It must be integrated with demographic satellite accounts |

| GOAL 12 | ENSURE SUSTAINABLE CONSUMPTION AND PRODUCTION PATTERNS | POTENTIAL SDGs-SEEA LINKAGES |
|---|---|---|
| Target 12.4 | By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment | |
| Indicator 12.4.2 | Hazardous waste generated per capita and proportion of hazardous waste treated, by type of treatment | Can be derived from SEEA-Land Use and SEEA-Energy |
| Target 12.5 | By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse | |
| Indicator 12.5.1 | National recycling rate, tons of material recycled | Can be derived from SEEA-Energy and SEEA-Land Use |
| Target 12.c | Rationalize inefficient fossil-fuel subsidies that encourage wasteful consumption by removing market distortions, in accordance with national circumstances, including by restructuring taxation and phasing out those harmful subsidies, where they exist, to reflect their environmental impacts, taking fully into account their specific needs and conditions of developing countries and minimizing the possible adverse impacts on their development in a manner that protects the poor and the affected communities | |
| Indicator 12.c.1 | Amount of fossil-fuel subsidies per unit of GDP (production and consumption) and as a proportion of total national expenditure on fossil fuels | Can be derived from SEEA-Energy |

| GOAL 15 | LIFE ON LAND | POTENTIAL SDGs-SEEA LINKAGES |
|---|---|---|
| Target 15.1 | By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements | |
| Indicator 15.1.1 | Forest area as a proportion of total land area | Can be derived from SEEA for land-use. |
| Indicator 15.1.2 | Proportion of important sites for terrestrial and freshwater biodiversity that are covered by protected areas, by ecosystem type | Can be obtained by constructing SEEA-Experimental Ecosystem Accounting |
| Target 15.2 | By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase a forestation and reforestation globally | |
| Indicator 15.2.1 | Progress towards sustainable forest management | Can be measured from SEEA for land-use. |
| Target 15.3 | By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land-degradation-neutral world | |
| Indicator 15.3.1 | Proportion of land that is degraded over total land area | Can be measured from SEEA for land-use. |
| Target 15.4 | By 2030, ensure the conservation of mountain ecosystems, including their biodiversity, in order to enhance their capacity to provide benefits that are essential for sustainable development | |
| Indicator 15.4.1 | Coverage by protected areas of important sites for mountain biodiversity | Can be obtained by constructing SEEA-Experimental Ecosystem Accounting |
| Indicator 15.4.2 | Mountain Green Cover Index | |
| Target 15.5 | Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity, and, by 2020, protect and prevent the extinction of threatened species | |
| Indicator 15.5.1 | Red List Index | Can be measured by constructing SEEA-Experimental Ecosystem Accounting |
| Target 15.9 | By 2020, integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts | |
| Indicator 15.9.1 | Progress towards national targets established in accordance with Aichi Biodiversity Target 2 of the Strategic Plan for Biodiversity 2011-2020 | Can be measured by constructing SEEA-Experimental Ecosystem Accounting |

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